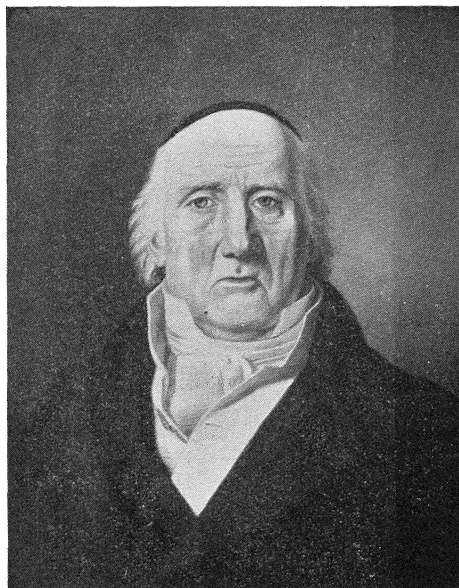


ENTOMOLOGISKE MEDDELELSER

UDGIVNE AF
ENTOMOLOGISK FORENING
KØBENHAVN



M. Th. Brünnich 1737—1823

XXVII BIND

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Ialt 89 for Faunaen nye Arter.

Berichtigung.

In Band 26, 1954, S. 609 (Abhandlung von H. Schmitz S. J.: Nachtrag zu den Bemerkungen über W. Lundbecks dänische Phoriden) Zeile 3 von unten bitten wir das Wort *nicht* zu streichen, das entgegen der Absicht des Verfassers und der Schriftleitung eingedrungen ist.

Symphyla and Pauropoda from Denmark

by

Ulf Scheller

Södertälje, Sweden.

The preparation of this paper has been undertaken in the belief that it will fill an actual deficiency in the Danish faunistic literature and on the other hand also promote the further investigation of these interesting groups of Myriapoda in this area. It will show that the present data are insufficient and that additional studies are needed. Our knowledge of the occurrence has up to date been restricted to what the well-known monographs by the late Dr. H. J. Hansen tell us. The first one, an excellent systematic study of the Pauropoda, was published in 1902 and the second, a corresponding study of the Symphyla, in 1903. Only brief data of the occurrence of the species up to that time were mentioned there.

According to the present observations these Myriapoda seem to be very scanty distributed here, but further collecting will result in the discovery of a great number of new localities for most of the species mentioned below. The number of species will also probably increase, but not much. Every zoologist studying the soil fauna may find both Symphyla and Pauropoda in many places, if he only looks for them. They are not as uncommon as the number of localities hitherto known indicates. The distribution within Denmark is unfortunately very incompletely known and a more detailed knowledge of it is of an obvious interest. As those who study these myriapods are highly interested in new finds from all parts of the world new Danish localities are of great value. Especially to a zoologist dealing with Scandinavian zoogeographical and ecological problems the Danish occurrence must be very important.

The following is a list of the hitherto known species of Symphyla and Pauropoda from Denmark and is largely based on not published material which has been accumulated in the collections of the Zoological Museum of Copenhagen. The main part of the samples has been brought together by Dr. S. L. Tuxen, but some other Danish zoologists have also contributed with several

specimens. Among them I will mention H. J. Hansen and C. With. Besides I have studied some samples collected by Mag. Scient. N. Haarløv and Dr. P. Aagaard Poulsen which will be deposited in the collections of the Zoological Museum, Copenhagen. Finally a few own samples are included, all from the Island of Møn, and also a single Pauropod-find¹⁾ belonging to the Zoological Museum of the University of Lund. My own collection will be deposited in the latter museum.

Four species of Symphyla, representing 2 families and 4 genera, have been found up to date. In this paper one of them is reported from this area for the first time. Of the Pauropoda we now know 13 forms belonging to 2 families and 4 genera. Eight of them are announced here for the first time for Denmark, 6 species and 2 varieties of already known species. One of the two varieties is new to science and very likely one of the other species as well.

Symphyla.

The first records of Danish Symphyla occur in Hansen's monograph of this order in 1903 (Quart. Journ. Micr. Sci. n.s. 47:1, pp. 1—101, Pl. 1—7), where he announces three species: *Symphylella vulgaris* (called *Scolopendrella v.*), *Scutigerella immaculata* and *Hanseniella caldaria* (called *Scutigerella c.*). To this list we can now add *Symphylellopsis subnuda*, described by Hansen but not found by him in Denmark. It is a minute symphylellid species looking much of a *Symphylella vulgaris*.

In spite of the scarce material from most of the area, certain preliminary facts about the distribution may be pointed out. Of the four species *Symphylella vulgaris* and *Scutigerella immaculata* seem to be the most common. In the future they will be discovered in many further

¹⁾ Møn, Maglevands Fald, 15/7 1905, leg. With.

localities, probably all over the country where suitable biotopes occur. *Symphylellopsis subnuda* is presumedly a common species, too, while *Hanseniella caldaria*, a species with its main distribution on the southern hemisphere, has been introduced and is, I think, very uncommon here. It is known from several places in Europe, but only from hothouses and Botanical Gardens, while it is an inhabitant of natural biotopes in New Zealand, South America and Africa.

Fam. ***Scolopendrellidae***.

Gen. ***Symphylella*** Silvestri.

1. ***Symphylella vulgaris*** (Hansen 1903).

Jylland. Horsens Fjord, Vorsø: Vesterskov, under high ashes, $21/6$ 1932, 1 juv 10 ad¹); Vestermærk, under high grass, $22/6$ 1932, 2 juv 11, 4 juv 10, 1 juv 9; Østre Remise, $23/6$ 1932, 3 ad, 1 juv 11, 1 juv 9; Vesterskov, spruce forest, $27/9$ 1933, 1 juv 9; Nørremærk, $27/9$ 1933, 1 ad; Vesterskov, $29/9$ 1933, 2 juv 8, leg Tuxen; Vesterskov, under young oaks, $22/9$ 1945, 1 juv 10, 1 juv 9, 2 juv 8; Østre Remise, $24/9$ 1945, 1 ad, 1 juv 9, 1 juv 8; Østermærk, $25/9$ 1945, 1 juv 10; Østermærk, $10/6$ 1946, 1 ad; without exact locality, $15/6$ 1946, 1 ad; without exact locality, $16/6$ 1946, 1 juv 9; without exact locality, $30/9$ 1947, 1 juv 9; without exact locality, $1/10$ 1947, 1 juv 9, leg Knudsen. — Thisted: Østerbakken 43, $10/9$ 1948, 1 ad, 2 juv 9, 1 juv 8; Kronborgvej 47, in a garden, $11/9$ 1948, 1 juv 11, 2 juv 9; in a garden, $12/9$ 1948, 1 juv 10; in a garden, $15/9$ 1948, 1 juv 10, 4 juv 9, 2 juv 8; in a garden, $14/8$ 1949, 1 juv 9, 1 juv 8; in a garden, $15/8$ 1949, 1 juv 8; in a garden, $9/10$ 1949, 1 ad; in a garden, $6/11$ 1949, 1 juv 10, 2 juv 9, leg Tuxen; in a garden, $20/9$ 1953, 2 ad, 2 juv 11, leg Poulsen.

Sjælland. N of Copenhagen, Eremitagesletten: $3/5$ 1942, 1 ad, 1 juv stage?; $25/3$ 1943, 1 juv 10, 1 juv 9, leg Haarløv. — Rudersdal, under moss, $31/10$ 1902, 1 ad, leg ?

Bornholm. Dynddalen, $20/6$ 1906, 1 ad, leg With. — Troldbjærg, $1/7$ 1906, 1 juv stage ?, leg With.

¹) Abbreviations: ad, it is here a specimen with the maximum number of legs; juv..., a juvenile specimen with the number of pairs of legs indicated. These numbers include the rudimentary first pair of legs in *Symphylella*.

Hansen collected several specimens under large flower-pots in the Rosenborg Have in Copenhagen, $16/7$ 1901 (1903, p. 80). This is the only record before the collections enumerated above.

Gen. *Symphylellopsi* Ribaut.

2. *Symphylellopsi subnuda* (Hansen 1903).

Jylland. Horsens Fjord, Vørsø: Vesterdam, under young elms, $22/6$ 1932, 1 juv 9; Vørsø Kalv, $30/9$ 1933, 1 ad; Østerskov, $3/10$ 1933, 4 ad, 1 juv 11, leg Tuxen. — Thisted: Østerbakken 43, in a garden, $10/9$ 1948, 1 juv 10; in a garden, $14/8$ 1949, 1 juv 11, leg Tuxen.

Sjælland. Copenhagen, Eremitagesletten, $14/2$ 1943, 1 juv 10, leg Haarløv. — Knurrevang, $22/5$ 1943, 1 juv 11, 1 juv 8, leg Haarløv.

Fam. *Scutigerellidae*.

Gen. *Scutigerella* Ryder.

3. *Scutigerella immaculata* (Newport 1845).

Jylland. Horsens Fjord, Vørsø: Vesterskov, beech forest, $27/9$ 1933, 1 ad, 1 juv 9, leg Tuxen; Vesterskov, under young oaks, $22/9$ 1945, 1 juv 9; without exact locality, $4/10$ 1947, 1 juv 11; without exact locality, $8/10$ 1947, 1 juv 9; without exact locality, $9/10$ 1947, 1 juv 9, 1 juv 7, leg Knudsen. — Mors, east of Assels, $20/4$ 1942, 1 ad, leg Nielsen. — Thisted: Kronborgvej 47, in a garden, $11/9$ 1948, 2 ad; in a garden, $15/9$ 1948, 2 juv 11, 1 juv 8; in a garden, $9/10$ 1949, 2 juv 8, leg Tuxen; in a garden, $28/9$ 1953, 1 juv 8, leg Poulsen.

Fyn. Western Fyn, Kalør-Holeskov, $19-20/7$ 1891, 1 ad, leg Hansen.

Sjælland. N of Copenhagen: Dyrehaven, $24/5$ 1891, 2 ad and $29/6$ 1891, 3 ad and $27/7$ 1891, 1 ad, leg Hansen; the same locality, under moss on a tree-stump, $4/5$ 1924, 2 ad, leg Hammer; the same locality, $4/6$ and $1/11$ 1924, 2 ad, 1 partly damaged, leg Stephensen; Dyrehaven, Ordrup, $31/8$ 1907, 1 ad, leg ?; Ermelunden, $14/4$ 1902, in moss, 1 ad and $12/10$ 1902, in maple mould, 8 ad, 2 juv 8 and $3/11$ 1902, in maple mould, 1 ad and $30/8$ 1903, in leaves, 2 ad and $10/5$ 1904 1 ad, leg ?; Eremitagesletten, in a grove, $17/5$ 1943, 1 ad and $21/6$ 1943, 1 juv 10 and $19/9$ 1946, 1 juv 9, leg Haarløv. — Damhusmosen, $17/1$ 1934, 1 juv 10, leg Kaiser. — Boserup, $11/9$ 1927, 5 stage?, leg ?. — Farum, $20/4$ 1935, 1 ad, leg Larsson. — Frederiksdal, tree stump, $8/5$ 1902, 1 ad, leg ?. — Ganløse Ore, Ryget Skov, $4/5$ 1930, 1 ad, leg Larsson. — Hillerød, beech forest, under stones,

$\frac{23}{8}$ 1926, 4 ad, leg Hammer. — Lillerød, at Allerød Lake, under board, $\frac{8}{7}$ 1939, 5 ad and at Allerød, $\frac{11}{6}$ 1940, 2 stage?, leg Kryger. — Lyngby, Lyngby Mose, in leaves, $\frac{31}{8}$ 1903, 1 juv 11, leg ?. — Ørholm, $\frac{5}{6}$ 1903, 1 ad, leg ?

Falster. — Nykøbing, date?, 1 ad, leg ?.

Hansen found *S. immaculata* being common in moderately damp places in forests (1903, p. 30), but he gave no exact localities himself. Hammer considers this species as being extremely common in well-shaded, not too dry places and he records it from under stones on shore-meadows as well (1931, pp. 12—13), but he did not publish any locality either.

Gen. *Hanseniella* Bagnall.

4. *Hanseniella caldaria* (Hansen 1903).

Sjælland. Copenhagen: Østerbro, gardener Olsen's Have, in the hothouses, $\frac{5}{8}$ 1891, 6 ad, 2 juv 11, 1 stage?; Frederiksberg Have, in hothouses, $\frac{8}{8}$ 1891, 13 ad, 1 juv 11; Rosenborg Have, in hothouses, $\frac{16}{7}$ 1901, 7 ad, 1 juv 10, leg Hansen.

This species, described by Hansen, has here been found only by him. In his monograph of the Symphyla he gives two localities (1903, p. 37): "In the tan-bark in hothouses in the royal garden, 'Rosenborg Have', Copenhagen, I discovered this species many years ago, and have found it again every time I visited the place. I have also found it in similar bark in a very warm hothouse in the Botanical Garden in Copenhagen." According to the material studied by the present author Hansen also has collected this species in two more hothouses in Copenhagen. It seems as if *H. caldaria* is not too uncommon here, probably a widely distributed hothouse species.

Pauropoda.

Hansen's revision of the Pauropoda in 1902 (Vidensk. Medd. nat. For. Kjøbenhavn, 1902, pp. 323—424, Pl. 1—6) contains the first information about the Danish Pauropo-

poda. Among others he there described three species mainly on material from Denmark: *Allopauropus danicus*, *gracilis* and *vulgaris*. The first and the third he could not find in the material from other parts of the world, but since then the distribution areas have widened. He also gave the first Danish localities for *Stylopauropus pedunculatus* and *Pauropus Huxleyi*, the first discovered of all Pauropoda. In all that was five species. The later finds, especially those by Tuxen, have shown that the pauropod fauna is considerably richer. Eight additional forms are given below: *Stylopauropus pedunculatus* var. *biramosus* n. var., *Pauropus Huxleyi* var. *lanceolatus* and the five *Allopauropus*-species *Cuenoti*, *helveticus* var. *obtusicornis*, *multiplex*, *sabaudianus* and *sequanus*, and finally a member of the genus *Asphaeridiopus*.

Of the species recorded by Hansen, only one, *Allopauropus vulgaris*, seemed to him possibly to be found here and there. Having been thoroughly investigated, also *Allopauropus sequanus* and *Cuenoti* will probably prove to be comparatively common as well as *A. vulgaris*. They will probably be found all over the country where suitable biotopes occur. *A. vulgaris* and *sequanus* are the only two species which have been collected at the four best investigated places: Vørsø, Thisted, the beech forests of the eastern part of the Island of Møn and the Copenhagen district. This points to a common occurrence. From Thisted 8 species are known, from the Island of Møn 6, but only 3 species, *A. vulgaris* and *sequanus* and *Stylopauropus pedunculatus* are found at both places. The distribution of the remaining species is very insufficiently known but they must be regarded as being rather scarce or even very uncommon.

In the list below the species of *Allopauropus*, the only genus with more than one species, are arranged in alphabetical order.

Fam. ***Pauropidae.***Gen. ***Stylopauropus*** Silvestri.1. ***Stylopauropus pedunculatus*** (Lubbock, 1868), type.

Møn. Maglevands Fald, $13/7$ 1905, 1 ad 8¹) (♀), 1 juv 6 and $15/7$ 1905, 1 ad 9 (♀), 2 stage?, leg With; upper part, $18-20/10$ 1949, 6 ad 9 (sex non det.), 7 ad 8 (sex non det.), 3 juv 7, 3 juv 6, 9 juv 5, 3 juv 3; lower part, $18-20/10$ 1949, 1 juv 7, leg Scheller. — Three stations in the eastern part of Store Klinteskov, $18-20/10$ 1949, 1 ad 9 (sex non det.), 1 juv 7, 1 juv 6, leg Scheller. — Sandskredsfald, $13/7$ 1905, 1 ad 8 (♀), 1 stage?, leg With. — Pinkenborg near Pomle, $14/7$ 1905, 1 ad 8 (♀), leg With.

Bornholm. Near Dynddal, under stones, $30/6$ 1906, 3 ad (♀♀), 1 ad 8 (♀), leg With.

The first Danish specimens of this pauropod were discovered by Hansen (1902, p. 345) in July 1891 when he found numerous specimens on the Island of Bornholm. One year later he found several specimens in Store Klinteskov and Maglevands Fald on the Island of Møn.

2. ***Stylopauropus pedunculatus*** (Lubbock 1868)

var. ***hiramosus*** n. var. (Fig. 1).

Jylland. Thisted: in a garden, $15/8$ 1949, 1 juv 6; in a garden, $6/11$ 1949, 1 juv 5, leg Tuxen.

None of these specimens are entirely suitable for a detailed description. The one with 5 pairs of legs is just molting and the older one with 6 pairs of legs is nearly crushed and broken in two pieces.

Pygidium. — The *tergum* overreaches the sternum and is posteriorly produced into a short, blunt triangle. The submedian setae, a_1 , are inserted slightly outside the styli, *st*. The distance between a_1 is nearly equal to their length. a_1 and the intermediate pairs of setae, a_2 , are of about the same length and about $4/5$ of the length of the lateral pair of setae, a_3 . All three pairs of setae

¹) Abbreviations: ad..., an adult specimen with the number of pairs of legs indicated; juv..., a juvenile specimen with the number of pairs of legs indicated.

are tapering with an acute end and covered with a moderate pubescence. *St* are short, their length not so much as $\frac{1}{5}$ of the length of a_1 . They are feebly clavate and are covered with a short delicate pubescence. The distance between *st* are somewhat shorter than the distance between a_1 .

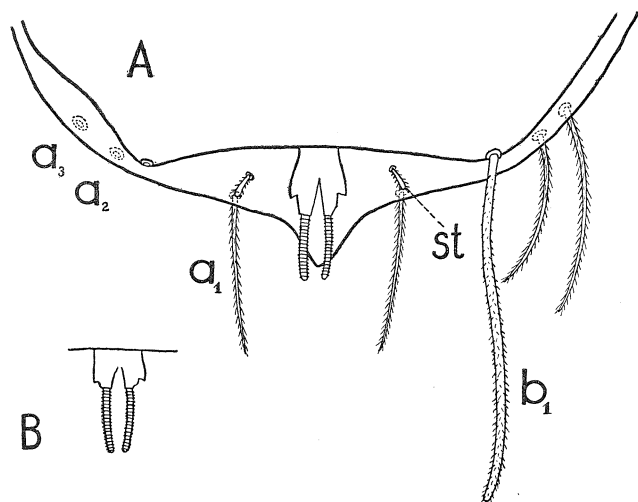


Fig. 1. *Stylopauiropus pedunculatus* Lubbock 1868 var. *bira-mosus* n. var. — A, juv 6, posterior part of the pygidium, ventral view. a_1 , submedian setae; a_2 , intermediate setae; a_3 , lateral setae; b_1 , posterior setae; *st*, styli. — B, anal plate, from the specimen with 5 pairs of legs, ventral view. — $\times 1000$.

Sternum. The posterior pair of setae, b_1 , are cylindrical and moderately pubescent. The distance between them is as long as their length. The lateral pairs of setae, b_2 , have not been studied. The anal plate is as long as it is broad. Posteriorly it is produced into two horizontally placed cylindrical branches which are weakly bent inwards. They are somewhat longer than the plate. Between these branches there is a V-shaped incision in the posterior margin. On the lateral sides of the plate there

are rudimentary processes corresponding to the outer branches occurring in f. *typica*. The plate is naked while the two posterior branches are striated and have a very delicate pubescence.

Affinities.— This pauropod is closely related to var. *brevicornis* which was described in 1935 by Remy (1935 b, pp. 273—275, fig. 2). Thus the outer branches of the anal plate are undeveloped and *st* are short and feebly clavate. However, the distance between a_1 is considerably longer in the here described variety than in var. *brevicornis* where it is only $\frac{3}{5}$ of the length of a_1 . This deviation causes a different relative location of a_1 and *st* in the two varieties. Besides the long submedian branches of the anal plate are striated and straight in var. *biramusus*, while they are bent towards the ventral side and quite glabrous in var. *brevicornis*.

Gen. *Pauropus* Lubbock.

3. *Pauropus Huxleyi* Lubbock 1868, type.

This species was collected in Copenhagen, in the forest Dyrehaven in June and July 1891 by Hansen (1902, p. 359). Hammer (1931, p. 22) contributes with another locality, Møns Klint, on the Island of Møn, but I suppose that this is a find of var. *lanceolatus*, which has been found on Møns Klint (see below). Var. *lanceolatus* was not established at the time of Hammer's publication.

4. *Pauropus Huxleyi* Lubbock 1868

var. *lanceolatus* Remy 1937.

Møn. Maglevands Fald, upper part, $18-20/10$ 1949, 3 ad 9 (♀♀), 2 ad 8 (♀♀), leg Scheller.— Lilleskov, Pomlerende, $9/7$ 1905, 1 ad 9 (♀), leg. With.

Gen. *Allopauropus* Silvestri.

5. *Allopauropus Cuenoti* (Remy 1931).

Jylland. Horsens Fjord, Vorsø: Vestermark, $21/6$ 1932, 1 stage?, leg Tuxen; without exact locality, $15/6$ 1946, 1 ad 8 (♀); without

exact locality, $10/6$ 1946, 1 stage?, leg Knudsen. — Thisted: Kronborgvej 47, in a garden, $11/9$ 1948, 1 juv 6; in a garden, $3/8$ 1949, 1 juv 6; in a garden, $6/10$ 1949, 1 ad 8 (♀); in a garden, $9/10$ 1949, 2 ad 9 (♀♀); in a garden $6/11$ 1949, 3 ad 10 (♀♀), 9 ad 9 (♀♀), leg. Tuxen. — Hillerslev, Præstegaardshaven, $24/7$ 1948, 1 juv 6, 2 juv 5, leg Tuxen.

6. *Allopauropus danicus* (Hansen 1902).

The only record for this species is that of Hansen (1902, p. 378). He found a single specimen in the wood Store Klinteskov on the Island of Møn in July 1892.

7. *Allopauropus gracilis* (Hansen 1902).

Only two specimens are known, both recorded by Hansen (1902, p. 397). One of them was collected by him on the Island of Møn and the second one by Dr. Th. Mortensen at Hellebæk, near Elsinore.

8. *Allopauropus helveticus* (Hansen 1902)

var. *obtusicornis* Remy 1935 a.

Jylland. Thisted: in a garden, $27/7$ 1948, 1 ad 9 (sex?); in a garden, $15/9$ 1948, 1 ad 8 (♀); in a garden, $6/11$ 1949, 1 ad 9 (♀), leg Tuxen.

9. *Allopauropus multiplex* Remy 1936.

Jylland. Thisted, in a garden, $12/8$ 1949, 1 juv 6, leg Tuxen.

10. *Allopauropus sabaudianus* (Remy 1935 a).

Jylland. Thisted, in a garden, $6/11$ 1949, 1 ad 10 (♀), 1 ad 9 (♀), 1 juv 7, leg Tuxen.

11. *Allopauropus sequanus* Remy 1930.

Jylland. Horsens Fjord, Vørsø, $25/9$ 1945, 1 ad 9 (♀) and $10/6$ 1946, 1 juv 5 and $9/10$ 1947, 1 juv 3, leg Knudsen. — Thisted: in a garden, $27/7$ 1948, 1 ad 9 (sex?), 1 ad 8 (sex?); Østerbakken 43, in a garden, $10/9$ 1948, 3 ad 9 (♀♀); Kronborgvej 47, in a garden, $11/9$ 1948, 1 ad 8 (♀), 1 juv 3; in a garden, $3/8$ 1949, 1 ad 8 (♀); in a garden, $5/10$ 1949, 1 ad 9 (♂); in a garden, $9/10$ 1949, 2 ad 10 (♀♀), 7 ad 9 (2 ♂♂, 4 ♀♀, 1 sex?), 1 ad 8 (♀), 1 juv 6, 1 juv 5, 2 juv 3; in a garden, $7/10$ 1949, 1 ad 8 (♀); in a garden, $8/10$ 1949, 1 ad 10 (♀), 7 ad 9 (3 ♂♂, 4 ♀♀), 2 juv 6; in a garden, $9/10$ 1949, 11 ad 9 (6 ♂♂,

5 ♀♀), 2 ad 8 (♀♀), 2 juv 3; in a garden, $\frac{6}{11}$ 1949, 2 ad 10 (♀♀), 14 ad 9 (5 ♂♂, 9 ♀♀), 2 ad 8 (♀♀), 2 juv 6, 1 juv 5, 1 juv 3, leg Tuxen; in a garden, $\frac{20}{9}$ 1953, 1 juv 5, leg Poulsen. — Hillerslev, Præstegaardshaven, $\frac{24}{7}$ 1948, 1 juv 6, leg Tuxen.

Sjælland. Copenhagen, Eremitagesletten, $\frac{12}{4}$ 1942, 1 ad 9 (♀); $\frac{9}{6}$ 1942, 1 ad 9 (♀); $\frac{7}{9}$ 1942, 1 ad 9 (♀), leg Haarløv.

Møn. Store Klinteskov, Lollikebakke, $\frac{18-20}{10}$ 1949, 1 ad 9 (♂), leg Scheller.

12. *Allopauropus vulgaris* (Hansen 1902).

Jylland. Horsens Fjord, Vorsø: Vesterskov, under young oaks, $\frac{22}{9}$ 1945, 1 ad 8 (♀); Østermark, $\frac{25}{9}$ 1945, 1 juv 3; without exact locality, $\frac{30}{9}$ 1947, 2 juv 3; without exact locality, $\frac{1}{10}$ 1947, 1 ad 8 (♀); without exact locality, $\frac{6}{10}$ 1947, 1 ad 8 (♀), 1 juv 3; without exact locality, $\frac{9}{10}$ 1947, 1 juv 3, leg Knudsen. — Thisted: in a garden, $\frac{27}{7}$ 1948, 1 ad 8 (sex?); Østerbakken 43, in a garden, $\frac{10}{9}$ 1948, 2 juv 6; in a garden, $\frac{15}{9}$ 1948, 1 ad 9 (♂); in a garden, $\frac{12}{8}$ 1949, 1 ad 9 (♀); in a garden, $\frac{7}{10}$ 1949, 1 ad 9 (♀), 1 juv 6; in a garden, $\frac{6}{11}$ 1949, 2 ad 9 (♀♀), 1 juv 6, leg Tuxen; in a garden, $\frac{20}{9}$ 1953, 1 ad 9 (sex?), leg Poulsen. — Hillerslev, Præstegaardshaven, $\frac{24}{7}$ 1948, 1 stage?, leg Tuxen.

Sjælland. N of Copenhagen, Eremitagesletten, $\frac{12}{4}$ 1942, 1 ad 9 (♀), leg Haarløv.

Møn. Maglevands Fald: upper part, $\frac{18-20}{10}$ 1949, 5 ad 9 (sex non det.), 1 ad 8 (sex non det.); lower part, $\frac{18-20}{10}$ 1949, 3 ad 9 (sex non det.), leg Scheller. — In the eastern part of the Store Klinteskov, Timmesø Bjærg, $\frac{18-20}{10}$ 1949, 1 juv 6, leg Scheller. — Lilleskov, Pomlerende, $\frac{9}{7}$ 1905, 1 ad 8 (♂), leg With.

Hansen (1902, p. 395) found *A. vulgaris* near Copenhagen, in Dyrehaven in June and July 1891 and again in July 1901 and at Ledreborg on July 31, 1891. He could also prove the occurrence in Store Klinteskov on the Island of Møn in July 1892. According to the same author Dr. Th. Mortensen collected this species at Hellebæk near Elsinore.

Besides these finds of *Allopauropus* there is a sample in the Copenhagen Museum containing one defect fore part of an *Allopauropus*-trunk. It is collected in beech leaves at Jonstrup, on the Island of Sjælland, collector and date are not mentioned on the label.

Fam. *Asphaeridiopidae*.Gen. *Asphaeridiopus* Bagnall.13. *Asphaeridiopus* sp. (Fig. 2—3).

Jylland. Thisted, in a garden, $\frac{5}{10}$ 1949, 1 juv 6, leg Tuxen.

Length. — 0.44 mm.

Head. — The surface of the head is completely free from pubescence, nor has it been possible to discover any pubescence on the setae. These are all thin, cylindrical, feebly annulate and generally long. The shortest of them are the submedian setae in the fourth row which are not half as long as the lateral setae in the same row. The setae in the two frontal rows are somewhat shorter than those of the hind part of the head. The shortest seta in the first, pre-antennal row is $1\frac{1}{4}$ times longer than the submedian setae in the fourth row.

Antennae. — The longest and evenly curved, slender seta on the antero-dorsal surface of the fourth antennal segment, *p*, is $1\frac{1}{3}$ times longer than the length in total of the two distal segments. The second seta of the fourth segment is shorter, about $\frac{3}{4}$ of the length of the mentioned longer seta. It is directed forwards and down. The two antennal branches are subequal in length, the upper branch is scarcely $\frac{1}{10}$ longer than the lower one. They are both cylindrical, the upper all through, while the lower branch is a little thinner towards the base and has a cutting out on the anterior side. The length of the upper branch is $2\frac{3}{4}$ times longer than the breadth, while the lower branch is $2\frac{1}{4}$ times its breadth. On the anterior part of the ventral side of the the lower branch a slightly curved seta, *q*, is inserted. Its length is equal to that of the branch. The flagellum of the upper branch, *F*₁, is $\frac{1}{10}$ longer than the branch and measures $\frac{4}{5}$ of the length of the posterior flagellum of the lower branch, *F*₃. The anterior flagellum of the lower branch, *F*₂, is much shorter than *F*₃ only measur-

ing about $\frac{1}{4}$ of its length. F_2 is much shorter than the lower branch, about $\frac{2}{5}$, while F_3 is noticeably longer than that branch, $\frac{3}{2}$. F_1 and F_3 are both cylindrical and of equal thickness. F_2 is nearly conic-shaped which is due to the decrease of the diameter of the rings towards the apex. The lower branch is distally furnished with

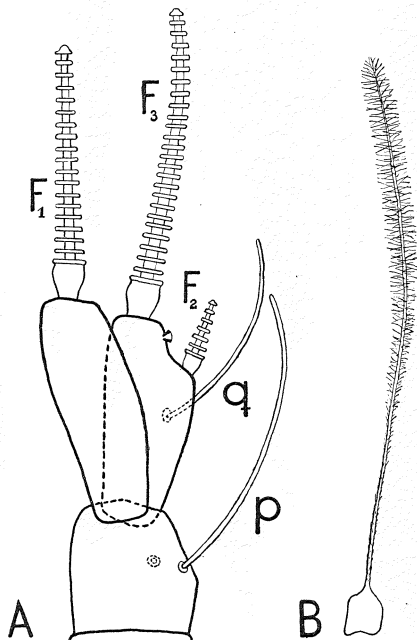


Fig. 2. *Asphaeridiopus* sp., juv 6, Thisted. — A, left antenna, dorsal view. — B, T_3 . — A $\times 1600$, B $\times 930$.

a very minute structure between F_2 and F_3 , nearest the latter. It is smaller than what is known from any other species and is just perceptible ($\times$ ca 1200, oil immersion, n. a. 0.2) and seems to consist of a ring of short diverging rods rising from one point. This organ must correspond to the globulus of other Pauropoda.

Trunk. — The length and the breadth are of medium size. The dorsal shields are nearly glabrous, the

first one being about the breadth of the head. The chaetotaxy here do not show anything remarkable. The length of the submedian pubescence-covered setae of the posterior part of the last shield measures $\frac{7}{10}$ of the distance between them.

Four pairs of tactile setae are developed, T_1 , T_2 , T_3 and T_5 . The first two of them are of the same length, about $\frac{4}{5}$ of T_3 . Along the proximal $\frac{2}{5}$ of T_3 the thin

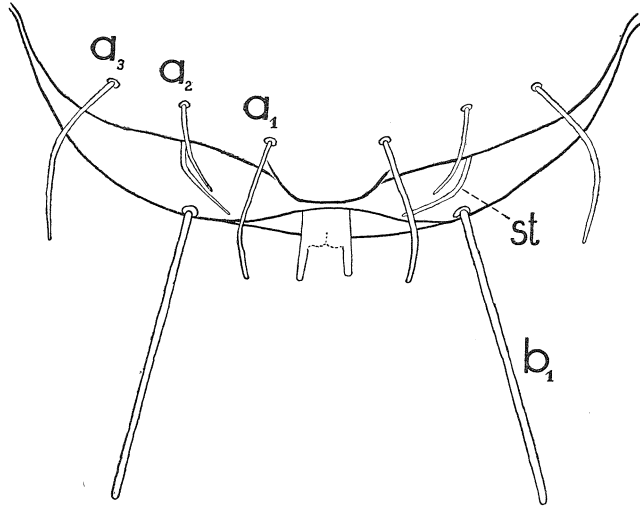


Fig. 3. *Asphaeridiopus* sp., juv 6, Thisted. — Posterior part of the pygidium, dorsal view. For the explanation see fig. 1. — $\times 1600$.

axis has a short outwards slightly increasing pubescence which in the outer part of this region is rather outstanding while towards the base it lies nearer to the axis. On the middle fifth of this tactile seta the pubescence becomes more long and more outstanding. The distal $\frac{2}{5}$ is covered with a right outstanding but delicate hairiness so that this part looks much of a testtube-brush.

Pygidium. — The *tergum* is rounded with a lobe-shaped protuberance projecting backwards and covering

the anal plate. The three pairs of setae, the submedian, a_1 , the intermediate, a_2 , and the lateral, a_3 , are all glabrous and directed backwards. The submedian pair is straight and cylindrical, while the two others are cylindrical but somewhat tapering towards the end. The distance between a_1 is $\frac{8}{10}$ of their length. The length of a_1 exceeds that of a_2 with $\frac{1}{3}$, while its length is $\frac{1}{5}$ below that of a_3 . The location of a_2 is nearly midway between a_1 and a_3 , just a little nearer a_3 than a_1 . The styli, st , are setiform and pointing inward-backwards. They project from the caudo-ventral surface of the sternum just below a_2 and are as long as these, $\frac{1}{3}$ shorter than a_1 . The distance between the basal points of st is three times longer than their length.

The *sternum*, the hind margin of which has two pairs of glabrous setae and the anal plate, is broadly rounded. The posterior pair of the setae, b_1 , is more strongly developed than the remaining setae of the pygidium. They are directed backwards and a little outwards and are somewhat longer than the distance between them. The lateral sternal setae, b_2 , are nearly as long as a_1 . The anal plate consists of a basal almost quadratic mainpart and two appendages from the caudo-lateral corners. The lateral margins of the glabrous plate are straight while the posterior margin is indented by a shallow notch. The two appendages are somewhat shorter than the breadth of the organ and they are cylindrical and naked without any pubescence. The structure of the plate between these processes has not been studied with sufficient accuracy because of foreign particles attached to the hind margin of the plate.

Affinities.—The members of the genus *Asphaeridiopus* are extremely uncommon. The first one, *ashworthi*, was discovered in 1935 by Bagnall (1935, pp. 625—627) near Edinburgh in Scotland, where he found several specimens of different stages. This pauropod was

assigned to the new family and the new genus. No author has since found this species at any other place. Some years later Remy records an *Asphaeridiopus* from a place near Sinaia in Wallachia in Roumania, (1939, pp. 36—40), where two specimens had been found and he described an animal with 8 pairs of legs. This pauropod has later got the name *dacicus* (Remy 1947, p. 4). Remy also gave the third record (1945, pp. 138—139). This time he describes a larva with 6 pairs of legs, which later has been given the name *villosus* (Remy 1947, p. 4). This single specimen was collected at Evisa on the Island of Corsica. Besides these three findings Gisin reports a new species, *trilobatus*, from Switzerland in 1947 (pp. 599—600). Thus this genus, the only of the family, is hitherto known from four countries with the same number of species. It is evident that the locality found by Dr. Tuxen is the fifth in the world for this type of pauropod. It is also the northernmost record we know.

According to the structure of the anal plate the larva from Thisted must be regarded as near related to *ashworthi* and *villosus*. However, in comparison with the descriptions of these species some differences must be noted, but as the material here dealt with is very scarce, it has not been possible to get a complete diagnosis. Bagnall did not figure the anal plate of *ashworthi* but gave a short description (1935, p. 626): "Anal plate small, subquadrate, and furnished with four short and apparently subequal distal processes." The Danish larva has only two distal processes, a character which must be regarded as a very valuable difference. The form of the hind margin of the plates are not accessible to a comparison as Bagnall omitted to describe it on his species. There are also some other characters which separate the Thisted- and the Edinburgh-material. The upper branch of the antenna of the former animal is

not as long as in *ashworthi* and the length of F_1 is shorter than in this species. In *ashworthi* F_1 is two times longer than the upper branch while in the Thisted-animal F_1 is only $1/10$ longer. Among the remaining separating characters it must be noted that F_2 is noticeably longer in *ashworthi* and that the long seta of the lower branch is shorter in this species than in the Thisted-specimen. As stated above *A. sp.* shows a certain degree of similarity to *villosus*, but here, too, there are essential separating features. The general form of the anal plate is probably the same, but they are not identical. The pubescence of the *villosus*-plate has not been found in *A. sp.* and the two distal appendages is here cylindrical and parallel, while they are clavate and feebly bent outwards in *villosus*. It is also worth mentioning that the length of the appendages is greater in *villosus* than in *A. sp.* Further differences are to be found on the antennae and the pygidium. The upper branch is more robust in *villosus*, its length is here of about double the breadth, while this branch is comparatively longer in *A. sp.*, $2^{3/4}$ times longer than broad. The lower branch is a little shorter than the upper branch in *villosus*, while this difference is more marked in *A. sp.* The shortness of F_2 compared with the length of F_1 is larger in *A. sp.* than in *villosus*, while the length of F_3 compared with the length of F_1 is larger in *A. sp.* than in *villosus*. According to the figure of the *villosus*-antenna in Remy's paper (1945, p. 138) the globulus here is well developed, while it is just perceptible in the above described specimen. This must be considered as an important difference. In *villosus* the length of a_1 is equal to the distance between them, but in *A. sp.* a_1 are proportionately longer. The distance between st is only a little longer than the distance between a_1 in *villosus*, while it is $2^{1/2}$ times longer in *A. sp.* Another difference lies in b_1 which is

tapering towards the apex in *villosus* but cylindrical in *A. sp.* Nor is the mutual location of b_1 equal.

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Une nouvelle espèce de Lépidoptère brachyptère de l'île Campbell

par
Pierre E. L. Viette.

Peu d'espèces de Lépidoptères brachyptères, dans les deux sexes, sont connues. Il s'agit, avant tout, d'espèces de petites îles isolées comme *Pringleophaga kerguelensis* Enderl. (*Tineidae*), *Embryonopsis halticella* Eaton (*Yponomeutidae*) des Kerguelen (Viette, 1948) et *Dimorphinotua cunhaensis* Vtt. de Tristan da Cunha (Viette, 1952). On trouvera ici la description d'une nouvelle espèce de l'île Campbell *Euproteodes galathea* n. gen. et n. sp. (*Elachistidae*).

Grace à l'amabilité du Dr. S. L. Tuxen, que je tiens à remercier ici, j'ai eu la possibilité d'étudier les quelques Lépidoptères récoltés, par l'expédition océanographique de la Galathea 1950—52, à l'île Campbell.

Le premier travail sur les Lépidoptères de cette île est celui de Meyrick (1909). Enderlein (1931) ne fait que citer les descriptions originales de Meyrick. Précédant le voyage de la Galathea, une collection de Lépidoptères, avait été faite à Campbell, par le Dr. J. T. Salmon, durant la New Zealand Sub-Antarctic Expedition. Ce dernier m'ayant écrit récemment (lettre du 23-2-1954), ce dont je le remercie, que rien n'était encore publié sur cette collection nous donnons ici la description de la nouvelle espèce brachyptère qui nous a intéressée particulièrement.

***Euproteodes* n. gen. (*Elachistidae*).**

Par rapport à la taille, les antennes sont bien développées, atteignant 4,5 mm de longueur chez l'espèce type; elles sont ciliées et présentent une rangée dorsale

d'écailles; le scape, sans pecten, est long, dépassant la longueur de la tête. Les palpes labiaux sont longs, recourbés vers le haut, avec le troisième article pointu à l'apex et dépassant le sommet de la tête; le deuxième et le troisième article sont presque de même longueur, avec le deuxième un peu plus long; ils sont lisses et recouverts d'écailles couchées. Les palpes maxillaires sont indistincts et la trompe est courte et rudimentaire. Les ocelles sont absents ainsi que les chaetosemas.

Les patagias et les tegulae sont peu développés. Les ailes antérieures sont réduites, étroites et allongées. Les principaux troncs des nervures sont simples. Les ailes postérieures sont également réduites et filiformes, à nervation indistincte. Les pattes sont longues, comme chez les autres espèces aux deux sexes brachyptères; le tibia prothoracique porte une épiphyse tibiale. La formule des éperons est 0,2, 4; ceux-ci sont de longueur inégale et les deux paires du tibia métathoracique sont très près l'une de l'autre; ce tibia est long et aminci dans sa partie terminale.

Les parties tergaux des segments abdominaux montrent des zones rectangulaires et transversales bien sclérifiées tandis que les parties sternales montrent juste une petite zone médiane, triangulaire bien sclérifiée, sauf aux segments abd. 7 et abd. 8 où l'on voit une petite bandelette transversale.

Armure génitale mâle. Le tegumen et l'uncus sont indistincts et confondus; ils portent distalement et latéralement deux grands lobes garnis intérieurement de fortes soies et d'une petite protubérance submarginale. Le vinculum est triangulaire, allongé et pointu à l'apex et renforcé latéralement. Le gnathos est fait d'un lobe oval, médian, porté par un petit pédoncule et recouvert de soies excessivement fines et courtes se recouvrant comme les tuiles d'un toit. Ces soies ne sont visibles qu'à un très fort grossissement. Les valves sont étroites

et allongées, avec une petite pointe à l'apex du bord ventral et une indication de clavus; elles sont intérieurement recouvertes, dans la moitié apicale, de fortes soies. Une sorte de harpe est présente. Le juxta présente, dorsalement, une fente médiane à bords ondulés; sa moitié ventrale est moins bien sclérifiée. Le pénis est long, étroit, légèrement sinueux, un peu élargi dans sa partie antérieure et sans cornuti (fig. 1).

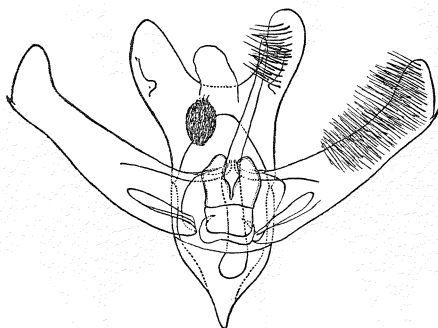


Fig. 1, genitalia ♂ d'*Euproteodes galathea* n. gen. et n. sp. (Holotype).

Espèce type du genre: *Euproteodes galathea* n. sp.

Ce nouveau genre est extrêmement proche du genre *Elachista* Tr. (espèce type: *bifasciella* Tr.) dont il diffère par la présence d'une protubérance interne submarginale aux lobes latéraux et dorsaux et par la présence de la harpe aux valves. Le pénis est également différent par sa forme dans les deux genres.

***Euproteodes galathea* n. sp.**

Envergure 6 mm; longueur des ailes antérieures 2,5 mm.

Les antennes sont gris bronzé. Les palpes labiaux, la tête, les patagias, les tegulae, le thorax et l'abdomen sont blanc jaunâtre; le dessous de l'abdomen est plus jaune. Les pattes sont gris blanchâtre.

Les ailes antérieures et postérieures sont gris blanchâtre, le dessous étant plus foncé.

Armure génitale mâle. Cf. fig. 1.

Holotype ♂. Campbell Is., station L. 409, 31-12-1951 (H. Lemche, Galathea Eksp. 1950—52) "very common in Tussock" (genitalia ♂, prép. P. Viette n° 2852) (Zoologisk Museum, Copenhagen). D'après M. le Dr. Lemche, cette espèce était extrêmement commune et ressemble, sur les plantes, à des petits grains de riz.

Paratypes: 2 ♂ *id. (id.)* — 1 ♂ *id.* (genitalia ♂, prép. P. Viette n° 2846) (Museum national, Paris).

Auteurs cités

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- Meyrick (E.), 1909. — Lepidoptera in The subantarctic Islands of New Zealand, vol. 1, p. 65—74, 1 pl., 23 fig.
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(Laboratoire d'Entomologie, Museum national, Paris).

Genital structures and terminology in the order *Neuroptera*.

By
Bo Tjeder.

The genitalia and the terminal abdominal structures of the *Neuroptera* have been dealt with in many papers but hitherto no account comprising representatives throughout the order seems to have been rendered. Almost all authors have used their own terminology and this fact has caused a great confusion, especially for the taxonomists. When the editor of the "Taxonomists' Glossary of Genitalia in Insects", Dr. S. L. Tuxen, Copenhagen, entrusted me with the task of composing a paper on the *Neuroptera* for the glossary I found it necessary to make a thorough examination of representatives of the genera and families, which were available to me, and this study has shown the necessity of inventing a partly new terminology which I have tried to make neutral and fit for use in papers in any language. As there exist, especially in the ♂ genitalia, from the standpoint of phylogeny obscure, not yet cleared cases, for instance the origin of the structures, named gonarcus and hypandrium internum, I have tried to make the terminology neutral also in this respect.

Some hitherto unknown or undescribed structures have been termed and other structures have in several cases received new, neutral denominations. As an example: the "superior appendages" = "anal plates" = "paraprocts", etc., a pair of pieces of the anal segment, has been termed ectoproct. The old terms have been rejected because the structure is not always appendage-similar, because it is not always plate-like, and because it cannot be true paraprocts (each ectoproct is composed of three fused structures, the anoproctus, the cercus, and the catoproctus, which latter possibly can be identified as the paraproct in the phylogenetic sense of this term). The denomination ectoproct, i. e. a structure bordering the anus from the outside, seems to me to be neutral and suitable for taxonomic purposes.

This paper may be considered as an attempt to elucidate the leading feature in the shape of the genitalia of this order and to apply a terminology, usable for taxonomists. When time and access to material will allow a more extensive examination no doubt also other structures, worthy of special terms may be discovered.

The ♂ genitalia.

The 9th segment is either synscleritous or discle-ritous. In many genera (e. g. in the families *Sisyridae*, *Chrysopidae*, *Myrmeleontidae*, *Ascalaphidae*) the 9th tergite is divided in its dorsal middle-line into a lateral plate on each side of the abdomen. The 9th tergite has in some genera (e. g. *Psectra* and *Annandalia*, fam. *Hemerobiidae*) on each side a backwards directed projection, the latero-processus, *prl* (fig. 1) and has in few cases also a single, median, backwards directed process, the dorsoproces-sus, *prd* (fig. 2) or other dorsal projections or outgrowths (e. g. some *Osmylidae*). The 9th sternite carries in the *Raphidiidae*, the *Inocelliidae*, and the *Coniopterygidae* a pair of gonocoxites, *gx* (fig. 3—4), often reduced or even fused with the 9th sternite. Each gonocoxite carries in the *Raphidiidae* a stylus, *st* (fig. 3) which is one-seg-mented, movably attached to a list or tooth of the gono-coxite. The sternal region of the 9th sternite is in the *Raphidiidae*, in *Polystoechotes* (fam. *Polystoechotidae*), in some *Mantispidae*, and *Chrysopidae* produced posteriorly to form a more or less large plate, the hypovalva, *hyv* (fig. 3). The gonocoxites of most *Coniopterygidae* are fused with one another and form an external hypandrium, *hy* (fig. 5), which frequently has a median apical inci-sion. The apices on each side of this incision are called processus terminales, *tpr*, and frequently there is also on the hind margin of the hypandrium on each side a tooth-like process, called the processus lateralis, *lpr* (fig. 5).

The majority of the Neuroptera have a simple plate- or half-ring-shaped, often elongate 9th sternite, covered from above by the membrane that forms the hind body wall of the lower part of the abdominal end. In many *Chrysopidae* this dorsal membrane of the 9th sternite has a single or a pair of sclerotized plates, carrying strong teeth, which structure is dealt with as the gono-

cristae, *gcr* (fig. 6). In some species of the same family there is an internal arched structure, fused to the under side of the membrane and to the gonocristae and with a central, strong apex extending through the membrane which structure is called the gonapsis, *gap* (fig. 6).

The ♂ genitalia proper are situated in the 9th sternite. The penis, *p*, is generally mostly membranous, sclerotized and distinct only in few genera, e. g. several *Coniopterygidae* (fig. 5) and *Mantispidae*. A kind of penis-filum, *pf*, is present in the *Berothidae* (fig. 7) and some *Mantispidae*, consisting of a single thread-like organ or of several such threads, closely adpressed, separated only at their bases and apices.

A pair of parameres, *pa*¹), is always present or can be traced, cf. fig. 1—5, 7—10, 12—15, arising close to the base of the penis. They are paired, either free or fused. Free parameres have the *Sialidae*, the *Raphidiidae*, the *Inocelliidae*, several *Hemerobiidae*, *Sisyridae*, *Berothidae*, etc. Parameres fused distally are present in *Nemopterella* (fam. *Nemopteridae*), several *Chrysopidae*, and in some *Mantispidae*, in which the apices occasionally are fused into a very long, sharp and narrow distal part, extending far out of the abdominal apex. A median fusion is present in some *Coniopterygidae*. In other genera they are proximally connected, e. g. *Protohermes* (fig. 8) or fused, e. g. many *Hemerobiidae* (fig. 9). In some *Corydalidae* they are wholly fused into a single plate, e. g. *Neochauiodes*. When proximally fused their proximal ends form in some genera an adpressed apophysis proximus, *app* (fig. 9). Apophyses laterales, *apl* (fig. 9) may also be present and frequently each paramere has a dorsal, backwards directed superproces-

1) J. G. Ferris (Microentomology, Vol. 5, 2, 1940) thinks that the parameres (he has examined one species of *Raphidiidae* and two of *Mantispidae*) are lobes of the coxopodite, secondarily cut off, and names them fragmenta of the coxopodite of the 9th sternite.

sus, *spp* (fig. 9, 14). In certain *Coniopterygidae* the parameres have each an immovable apical, upwards directed processus apicalis, *pap*, connected with the main stem of the paramere by means of a sclerotized membrane (fig. 5). In *Osmylops* (fam. *Myiodactylidae*) each paramere is bulbous with a weak dorsal surface in which a very long, dorsally directed process, called the adscensio, *ads* (fig. 10) is movably inserted.

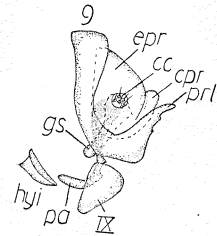
A pair of hypomeres, *hm* (fig. 7) are present in *Spermophorella* (fam. *Berothidae*). They are placed ventrally of the aedeagus and project downwards over the hind margin of the 9th sternite.

Many *Chrysopidae* have a peculiar, tube-like, unpairy organ, the pseudopenis, *psp*, situated centrally between a pair of membranous sacs, from the inner surfaces of which arise a number of setae (fig. 11). In such species the parameres are absent, the pseudopenis apparently being developed from them.

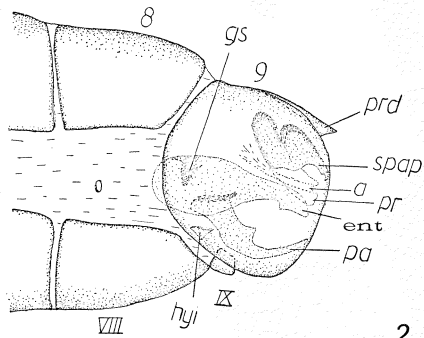
A peculiar organ, the hypandrium internum, *hyi*, or internal hypandrium is present in most families. It is situated below the bases of the parameres and has almost always the shape of the stem of a boat. It is generally a relatively very small and unpigmented structure but in the *Berothidae* (fig. 7) and in some *Myrmeleontidae*, e. g. *Acanthaclisis*, it is a large structure. In the latter genus it is also dark-pigmented.

Another organ which seems common to all male Neu-

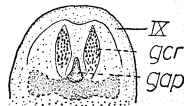
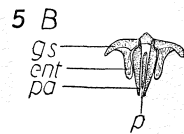
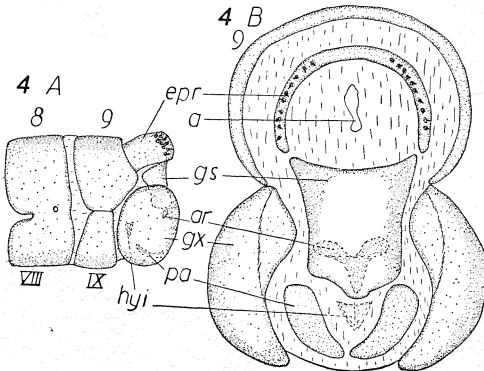
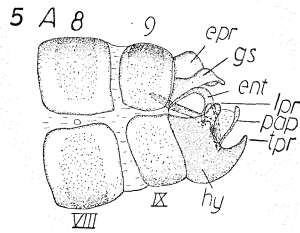
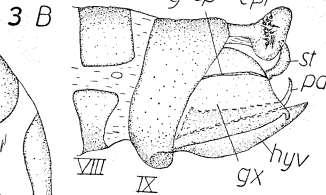
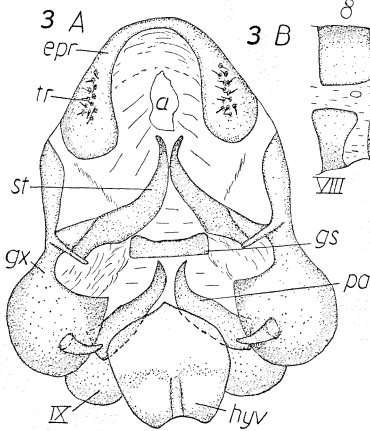
Fig. 1. *Psectra diptera* Burm. ♂ (fam. *Hemerobiidae*), lateral. Hairs not drawn. — Fig. 2. *Dilar burmanus* Tjed. ♂ (fam. *Dilaridae*), lateral. Hairs not drawn. — Fig. 3. *Raphidia notata* F. ♂ (fam. *Raphidiidae*). Hairs not drawn. A, from behind. B, lateral. — Fig. 4. *Inocellia crassicornis* Schumm. ♂ (fam. *Inocelliidae*). Hairs not drawn. A, lateral. B, from behind. — Fig. 5. A. *Coniopteryx borealis* Tjed. ♂ (fam. *Coniopterygidae*), lateral. B. *Coniopteryx tullgreni* Tjed. ♂, gonarcus and aedeagus from behind. Hairs not drawn. — Fig. 6. *Chrysopa sensitiva* Tjed. ♂ (fam. *Chrysopidae*). 9th sternite, dorsal.



1



2

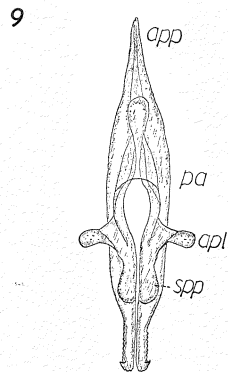
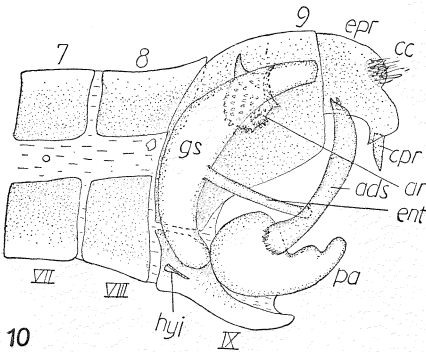
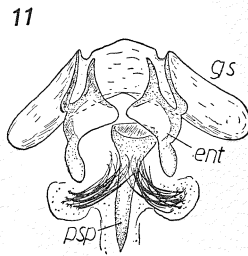
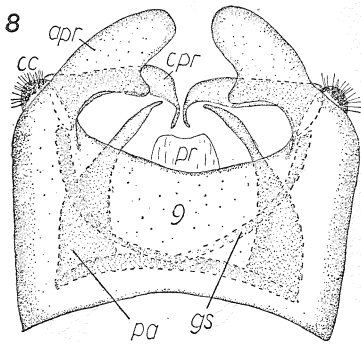
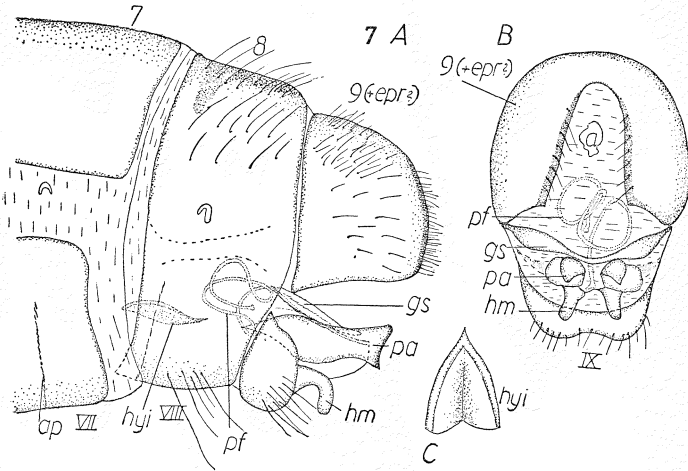


6

roptera is the gonarcus¹), *gs* (fig. 1—8, 10—15). It is situated between the anal segment and the 9th sternite, in some genera very close to the anal segment, e. g. *Sialis*, *Inocellia*, *Nymphes*. Its upper part may in these genera serve as a subanal plate. In *Nymphes* its upper part is hollowed into a furrow for the rectum and the anus opens in a broadened apical excavation of this furrow (fig. 14). In other genera the gonarcus is distinctly median, e. g. *Raphidia* (fig. 3), *Hemerobius*, and *Protohermes* (fig. 8). In others it is situated very closely above the aedeagus (fig. 7) and in others, e. g. many *Myrmeleontidae* it is so fused with the parameres that it forms together with them a central, huge, penis-like organ (fig. 12). The gonarcus thus is very heterogenously developed but may be described as a generally arch-formed structure with its arches directed downwards or inwards. In some *Coniopterygidae* the arch is split in its dorsal middle-line. The median upper part of the organ ends frequently in a backwards directed process, the mediuncus, *mu* (fig. 12—14). The genus *Nymphes* has on the under side of the mediuncus a downwards directed, unpaired but twice forked, immovable process, called the hypocuspis, *hyc* (fig. 14). Some *Sialis* have a pair of weak, tube-like utriculi, *u*, close to the mediuncus (fig. 13). Each arch of the gonarcus may have a

¹) J. G. Ferris (Microentomology, Vol. 5, 2, 1940) considers as a really tenable assumption that this peculiar arch is composed of remainders of the coxopodites of the 9th sternite which are fused over the penis-base.

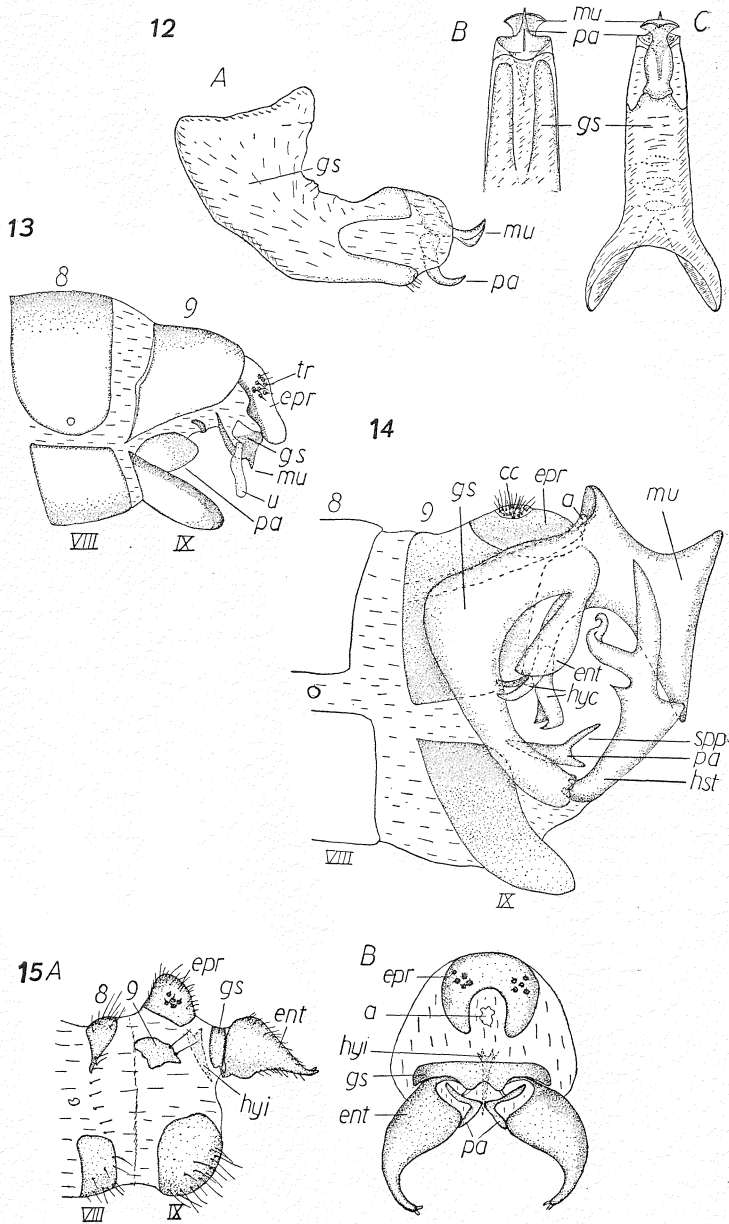
Fig. 7. *Spermophorella maculatissima* Till. ♂ (fam. *Berothidae*). A, lateral. B, from behind. C, hypandrium internum, dorsal. — Fig. 8. *Protohermes xanthodes* Nav. ♂ (fam. *Corydalidae*), dorsal. — Fig. 9. *Neuronema sinensis* Tjed. ♂ (fam. *Hemerobiidae*), parameres, dorsal. — Fig. 10. *Osmylops pallidus* Banks ♂ (fam. *Myiodactylidae*), lateral. Hairs not drawn. Left portion of 7th—9th segments removed. — Fig. 11. *Chrysopa formosa* Br. ♂ (fam. *Chrysopidae*), gonarcus and pseudopenis from behind.



lateral process, the entoprocessus, *ent* (fig. 2, 5, 10, 11, 14, 15). The entoprocessus are very varying in shape and size; either they are narrow simple or forked rods or they are hugely developed as broad, hairy plates (*Polystoechotes*, etc.) or they form a pair of large claspers, dominating the abdominal apex (*Sisyra*) (fig. 15). In some genera there is an additional structure, movably attached below the uppermost part of the gonarcus, which organ is called the arcessus, *ar*, and is of very varying shape in different genera. It may be developed as a plate, as a thin rod-like, sometimes forked structure, or even as a bladder-like, echinate, large organ, e. g. *Osmyllops* (fam. *Myiodactylidae*), cf. fig. 10, or as a pair of movably attached spine-like appendages, e. g. *Hemerobius*. In *Polystoechotes* it is club-shaped and has both spines and long hairs. In *Nymphes* (fam. *Nymphidae*) there is another additional organ, belonging to the gonarcus, movably attached to the lowest part of each arch by means of a real joint, the hypostylus, *hst* (fig. 14). Some *Osmylidae* have on either side of the gonarcus an additional narrow strut, the baculum, the upper end of which fits into a socket of the respective end of the arch.

The anal segment is in primitive *Corydalidae* present as three processes on each hind lateral margin of the 9th tergite, bordering the anus laterally. The uppermost of these processes is denominated the anoproessus, *apr*, the lowermost the catoproessus, *cpr*, while the middle process is the one-segmented cercus, *c*, which bears a number of trichobothria, *tr*. This condition

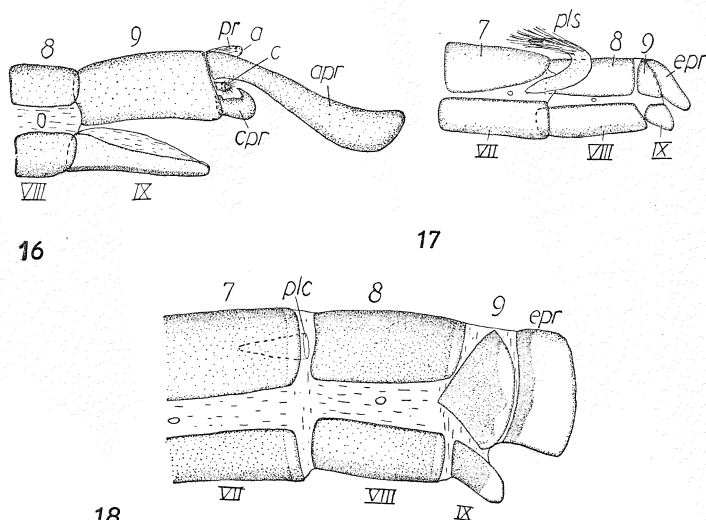
Fig 12. *Cueta* sp. ♂ (fam. *Myrmeleontidae*). Fused, tube-like gonarcus and parameres. A, lateral. B, ventral. C, dorsal. — Fig. 13. *Sialis sordida* Klingst. ♂ (fam. *Sialidae*), lateral. Hairs not drawn. — 14. *Nymphes myrmeleonoides* Leach ♂ (fam. *Nymphidae*), lateral. Hairs not drawn. Left portion of 7th—9th segments and ectoproct removed. — Fig. 15. *Sisyra fuscata* F. ♂ (fam. *Sisyridae*). A, lateral. B, dorsal; hairs not drawn.



of the anal segment is represented in the figured *Platyneuromus soror* (fig. 16). In other *Corydalidae*, e. g. *Protohermes xanthodes* (fig. 8) the anoproct and the cercus are fused and included in the 9th tergite while the catoproct is free. In most Neuroptera, however, the three processes have united into a single lateral plate, here called the ectoproct, *epr* (fig. 1, 3, 4, 5, 10, 13, 14, 15, 17, 18). The cercus is reduced to a callus cerci, *cc*, bearing the trichobothria, or is totally wanting. In some genera there are no traces of a callus but a number of trichobothria are retained (*Sialis*, fig. 13, and *Raphidia*, fig. 3). In the *Raphidiidae* and the *Inocelliidae* these trichobothria are placed in a transverse row, the portion before the row having been identified as the 10th tergite while the portion behind the row has been supposed to be the 11th tergite. In these families and in several others, e. g. the *Sisyridae* (fig. 15), the *Polystoechotidae*, the *Osmylidae*, the *Chrysopidae*, the two ectoprocts are united to form a dorsal half-ring, covering the anus also dorsally. In the *Sialidae* the ectoprocts are frequently a somewhat depressed, transverse plate with the anus opening on its dorsal surface. The ectoproct has frequently two (many *Hemerobiidae*) or one prong, representing the anoproct and the catoproct or either of them. Very often all traces of prongs are absent. Other processes, spines or teeth, occur in many species on the surface of the ectoproct or on the prongs. No traces of the ectoprocts are visible in the genera *Spermophorella* and *Acroberotha* (fam. *Berothidae*), cf. fig. 7. Perhaps the ectoprocts in these genera are fused with the 9th tergite, which is very large and covers the anus dorsally and laterally. The figured species of *Dilar* (fig. 2) has a very differently shaped anal segment. The 9th tergite is huge, covering the anal segment and the genitalia from the sides. No ectoprocts are present and the anal segment consists of a strongly sclerotized and pigmen-

ted supraanale, *spap*, and below this a less strongly sclerotized proctiger, *pr*, through which the anus opens.

It was intended that this paper should deal only with the external genitalia and the terminal abdominal structures. There are, however, in many *Myrmeleontidae*, paired anteapical structures which possibly have a function



16. *Platyneuromus soror* Hag. ♂ (fam. *Corydalidae*), lateral. Hairs, parameres and gonarcus not drawn. — Fig. 17. *Lopezus fedtschenkoi* Mc Lachl. ♂ (fam. *Myrmeleontidae*), lateral. Hairs and internal genitalia not drawn. — Fig. 18. *Grocus inconspicuus* Ramb. ♂ (fam. *Myrmeleontidae*), lateral. Hairs and internal genitalia not drawn.

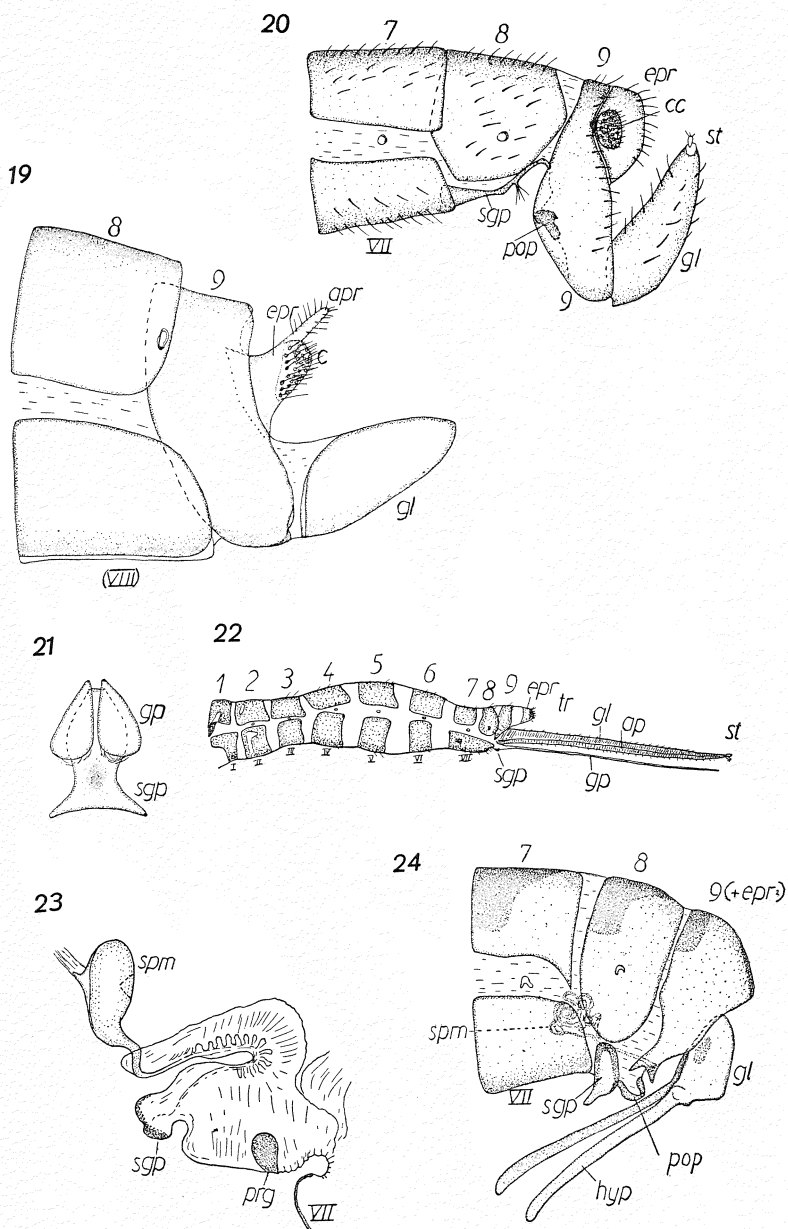
during copulation and which organs I will not omit. In many genera there are thus one or two pairs of pleuritosquamae, *pls* (fig. 17), a kind of intersegmental organs of the 7th or 6th and 7th segments, formed as large hook-like structures, as round plates, or even as ridges, always clothed with long hairs. In other genera, e. g. *Myrmeleon* and *Grocus* there are instead of pleuritosquamae pocket-like, inwards turned, perhaps eversible

organs between the same segments, but they are placed more dorsally, between the tergites. These pockets may be denominated *pleuritocava*, *plc* (fig. 18). It should be noted that they are not homologous with the ever-sible sacs, present on the lateral sides of the 2nd—8th sternites in certain ♂ and ♀ *Coniopterygidae* (subfam. *Aleuropteryginae*). The 7th and 8th tergites of the genus *Annandalia* (fam. *Hemerobiidae*) bear prongs or teeth.

The ♀ genitalia.

The 8th segment frequently consists of a dorsal half-ring, the tergite, with often downwards prolonged sides. A sternite is generally missing but in some *Corydalidae* and *Coniopterygidae* a secondary 8th sternite has been developed. A distinct median longitudinal suture is occasionally present, indicating that the sternite at least in such cases may have been developed from two plates or pieces (?remainders of the gonapophyses anteriores), cf. fig. 19. Below the 8th tergite there is frequently a subgenital plate, subgenitale, *sgp*, cf. fig. 20—25, 28. This plate is of very varying shape in different genera or even different species. It is certainly developed from the gonapophyses anteriores. In many *Myrmeleontidae* the gonapophyses anteriores are present as long, finger-like lateral appendages, projecting considerably downwards, cf. fig. 27. Occasionally there is a second, single or paired plate present, situated proximally to the subgenitale closely behind the distal lower apex of the 7th sternite, for which structure the term *prae-*

Fig. 19. *Protochauliodes cinerascens* Blanch. ♀ (fam. *Corydalidae*), lateral. Hairs not drawn. — Fig. 20. *Porismus strigatus* Burm. ♀ (fam. *Osmylidae*), lateral. — Fig. 21. *Boriomyia baltica* Tjed. ♀ (fam. *Hemerobiidae*). Subgenitale, dorsal. — Fig. 22. *Inocellia crassicornis* Schumm. ♀ (fam. *Inocelliidae*), lateral. — Fig. 23. *Chrysopa septempunctata* Wesm. ♀ (fam. *Chrysopidae*). Praegenitale, subgenitale, and spermatheca, lateral. — Fig. 24. *Spermophorella maculatissima* Till. ♀ (fam. *Berothidae*), lateral. Hairs not drawn.



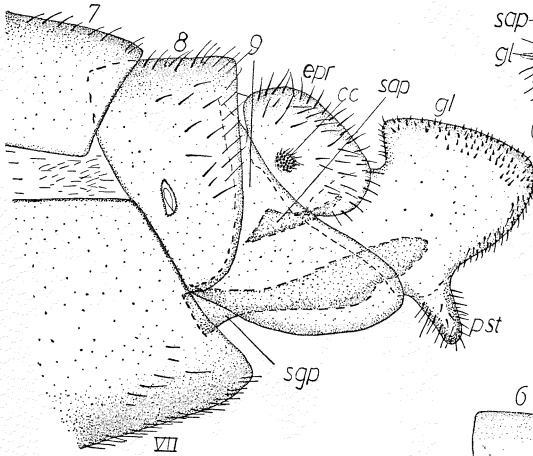
genitale, *prg*, may be used (fig. 23). In some *Myrmeleontidae* the praegenitale has the shape of a small tooth.

The 9th tergite forms a half-ring or is longitudinally split in its dorsal middle-line, in some *Chrysopidae* situated distant from the dorsum and fused with the ectoprocts on their under border, forming a kind of lateral plates. In the *Sisyridae* and the *Ithonidae* (fig. 25) they are almost sternite-similar, reaching the lower surface of the abdomen. The downwards prolonged sides of the tergite have rarely processes or other modifications. In some species of *Micromus* (fam. *Hemerobiidae*) a lateroprocessus is developed; in *Sisyra* there is an apical internal tooth and in the figured species of *Spermophorella* (fam. *Berothidae*) they end in two sharp prongs (fig. 24). In the latter species, however, the 9th tergite forms the dorsal end of the abdomen and is — I think — fused with the ectoproct. If so is the case the prongs may belong to the ectoproct.

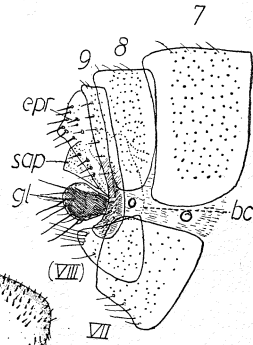
The two gonapophyses-pairs of the 9th sternite are present in some families, most distinctly in the *Raphidiidae* and the *Inocelliidae*, in which they form a long ovipositor (fig. 22). The gonapophyses laterales, *gl*, form the lateral sides of the ovipositor. They are membranously connected dorsally to near the apex and have a longitudinal, ridge-like apodeme, *ap*, giving rigidity to the ovipositor. The gonapophyses posteriores, *gp*, proceed from the membranous structure above the apex of the subgenitale and fuse in their proximal part to a long, narrow process, which runs between the gonapo-

Fig. 25. *Ithone fusca* [Newm. ♀ (fam. *Ithonidae*), lateral. — Fig. 26. *Coniopteryx tineiformis* Curt. ♀ (fam. *Coniopterygidae*), lateral. — Fig. 27. *Lopezus fedtschenkoi* Mc Lachl. ♀ (fam. *Myrmeleontidae*). A, dorsal. B, right gonapophysis posterior, lateral (to show the digging hairs). — Fig. 28. *Acroberotha xiphophora* Tjed. ♀ (fam. *Berothidae*). A, lateral. B, oviduct with ovipilum and spermatheca with glandula accessoria from the right side.

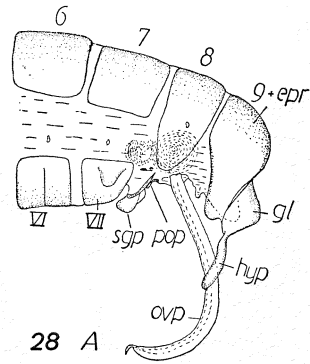
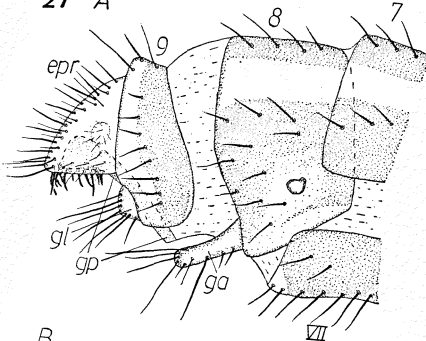
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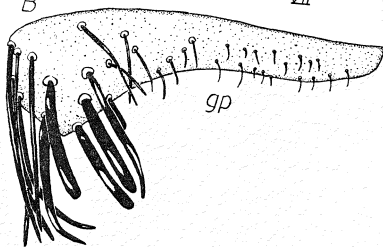


27 A

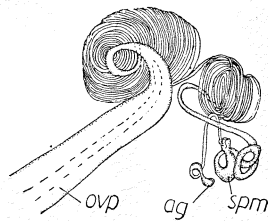


28 A

B



B



physes laterales and reach their apex. The gonapophyses laterales carry each one stylus, *st*.

The gonapophyses laterales form also in the family *Dilaridae* a long ovipositor. The gonapophyses posteriores are in that family short and the gonapophyses laterales are membranously connected also ventrally; the styli are lacking. Also *Symphrosis* and *Plega* (fam. *Mantispidae*) have a long ovipositor and the *Sisyridae* have a short but distinct ovipositor, formed by the gonapophyses laterales; the apodemes are strong and remainders of styles are present between the apices of the gonapophyses laterales in *Sisyra*.

Remainders of the gonapophyses posteriores are often present, situated either at the apex of the subgenitale, behind that plate, or between the bases of the gonapophyses laterales, e. g. many *Hemerobiidae*. In *Boriomyia* (fig. 21) they are membranously connected to the subgenitale. In other *Hemerobiidae* they are often fused into a plate below the 9th tergite or between the proximal ends of the gonapophyses laterales and in the *Osmylidae* they form an occasionally small, occasionally very large plate- or bladder-like organ, often with long prongs or processes. I name the structure in question the postgenital plate or postgenitale, *pop* (fig. 20, 24, 28).

The most common condition of the mentioned gonapophyses pairs is that the gonapophyses posteriores are lacking and the gonapophyses laterales are present as a pair of short or elongate plates, proceeding from the lower hind margin of the 9th sternite. Styli are present in some families or genera (*Sialidae*, *Osmylidae*, many *Corydalidae* and *Hemerobiidae*). The lateral gonapophyses of *Ithone* (fam. *Ithonidae*) have on the under margin each a strongly sclerotized, plug-like process, the pseudostylus, *pst*, for digging purposes (fig. 25). The highly specialized *Berothidae* have from the under margin of each gonapophysis lateralis a slender, finger-like organ,

the hypocausta, *hyp* (fig. 24, 28). Each hypocausta is somewhat movable, the gonapophysis being very weak at the place, where the hypocausta is inserted. The hypocaustae are generally somewhat diverging.

The gonapophyses laterales of the *Coniopterygidae* are frequently placed closely together (in one of the known species fused into a single broad plate) on a weakly sclerotized plate-like structure distally of an internal structure which is possibly a bursa copulatrix, *bc* (fig. 26). A sclerotized bursa copulatrix is also present in the *Sialidae*. Many other Neuroptera have a strongly sclerotized spermatheca, *spm*, very different in shape in the different families. It may have the shape of a long tube (many *Myrmeleontidae*), a long duct, coiled to a ball (*Spermophorella*, fig. 24), a more or less twisted sac (many *Hemerobiidae*), or a round, flattened box with dorsal triangular processes, the vela, *v*, and a ventral impression (many *Chrysopidae*, cf. fig. 23). It may also be twofold and may have paired vesicles (*Raphidia*) or a single glandula accessoria, *ag* (e. g. *Acroberotha*, fam. *Berothidae*, cf. fig. 28).

A very peculiar type of ovipositor is present in the genus *Acroberotha* (fig. 28). In the figured species the very long and beautifully curled oviduct is strongly sclerotized and ends as a dilated, downward projecting, very long, sabre-formed and strong tube. Such a structure may be called the ovipilum, *ovp*.

The anal segment is shaped much as in the male. There is thus an ectoproct, situated laterally on each side of the anus. The primitive Corydalid *Archichauliodes diversus* Walk., from New Zealand, has a long one-segmented cercus, extending from the middle of the ectoproct (figured by D. E. Kimmins, Ann. Mag. Nat. Hist. Vol. II, p. 354, f. 5, 1938). Distinct remainders of the cercus are present also in other *Corydalidae*, e. g. *Protohermes* and *Protochauliodes* (fig. 19). In the last species

a dorsal prong, the anoproductus, *apr*, is very distinct. In other species, e. g. *Protohermes*, also the catoproductus is distinct. Generally, however, the ectoproct is a plate without processes and with or without a callus cerci, *cc*, with trichobothria (fig. 20, 22, 25—27). A subanal plate, subanale, *sap*, is distinct in *Ithone* (fig. 25) and *Coniopteryx* (fig. 26) but else absent or indistinct, being occasionally a small ill-defined sclerotization with some small hairs. No distinct ectoproct is present in the *Berothidae* (fig. 24, 28), presumably being fused and included in the 9th tergite.

List of abbreviations.

<i>a</i> , anus	<i>hyp</i> , hypocauda
<i>ads</i> , adscensio	<i>hyv</i> , hypovalva
<i>ag</i> , glandula accessoria	<i>lpr</i> , processus laterales
<i>ap</i> , apodeme	<i>mu</i> , mediuncus
<i>apl</i> , apophyses laterales	<i>ovp</i> , ovipilum
<i>app</i> , apophysis proximus	<i>p</i> , penis
<i>apr</i> , anoproductus	<i>pa</i> , parameres
<i>ar</i> , arcessus	<i>pap</i> , processus apicalis
<i>ba</i> , baculum	<i>pf</i> , penisfilum
<i>bc</i> , bursa copulatrix	<i>pg</i> , proctiger
<i>c</i> , cercus	<i>plc</i> , pleuritocava
<i>cc</i> , callus cerci	<i>pls</i> , pleuritosquamae
<i>cpr</i> , catoproductus	<i>pop</i> , postgenitale
<i>ent</i> , entoproductus	<i>prd</i> , dorsoproductus
<i>epr</i> , ectoproct	<i>prg</i> , praegenitale
<i>ga</i> , gonapophyses anteriores	<i>prl</i> , lateroproductus
<i>gap</i> , gonapsis	<i>psp</i> , pseudopenis
<i>gcr</i> , gonocristae	<i>pst</i> , pseudostylus
<i>gl</i> , gonapophyses laterales	<i>sap</i> , subanale
<i>gp</i> , gonapophyses posteriores	<i>sgp</i> , subgenitale
<i>gs</i> , gonarcus	<i>spap</i> , supraanale
<i>gx</i> , gonocoxites	<i>spm</i> , spermatheca
<i>hm</i> , hypomeres	<i>spp</i> , superproductus
<i>hst</i> , hypostylus	<i>st</i> , stylus
<i>hy</i> , hypandrium	<i>tpr</i> , processus terminales
<i>hyc</i> , hypocuspis	<i>u</i> , utriculi
<i>hyi</i> , hypandrium internum	<i>v</i> , vela

1—9, 1st—9th tergites. I—IX, 1st—9th sternites. (VIII), secondary 8th sternite.

Ændringer i vor billefauna. 1953 ¹⁾.

Af Victor Hansen.

787. *Lesteva fontinalis* Kies. (D. F. XV. 90) *udgår*, idet den under dette navn opførte art ifølge G.-A. Lohse ikke er *fontinalis* Kies. og nu er beskrevet som *hanseni* G.-A. Lohse, jfr. Ent. Medd. XXVI, p. 587—590.
787. *L. hanseni* G.-A. Lohse. Se lige foran.
- 1101 a. *Quedius pallipes* Lucas (H. R. Last i E. M. M. 1952, p. 148—150). Arten har været sammenblandet med *Q. picipennis* Payk. (D. F. XVI. 142), fra hvilken den bl. a. adskilles ved afvigende formet, længere tilspidset penis og paramer. Arten forekommer både med brunlige og med sorte (var. *secundus* H. R. Last) vingedækker. Den er i Norge fundet nær havkysten på saltholdig bund. Danske eksemplarer foreligger fra Esbjerg og Fanø, juli (F. L. og V. H. leg., V. H. det.).
- 1159 a. *Tachyporus scutellaris* Rye (D. F. XVI. 207). 3 stkr. i høbunker på en grøfteskrænt ved Kværkeby, 7. 9. 52 og 24. 8. 53 (stud. jur. Kornerup leg., samme og V. H. det.).
- 1233 a. *Autalia longicornis* Scheerp. (E. M. M. 1947, p. 104—107; D. F. XVII. 88). Arten har været sammenblandet med *impressa* og er antagelig udbredt som denne (J, Ø, B) (V. H. og tildels H. R. Last det.). Den lever ligesom *impressa* i svampe og forekommer ikke sjældent i selskab med *impressa*. Den kan undertiden være vanskelig at adskille fra *impressa* ved ydre kendetegn, men artsberettigelsen fremgår af afvigende penisform (jfr. D. F. I. c. fig. 71a).
- 1254 a. *Amischa decipiens* Sharp. (D. F. XVII. 124). Arten har antagelig været sammenblandet med *A. analis*, fra hvilken den afviger ved, at 6. frie rygleds bagrand er jævnt og svagt indbuet i hele sin bredde (jfr. D. F. I. c. fig. 84). Eksemplarer (♀♀) foreligger fra Damhusmosen og Dyrehaven, begge steder i kompost i selskab med *analis*, forår og efterår (V. H. leg. og det.).
1265. *Atheta cambrica* Woll. *udgår*, idet de under dette navn opførte fund angår *A. coulsoni* H. R. Last (E. M. M. 1952, p. 263—264 og D. F. XVII. 184) (L. Brundin og V. H. det.).

¹⁾ Jfr. Ent. Medd. XXV, p. 209—211, p. 326—327, p. 405—406 og p. 465—466 samt XXVI, p. 278—279 og p. 502—504.

1265. *A. coulsoni* H. R. Last, se lige foran. Herhen hører også det i Ent. Medd. XXV, p. 210 under *A. longicollis* opførte fund fra Haderslev.
1266. *A. debilicornis* Er. *udgår*, idet de to ved Haderslev og på Ærø fundne eksemplarer har vist sig at være *planifrons* Wat., der er artsforskellig fra *debilicornis* (L. Brundin det.).
1266. *A. planifrons* Wat. (D. F. XVII. 178). Se lige foran.
- 1269 a. *A. longicollis* Muls. et Rey (Ent. Medd. XXV, p. 210) *udgår*, jfr. foran under 1265.
- 1272 a. *A. botildae* L. Brundin (Norsk Ent. T. IX, 1953, p. 1; D. F. XVII. 166). 1 stk. (♂) Hejrengen i Sundby Storskov, sigtet i en fugtig grøft, $\frac{4}{7}$ 1949 (V. H. leg., L. Brundin det.). Dette stykke er typeeksemplar (coll. V. H.).
- 1428 a. *Ocalea rivularis* Mili. (D. F. XVII. 385). Arten har muligvis været sammenblandet med *picata*. Eksemplarer foreligger fra Bygholm, Varnabakken ved Århus og Borre sø (Hg., F. L. og V. H. leg., V. H. det.). Den kan undertiden være vanskelig at adskille fra *picata* ved ydre kendetegn, men artsberettigelsen fremgår af udpræget penisforskel (jfr. l. c. fig. 328 a).
1513. *Bibloplectus minutissimus* Aubé *udgår*, idet de som denne art opførte dyr er *Pseudoplectus perplexus* Jacqu. Duval (K. M. II, p. 792). Arten er hjemmehørende i det vestlige Middelhavsområde, bl. a. Frankrig og Spanien, og dens forekomst hos os måske af tilfældig art.
1513. *Pseudoplectus perplexus* Jacqu. Duval. Se lige foran.
- 2184 a. *Cis fusciclavis* Nyholm (Ent. T. 1953, p. 181—196). Arten har været sammenblandet med *C. fagi*, fra hvilken den bl. a. adskilles ved, at følehornskollen er gulbrun eller brun, ikke som hos *fagi* rødgul. Den foreligger fra Dyrehaven (tildels i selskab med *fagi*) (V. H. leg. og det.).
2488. *Leptura dubia* Scop. *udgår*, idet eksemplaret fra Hørsholm er *inexpectata* Jansson og Sjöberg, og eksemplaret mrk. "Nordsjælland" er *sandoeensis* Palm (Palm det., jfr. Ent. Medd. XXVI, p. 523—524).
2488. *L. inexpectata* Jansson og Sjöberg (Ent. T. 1928, p. 209—213). 1 ♀ mrk. "Hørsholm", jfr. lige foran.
- 2488 a. *L. sandoeensis* Palm (Ent. T. 1953, p. 124—129). 1 ♂ mrk. "Nordsjælland", jfr. lige foran.
-

**Une nouvelle espèce de *Brachygluta*
du Danemark
(Col. Pselaphidae)**

par
Claude Besuchet
Musée zoologique de Lausanne.

***Brachygluta* (s. str.) *hanseni* n. sp.**

Longueur: 1,5 mm. Allongé, brun-noirâtre, les élytres roux, antennes, palpes, pattes bruns. Intermédiaire des palpes maxillaires épais, globuleux, presque aussi large que la base de la massette. Antennes grêles, tous les articles plus longs que larges, sauf le 8 qui est carré; scape et pédicelle un peu plus larges que les articles du funicule; articles 3, 4, 6—8 de même largeur, le 3 une fois et demie aussi long que large, le 4 un peu plus court, le 5 un peu plus large que les articles voisins, une fois et demie aussi long que large; articles 6 et 7 semblables au 4; le 9 un peu plus large que les précédents, légèrement plus long que large, le 10 tronconique, un peu plus long que large; dernier article allongé, ovalaire. Pronotum aussi large que la tête, peu transverse, les côtés longuement sinués en arrière; surface lisse, brillante. Elytres courts, convexes, pas plus larges que longs, les côtés arqués, leur surface légèrement ponctuée. Premier tergite abdominal deux fois plus large que long, un peu atténué en arrière, ses côtés faiblement arqués; ainsi il est moins large en arrière qu'à sa base (fig. 1); carénules basales atteignant le milieu de la longueur du tergite, divergentes, l'espace entre elles égal au tiers de la largeur du tergite. Tibias postérieurs arqués dès leur moitié apicale. Métasternum faiblement impressionné.

Caractères sexuels du mâle. Trochanters antérieurs armés d'une longue épine recourbée en dehors; tibias intermédiaires avec un éperon subapical interne très long, égal au quart de la longueur du tibia (fig. 2). Premier tergite abdominal portant au milieu du bord postérieur une petite impression en forme de V très largement ouvert (fig. 1).

Edéage (fig. 3) court, la capsule basale peu chitinisée. Styles courts, convergents, portant dans leur partie

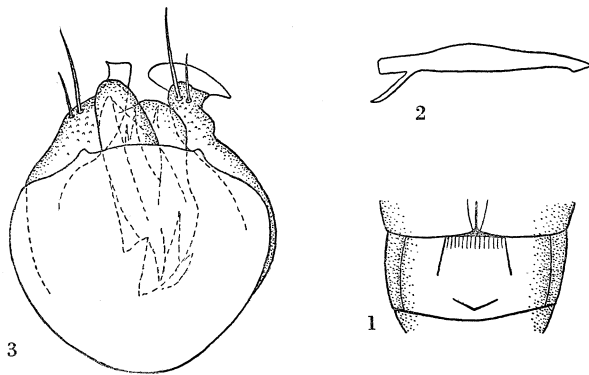


Fig. 1—3. — *Brachygluta hanseni* n. sp. ♂. — 1. premier tergite abdominal. — 2. tibia intermédiaire. — 3. édéage, face dorsale.

apicale deux soies inégales, et terminés par une palette, bien plus grande au style gauche. Sac interne avec une grande et plusieurs petites dents, peu chitinisées.

Femelle inconnue.

Holotype et seul exemplaire connu: 1 ♂, étiqueté "Nordsjælland", dans la collection du Musée zoologique de Copenhague.

Brachygluta hanseni est bien distinct des autres espèces du genre et facile à reconnaître. Par son premier tergite abdominal atténué en arrière, il serait à rapprocher de *B. schüppeli* Aubé, mais de nombreux caractères l'en distinguent, et il est plutôt voisin de *B. helferi* Schm.

dont il a en effet un peu l'aspect. Mais *B. hanseni* est plus svelte, les antennes plus grêles, le premier tergite abdominal atténué en arrière, celui-ci étant chez *B. helferi* légèrement élargi, alors que chez les autres *Brachygluta s. str.*, il est nettement élargi en arrière (*schüppeli* excepté). *B. hanseni* encore différent de *B. helferi* par les caractères sexuels des tibias intermédiaires et du premier tergite abdominal; édéage différent aussi.

M. Dr. Victor Hansen, frappé par l'aspect insolite de ce *Brachygluta* de la collection du Musée zoologique de Copenhague, me l'a communiqué, et c'est avec plaisir que je lui dédie ce Psélaphide. L'espèce m'a paru assez caractérisée pour m'autoriser à la décrire sur ce seul exemplaire.



Ad. S. Jensen

23. Maj 1866—29. August 1953.

Ved Professor Adolf Jensens Død har ogsaa Entomologien mistet en ivrig Dyrker og Entomologisk Forening et mangeaarigt og interesseret Medlem. Ad. Jensen var en Biolog af den gamle Skole, der overalt hvor han befandt sig, *iagttog*. Han havde Evnen til at undres. Paa sine Søndagsture kunde han studse over snart det ene, snart det andet; og med sin gammeldags litterære Viden kunde han erkende Betydningen af det sete og sætte det i Relief. Specielt inden for Entomologien viste denne hans Evne sig til at sætte i Relief, og de maaske ikke altid saa betydningsfulde Iagttagelser fik Format. Ogsaa i sine Foredrag udnyttede han denne Evne, som gav Emnet Bredde og Dybde; i Forening med hans indtagende Lune gjorde den altid hans Foredrag til en Fornøjelse. Ad. Jensen var en stor Pædagog, især for Begynderne. I sine Examinatorier forstod han at lede Delinkventen paa Glatiis, for der-

efter ved et indlysende Ræsonnement at trække ham i Land igen, og Løsningen blev ikke siden glemt. Og beklagede man sin Brøler fik man at vide, at det jo netop var Meningen, Fejlen skulde gøres — for de andres Skyld. Hans berømte Morgen-Examinatorier var lærerige; senere gik han i Erkendelse af sin svigtende Hukommelse over til forberedte Forelæsninger, der ikke havde Examinatoriernes Slagkraft — som i det hele taget Hukommelsens Svigten, der pinte ham selv meget, vanskeliggjorde ham Arbejdet i de senere Aar.

Indtil sit 85. Aar kom Ad. Jensen til at virke og arbejde ved Zoologisk Museum; i sin høje Alder fik han den Ro til Arbejdet, som Administrationen i hans Professortid tog saa megen Tid fra, og daglig tilbragte han mange Timer med Afslutningen af Værket om grønlandske Fisk, som han allerede ved Aarhundredskiftet satte sig som Maal, og som det lykkedes ham at bringe til Ende. Dette Værk, eller vel navnlig dets Forstudier, er vel det der længst vil bevare hans Navn inden for Videnskaben, ligesom hans dertil knyttede praktiske Arbejde for de grønlandske Fiskerier længst vil bevare hans Minde blandt Menigmand. Det ledede ham via et Arbejde om Grønlands Fauna over til Studier over de senere Tiaars Klimaforbedring i arktiske og subarktiske Egne.

For Entomologisk Forening interesserede han sig fra han blev Professor, og han var meget imødekommende over for Ønsker fra Foreningens Side, som han kunde opfylde, selvom han ikke var en hyppig Gæst; for Amatør-Entomologerne interesserede han sig fra han 1913 blev Redaktør af "Danmarks Fauna", idet han havde en fuld Forstaaelse af deres Betydning for den danske Faunistik, som ogsaa "Danmarks Fauna" bærer Vidne om. Allerede i sine unge Aar skrev han en acarologisk Afhandling, inspireret af R. S. Bergh, og han kom senere atter ind paa Miderne i Forbindelse med et stort Husmideangreb, som i Aarene 1905—07 hjemsøgte København, og hvor han blev den, der maatte søge at imødegaa det. Ellers er hans faa andre entomologiske Arbejder Resultatet af Søndagstur-Iagttagelser og de biologiske Undersøgelser, disse trak med sig, som Afhandlingen om "det nøjsomme Møl", hvor han fik Lejlighed til at hylde O. F. Müller, og Afhandlingerne om *Carpocapsa grossana* og om *Chermes-Galler* og Egern — eller litterære, som Artiklen om Jødernes Manna.

I sine første Aar paa Museet var han kun beskæftiget med Samlingerne af Slinger, Fisk og Mollusker; men fra han 1917 blev Professor og Formand i Museumsraadet maatte han varetage hele Museets Interesser, et Hverv der var ham byrdefuldt, men som han udførte med stor Pligttroskab. Man kan sige om ham, at han med Roden i det XIX. Aarhundredes Zoologi bragte Museet ud af dets

Afhængighed deraf. I hans Tid blev en Del praktiske Anordninger indført paa Museet, i hans Tid paabegyndtes Opstillingen af de biologiske Grupper, i hans Tid begyndtes Udtyndingen af de kolossale Masseopstillinger for Publikum, med andre Ord Udskillelsen af en særlig Publikumssamling. Og selv om det ikke altid var paa hans Initiativ, saa var det med hans Billigelse. I sin Sans derimod for det rene Museumsarbejde, for Etikettering o. lgn., bevarede han det bedste af det XIX. Aarhundredes Traditioner; Samlingerne var "hans", og hans var Ansaret for alt, hvad der skete med dem.

For sine mange Elever viste Ad. Jensen en stor og levende Deltagelse, og han var som Lærer meget afholdt. Han var ingen kold og nøgtern Bedømmer, han kunde være ubillig, hvor Sympatien manglede, og han kunde gaa voldsomt ind for en Sag eller en Person, der interesserede ham; men hans Interesse var altid uselvisk, han havde fra de tidligste Aar været vant til Nøjsomhed og ønskede lidet for sig selv, kunde ogsaa lejlighedsvis være for beskeden i hvad han ønskede til andre; men han følte meget varmt, og han satte hele sin Personlighed ind for den Sag, han ønskede fremmet. Faa har som han identificeret sig med den eller det, han ønskede at opnaa noget for, og den Pondus, han navnlig med Aarene erhvervede sig, gav hans Udsagn Vægt. Sit Blik over Brillerne, der kunde fyldes af Ironi, men som ogsaa kunde lyne, der kunde lyse sarkastisk, ogsaa med Selvironi, og som kunde rumme et Lune og en varmende Menneskelighed, bevarede han til sine seneste Aar; og vi, der saa at sige er voxet op under dette Blik over Brillerne, vil altid i taknemmelig Erindring bevare Mindet om Øjnene bagved og om deres menneskelige Forstaaelse. S. L. Tuxen.

Fotografiet er taget til Berl. Tid. af A. Moe i Maj 1951 og venligst tilladt reproduceret af "Nordisk Pressefoto A/S".

Ad. S. Jensens entomologiske Publikationer.¹⁾

- 1895. En Tryglyphide i Hesteiglens Ægkapsel. Vid. Med. Nat. For. 1895 p. 72—104, Tab. I—II.
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- 1947. *Chermes abietis*-Galler og Egern. Vid. Medd. Nat. For. 110 p. 221—32.
- 1948. *Chermes abietis* galls and squirrels. Vid. Selsk. Biol. Medd. XX 13, 15 pp.

¹⁾ foruden entomologiske Oplysninger i hans to Afhandlinger om Grønlands Fauna 1928.

Anmeldelser.

János Balogh: *A zoocönológia alapjai. Grundzüge der Zoözönologie.* Budapest (Akad. Kiadó) 1953. 8°. 248 pp.

Coenologi er ikke Økologi, men det kan være et nyttigt Grundlag derfor, et Fingerpeg. Coenologien giver et talmæssigt Udtryk for Dyre- (eller Plante-) Bestanden paa Lokaltetstyper; man kan opfatte disse Typer videre eller snævrere, man kan indsamle Dyrene paa mange Maader, og man kan behandle de fundne Tal ud fra talløse Synspunkter. Følgen er, at der er lavet umaadelig mange Begreber inden for Coenologien og præget utallige Ord derfor. Balogh i sin Bog forøger disse Ord og Begreber ikke uvæsentligt; men det særlige er, at han gør det i fuld Klarhed over de allerede forhaandenværende, og han søger paa en særdeles klar og kritisk Maade at definere baade alle Ord, der er brugt, og de nye, han skaber og indfører i dette System. I denne kritiske Sammenhæng inddrager han ogsaa den fortvivlede Phyto-Coenologi, hvor to Skoler har bekriget hinanden, og skiller, som det synes Anm., Sol og Vind lige, for ud af Kaos at skabe Liv. Coenologi er tør og statistisk; det maa aldrig glemmes, at den først og fremmest er Udtryk for Liv. Til Trods for, at Baloghs Bog er meget tør og meget skematisk opstillet, mærker man dog, at han stadig ved, det er levende Væsener han taler om.

Bogen er delt i en ungarsk Del og en tysk Del. Teksten er ens i begge Dele, men Figurerne, som der dog kun er faa af, og Skemaerne, findes kun i den ungarske Del. I fire Hovedafsnit er den inddelt: biocoenologiske Enheder, Zoocoenosernes Analyse, Produktionsbiologi, og Metoder i Marken. Hvert Afsnit er igen delt i mange smaa, med koncise Overskrifter og et Hav af Definitioner. Mange af disse Afsnit er yderst kortfattede, som man i det hele mærker, at Bogen ikke har maattet blive for stor; i talrige Tilfælde havde Exempler gjort Teksten langt lettere tilgængelig, ligesom ogsaa flere Billeder og Kurver. Særlig knap er desværre Kapitellet om Jordbundsprøver og deres Metodik, hvor en Del Oplysninger og Vejledninger savnes. Yderst righoldig er derimod Literaturlisten, hvor Anm. er forbløffet over Forf.s Kendskab, større og mere alsidigt end i nogen mig bekendt Økologi.

Spredt i den tørre Text finder man Oplysninger, der pludselig slaar ned i En, saaledes Fremhævelsen af, at medens Biotoperne, hvor Dyrene lever, glider jævnt, kontinuerligt, over i hinanden, saa er selve Biocoenoserne skarpt, diskontinuerligt, afgrænsede, hvad han forklarer ved Arternes Konkurrence, men hvad der vel ogsaa

kan være spredningsøkologisk betinget. Morsom er ogsaa den produktionsbiologiske Oplysning, at Klorofyl-Indholdet pr. Arealenhed er nogenlunde ligestort enten det drejer sig om Phytoplanktonet i Havet, eller Planter og Træer i Skove og Enge paa Landjorden. Og mange andre smaa fængende Glimt kunde nævnes.

Bogen er allerede udsolgt, men Forf. har fortalt, at en 2. Udg. er nærførestaaende og at denne er tænkt udgivet paa Engelsk.

S. L. Tuxen.

Karl Strenzke: *Untersuchungen über die Tiergemeinschaften des Bodens: Die Oribatiden und ihre Synusien in den Böden Norddeutschlands*. Zoologica 37, 5—6 (Heft 104) Stuttgart (Schweizerbart) 1952. 4°. 173 pp.

Denne højst interessante Bog er overordentlig vanskelig Lektüre. Den er saa fuld af tankemæssige Indskud, Henvisningsindskud og Undtagelsesindskud, at man taber Traaden i hveranden Sætning. Et helt Sæt Forkortelser maa læres udenad. Og den typografiske Opstilling letter ikke Arbejdet: det kæmpemæssige Format, for faa forskellige Typer, for ringe Mellemrum mellem Arterne i Artslisten osv. Den knappe og knudrede Stil maa staa for Strenzke's Regning, en Del maa Forlaget tage Ansvaret for, der har været for ivrig efter at spare. Det er Synd, for det forringer Bogens Nytte.

Denne er forøvrigt stor. Strenzke har i 1940-41 undersøgt en lang Række Biotoper i Pommern, Holsten etc. og sammenfatter i dette Arbejde Oribatiderne under Betoning af, at denne Midegruppe spiller kvantitativt saa langt den største Rolle blandt Jordbundens Mikroarthropoder. Han deler Redegørelsen i 4 Afsnit. Det første drejer sig om de ydre Kaars Indvirkning paa de enkelte Arter og omfatter Fugtighed, Humusstoffer, Surhedsgrad, Jordens Dækningsgrad, og Saltholdighed, og konkluderer i, at de to førstnævnte, og især Humusindholdet, er vigtigst for Oribatidernes Fordeling. Han opstiller paa Grundlag heraf en Række "plastiske" Typer efter den større eller mindre Afhængighed af den paagældende Faktor, delt for hver Faktor i oligo-, meso- og polyplastiske Grupper og derfra i Eury- og Stenoplasticitet. Han har ikke haft Mulighed for at bestemme Faktorerne kvantitativt, men er egentlig ikke tilbøjelig til at betragte Skønnet i disse tre Grupper som tilstrækkeligt. Ogsaa paa Arternes Optræden til forskellige Aarstider kommer han ind, men med ringe Resultat, bl. a. fordi han erkender at kende for lidt til Ungdomsstadierne og derfor sommetider blot slutter af Forekomsten af Hunner med Æg. (Det rene Selvmord for Arten maa det da være, naar han antyder Muligheden af, at hver Hun kun

har eet Æg i hver Yngleperiode. Hvor gammel bliver en Oribatid?). Mere Resultat faar han af Studiet af Oribatidernes vertikale Udbredelse i Jordbunden, hvor han mener at kunne paavise aarlige Vandringer, og ligeledes af deres Livsformer, deres ydre Bygnings Afhængighed af, hvor de lever — hvor han dog med Beklagelse ikke faar saa fine Resultater som Gisin hos Collembolerne.

I 2. Afsnit opstiller han 6 Oribatidsamfund med Underafdelinger efter Oplysningerne om deres Udbredelse, med lange uoverskuelige Tabeller. Det er højest værdifuldt at faa "samfundsmæssige" Oplysninger og Grupperinger inden for Oribatiderne i Tyskland til Sammenligning med de i de senere Aar fra andre Lande opstillede. 3. Afsnit sammenfatter de økologiske og biologiske Resultater, og 4. Afsnit giver Oplysninger for hver enkelt af de 240 undersøgte Arter og er en faunistisk og biologisk "Haandbog" af største Vigtighed.

S. L. Tuxen.

Nye og sjældne sommerfugle 1953.

Af Wilh. van Deurs.

Et par sjældne arter fra tidligere år, hvis identitet først blev fastslået i 1953, er medtaget.

Nye arter:

Gastropacha populifolia Esp. 1 ♂ på kviksolvlampe ved Rønne ¹³/₉ (C. Kromann).

Hemistola chrysoprasaria Esp. Mellemkoven, Falster, ¹⁴/₇ (Niels U. Møller).

Endothenia carbonana Dbld. 4 eks. Hannenov ²¹⁻²³/₇ (W. van Deurs).

Gonorimoschema (Lita) *maculiferella* Dgl. Flere eks. Fanø på lyslokning ultimo juli. Tidligere danske materiale er *G. semidecandrella* Threlf. (Niels L. Wolff).

Ny aberration:

Rhyacia glareosa Esp. ab. edda Staud. Fanø ²⁹/₈; formen er hidtil kun kendt fra Shetland (Niels L. Wolff).

Sjældne arter:

Sedina büttneri Her. Mellemkoven, Falster, ³/₁₀ (A. Dalberg).

Thaumatopoea pinivora Tr. Flere eks. Dragør, ²²⁻²⁷/₇ (J. E. Gümöes og W. Rasmussen); 6 eks. Mellemkoven, Falster (Niels U. Møller og Henning Hansen).

Cucullia lactucae Schiff. 1 eks. Saltuna (Bornholm) ¹⁸/₇; 2det danske eksemplar (E. Wilsund).

Xanthorhoe obstipata F. Hyllinge ³/₁₀ (H. K. Jensen); 1 eks. Saltuna ²⁴/₁₀ (E. Wilsund); 1 eks. Holte ³⁰/₁₀ (F. Schepler).

Ephestia cautella Wlk. 1 eks. Fanø ²⁹/₈ 1947 på lyslokning i det fri; 2det danske eksemplar (Niels L. Wolff).

Nephopteryx similella Zck. Hannenov ¹⁵/₈ (Niels L. Wolff).

Glyphodes unionalis Hb. 1 eks. Holte ³⁰/₁₀, 3die danske eksemplar (F. Schepler).

Platyptilia capnodactyla Zell. Talrig Jægersborg ultimo juni (Niels L. Wolff).

Piercea (Phalonia) alismana Rag. 1 eks. Glænø ²⁵/₇, 2det danske eksemplar (Niels L. Wolff).

Cnephasia genitalana Pierce & Metcalfe. 1 ♂ Ulfshale ²⁸/₇ 1942, 2det danske eksemplar (W. van Deurs).

Anmeldelse.

Martin Hering: *Lepidopterologisches Wörterbuch*. Eine Erklärung der wichtigsten in der Schmetterlingskunde gebrauchten Fachausdrücke, zugleich eine Einführung in die Morphologie der Lepidopteren. Stuttgart (Alfred Kern Verlag) 1940 8°. 123 pp. Pris: 6 DM.

Skönt denne Bog af Lederen af Sommerfugleafdelingen ved Berliner-Museet, Prof. Hering, er udkommet for mange Aar siden, skal den dog omtales her, da den vist ikke er almindelig kendt i Danmark og faktisk er et ogsaa for danske Sommerfuglesamlere uhyre nyttigt Værk. Dens Formaal og Indhold er egentlig givet i den meget lange Undertitel. I Ordbogsform forklarer den Sommerfuglenes Bygning, med mange Afbildninger, men omtaler ogsaa udførligt biologiske, genetiske, nomenklatoriske Foreteelser, der vedrører Entomologien, ja Zoologien i videste Forstand mere end selve Lepidopterologien. Den være hermed anbefalet til Lepidopterologernes Bevaagenhed.

S. L. Tuxen.

Sommerfugle i Nord- og Østvendssyssel

(*Diarsia sigma* Schiff., ny for Danmark)

af B. Johannesen.

Vendssyssel er stadig kun kendt af meget få entomologer. — Især når talen er om boreo-montane arter, må man ikke glemme, at der er land også 100 km nord for Limfjorden. Nord- og Østvendssyssels storslåede natur, hvor der endnu findes ødemarker og uberørte strækninger, må med sit barske klima være ideelt for boreale relikter og nyindvandringer fra nordøst, og iøvrigt er her overalt interessante forskningsobjekter, men desværre eksisterer dette stykke Danmark kun i få danskes bevidsthed. Lad mig på min måde med disse fund slå Vendssyssels eksistens fast!

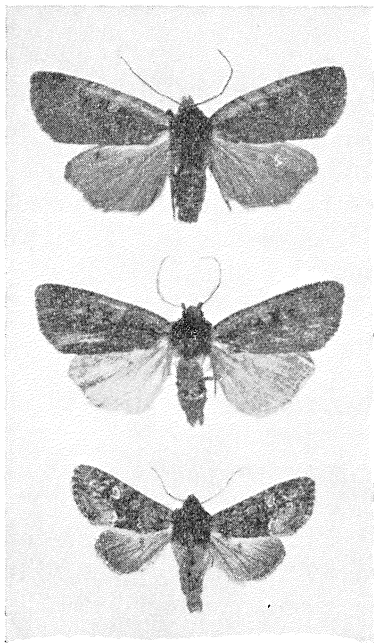
Drymonia trimacula Esp. Sæbygaardskov i antal på kviksølvlys 1954.

Drymonia chaonia Hb. Sæbygaardskov i antal på kviksølvlys 1953 og 1954.

Paranthrene tabaniformis Rott. 1 stk. på Dyrheden ved Sæby $\frac{6}{6}$ 1954; dyret svirrede langsomt rundt i vegetationen, formentlig ved tyttebærblomster, og var let kendeligt under flugten på grund af antennernes størrelse. Lokaliteten er uberørt lyngheide på ældgamle klitrækker med mængder af små og middelstore bævreaspe, mellem klitrækkerne hist og her nyopdyrkede marker. Dårligt vejr har forhindret mig i yderligere eftersøgning, og min kones ture i de få solskinstimer blev forgæves.

Diarsia sigma Schiff. (*signum* F.) 1 ♂ Sulbæk $\frac{13}{7}$ 1954 kl. ca. 23³⁰ på kviksølvlys. Lokalitet: blandet krat af løvtræer og buske, domineret af bævreasp, røn og el, omgivet af små lyngarealer og spredte nåletræsplantager, godt 1 km fra kysten. Dyret mindede under sin flagren

ved lampen om en stor grumset *c-nigrum*. At den under andre forhold, f. eks. i gult lys på sukkerlokning, kan minde om *augur*, er muligt. Men den lyse kant er meget tydelig. Ang. artens udbredelse: se Hoffmeyers "Uglebog" pag. 63. Udførlig beskrivelse af imago, larve og puppe findes i "Svenska Fjärilar". Følgende er en be-



Øverst:

Diarsia sigma Schiff. (*Agrotis signum* F.) Tysk eksemplar.

I midten:

do. Eksemplaret fra Vendsyssel.

Nederst:

Hadenia illyria Frr. Skarptegnet eksemplar fra Vendsyssel.

(Fot. Niels L. Wolff)

skrivelse af eksemplaret fra Sulbæk på de punkter, der adskiller dyret fra andre danske arter: ♂'s antenner med fine børster på undersiden, forv. mørkebrune, sortagtige, alle linier utydelige, mærkerne af grundfarven eller lysere, sortkantede, tapmærket mangler næsten, forvingekantens inderste $\frac{2}{3}$ bredt rødlig gulbrun, sort rød-streg, bagv. gråbrune. — Sammenlignet med billedet og beskrivelsen i Sv. Fj. er dette eksemplar meget mørkt og tegningen udflydende. Larven skal leve på urter, og efter billedet i Sv. Fj. være af en iøjnefaldende rødbrun

farve med fine gule ryg- og sideryglinier, og iøvrigt med sædvanlig noctuidetegning; overvintrer. — Flyvetiden angives i Sverige som juli. Til slut: vejret i år har umuliggjort yderligere effektiv eftersøgning, — en bemærkning, som jeg kunne føje til næsten alle mine vendsysselske fund.

Calophasia lunula Hfn. (den mørke vendsysselske race) har stadig fodfæste: 12 larver ved Ålbæk ¹⁹/₇ 1954 og 2 larver i Kandestederne s. d.

Hadena illyria Frr. 3 stk. ved Ålbæk: ³⁰/₅ 1946 på syrenblomster på Jennet, ⁵/₆ 1954 på syrenblomster ved det sydøstlige hjørne af den store Ålbæk plantage, ¹²/₆ 1954 på kviksølvlys s. st., alle ret tidligt på aftenen. Desværre erkendte jeg først arten efter at have taget det andet stk. og sammenlignet det med beskrivelsen i Ent. Medd. — Det vigtigste kendetegn må være mellem-linierne, der er skarpt hvide på friske ekspl., iøvrigt er det et spraglet dyr med varme rødbrune farver. Man skal være godt kendt med *unanimis*'s variationer, før man kan udskille evt. *illyria*.

Plusia confusa Stph. 2 ekspl. Sæby på kviksølvlys ²⁹/₈ 1949 og ¹¹/₈ 1950.

Venusia cambrica Curt. genfundet i få ekspl. ved kviksølvlys i Sæbygaardskov 1953 og 1954, næsten alle omkring og efter midnat. Lokalitet: en gruppe rønne-træer i egeskov. Røn vokser iøvrigt over hele skoven og rundt om findes ubetydelige bevoksninger af lyng.

A new species of *Trachyopella* (Dipt., Borboridae) from Iceland.

By

J. E. Collin F. R. E. S., England.

In 1953 Dr. S. L. Tuxen of Copenhagen sent to me, among other Diptera, some specimens of a *Trachyopella* taken under cow-dung in Iceland, which he thought might be the *T. melania* Hal. recorded by Dr Lindroth from Iceland in 1931 (Zool. Bidr. Uppsala, XIII), as identified by Duda; and as Duda prior to 1931 had quite unnecessarily transferred the name *melania* to the species described by him in 1918 as *T. coprina* n. sp., these specimens were presumably this *T. coprina* Duda. I have seen these specimens of Dr Lindroth's and they are the same species as those received from Dr Tuxen, but this species is neither the *T. melania* Hal., nor *T. coprina* Duda, as represented by the specimens in their respective collections, but apparently an undescribed species which may be known as:—

Trachyopella bovilla sp. n.

A very small species, much like *T. coprina* Duda and *melania* Hal., but with quite distinctive male genitalia.

♂. A comparison with Duda's figure of the wing of his *T. coprina* (Abh. z.-b. Ges. Wien, X. 1. Pl. viii, f. 64) shows that the new species has the second costal segment longer (longer than third), and second vein diverging less from third, both more as in his figure of *leucoptera*, but third vein straighter than in that species (more as in *coprina*), and upcurved at end only, while a continuation of the outer crossvein upwards would reach the costa rather before end of second vein.

Legs with mid tibial bristles as in *coprina*, the antero-dorsal bristle on lower half of middle tibiae not so far

above the dorsal one as it is in *melania* and *atoma*. First joint of middle tarsi longer than next. Abdomen with smaller hypopygium than in *coprina*, and with paralobes of quite different shape and armature, (fig. 1 b).

♀. Cerci of ovipositor with similar hairs to those of *coprina* though rather shorter, and cerci themselves not so long or outstanding, though distinctly longer and longer haired than in *melania*.

Length about .75 mm.

This species has not the long lateral hindmarginal abdominal bristles of *lacteipennis*, nor the distinct blunt preapical anteroventral bristle to hind femora, nor so distinct a preapical dorsal bristle to hind tibiae, as in that species.

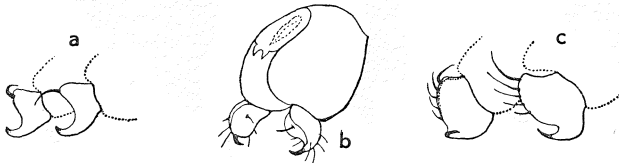


Fig. 1. Genital details of species of *Trachyopella*: — a. Paralobes of *T. melania* Hal. b. Ninth tergite (without setae) and paralobes of *T. bovilla* sp. n. c. Paralobes of *T. coprina* Duda.

Described from one male and four females, originally preserved in spirit, taken at Vaglaskógur, Iceland, on 31st July 1920, and now (with the exception of one female in my own collection) preserved in the Copenhagen Museum. The hypopygium of the only male, after a sketch had been made while in spirit, was lost when the insect was pinned and dried, but a balsam mount of one of Dr Lindroth's males is in my collection, and there is a similar mount in the Berlin Museum of a male from Iceland found among Duda's specimens of his *T. melania* = *coprina*, which is almost certainly another of Dr Lindroth's specimens identified by Duda, the rest of his specimens being in the Göteborg Museum.

Eine neue Art der Gattung *Meotica* Muls. Rey aus Dänemark (*Col. Staphyl.*).

(58. Beitrag zur Kenntnis der paläarktischen Staphyliniden)
von Otto Scheerpeltz, Wien.

Meotica Hanseni nov. spec.

Ganz dunkel gelbbraun, der Kopf und das sechste (vierte freiliegende) Hinterleibssegment meist etwas dunkler braun, Mundteile, Fühler, Beine, die hintere Hälfte oder das ganze siebente (fünfte freiliegende) Hinterleibssegment und die Hinterleibsspitze heller braungelb bis hellgelb.

Kopf ziemlich gross, im Gesamtumriss queroval, mit verhältnismässig kleinen Augen, ihr von oben sichtbarer Längsdurchmesser nur wenig grösser als die Enddicke des ersten Fühlergliedes. Seitenkonturen des Kopfes von den Hinterrändern der Augen an nach hinten ganz schwach bis zu einem Punkte in einer Querlinie etwa durch die Mitte der Kopflänge leicht erweitert, von diesem Punkte nach hinten wieder leicht verengt, so dass die grösste Kopfbreite in der eben genannten Querlinie durch die Mitte der Kopflänge liegt. Schläfen hinter den Augen etwa zweiundeinhalbmals länger als der von oben sichtbare Längsdurchmesser der Augen, Schläfenhinterwinkel aber sehr breit abgerundet. Oberseite des Kopfes flach gewölbt, in der Längsmittellinie mit einer vom Nacken bis etwa zu einer Querlinie durch die Hinterränder der Augen ziehenden, hinten etwas erweiterten und vertieften, vorn verflachenden Mittellängsfurche. Oberfläche ziemlich kräftig und etwas rauh rundnetzmaschig mikroskulptiert, daher nur schwach glänzend und sehr fein und dicht, in der Mikroskulptur aber schwer erkennbar punktiert. In der feinen Punktierung inseriert eine äusserst feine und kurze, von hinten innen nach schräg vorn aussen gestellte, gelbliche Behaarung.

Mundteile wie bei den verwandten Arten gebildet.

Fühler verhältnismässig lang und kräftig, zurückgelegt den Hinterrand des Halsschildes erreichend. Erstes Glied ziemlich lang, keulenförmig, etwa zweiundeinhalbmal länger als am Ende breit; zweites Glied dem ersten Glied gleich stark, aber nur von etwa zwei Dritteln der Länge dieses Gliedes, verkehrt kegelstumpfförmig; drittes Glied etwas schwächer als das zweite Glied und wieder nur von zwei Dritteln der Länge dieses Gliedes; viertes Glied quer, nur etwa halb so lang, aber um die Hälfte breiter als das dritte Glied, etwa um die Hälfte breiter als lang; fünftes Glied kaum länger, aber noch etwas breiter als das vierte Glied, schon fast doppelt breiter als lang. Die folgenden Glieder kaum an Länge und nur mehr sehr wenig an Breite zunehmend, das neunte und zehnte Glied doppelt breiter als lang. Endglied an der Basis so breit wie das vorletzte Glied, zum Ende ogival abgerundet, so lang wie die beiden vorhergehenden Glieder zusammengenommen. Alle Glieder, vom dritten Gliede an, an ihren distalen Enden mit einem Kranz von feinen, aber länger abstehenden, hellgelben Sinneshaaren besetzt, vom vierten Gliede an überdies mit einer äusserst feinen, hellgelben Pubeszenz bekleidet.

Halsschild wenig quer, seine grösste Breite in einer Querlinie etwa durch das erste Viertel der Mittellänge nicht viel grösser als jene des Kopfes und nur um beiläufig ein Viertel grösser als seine Mittellänge, sein Vorder- und Hinterrand nur sehr flach konvex, Vorderwinkel sehr breit abgerundet, Seitenkonturen ganz leicht und fast geradlinig nach hinten konvergent, Hinterwinkel nur in ihrer stumpfwinkeligen Anlage erkennbar, die Hinterecken selbst auch ziemlich breit abgerundet. Oberseite flach gewölbt, in der Mittellängslinie mit einer mehr oder weniger deutlichen, schwachen Mittellängsfurche, die aber gewöhnlich nur gegen den Vorder- und Hinterrand etwas deutlicher erkennbar wird, in der Mitte

aber meist ganz geschwunden ist. Oberfläche so wie der Kopf ziemlich kräftig und etwas rauh rundnetzmaschig mikroskulptiert, daher gleichfalls nur schwach glänzend und sehr fein und dicht, in der Mikroskulptur gleichfalls schwer erkennbar punktiert. In der feinen Punktierung inseriert eine äusserst feine und kurze, in der schmalen Mittellinie gerade nach hinten, sonst quer, an

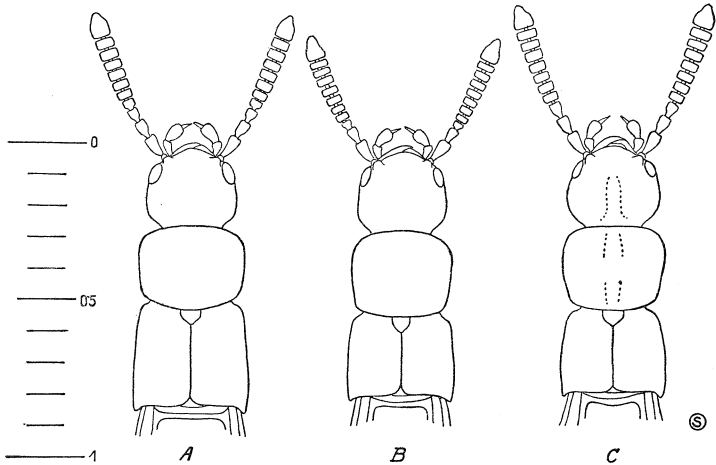


Abb. 1. — Halbschematische Habitusbilder der Vorderkörper von: A. *Meotica exilis* Er. — B. *Meotica exillima* Sharp. — C. *Meotica Hansenii* nov. spec. — Massstab in Millimetern.

den Seiten schräg nach hinten aussen gestellte, gelbliche Behaarung. Am Seitenrand, gegen die Vorderwinkel und am Vorderrand stehen einzelne längere, helle Sinneshaare weiter ab.

Schildchen leicht quer, im Umriss fünfeckig, mit stumpfer Spitze, dicht und auch etwas rauh mikroskulptiert, fast matt.

Flügeldecken nur so lang wie der Halsschild, in ihrer grössten Breite jene des Halsschildes nur wenig überragend, ihre zur Körperlängsachse fast parallelen, nach hinten nur ganz leicht divergenten, vor den Hinter-

winkeln wieder etwas eingezogenen Seitenkonturen von den Schulterwinkeln bis zu den Hinterwinkeln so lang, ihre Nahtlänge (Schildchenspitze bis Nahtwinkel) um etwa ein Sechstel kürzer als die Halsschildmittellänge, ihre Gesamtbreite vor den Hinterwinkeln um etwa ein Viertel grösser als die Schulterlänge, ihr Gesamtumriss daher deutlich etwas quer-rechteckig. Hinterrand in der Gesamtanlage zur Körperlängsachse senkrecht abgestutzt, innerhalb der Hinterwinkel und zum Nahtwinkel nur ganz leicht ausgerandet. Oberseite abgeflacht, mit einem nur ganz seichten und kleinen Nahteindruck hinter dem Schildchen. Oberfläche auf äusserst fein rundnetzmaschig mikroskulptiertem, daher wenig glänzendem Grunde ziemlich kräftig und dicht, leicht von hinten eingestochen und daher etwas schuppig erscheinend punktiert. In den Punkten inseriert eine ziemlich lange, hellgelbe, überall gerade nach hinten gestellte, nur unmittelbar vor dem Hinterrande quer gelagerte Behaarung.

Flügel voll ausgebildet und in normaler Weise unter den Flügeldecken eingelagert.

Hinterleib an der Basis nur ganz wenig schmaler als die Flügeldeckengesamtbreite, seine Seitenkonturen bis zu dem mit einem feinen, weissen Hautsaum besetzten Hinterrande des siebenten (fünften freiliegenden) Tergites nur ganz wenig erweitert, das Abdominalende selbst dann stumpf zugespitzt. Die drei ersten freiliegenden Tergite an der Basis schwach querfurchenartig eingedrückt, die beiden nächsten flach quer gewölbt, das siebente (fünfte freiliegende) Tergit um etwa die Hälfte länger als das vorhergehende Tergit. Pleurite und Epi-pleurite kräftig entwickelt, Hinterleib daher ziemlich stark gerandet erscheinend. Oberfläche auf den drei ersten freiliegenden Tergiten sehr fein rundnetzmaschig, auf der beiden folgenden sehr fein quermaschig mikroskulptiert, daher stärker glänzend als der Vorderkörper. Punktierung fein, auf den ersten Tergiten etwas dichter

angeordnet, nach hinten weitläufiger werdend, Punkte meist in lockeren Querreihen, auf dem siebenten und achten (fünften und sechsten freiliegenden) Tergiten ziemlich weitläufig eingestochen. In den Punkten inseriert eine ziemlich lange, gelbliche, gerade nach hinten gelagerte Behaarung, die an den Tergitseitenrändern, auf den Pleuriten und Epipleuriten ziemlich stark verdichtet ist. An diesen und an der Abdominalspitze längere

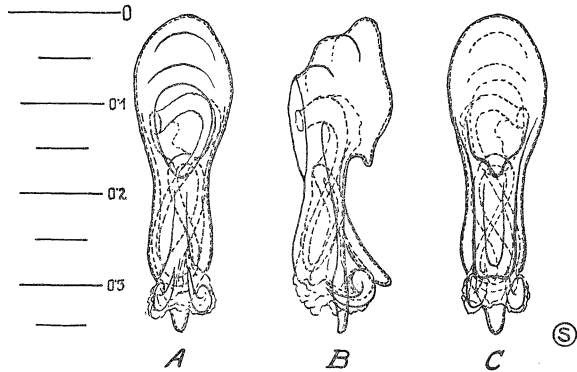


Abb. 2. — Aedoeagus des ♂ von *Meotica Hanseni* nov. spec. — A. Dorsalansicht. — B. Lateralansicht von rechts. — C. Ventralansicht. — Massstab in Millimetern.

gelbliche Tasthaare ziemlich dicht abstehend. Sternite wie die Tergite mikroskulptiert und ziemlich gleichmässig dicht und fein punktiert und behaart.

Beine wie bei den verwandten Arten gebildet. Tarsengliederschema: 5, 5, 5.

Beim Männchen ist das neunte Tergit und das siebente Sternit zum Ende etwas stärker verschmälert und tritt daher etwas deutlicher aus dem Abdominalende vor; beim Weibchen sind diese Segmente zum Ende etwas stärker und breiter abgerundet und treten daher aus dem Abdominalende weniger deutlich hervor.

Aedoeagus des Männchens äusserlich für eine Sagittalebene symmetrisch gebaut, an der Basis leicht blasig

aufgetrieben, seine Ventralseite in der Basismitte mit einem kleinen, vorspringenden Zahn zum Ansatz der Muskulatur, sein Dorsal- und Ventralblatt zu einem einfachen Penisrohr verwachsen, aus dessen Ende das Dorsalblatt mit einer geraden, stumpfen Spitze, das Ventralblatt mit einer ventralwärts abgebogenen ziemlich breiten, am Ende abgestumpften oder etwas ausgerandeten, in der Längsmittle ventral leicht längsfurchig gerinnten

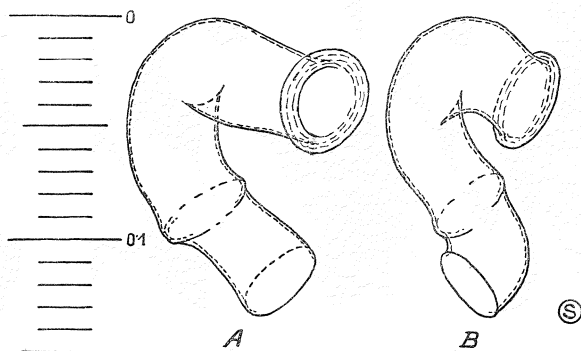


Abb. 3. — Spermatheca des ♀ von *Meotica Hansenii* nov. spec. — A. Ventralansicht. — B. Dorso-Lateralansicht. — Massstab in Millimetern.

Zunge hervortritt. Zwischen beiden tritt der häutige Innensack bei der Ausstülpung hervor, der durch einen im Inneren des Penisrohres in mehrere Schleifen gelegten Ductus (Stenazygos) zur Ausstülpung gebracht wird und hinter der Umstülpstelle jederseits in seiner Wandung je einen auffälligen, sichelartig gekrümmten, an seiner Basis verdickten, zum gekrümmten Ende zugespitzten und damit von der Wandung abstehenden Klammerhaken trägt.

Beim Weibchen ist die Spermatheca eigenartig doppelhakig gekrümmt, ihr distaler kürzerer Teil öffnet sich in einer stärker chitinierten Ringöffnung, ihr proximaler längerer Teil trägt in der Mitte eine wulstige Wandverdickung, eine Art Versteifungsring.

Länge: 1.7 mm.

Die interessante neue Art wurde mir von Herrn Dr. phil. Victor Hansen, København, in einigen Stücken zum Studium vorgelegt. Sie tragen alle die Fundortbezeichnung "Malmlose" (Nord-Seeland) und wurden alle — was für diese Art charakteristisch zu sein scheint! — in den Frühlingsmonaten, wenn auch in verschiedenen Jahren, aufgefunden (31. 4. 1934; 13. 5. 1942; 13. 6. 1942), ganz so wie man *Meotica pallens* Redtb. auch meist nur in den Frühlingsmonaten zu finden pflegt, wogegen zum Beispiel die häufige *Meotica exilis* Er. fast das ganze Jahr über gefunden werden kann.

Ich erlaube mir die sehr charakteristische neue Art Herrn Dr. phil. Victor Hansen in hoher Anerkennung seiner ausgezeichneten entomologischen Arbeiten und in Dankbarkeit für die Überlassung von Paratypen der neuen Art zu widmen. Typus in coll. Hansen, Paratypen ebendort und in meiner Staphyliniden-Spezialsammlung.

Da die neue Art in die nächste Verwandtschaft der über Europa und Westasien weit verbreiteten Art *exilis* Er. und der bisher nur aus England bekannt gewordenen Art *exillima* Sharp (= *exiliformis* Joy) gehört, füge ich eine kurze Tabelle bei, die es im Verein mit den halb-schematischen Habitusbildern der Vorderkörper dieser drei Arten in Abb. 1 möglich machen wird, diese bisher ziemlich schwierig zu unterscheidenden Arten leichter von einander zu trennen.

- 1 (4) Seitenkonturen des Kopfes von den Hinterrändern der Augen nach hinten ganz schwach und fast geradlinig leicht erweitert, so dass die grösste Kopfbreite etwa im hinteren Viertel der Kopflänge und knapp vor den Punkten, in denen die Seitenkonturen beginnen sich wieder zum Halse zu verengen, liegt; Gesamtumriss des Kopfes daher quer-rechteckig, seine Schläfenhinterwinkel enger abgerundet. Oberseite von Kopf und Halsschild ohne deutliche Mittellängsfurche, höchstens der letztere mit breiter Mittellängsabflachung.
- 2 (3) Etwas grösser und kräftiger; Halsschild etwas stärker quer,

Fühler etwas länger und gestreckter, zum Ende weniger stark verdickt, ihre vorletzten Glieder nur wenig mehr als doppelt breiter als lang, ihr drittes Glied schlanker und gestreckter, von etwa zwei Dritteln der Länge des zweiten Gliedes, ihr viertes Glied nur um etwa die Hälfte breiter als lang. Aedoeagus des ♂ mit gegabeltem Ende. — Länge: 1.9—2 mm. — Über fast ganz Mittel- und Südeuropa, sowie das südlichere Nordeuropa und Westasien verbreitet.

... *exilis* Er.

Käf. Mark Brandenburg I, 1837—39, p. 333.

- 3 (2) Etwas kleiner und zarter; Halsschild etwas weniger stark quer, Fühler viel kürzer und dicker, zum Ende stärker verdickt, ihre vorletzten Glieder fast dreimal breiter als lang, ihr drittes Glied viel kürzer und gedrungener, nur wenig mehr als halb so lang wie das zweite Glied, ihr viertes Glied fast doppelt breiter als lang. Aedoeagus des ♂ mit einfach spitzem Ende. — Länge: 1.7 mm. — Bisher nur aus England bekannt geworden.

... *exillima* Sharp.

Ent. Monthly Mag. LI, 1915, p. 205.

(*exiliformis* Joy, ibid. LI, 1915, p. 277.)

- 4 (1) Seitenkonturen des Kopfes von den Hinterrändern der Augen an nach hinten ganz schwach bis zu einem Punkte in einer Querlinie durch die Mitte der Kopflänge leicht erweitert, von diesem Punkte nach hinten wieder leicht verengt, so dass die grösste Kopfbreite in der eben genannten Querlinie durch die Mitte der Kopflänge liegt; Gesamtumriss des Kopfes daher queroval, seine Schläfenhinterwinkel viel breiter abgerundet. Oberseite von Kopf und Halsschild mit einer deutlichen Mittellängsfurche, die auf dem Kopfe stärker, auf dem Halsschilde seichter ausgebildet ist. Aedoeagus des ♂ mit stumpfem Ende. — Länge: 1.7 mm. — Bisher nur aus Dänemark bekannt geworden.

... *Hanseni* nov. spec.

Die neue Art wurde bisher unter anderen Namen aus Dänemark gemeldet, nämlich als *Homalota indocilis* Heer in J. P. Johansen: Danmarks Rovbiller 1914 p. 194, und als Nr. 1431 *Meotica ?pallens* Redtb. in Aug. West: Fortegnelse over Danmarks Biller, Ent. Medd. 21 1941 p. 255.

***Hemimene obscuratana* n. sp. (Lep., Tortr.).**

By

Niels L. Wolff.

Some years ago (1949, Entomol. Medd. **25**: 351—360) I mentioned a widely distributed, but hitherto unappreciated, *Hemimene* species which in the past had been confused with *H. plumbagana* Tr., *consortana* Wilk., *senectana* Gn., and *tanaceti* Stt.

The study of the literature led me to conclude that this species had to be identified as *H. cinerosana* Herrich-Schäffer (1849, System. Bearb. Schm. Eur. **4**: 255, pl. 41, fig. 290). At that time I was unable to obtain any absolutely reliable material of *H. cinerosana* H.-S. for comparison, and in fact my opinion was that Herrich-Schäffer's type specimen did not exist any more.

Recently Professor Erich Martin Hering has informed me that the collections of the Zoological Museum of the Humboldt University in Berlin was in possession of 7 specimens of *H. cinerosana* H.-S., including the holotype. In a most generous way Professor Hering has placed at my disposal the entire material, permitting me to make the necessary dissections of the genitalia, and to publish the results, for which assistance I here ask him to receive my cordial thanks.

The material consisted of the holotype (a female, from Hungary), 2 specimens (male and female, ex coll. Lederer, from the Balkans), 2 males (ex coll. Staudinger, from Macedonia), a female (ex coll. Staudinger, of unknown origin, labelled "Daedaleana mihi"), and a female (ex coll. Staudinger, taken, probably in Brunschweig, by v. Heinemann).

The examination proved that the species which, in my previous paper, I have considered identical with *H. cinerosana* H.-S. does differ from that species.

As the species described and illustrated by me in Entomol. Medd. 25: 351—360 as "*cinerosana*" thus has to be given a separate name, I now name the species *H. obscuratana* n. sp. Since description and illustrations of

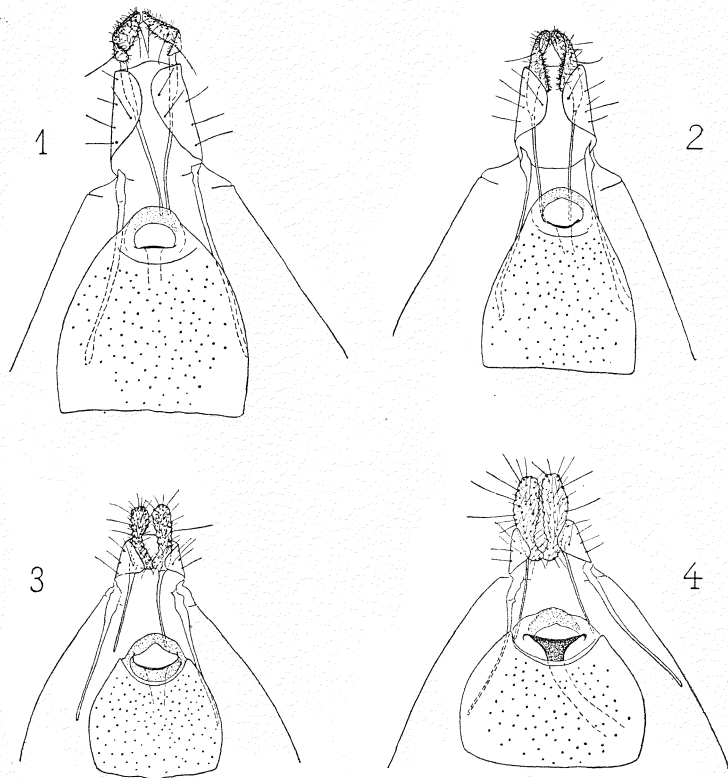


Fig. 1. Female genitalia. No. 1—2: *Hemimene cinerosana* H.-S. No. 3: *H. plumbagana* Tr. No. 4: *H. obscuratana* n. sp.

the new species in comparison with *H. plumbagana* Tr. are given in my previous paper I refer to those and here confine myself to a reference to the present illustrations of the genitalia of *H. obscuratana* n. sp. compared with those of *H. cinerosana* H.-S.

The genitalia of the type of *H. cinerosana* H.-S. are shown in fig. 1, no. 1. Because the mount exhibits the *laminae abdominales* in a somewhat distorted position, an illustration of the female genitalia of one of the other specimens of *H. cinerosana* H.-S. (ex coll. Lederer) is added (fig. 1, no. 2). It will be seen that the form of the *laminae* and the length of the *ovipositor* as a whole

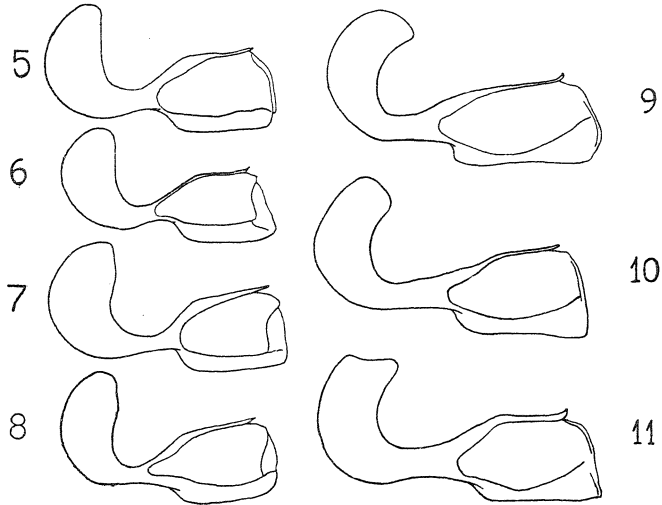


Fig. 2. Male genitalia (valva). No. 5—8: *Hemimene obscuratana* n. sp. No. 9—11: *H. cinerosana* H.-S.

are characteristics for *H. cinerosana* H.-S. The differences to be found in the *ostium* plate (especially the orifice) of *cinerosana* H.-S., *plumbagana* Tr., and *obscuratana* n. sp. also appear from fig. 1.

Fig. 2 shows part of the male genitalia (one of the valves) of *H. obscuratana* n. sp. (no. 5—8), and *H. cinerosana* H.-S. (no. 9—11). The *valva* of the lastnamed species is longer, and the *cucullus* distinctly incurved.

The male of *H. cinerosana* H.-S. is larger than that of *obscuratana* n. sp., the forewings much more sharply

pointed, wing markings less distinct. The females of the two species may come close to each other. (The specimen, mentioned above, taken by v. Heinemann, and determined by Staudinger as *cinerosana* H.-S., proved to be *obscuratana* n. sp., its genitalia are figured here as fig. 1, no. 4).

At present *H. obscuratana* n. sp. is known from Denmark, Sweden, Finland, Germany. Its occurrence in the British Isles has not been confirmed. Although the illustration of the female genitalia of *H. plumbagana* given by Pierce & Metcalfe (1922, Genit. Tortr., pl. 33) strongly resembles the genitalia of *obscuratana*, the actual slide, which I have had an opportunity to examine in the British Museum (Natural History) in London, did not exhibit characteristics different from *H. plumbagana* Tr.

The two females of *H. cinerosana* from the Paravicini collection preserved in the British Museum (Nat. Hist.) — taken in Asia Minor (Broussa) — and mentioned in my previous paper, are true *cinerosana* H.-S.

H. obscuratana n. sp. feeds on *Tanacetum*. In Denmark the moths always fly near that plant, and an examination of the genitalia of several specimens of the species which in former times were bred in numbers from *Tanacetum* by Stange in Mecklenburg (Friedland) and considered *H. tanaceti* Stt. has proved these specimens to belong to *H. obscuratana* n. sp.

The Types of *Chrysops laeta* Fabricius and a New Species of Neotropical Deerfly in the Copenhagen Zoological Museum.¹⁾

By
Cornelius B. Philip.

In July 1953, the author studied types of Tabanidae in the collections of the University of Copenhagen Museum through courtesy of Dr. S. L. Tuxen in charge of entomological material. The visit was supported by a grant from the American Philosophical Society.

Fabricius' syntypes of *Chrysops laeta* are present but represent two species of deerflies, and since the name is commonly discussed in Neotropical tabanid literature, clarification and lectotype establishment are needed for future reference. In some cases the species has obviously been misidentified, but variation in this complex also has led to assignment of three varieties to *C. laeta* making detailed redescription of the typical form advisable.

Of the two syntypes present, the one most nearly fitting present conception of the species is hereby selected as lectotype, and has been so labelled; the other syntype does not belong in the *laeta* complex as discussed below. In the Kiel Collection of Fabricius, there is a pest-destroyed specimen of which only the wings remain; this may be from the original series, but Fabricius states the type to be in "Mus. Dom. Lund" which is now in the Copenhagen Museum.

The lectotype is intact including antennae. It has yellow frontal callosity, face and cheeks, notum with

¹⁾ From the U. S. Department of Health, Education, and Welfare, Public Health Service, National Institutes of Health, National Microbiological Institute, Rocky Mountain Laboratory, Hamilton, Montana.

two submedian gray lines on a median plumbeous stripe, and two lateral yellow lines above the wing bases. Wing pattern is like that figured by Kröber for "var. *tenuistrius*" (misspelled "*tenuifascius*" on tables III and V, 1925). The apical spot is narrower than he figures for his typical *laeta* and is separated from the crossband at the end of the stigma; the crossband is relatively narrow with a hyaline indentation in cell R_5 so that the outer margin continues along outer end of discal cell straight to the hind margin filling cell M_3 but leaving cell M_1 completely hyaline; the anterior margin of cell Cu_1 is hyaline nearly to the base where a prong connects with a narrow fork along vein Cu_2 to the apex of the anal cell. The abdominal pattern is intermediate between Kröber's figures of *laeta* and var. *tenuistrius*. There are two, small yellow spots on the sides of tergite 1; the median, yellow triangle crossing tergite 2 is not widened above. Incisures of the remaining tergites have decreasingly narrow yellow bands, widening to low triangles on 3 to 5, that on 3 only half crossing the tergite. Venter dusky with narrow yellow incisures and sublateral yellow spots on sternites 2 to 4.

"Amer. merid." probably refers to northern South America rather than Central America as the published type locality.

The yellow head calli and reduced wing pattern obviously relate the lectotype more closely to Kröber's variety "*tenuistrius*" (the type of which was unfortunately lost in the bombing of Hamburg) than to his typical form. The wing pattern of the lectotype also resembles that of *C. nigroviolacea* Krb. Pechuman (1937) correctly reduced the latter to a variety in which the heavier abdominal pattern restricts the median yellow spot on tergite 2 to a triangle not reaching the anterior tergal margin. He also comments on intergrades and variation.

The author also studied pertinent specimens in the

Wiedemann Collection in the Vienna Museum of Natural History through courtesy of Dr. Helmut Mayer. There were three specimens of Kröber's typical form of *laeta* labelled "type" No. 3201 from "Amerika Mer.", as well as two cotype females of *C. varians* Wied., No. 3202, which Kröber, correctly, also reduced to a variety of *laeta* having a lighter abdominal pattern. It is uncertain if the former are actually part of the original series acquired by Wiedemann when he studied the Fabrician Collection. Since these differ from both the Copenhagen types, the need for lectotype establishment of the one syntype above is thus further emphasized.

In the material seen by the writer, Kröber's typical form with heavier wing pattern, and blackish callosity and cheeks is most common, and a name appears desirable in spite of variation since the typical form now replaces Kröber's variety *tenuistria*.

***Chrysops laeta* subsp. *sublaeta* nov.**

Differs from the lectotype above in having black frontal callosities, facial pits and cheeks, the outer margin of the crossband straight and wider than the discal cell, the apical spot usually wider and not separated from the crossband, and the median yellow spot on tergite 2 expanded above like an hour glass, that on 3 often just crossing the tergite (in 3 paratypes it is expanded anteriorly and shaped very like that on tergite 2).

Holotype female and two paratypes from Andrelandia, Minas Geraes, Brazil, Jan. 1938, B. F. Gomes. In the collection of the author through courtesy of Dr. Amilcar Martins of the Instituto Ezekial Dias. Paratype female, Victoria, Brazil "X 15". Paratype female, "Brazile". The eye pattern of one relaxed paratype is heavy, the occipital margin adjoins the eyes and connects with the shaft of the arrowhead above but not below; arrowhead

and median spot connected, and upper and lower frontal spots touching the ocular margins. Kröber (1925) has figured the wing and abdominal patterns of this form as "*laetus* ♀". In the Pechuman Collection are 14 paratype ♀'s: 6, "Angra Japuhya, Oliviera & Venfel, XII-940"; 4, various Sao Paulo data; ♀, Wismar, Brit. Guiana, 9 Oct. 1933; ♀, Villarica, Paraguay XII, 1938, F. Schade Coll.; and ♀ [illegible locality] 30-IV-32. One paratype each in the Zoological Museum, Munich ("Brasil-Mendes, 92 kil. de Rio de Janeiro", coll. le Moul, loaned by Dr. Fr. Kühlnhorn) and the American Museum of Natural History ("Limon, 900 m. E. Ecuador, II 1948, z Muller").

The second syntype in the Fabrician Collection in Copenhagen represents an undescribed species related to *C. parvifascius* Lutz without apical spot in the wings, an unusual character among Neotropical species. The species is named for Dr. S. L. Tuxen whose generosity has provided the writer with much valuable assistance in times past.

***Chrysops tuxeni* n. sp.**

A small, blackish species with a row of yellow triangles on the abdomen, and no apical spot in the wing pattern.

Holotype female, 7 mm. Front a little taller than wide, buff pollinose with a large quadrangular, black occipital spot about the ocelli at the vertex and a tranverse very dark brown, almost black basal callosity; face bare, yellow with lateral brown shadows, cheeks brown; facial callosities not unusually swollen. Antennae slender, yellow with black hairs, the flagellums missing. Palpi yellow. Right eye destroyed by pests without damage to the head characters.

Thorax (right shoulder also eaten) and scutellum subshiny black, a broad median, plumbeous stripe, but no

bright yellow lateral stripes above or below the wing bases, the anterior calli brownish. Coxae deep brown; femora and mid-tibiae with reddish shades, fore and hind tibiae, and base of hind femora dark brownish. Wings with costal cell and crossband saturate, no apical spot, though there is a narrow indefinite shadow along the costal margin. Two basal and anal cells hyaline. Outer border of crossband straight from apex of the stigma to the end of vein M_3 ; a small subhyaline spot in the discal cell which is probably adventitious, and a larger one in the outer two-thirds of cell Cu_1 not as well defined as usual in many Neotropical species; cell M_3 completely infuscated.

Abdomen black, tergite 1 brownish with small yellow patches on the extreme edges, tergite 2 with a heavy, flat, black inverted "v", the arms extending to the outer posterior corners, the truncated apex resting broadly on the anterior border, and an enclosed equilateral yellow triangle with apex midway across the tergite; the following tergites with prominent yellow incisures expanding mesally on tergites 3 to 6 into low triangles. Venter blackish, sternite 2 extensively yellow, and all succeeding incisures yellowish.

Type is the second of two Fabricius' syntypes in the Copenhagen Collection under "*Chrysops laetus*" and bears no label other than type but is presumed as with the other to come from "*America meridionalis*", (probably northern South America).

Summary.

Described as new are: *Chrysops laeta* subsp. *sublaeta* nov., holotype female from Minas Geraes, Brazil, in the collection of the author, and *Chrysops tuxeni* n. sp., holotype female presumably from Amer. merid., one of two syntypes of *C. laeta* Fabricius in the Copenhagen Zoological Museum. The other syntype in the same collection is established as lectotype of typical *C. laeta* which proves to be the prior name for *C. laeta* var. *tenuistria* Krb.

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Anmeldelse.

Deutscher Entomologentag in Hamburg 30. Juli bis 3. August 1953. Hrsg. von Erich Titschack. Jena (Gustav Fischer) 1954 8°. 215 Sider, 2 Tavler. Pris: 21 DM.

Som vi har vore nordiske Entomologmøder (siden 1923) har Tyskerne siden 1926 haft deres Wanderversammlungen deutscher Entomologen, som fandt Sted sidste (6.) Gang 1936. Inspireret bl. a. af Zoologkongressen i København i 1953 indbød imidlertid Hamburg-Entomologerne til en "Entomologentag" umiddelbart inden denne Kongres, hvis Resultat blev Basis for en Genopliven af Wanderversammlungen, hvoraf den 7. nu i 1954 har fundet Sted i Berlin. Fra dette saaledes "indskudte" Entomologmøde er Foredragene udgivet som en selvstændig Bog, der naturligvis her ikke kan refereres i Enkeltheder.

Fr. Lenz skriver om "Insektproblemer i Ferskvand", en Diskussion om Tilpasning og Omverden. Georg Warnecke: Om postglaciale Areal-Disjunktioner hos europæiske Storsommerfugle, giver en Række Exempler paa "boreo-alpine" Arter, ogsaa Biller. F. Weyer og K. Enigk fortæller om hhv. Kroplusens og Ixodidernes Biologi, H. Francke-Grossmann om Bladrullernes. Meget spændende er Dietrich Magnus' experimentelle Undersøgelser over Kejserkaabens Synopfattelse især af Farve og Form, undersøgt med Attrapper af Hunner, en Afhandling der forbinder det bedste i v. Frisch's sansefysiologiske Metoder med Tinbergens Problematik. Han har ogsaa anstillet Mærkningsforsøg med Kejserkaaber. Et andet sansefysiologisk Arbejde er Karl Cleve's om Bølgelængdernes Betydning ved Lyslokning af Sommerfugle. G. Timmermann belyser Sammenhængen mellem Vært- og Parasitarter i Forbindelse med Fugle-Mallophager, W. Rühm Nematoderne som Insektparasiter, og W. H. Nolte skriver udførligt om Planternes Reaktion paa Galledannere, et plantefysiologisk Spørgsmaal, som herhjemme Boysen Jensen har vist Vej til Løsningen af. Og endelig giver Karl Ermisch, G. A. Lohse, Warnecke o. a. en Del Bidrag til tysk Sommerfugle- og Bille-Faunistik. Som man ser, et alsidigt og udbytterigt Udtryk for tysk Entomologi af i Dag.

S. L. Tuxen.

Observations on collections of ticks from Denmark.

By

D. R. Arthur, King's College, London, England.

As a result of a visit to Denmark I had an opportunity of examining undetermined ticks in the collections of the Veterinary School (Den Kgl. Veterinær- og Landbohøjskole, Zoologisk Laboratorium, abbr. V.S.) and of the Zoological Museum (Universitetets Zoologiske Museum, Copenhagen, abbr. Z. M.). In this survey I was materially assisted by Mr. N. Haarløv, M. Sc. and Dr. S. L. Tuxen, who in addition to loaning me material also deciphered the Danish labels. I am deeply indebted to both.

Earlier reports on Danish ticks have been given by Schulze (1930a) who recorded 7 species of *Ixodes* and *Haemaphysalis punctata* Can. & Fanz. and Palle Johnsen who reported 4 species of *Ixodes* (1946), *Hyalomma ægyptium* L. (1943a) and *Hyalomma marginatum* Koch (1943b) Christiansen (1934) wrote on the occurrence of *Argas reflexus* Latr. in Denmark. To these existing records I now add the following which are recorded for the first time from Denmark: *Ixodes trianguliceps* Birula 1895, *I. canisuga* Johnston 1849, *I. arvicolae* Warburton 1926, *I. arvicolae* var. *danica* Arthur 1954, *I. caledonicus sculpturatus* Schulze 1929, *I. passericola* Schulze 1933 and *Argas pipistrellae* Audouin 1832. — Twenty species and varieties of ticks are now known from Denmark. From the collections it would appear that *Ixodes reduvius* L. (= *ricinus* L.) is the most common species; the many findings of this species also in the new material are not recorded in the present paper.

***Ixodes hexagonus* Leach 1815.**

Bornholm, 9. 1918. One female from dog (*Canis familiaris*) (V. S.). Jylland, latter half of nineteenth century. 1 larva from *Mustela foina*. Conradsen leg. (Z. M.).

This species is found in Western and Central Europe, but undoubtedly confusion with other species has resulted in erroneous limits to its distribution. Its general distribution (Tambs Lyche, 1943) and a more detailed survey within a limited area (Arthur, 1953) suggest that *I. hexagonus* does not extend as far north as *I. redurivius*.

***Ixodes trianguliceps* Birula 1895.**

Bregninge, Taasinge, S. of Fyen, 12. 7. 1947. Two nymphs off *Clethrionomys glareolus*. E. Ursin leg. (Z. M.).

Bregninge, Taasinge, S. of Fyen, 12. 7. 1947. Three larvae off *Apodemus flavicollis*. E. Ursin leg. (Z. M.).

Brahettrolleborg, 25. 10. 1950. Two larvae from the nest of *Mus minutus* (V. S.).

Rudehegn (North Zealand), no date. From nest of mouse. One male(?) (Z. M.).

The systematic status of this species has been discussed by Tambs Lyche (1943) but on comparing the Danish with the English specimens I must conclude that the former are *I. trianguliceps*. I have queried the identification of the male tick from Rudehegn recorded in the foregoing list as *I. trianguliceps* because of its association with *I. arvicolae* var. *danica* Arthur. Similarly Warburton (1926) found a single male which was identified as *tenuirostris* (= *trianguliceps*) associated with the females of *I. arvicolae* from Cambridge, England. Whether these males are actually *trianguliceps* or not is difficult to determine, and we may have here something analogous to the condition found in *I. canisuga* Johnston and *I. baergi* Cooley & Kohls, where the females can be separated but the males of the two species are morphologically indistinguishable. The separation of such males requires further investigation with larger supplies of material.

***Ixodes frontalis* Panzer 1795.**

No locality. Latter half of nineteenth century. Four nymphs off *Turdus merula*. A. Benzon leg. (Z. M.).

***Ixodes canisuga* Johnston 1849.**

Skovledmose, near Jonstrup Vang, Zealand. 10. 8. 1941. One female from nest of hedgehog (*Erinaceus europaeus*) (Z. M.).

Jægerspris. 27. 1. 1932. Associated with mites. One female. I. Als leg. (V. S.).

Previous writers have not reported this species from Denmark, nor indeed from any of the Scandinavian countries.

***Ixodes arvicolae* Warburton 1926.**

Holte, North Zealand. 8. 1928. One female from a living rat. J. P. Kryger leg. (Z. M.).

The occurrence of *I. arvicolae* from Denmark is of some interest as the only previous records appertain to the holotype and paratypes, which were determined by Warburton (1926). This type material has since been re-examined by the writer and the species re-described (Arthur, in press).

Ixodes arvicolae, *I. acuminatus* Neumann and *I. guernseyensis* Arthur have so many characters in common that they may be considered as closely related. The constant differentiating characters in the limited material available do however suggest that they are distinct species.

***Ixodes arvicolae* var. *danica* Arthur 1954.**

Rudehegn, North Zealand. From mouse nest (Z. M.).

This variety was designated on the basis of one female specimen. It is with some diffidence, due to lack of knowledge of intermediate variation and material, that I have given varietal rank to this unique specimen. However, the unequal spurs on coxa I, the shortness of the scapulae, the slight emargination of the scutum and the more broadly rounded posterior margin with its less

convex sides, the larger spiracle and the more numerous goblets as compared with *I. arvicolae* seem to justify such action. The variety has been described elsewhere (Arthur, in press). The holotype female and associated preparations will be deposited in the Zoologisk Museum, Copenhagen.

Ixodes melicola P. Sch. and Schl. 1929.

Langholt, Vendsyssel, Jylland. 17. 1. 1948. One female, 44 nymphs and two larvae from *Meles meles*. Tuxen leg. (Z. M.).

Both Johnsen and Schulze have reported this species from Denmark, but it is not on record from either Norway or Sweden.

Ixodes caledonicus sculpturatus P. Sch. and Schl. 1929.

Neither locality nor collector are given for this species, whose recorded host is *Cypselus apus*. The legend reads 'Af *Cypselus apus*. Tilv: 3 Juli, 1878'. Dr. Tuxen in private correspondence (1st April, 1954) informed me that it should have been given a journal number on this day, but is unable to trace any such record. He does however point out that it did come with absolute certainty from Denmark. This species is new for Denmark, and it agrees quite well with Schulze & Schlottke's description (1929). Nevertheless this giving of varietal status may prove to be erroneous when a better knowledge of the variability of the species becomes available.

Ixodes passericola P. Sch. 1933.

Bellahøj, Copenhagen. 25. 9. 1915. One female from nest of *Sturnus vulgaris*. J. P. Kryger leg. (Z. M.).

Schulze (1944) reported this tick from the starling in Mecklenburg, Germany; more recently it has been collected from a starling, a robin, blue tits, great tits and nuthatches from Silwood Park, Berks, England by Arthur (1952) and from the sandmartin and little owl in England by Arthur and Thompson (1953). The occurrence of *I. passericola* from the Scandinavian countries is new.

Haemaphysalis cinnabarina var. **punctata** Can.
and Fanz. 1877.

Amager, 1. 9. 1924. 1 larva from *Philomachus pugnax*. Harry Mad-
sen leg. (Z. M.).

Argas pipistrellae Aud. 1832.

Helsingør, 6. 8. 1917. Large number of nymphs and larvae from
the bat *Vespertilio pipistrellus*. R. Hørring leg. (Z. M.).

"Peter Lieps Hus", Dyrehaven, north of Copenhagen. 6. 3. 1932.
1 female from a beech tree. Rosenberg leg. (Z. M.).

"Peter Lieps Hus", Dyrehaven, north of Copenhagen. 19. 4. 1937.
1 female from a beech tree. Rosenberg leg. (Z. M.).

This is apparently the first record of *Argas pipistrellae*
from Denmark, nor has it been reported from Norway.
Schulze (1930) has collected the species from Sweden.

Argas reflexus Latreille 1796.

Copenhagen. 7. 1936. Two females on poultry which live in former
pigeon house (V. S.).

Mimersgade, Copenhagen. 28. 9. 1936. Two females in pigeon loft.
Schwalbe leg. (V. S.).

Kattesundet 10, Copenhagen. 27. 7. 1933. Four females from pigeon
loft (V. S.).

Copenhagen. 19. 6. 1933. One female in pigeon house (V. S.).

This species lives chiefly in chicken coops, hiding in
crevices of the woodwork and walls; the adults and
nymphs attack the birds mainly at night.

Hyalomma aegyptium L.

Copenhagen. 14. 5. 1928. Four males and three females from a
newly imported Testudo. Miss Henriksen leg. (Z. M.).

West coast of Amager. 30. 4. 1908. One nymph from *Aegialites can-
tianus*. R. H. Stamm leg. (Z. M.).

Copenhagen. 27. 7. 1954. 1 male from Testudo purchased in animal
shop. Erik Hugger leg. (Z. M.).

Acknowledgements.

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from the Royal Society and completed when in receipt of a Lever-
hulme Research Award. To both these bodies the author is deeply
indebted.

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***Nepticula repentiella* n. sp. (Lepidoptera,
Nepticulidae).**

By
Niels L. Wolff.

Genus.

Nepticula Heyd. (sensu Beirne 1945 p. 201).

Species.

N. repentiella n. sp.

Male.

See fig. 1. Al. exp. 4.0—5.5 mm. Antennae $\frac{3}{5}$.

Head brownish, collar and antennal eyecaps yellowish white. Antennae blackish. Thorax dark grey. Abdomen blackish grey.

Forewings dark grey, on apical area a blotch of coarse black scales with a violet gloss. No pronounced transverse band, but frequently at $\frac{2}{3}$ a number of colourless transparent scales, giving that portion of the wing a lighter appearance. Cilia grey, at dorsum dark, at termen lighter, in some specimens apical cilia yellowish. Hindwings grey.

Neuration see fig. 13.

Genitalia see fig. 7. Valvae comparatively broad at apex, apical hooks (style and cuiller) small, strongly inwardly-curving. Inner surfaces of valvae set with long hairs. Uncus bilobed, excavation deep, each lobe terminating in two protrusions of almost equal size. Cornuti one pair of very strong spines, two pair of strong spines, a bunch of long slender spines curved at point, some small spines, and a plate.

Female.

Se fig. 2. Al. exp. 4.7—5.4 mm. Antennae $\frac{2}{5}$.

Head, collar, antennal eyecaps, and colour of antennae as in male. Thorax yellow. Abdomen grey, anal tuft lighter.

Forewings shining yellowish, on apical area a black, violet tinting spot, more extended and much more distinct than in male. Cilia at dorsum grey, at termen light grey at base, otherwise yellow. Hindwings grey.

Ovipositor protruding. Body and genitalia see fig. 14.

Cocoon.

Size and shape as usual in the genus, colour dark or light brown. Attached to fallen leaves, or moss etc.

Larva.

Shining amber-coloured. More like *N. obliquella* Hein. than *N. salicis* Stt. Head (see figs. 15—16) strongly pigmented. Eyes forwards directed (in *salicis* sideways).

Contents of central part of intestinal tube brown (in *salicis* green).

In the mine the larva lies dorsum upwards.

Egg.

Cemented to the underside of the leaf, normally close to the mid-rip, and covered by the long silky hairs of the leaf, thus difficult to observe.

Mine.

The mine starts as a narrow gallery (fig. 3), often running alongside the edge of the leaf (fig. 6), afterwards terminating in an irregular blotch, occupying a large portion of the leaf (figs. 4—5). The black excrement lies in the gallery compact, in the blotch in irregular heaps.

Food plant.

Salix repens L.

Appearance.

Numerous specimens observed in late third of May, swarming in late afternoon sunshine, or taken by sweeping the bushes of *Salix repens*. Larvae found in late September and first in October (author leg.).

Biotope.

Sandy open grounds where heather and dwarf sallow grow.

Localities.

Denmark: Fanø (at the west coast of Jutland), Asserbo (North Sealand).

Material examined.

Total 54 specimens (39 males, 15 females) including 31 specimens taken as adults, 23 specimens bred from larvae.

Type material.

Holotype (♂) and allotype (♀) are in the collection of the Zoological Museum of Copenhagen. Paratypes are in the collections of the Humboldt University Museum in Berlin, the British Museum (Natural History) in London, Dr. J. Klimesch in Linz (Austria), Mr. A. G. Carolsfeld-Krausé in Copenhagen, and of the author.

Salix feeding Nepticulidae.

N. repentiella n. sp. can hardly be confused with any other previously known Salix feeding species.

The almost unicolourous ground colour of the forewing — so different in the two sexes, dark grey in male, yellowish in female — together with a black patch of violet tinting scaling at apex makes the species easily recognizable. The hair tuft on the head is darker than in the other species, in freshly emerged specimens brownish, in some of the captured males dark grey.

As appears from the illustrations on plate III the male genitalia of *N. repentiella* n. sp. approaches those of *N. vimineticola* Frey (fig. 8) and of *N. salicis* Stt. (fig. 9). The differences in shape of the valvae, cornuti, etc. appear from the illustrations. The shape of the two lobes of the uncus also separates *N. repentiella* from the related species in the group.

Besides *N. repentiella* n. sp. the known Salix feeding species are:—

1. *salicis* Stt.

A well known species, illustrated by e. g. Stainton

(1855 pl. 2) and Klimesch (1951 pl. 10). Forewings with white, rarely inconspicuous, transverse band. Head reddish brown or yellow. Male genitalia see fig. 9. Food plant *Salix caprea*, *cinerea*, etc. Mine a short wound gallery, terminating in a blotch. (*Nepticula* Heyd. sensu Beirne).

2. *auritella* Skala.

Unsatisfactorily defined, by E. M. Hering (in litt.) supposed conspecific with *N. salicis* Stt. The illustration of the genitalia published by Skala (1939 p. 128) is poor. Bred from *Salix aurita*.

3. *arbusculae* Klim.

Close to *N. salicis* Stt., illustrated by Klimesch (1951, pl. 10). Transverse band in forewings broad, white. Hair tuft on head in male dark brown, mixed with reddish hairs, in female yellow. Food plant alpine species of *Salix*, e. g. *arbuscula*, *glabra*, *reticulata*, and *retusa*. Mine similar to that of *salicis* Stt. (*Nepticula* Heyd. sensu Beirne).

4. *vimineticola* Frey.

Although most carefully described by Frey (1856 p. 382—383) this species has puzzled several authors. Its identity has been definitely established by E. M. Hering (1943 p. 276—277). Forewings with narrow, little conspicuous, yellowish transverse band. Ground colour light brownish, peppered with dark coarse scales. Cilia shining yellowish. Head yellowish red. Both sexes alike. Food plant *Salix viminalis* and *eleagnos*. Mine (according to description by Frey (l. c.) and illustration by Sorhagen-Strand (1922 pl. 3), not controlled by the author) a long, rather straight gallery, not combined with a blotch. (*Nepticula* Heyd. sensu Beirne).

Note: — "*N. vimineticola*" treated by Petersen (1930 p. 72, fig. 102) as well as the published Danish finds (Larsen 1916 p. 278, 1927 p. 183) — and probably the Swedish (Benander 1946 p. 70, 1953 p. 47) and Finnish (Hackman etc. 1950 p. 30) finds too — have to be referred to *N. obliquella* Hein. The illustration of the genitalia of

an English specimen, published by Beirne (1945 p. 215) seems to correspond with the illustration of the genitalia of a paratype from Frey's collection, shown in the present paper (fig. 8). Klimesch (1946 p. 166) gives a good illustration of the male genitalia of a specimen of *N. vimineticola* Frey from Austria.

5. *pallidiciliella* Klim.

A distinct species. According to Klimesch (1946 p. 165—166) similar to *N. vimineticola* Frey. Wings more monotonous in colour, cilia less shining yellow. Head ferruginous-yellow. Valva narrow, terminating in a long, inwardly-curving, pointed style. Gnathos arms connating, just split at ends. Mine combined, blotch occupying half of the leaf, containing excrement placed in a regular line. In leaves of *Salix purpurea*. (*Nepticula* Heyd. sensu Beirne).

6. *obliquella* Hein.

Often confused with *N. salicis* Stt. and *N. vimineticola* Frey. Recognizable by e. g. the shape of the valvae and the close approach of gnathos arms at base (see fig. 10). Forewings with distinct, curved, narrow, white fascia. Head reddish-yellow. Feeds preferably in leaves of *Salix viminalis* etc., but also of various sallows. Mine a rather long, straight gallery, terminating in an oblong blotch. (*Nepticula* Heyd. sensu Beirne).

Note: — "*N. obliquella*" as figured by Petersen (1930 fig. 98) does not belong to this species, its identity has not been established, and the preparation does not seem to exist any more (vide Hering 1943 p. 277).

7. *uniformis* Hein.

A doubtful species. According to Heinemann (1871 p. 210, 1877 p. 730) very similar to *N. ruficapitella* Hw. Head ferruginous-yellow. Tibia and tarsus of middle legs yellow (in *repentiella* grey). Bred from *Salix caprea*. Described in 1871 and not refound. The old material seems lost.

8. *wockeella* Hein.

A doubtful species. According to Heinemann (1871 p. 223, 1877 p. 770) close to *N. cryptella* Stt. Head reddish-yellow. Bred from *Salix alba*. Described in 1871, and not refound. The original material (2 specimens) seems lost.

9. *dewitziella* Sorh.

Described by Sorhagen (1885 p. 284—285) as close to *N. wockeella* Hein. Head light ferruginous-yellow. Bred from *Salix caprea*. Not refound since 1884. A doubtful species.

10. *nivenburgensis* Preiss.

A distinct species. As appears from the illustration published by Hering (1943 p. 275) the cornuti consist of two large, strongly sclerotised, cup-shaped formations, and a spine. (*Stigmella* sensu Beirne).

11. *intimella* Zell.

A distinct species. Forewings blackish with a whitish dorsal spot. Head ferruginous-orange. Mine a blotch containing two walls of excrement. On *Salix caprea*, *fragilis* etc. Illustration of the male genitalia of a Danish specimen see fig. 12. (*Dechtiria* Beirne).

12. *Nepticula* n. sp.

On my request Dr. P. Benander has been kind enough to send me for dissection a *Nepticula* sp. ♂, bred on 30th July 1941 from a larva which he had taken on 11th July 1941 mining a leaf of *Salix repens* at Listerlandet (Blekinge in Sweden). The specimen had been ignored until Dr. Benander rearranged his collection of Nepticulids in late 1953.

The genitalia of this specimen differ from those of the other known species of this group, and the specimen belongs to an undescribed species. (*Nepticula* Heyd. sensu Beirne).

Related species.

One species, not belonging to the *Salix* feeding group, viz. *N. myrtillella* Stt. — feeding on *Vaccinium* — is closely related to some of the species of the group, especially to *N. salicis* Stt. The genitalia of a Danish specimen are illustrated in fig. 11.

Nomenclature.

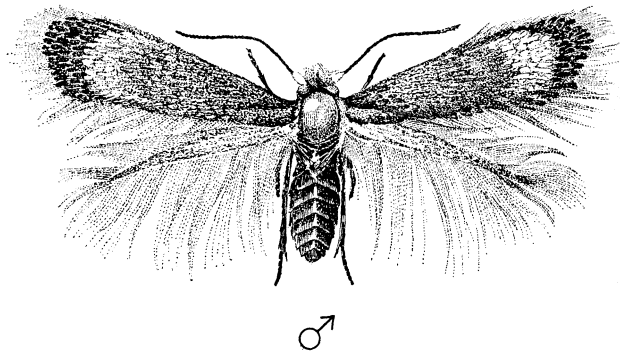
The well established genus name *Nepticula* Heyd. (1843) has recently by some authors been dropped in favour of the older name *Stigmella* Schr. (1802), and consequently the family name *Nepticulidae* has been changed into *Stigmellidae*.

The validity of Schrank's name seems somewhat doubtful, but even if that was not the case, a change like this of a universally used name for a genus, so often mentioned in the literature, into a name which has not been in use for a period of 132 years seems most difficult to accept.

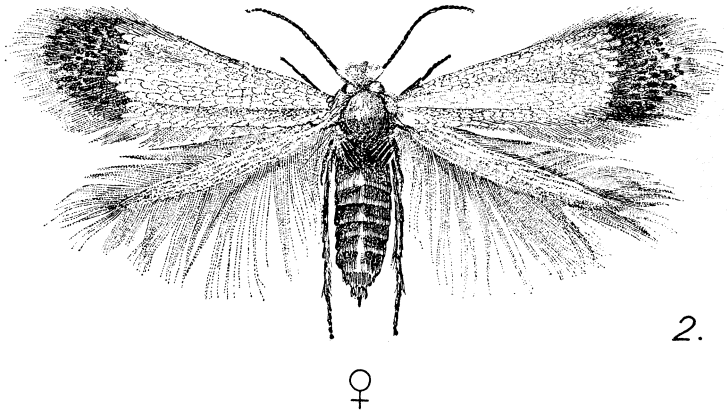
Miscellaneous.

The author took the first imago of *N. repentiella* on the isle of Fanø on June 21st 1948, and afterwards found several adult specimens at Asserbo on May 19th 1951, May 17th and 22nd 1952, May 18th, 20th and 24th 1953. Searching for the larva led to success on September 20th and October 4th 1953.

Breeding of *N. repentiella* proved very easy. A number of larvae were collected on October 4th 1953. Some of them, destined for anatomic study, were kept indoors. One of these pupated, and an imago emerged already first in November of the same year (less than a month after the larva had been taken). The remainder of the cocoons were kept in the cold. 4 specimens, transferred to a warm room on November 15th 1953, emerged in the period December 28th 1953—January 1st 1954, and



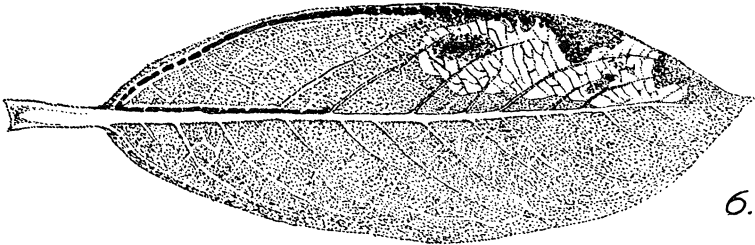
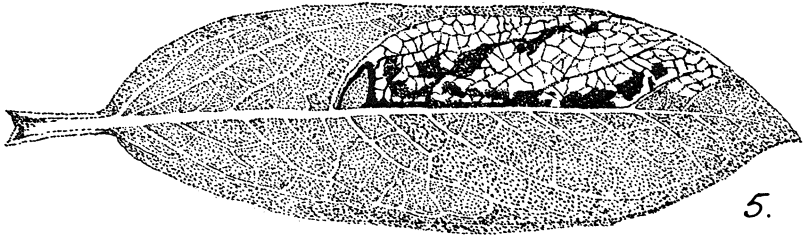
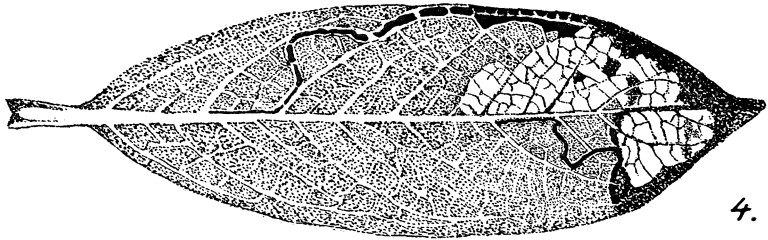
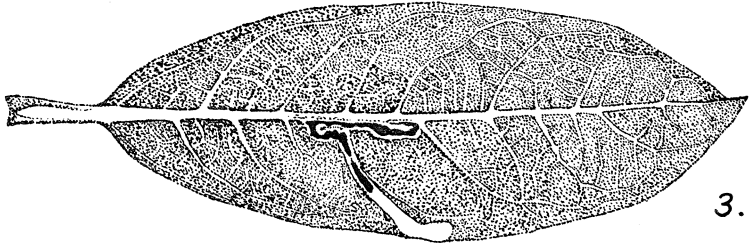
1.



2.

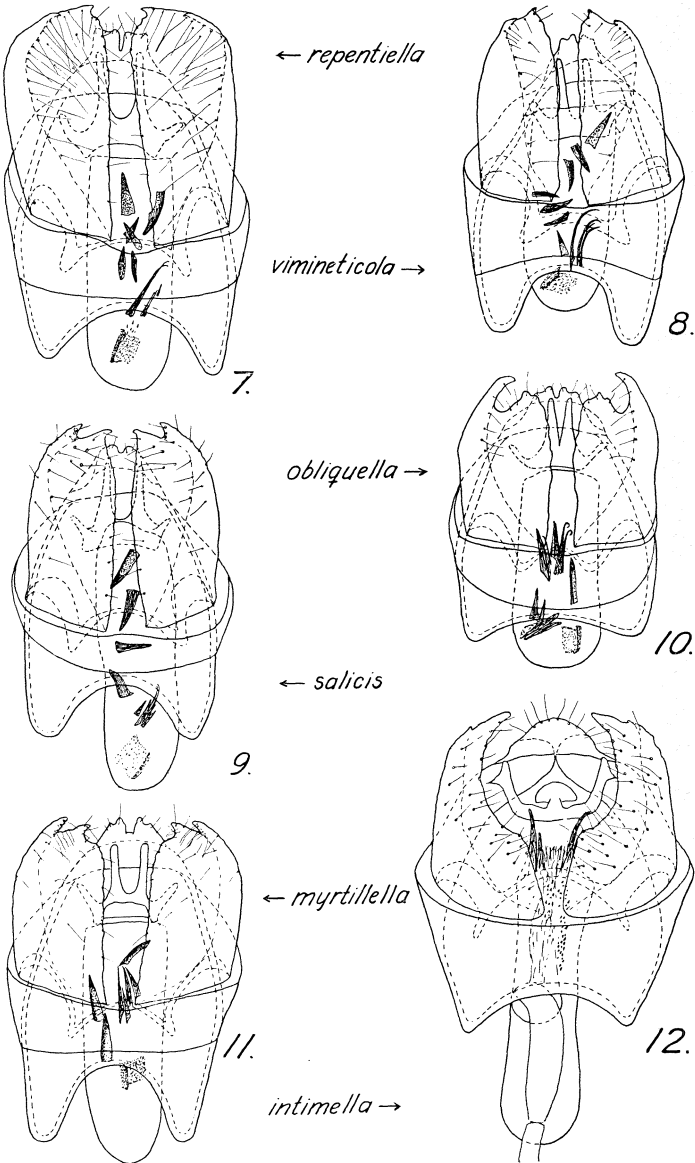
Nepticula repentiella n. sp. Fig. 1: male, fig. 2: female. (× 20).

PLATE II

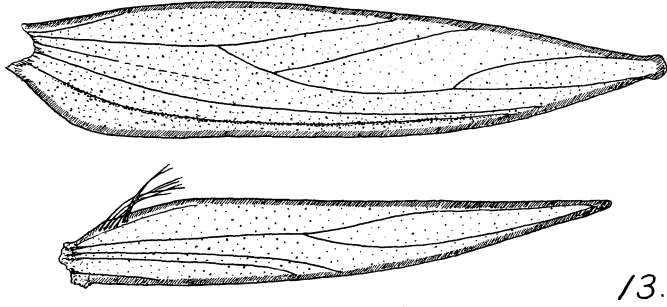


Figs. 3—6: Leaves of *Salix repens* mined by *Nepticula repentiella* n. sp. ($\times 4$).

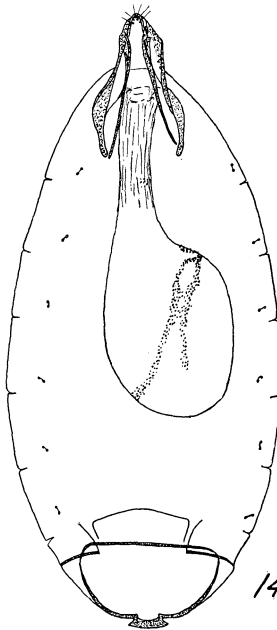
PLATE III



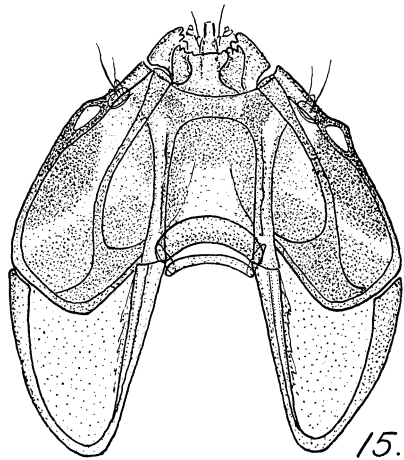
Figs. 7–12: Male genitalia of species of *Nepticula* ($\times 130$).



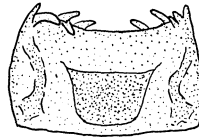
13.



14.



15.



16.

Nepticula repentiella n. sp. Fig. 13: Wings (scales removed) ($\times 30$). — Fig. 14: Female body (scales removed) ($\times 30$). — Fig. 15: Head of larva ($\times 150$). — Fig. 16: Labrum of larva ($\times 400$).

18 specimens, having been taken into the room on April 27th 1954, bred between April 27th and May 10th 1954.

Not a single of the larvae were infested.

Acknowledgments.

I wish to express my sincere thanks to Professor E. M. Hering for generous assistance in various ways, e. g. by enabling me to examine the entire material of *Nepticula vimineticola* Frey — including 6 paratypes — preserved in the Berlin Museum. Further to Dr. J. Klimesch for valuable comments and for animating me to search for larvae on *Salix repens*, to my friend Dr. P. Benander for sending me the Swedish specimen mentioned on p. 87 (no. 12), to Mr. A. G. Carolsfeld-Krausé for anatomic study of the specimen from 1948 and of the larvae, and to my wife, Mrs. Malle Wolff, who accompanied me on the excursions and collected several of the mines.

Preparations.

The preparation, illustrated in fig. 8 is made by Professor E. M. Hering, in figs. 15—16 by Mr. Carolsfeld-Krausé, and in the remainder by the author.

Illustrations.

Illustrations figs. 1—2—3—4—5—6 are drawn by Mr. Poul Larsson, figs. 15—16 by Mr. Carolsfeld-Krausé, the remainder by the author.

The cornuti are drawn in full line even if concealed by other parts of the genitalia.

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Ændringer i vor billefauna. 1954 ¹⁾.

Af Victor Hansen.

- 754 a. *Omalium laeviusculum* Gyll. (D. F. XV. 64). Samsø (1 stk. under tang på Nordby strand, 17. 6. 54; disponent Andr. Sørensen leg., F. L. det.).
1431. *Meotica* (?) *pallens* Redtb. udgår. Vor art har vist sig at være en ny art, der nu er beskrevet af O. Scheerpeltz som *M. hansenii* i Ent. Medd. XXVII, p. 58, jfr. D. F. XVII. 393.
1431. *M. hansenii* Scheerp., se lige foran.
1519. *Brachygluta* (?) n. sp. Arten er nu blevet beskrevet som *B. hansenii* af Besuchet i Ent. Medd. XXVII, p. 43.
- 2011 a. *Atomaria lewisi* Reitter. Sundby Storskov, sigtet af rester fra høstakke i skovengene, juli 1953, aug. 1954 (i stort antal) (J. A., F. L. og V. H. leg., V. H. det.). Arten, der er beskrevet fra Østasien, har i de senere år bredt sig ud over Europa (England, Holland, Nordvesttyskland, Sverige (Sjöberg in litt.)), jfr. „*Bombus*“, nr. 82—83 (1954) p. 250 og Horion i Deutsche Entomologische Zeitschrift, N. F. Bd. 1, p. 16. Den ligner *A. fuscata* Schönh., men kendes let fra den og de andre nærtstående arter ved opstående vingedækkebehåring. Kroppen er bred og hvælvet, farven rødlig eller brunrød og de to næstsidste følehornsled tværbrede.
- 3070 a. *Pissodes validirostris* Gyll. Hornbæk plantage, 1 stk. 13. 6. 48 (Kornerup leg., V. H. det.). Bemærkningerne om arten i D. F. IV, p. 96 er ikke fyldestgørende. Arten ligner *P. pini*, men har bl. a. meget finere punktstriber på vingedækkerne.
- 3109 a. *Gronops inaequalis* Boh. Bornholm: Boderne (1 stk. 5. 5. 54, under marehalm, civiling. Erik Larsen leg.), Dueodde (1 stk. 8. 6. 54, under tang på strandbredden, Kornerup leg.); V. H. det. Arten er kendt fra Sibirien, Finland og Sverige (hvor den bl. a. er fundet på Gotland, under tang på strandbredden) og er antagelig ved at brede sig. Jfr. Ent. T. 1946, p. 82 og 1947, p. 177. Den er let kendelig fra *G. lunatus* ved større, bredere krop og kraftigt tuberkulerede vingedækker med kraftigere sideknode bagtil.

¹⁾ Jfr. Ent. Medd. XXV, p. 209—211, p. 326—327, p. 405—406 og p. 465—466, XXVI, p. 278—279 og p. 502—504 samt XXVII, p. 41—42.

3270. *Hylastes ater* Payk. Det om denne art anførte angår i det væsentlige *H. brunneus* Er. *H. ater* synes at være sjælden eller meget sjælden hos os (J, Ø, B). Fund foreligger fra Esbjerg, Bromme plantage, Annebjerg skov i Odsherred, Gelsskov og Rønne nordskov. Maj, juli, sept. Arten kendes fra *H. brunneus* bl. a. ved mikrochagrine-rede stribemellemrum på vingedækkerne.
- 3270 a. *H. brunneus* Er. Se lige foran.
- 3272 a. *H. angustatus* Hbst. Draved skov, 1 stk. (♂), 20. 5. 29 (V. H. leg. og det.).
3283. *Trypophloeus granulatus* Ratz. udgår, idet vor art er *T. grothi* Hagedorn.
3283. *T. grothi* Hagedorn, se lige foran.
3292. *Pityophthorus* (?) *pityographus* Ratz. udgår, idet vor art er *P. pubescens* Marsh.
3292. *P. pubescens* Marsh., se lige foran.

Anmeldelser.

Victor Hansen: *Biller XIII, Clavicornia* 1. "Danmarks Fauna" 55 Kbh. 1950. 278 S. 14 Kr. — *XIV, Clavicornia* 2 og *Bostrychoidea*. D. F. 56 1951. 253 S. 14 Kr. — *XV, Rovbiller* 1. D. F. 57 1951. 274 S. 15 Kr. — *XVI, Rovbiller* 2. D. F. 58 1952. 251 S. 15 Kr. — *XVII, Rovbiller* 3. D. F. 59 1954. 499 S. 26 Kr., ib. 3 Kr. mere,

Med disse 5 Bind er Højesteretsdommer, Dr. phil. Victor Hansen naaet meget nær Afslutningen af Billederne i Serien "Danmarks Fauna"; kun Barkbillerne, der er under Arbejde, mangler, saa er Billederne med 17 (18) Bind, som den første af de store Insektgrupper afsluttet. Dens første Bind, fra 1908, var "Danmarks Fauna"s 3., dens foreløbig sidste det 59., og saaledes har denne Gruppe faktisk gjort hele Seriens Udvikling med. "Danmarks Fauna" er bygget paa den Illusion, at enhver interesseret kan bestemme et hvilket som helst Dyr nogenlunde let. Paa den Illusion opbyggedes det første Billebind, Løbebillerne, som var saa slet, at det maatte omlaves (Bd. 11), og ogsaa Henriksens Smælder-Bind og Jensen-Haarup og Henriksens Træbukke bygger derpaa, men med mere Rette; de er faktisk for Skolebørn de mest inspirerende. Med 4. Bind, Snudebillerne, begynder den Victor Hansen'ske Æra, en vanskelig Gruppe at starte med, hvor da ogsaa følelige Synonymi-

Mangler gør sig gældende, og hvori Larverne kun faar een Sides Omtale. I det følgende Bind, Aadselbiller "m. m.", der delvis indeholder Grupper med langt mere Publikumstække, har Victor Hansen fundet sin Form, baade de anskuelige Tegninger af smukt opstillede Exemplarer og den lidt udførlige Text er i dette Bind som i alle de følgende, og Larverne faar, af Kai L. Henriksen, en Omtale, hvis Knaphed skyldes det daværende manglende Kendskab til mange Former. Og med Torbister, Bladbiller, Vandkalve, Vandkærer, Blødvinger etc., Løbebiller (nyudg.), og Heteromerer, Billernes 6.—12. Bind, er vi naaet til Seriens Højdepunkt, hvori baade Imagines og Larver faar en saa fyldig Behandling, som det daværende Kendskab tillod, ja for Henriksens sidste Larvebind (Vandkæernerne) og for de tre følgende Bind, hvor Sv. G. Larsson overtager Larveafsnittet, gælder det, at de indeholder et stort videnskabeligt nyt Stof og derved bringer Serien op paa et meget højt internationalt Stade, hvor Forskere lærer sig Dansk for at kunne bruge den. Mange af disse Bind behandler ogsaa Grupper af stor biologisk Interesse, hvor ogsaa Imago-Delen indeholder Stof ud over det for Bestemmelse og Kendskab til Arternes Udbredelse nødvendige, saaledes at vel disse Bind vil staa baade for Samleren og for den alment interesserede som meget vigtige Haandbøger.

Tilbage stod da, foruden Barkbillerne, nogle meget vanskelige Grupper, hvad Bestemmelse angaar, nemlig alle Køllehornede, deriblandt Mariehøns, og alle Rovbiller. De sidste var i 1914 behandlet, hvad Bestemmelse af Imagines angaar, af I. P. Johansen, men efterhaanden var denne Bog blevet forældet; baade var flere Arter kommet til og Bestemmelsen delvis lagt over paa andre og vanskeligere tilgængelige Karakterer, saaledes at en Behandling af disse Dyr i "Danmarks Fauna" var i høj Grad paakrævet. Forinden blev imidlertid Clavicornierne bearbejdede, og her viste det sig, at Kendskabet til Larverne ad literær Vej var saa mangelfuldt, at en lang Række Nybeskrivelser, som Museets Materiale ganske vist tillod, var nødvendige; og da Kendskabet til Imagines, alt taget i Betragtning, var langt længere fremme, kunde de to Forfattere ikke holde Trit, hvorfor det blev vedtaget at udgive Imago-Omtalen for sig, selvom Seriens Karakter derved gik fra det almene mere over til det specielt faunistiske. Dette var vel under Omstændighederne nødvendigt, men beklageligt. Endnu mere beklageligt, at ikke blot Clavicornierne, men ogsaa Rovbillerne kom til at lide af denne Mangel.

Clavicornierne etc. omfatter over 400 danske Arter, Rovbillerne over 800, saaledes at over en Tredjedel af alle danske Biller omtales i disse 5 Bind. Intet Under derfor, at de er digre, og en

stor Fortjeneste, at de er kommet, saaledes at en virkelig sikker Bestemmelse er mulig for Samlerne af disse Grupper, som mange viger tilbage for paa Grund af deres utvivlsomme Vanskelighed. Victor Hansen fremhæver dog, at en meget stor Del Arter faktisk ikke volder større Vanskelighed; det er specielle Slægts-Grupper, der giver Hovedbrud — og forøvrigt ogsaa "Storsystematikken", der skal omfatte saa meget, at den ofte er vanskelig at faa bragt i "populær" Form. Og her maa i Fortsættelse af det allerede sagte siges, at Billeserien ogsaa i den Forstand har gjort "Danmarks Fauna's" Udvikling med, at man har opgivet at tage Hensyn til den "læge" Læser; vil man bestemme Dyrene, maa man kende og kunne finde frem til de virkelig adskillende Karakterer; "det er ikke billigere", som Marcus Rubins Valgsprog lød; vil man Maalet, maa man ville Midlerne. (Paa Populariteten havde det dog maaske nok hjulpet lidt, om f. Ex. Ordene Mariehøns og Borebiller havde været at finde i Titlen, eller i hvert Fald i Registret.) Men det har gjort Bindenes Salgssucces mere tvivlsom, og det er derfor et Gode, at man har kunnet interessere Carlsbergfondet i at støtte dem; "Danmarks Fauna's" 60-Binds Serie er i sit Oplæg og sin Udformning saa gedigen, af den bør holdes i Live, omend kun for et Faaltal — idet vi dog ikke maa glemme, at vi har Fenno-Skandia og delvis Tyskland og Holland som en udvidet Læserkreds.

Det vil ikke være muligt eller nødvendigt her at fremhæve enkelte Sider af de 5 Bind; at Dyrene ofte er saa smaa og vanskeligt bestemmelige, motiverer den undertiden lidt vel udførlige Beskrivelse sammenholdt med Bestemmelsestabellerne, og en vis Vaklen i Beskrivelsens Præcision er absolut nødvendig for vanskelige Former; al Artsopfattelse beror jo paa et Skøn, og den Variationsbredde, en Arts Karakterer omfatter, er ogsaa skønsommæssig; saalænge — og det vil vist sige til Tid og Evighed — et absolut Artskriterium ikke er givet, vil en "Arts" Beskrivelse rumme vage Karakterer. Kopulationsorganerne er her kommet til at spille en stor Rolle, idet de ofte har Præcision i Adskillelsen, hvor denne iøvrigt mangler; hvor disse Organer har vist sig nødvendige for den sikre Artsadskillelse er de medtaget, trods de tekniske Præparationsvanskeligheder, i Victor Hansens senere Bind, saaledes i de 5 her omtalte, og med klare Figurer. For det fremtidige faunistiske Kendskab til den danske Billefauna er et meget værdifuldt Grundlag lagt i disse 16 Bind, og det maa haabes, at man ikke tror, at der nu ikke er mere at gøre inden for Billerne, men at de tværtimod maa inspirere til øget Opvæxt af danske Billesamlere, der for Tiden tal-mæssigt staar i Skygge af Lepidopterologerne.

S. L. Tuxen.

F. G. A. M. Smit: **Lopper**. Danmarks Fauna bd. 60. 125 pp., 182 figg. Kbh. 1954. Pris 10 kr., ib. 13 kr.

I Danmarks Fauna bd. 1 (1907) hed det, at man tog sigte på "Tilvejebringelsen af en Række let tilgængelige, billige, populære og dog videnskabelig paalidelige og fuldstændige Haandbøger i den danske Fauna", der skulle "indeholde Beskrivelser af samtlige danske Arter" og "byde saadan Vejledning, at enhver, som blot har det almindelig dannede Menneskes Forudsætninger, derigennem vil blive sat i Stand til at bestemme de Dyr, han træffer her i Landet."

Hvis initiativtagerne i Naturhistorisk Forening omkring århundredskiftet havde turdet drømme om at serien stadig var fuld af livskraft ved udsendelsen af bd. 60 havde de næppe annonceret den som værende samtidig populær og fuldstændig. Det går så længe der er "lette" dyregrupper at tage af, men da disse nu er ved at slippe op *må* serien ændre karakter i retning af det mindre populære.

Det foreliggende bind hører til denne nye kategori. Det omhandler en dyregruppe, som næppe kan gøres populær hverken blandt samlere, naturhistorisk interesserede eller hos menneskeheden som helhed. Studiet af den kræver en del teknisk forarbejde under indsamling og præparation, mere end amatører i almindelighed er indstillet på, ligesom mikroskopering er uundgåelig ved bestemmelsen rent bortset fra at der med hensyn til lopper ikke er meget at "gøre" her i landet.

Bogen henvender sig derfor til en snævrere kreds, hvad der også afspejles tydeligt i behandlingen. Anm. finder bogen særdeles god; den er grundig, præcis og forsynet med et væld af velvalgte og vel tegnede illustrationer. Den gør det faktisk muligt at bestemme enhver art, der kan forventes at forekomme herhjemme og at hefte det nyeste navn på samme. Endvidere er der en god beskrivelse af anatomen og af den teknik, der fører til gode præparater. Hvis man således betragter bogen som en monografi over danske lopper, er det meget svært at finde noget at kritisere (det skulle lige være at fig. 1 (mest) men også fig. 4 i høj grad behøver en målestok).

I dens egenskab af bd. 60 i D. F. kan der peges på endnu et par småting. Der kunne godt gøres lidt ud af loppernes betydning for menneskeheden (specielt som sygdomsvektorer). Ganske vist er problemet ikke så aktuelt her, men den almindelige danske læser vil fra nu af først kigge i D. F. Her vil han intet finde om sagen, ikke engang henvisning til at litteratur om emnet *er* anført i litteraturlisten. Dette er så meget mere påkrævet som der p. 42 fortælles (med litteraturhenvisning) at *C. trichosa* "har vist sig at

overføre" grævlingens lus (altså fra grævling til grævling). Som det står vil den ikke-skolede læser uvilkårlig tillægge en sådan sidebemærkning en urimelig stor betydning.

En anden ting, som den naturhistorisk interesserede vil spørge om, er hvorfor lopper har så mange underarter. Forklaringen herpå er nok den, at mens lopperne ved bestemmelsen må "studeret fra siden og ikke fra oven" (side 3), så har man ved storsystematikken handlet modsat og anlagt globale synspunkter. I højere grad end ved de fleste dyregrupper er størstedelen af systematikken udført af et fåtal zoologer, der har rådet over store museums-materialer. Derfor kan der om slægten *Tarsopsylla* stå: "kun een art med een palæarktisk og een nearktisk underart." Der er næppe tvivl om at "loppefolkene" arbejder med andre underarts- og artsbegreber end flertallet af zoologer. Havde *Tarsopsylla* været en løbebilleslægt, havde den nok haft 2 arter i stedet for een art med 2 underarter.

Disse småbemærkninger rokker dog intet ved den kendsgerning, at vi har fået en god og autoritativ dansk håndbog om danske lopper, men hvis man helt glemmer hensynet til den almindelige "læser" under bearbejdningen af fremtidige "vanskelige" grupper kan D. F. miste noget af sin oprindelige karakter hvilket, i anmelderens øjne, vil være et tab. Det er nemlig også rigtigt, hvad der stod i bd. 1, at når serien er færdig (og for den sags skyld allerede nu) vil Naturhistorisk Forening have skabt et værk, hvortil intet land har noget sidestykke. Ganske vist har andre lande tilsvarende serier men i en hel anden prisklasse og uden det populære islæt som utvivlsomt har betydet meget for højnelsen af den almindelige naturhistoriske interesse her i landet.

C. Overgaard Nielsen.

August Thienemann: *Chironomus. Leben und wirtschaftliche Bedeutung der Chironomiden*. Die Binnengewässer bd. 20. (Schweizerbart'sche Verl.) 1954. XVI + 834 sider. Pris 140 DM. Indbundet 143,50 DM.

Enhver der beskæftiger sig med ferskvand eller blot færdes lidt i naturen kan ikke undgå at mærke, hvilken uhyre rolle de oftest meget små og uanselige chironomider spiller. Forfatteren af ovennævnte bog er kommet til det resultat, at chironomider i ferskvand udgør $\frac{1}{3}$ af makrofaunaens artsantal. Og mængdemæssigt kan de på egnede lokaliteter udvikle sig til en veritabel landeplage. Det er en kendt sag, at de viden om i Europa bruges som hønsefoder, ved Baikalsøen endog som gødning. Denne i systematisk henseende så vanskeligt tilgængelige dyregruppe er nu blevet monografisk be-

arbejdet af direktøren for den hydrobiologiske station i Plön, Professor August Thienemann. Som allerede understreget i undertitlen handler monografien ikke om chironomidernes systematik, men om deres biologi og økologi. De zoogeografiske problemer er behandlet i korthed, da forf. i 1950 skrev en monografi (af samme størrelse) om „Verbreitungsgeschichte der Süßwassertierwelt Europas“.

Gennem et halvt århundrede har Prof. Thienemann stået i spidsen for tysk chironomideforskning og bogen er en værdig afslutning på dette livsværk. Ved århundredskiftet fandtes i det væsentlige kun Meigens og Zetterstedts systematiske værker og en chironomide lod sig meget vanskeligt bestemme. I dag er Prof. Thienemann i stand til at skrive en bog alene om chironomidernes biologi og økologi, i hvilken literaturlisten optager 50 sider!

Bogens titel må ikke misforstås, idet den ikke alene behandler Chironomus, men både chironomider og ceratopogonider. I et indledende afsnit omtales chironomidernes økologiske valens med en omtale af forskellige biotoper og de mest karakteristiske arter. Et meget stort kapitel omhandler chironomidernes biologi, de akvatiske larvers og puppers autøkologi. I et hovedafsnit gennemgås chironomidernes udbredelse og arternes fordeling på forskellige biotoper, nemlig huler, kilder, bække, floder, søer, damme, mineralkilder, solfatarer og saltvand. De mest grundige undersøgelser er udført i Mellem- og Nordeuropa, Nordamerika og til dels Japan. Forf. har på sine ekspeditioner til Lapland og Sundæerne udvidet kendskabet til disse egne chironomide-fauna. På grundlag af disse undersøgelser giver forf. en grundig oversigt over tropiske, boreale og arktiske søers fauna og de økologiske årsager herfor. Det klassiske problem med chironomider og sætypeteorier finder også omtale. Forf. giver god plads til citater og man føler sig derfor i nøje kontakt med originallitteraturen. Et større afsnit giver en oversigt over chironomidernes økonomiske betydning. Det er et meget vigtigt kapitel med alsidige betragtninger over deres kvantitative forekomst, fiskerimæssige betydning og næringsværdi.

Bogen er stor, men det mærkes ikke, fordi man bliver grebet af den inspirerende og inciterende fremstilling. Kun få evner som Prof. Thienemann at skrive så elegant og fascinerende om videnskabelige emner, den glødende interesse skinner altid igennem.

Det er en smukt udstyret bog. Chironomidelitteraturens tegninger har ikke altid været en skønhedsåbenbaring, men her er foretaget et godt udvalg samt mange nye føjet til. De mange og fortrinlige fotografier støtter fremstillingen væsentlig. Dog kan der rettes indvendinger mod anvendelsen af fotografier som nr. 210 og navnlig 285 („Photographisches Produktionsdiagramm“), idet anm.

må hævde at der selv for rindende vand findes instruktive tegninger. Endvidere nærer anm. store betænkeligheder ved at se Schräders figurer og tal for Weser brugt som en norm. Anvendelsen af snævre procentsatser (sågar med decimaler) for faunafordelingen på biotoper, som til stadighed undergår store ændringer, kan materialet næppe bære. Schräders brug af forskellige redskaber kombineret med tekniske vanskeligheder bevirker, at de kvantitative resultater her er særlig vanskelige at vurdere.

Til slut et ønske. Prof. Thienemann advarer mod anvendelsen af Karnys bog „Biologie der Wasserinsekten“, fordi dens bestemmelsesnøgler vrirler med fejl. Denne bog har med sine oversigtsnøgler sikkert været den første redningsplanke for mange før de dykkede ned i junglen af systematisk speciallitteratur om chironomider. Det er netop en sådan oversigtsnøgle til bestemmelse af larver og pupper, der savnes. En nøgle, hvor bestemmelsen kan føres igennem til familie, underfamilie, slægter og artsgrupper med anskuelige figurer og henvisning til de nyeste og mest anvendelige specialafhandlinger. En nøgle til brug for limnologer, så det systematiske arbejde ikke virker afskrækkende, idet de færreste vil have tid og lejlighed til at beskæftige sig med systematik, biologi og milieu på een gang. Hvem kan? Sikkert kun få, men en af dem er i hvert fald Prof. Thienemann, som derved ville gøre europæisk chironomideforskning en uvurderlig tjeneste og bringe den et jætteskridt videre.

Pétur M. Jónasson.



H. P. S. Sønderup.

10. August 1870 — 28. Maj 1954.

Den 28. Maj døde paa Lemvig Sygehus, efter nogen Tids Svag-
hed, H. P. S. Sønderup. Med Sønderups Bortgang har Dansk Ento-
mologi atter mistet en af de virkelige store gamle Samlere, og hans
Død vil være et stort Tab for vore entomologiske Undersøgelser.

Hans Peder Steffen Sønderup var født i Vester Kippinge paa
Falster og tog i 1879, 19 Aar gammel, sin Lærereksamen fra Jøl-
linge Seminarium. Efter i nogle Aar at have været dels Huslærer
paa Bjødstrup og derpaa Lærer i Løgstør og Odder, kom Sønderup
i 1892 til Lemvig Borgerskole, hvor han blev til 1909, da han
flyttede til Maribo Borger- og Realskole. I Maribo blev Sønderup
til 1942, hvorefter han flyttede til Lemvig og her nød sit Otium
til han døde i 1954.

Sønderups naturhistoriske Interesse stammer allerede fra 1894,
da hans første Artikler, mindre Meddelelser om Fugle, Fisk og Vik-
lere, fremkommer. Men i 1901 kommer hans første virkelige ento-
mologiske Artikel i "Flora og Fauna", og i Aarene, der følger op
til 1950, kommer stadig den ene Artikel efter den anden, næsten
alle i "Flora og Fauna".

Fotografiet er taget 1940.

Fra Begyndelsen var det selvfølgelig Storsommerfuglene, der interesserede, og som senere var det det mindste, der trak mest for ham, nemlig Eupithecieerne, hvilket resulterede i, at Sønderup udarbejdede Afsnittet om Slægterne Tephroclystia og Chloroclystis i Kløckers Sommerfugle 4, i "Danmarks Fauna" 1915.

Men allerede da er Sønderup stærkt igang med Microlepidoptera, som sagt jo mindre jo bedre. Sønderup yndede hele sit Liv at dykke ned i den allermindste Lilleputverden, han kunde finde, og dette resulterede saa senere i, at han gik over til at studere Miner og minerende Insekter, og ved sin Død vel stod som vor fineste Ekspert paa dette Omraade, ogsaa meget kendt og anset blandt Udlandets Mineforskere, som han stod i livlig Korrespondance med.

Det næste større Arbejde, der følger, er sammen med J. P. Kryger i 1940: Biologiske Iagttagelser over 200 Arter danske Billelarver, fulgt 1945 og 1952 af endnu 2 Artikler over samme Emne. Og saa følger vel Kronen paa Sønderups Livsværk, den Publikation, der glædede ham mest, i 1949, hans store og prægtige: Fortegnelse over danske Miner, hvori Sønderup har nedfældet hele sit Livs Erfaring.

For den, der har prøvet at arbejde sammen med Sønderup, var der noget, der slog een, og som vi yngre Samlere mangler i højeste Grad. Det var den Ihærdighed og Omhyggelighed, hvormed han undersøgte selv den mindste Ting. Men det gav Resultater; Sønderup selv mente han havde fundet mellem 200 og 300 nye Arter Insekter for Danmark, og deraf var 7 novae species. Mon nogen nulevende Samler nogensinde naar op paa det Antal?

Jeg havde i de sidste 10 Aar nærmest daglig Kontakt med Sønderup og lærte ham at kende særdeles godt, som en Mand, der villigt og glad øste ud af sin umaadelige Viden. Mange Ekskursioner har vi haft sammen, og det var en Oplevelse at se Sønderup i Arbejde. Han kunde sætte sig ned paa en Grøftekant og ikke bevæge sig ret langt derfra i flere Timer og alligevel have Masser af Æsker fyldt med Prøver, naar vi skulde hjem.

Nogen egentlig Samling efterlod Sønderup sig ikke ved sin Død. For adskillige Aar siden solgte han den til Aarhus Naturhistoriske Museum, hvor den danner Grundstammen i dettes Microsamling. Men senere har han i meget høj Grad beriget saavel Københavns Zoologiske Museum som Aarhus med Masser af Miner til Mineherbariet og af klækkede Insekter. Alt hvad han efterlod sig af entomologisk Materiale, Bøger, Særtryk og alle hans smaa haandskrevne Notater, testamenterede han den, der skriver disse Linier.

Men Sønderup havde mange Interesser foruden Entomologien. Fra sin Ungdom var han stærkt interesseret i Afholdssagen og gjorde her et meget stort Arbejde, ogsaa Sangforeningen og Gymnastikforeningen i Lemvig stod hans Hjerte nær. Og han var ved sin Død Æresmedlem af baade de danske Afholdsforeninger og af Lemvig Gymnastikforening. Sønderup var selv i sine yngre Dage en meget dygtig Gymnast. Endnu lever her Historien om Sønderup, da han en Dag sammen med sin Frue og nogle Venner stod og nød Udsigten over Fjorden fra den nybyggede Jernbaneviadukt, hævet ca. 20 m over Vejbanen, og da pludselig, inden nogen vidste noget om det, stod paa Hænder paa Rækværket ud over Dybet.

Ved Siden af Foreningsarbejderne var Sønderup og hans Frue et Par meget skattede og dygtige Amatørskuespillere og Oplæsere, saavel i Lemvig som i Maribo. Saa sent som for et Par Aar siden havde mange Fornøjelsen at høre dem læse op i en Radioudsendelse her fra Lemvig.

Efterhaanden var Sønderup i Besiddelse af en næsten legendarisk Glemsomhed, og utallige er de morsomme Episoder vi har oplevet sammen, og den der morede sig mest var Sønderup selv. Ingen kunde le saa hjertelig som han over sig selv. Ved den Nordiske Entomolog Kongres i 1950, havde jeg den Fornøjelse at følges med Sønderup til Falster, hvor vi traf en Del Entomologer paa Ekskursion ved Bøtø, blandt andre Kryger. Mødet mellem disse to gamle Mænd var en Oplevelse. Det første Kvarter stod disse to alvorlige ældre og skældte hinanden ud som et Par Skoledrenge, til vild Jubel for de danske Tilhørere og stor Undren for de udenlandske. Sønderup bevarede i det hele taget lige til sin Død, det lyse muntre og drengede Livssyn, og selv i de sidste Maaneder, som han tilbragte i Sengen, var han altid munter og glad, naar man kom paa Besøg. Han laa næsten altid og læste gamle Tidskrifter eller havde faaet Breve, og havde altid noget som han absolut skulde vise mig.

Samarbejdet igennem Aarene med Kryger, C. S. Larsen og de udenlandske Samlere, især Professor Hering i Berlin, var iøvrigt en af Sønderups store Glæder, og selv til det sidste, hvor det kneb at overkomme det, gjorde han alt, hvad han kunde, for at passe sin Korrespondance.

Sønderup hviler nu i Lemvig, og meget betegnende er der over hans Navn paa Gravmindet hugget en Sommerfugl, med Farver, og naar jeg hver Dag gaar til mit Arbejde kan jeg netop se denne over Kirkegaardshækken og mindes alt, hvad jeg har haft sammen med og lært af Sønderup.

N. Ulrik Møller.

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On the types of *Drosophila picta* Zett. and *D. spurca* Zett. (Drosophilidae, Dipt.) and a new description of the former

by

Ove Frydenberg

Institute of Genetics, Copenhagen.

In 1847 Zetterstedt described a yellow species of *Drosophila* under the name *Drosophila picta*. Zetterstedt had only a single specimen at his disposal loaned to him by Stæger. This specimen had been caught by Stæger in Denmark but no locality was given. The type specimen in Stæger's collection, which now belongs to the Zoological Museum of Copenhagen, has been examined by the present author in order to ascertain the meaning of the name *D. picta* Zett. From this examination it is concluded that *D. picta* Zetterstedt 1847 is the correct name for the *Drosophila* species hitherto known as *Drosophila macularis* Villeneuve 1921.

Duda (1924, 1935) discussed the synonym of *D. picta*. According to this author *D. picta* is either a later synonym of *D. histrio* Meigen 1830 or the correct name for *D. macularis* Villen. Oldenberg in his own collection used the name *D. picta* in the latter sense. Duda, stressing the fact that Zetterstedt knew *D. histrio* Meig. only from Meigen's somewhat inexact description, held on the contrary that *D. picta* is a synonym of this species. In support of his view Duda pointed out that Zetterstedt described the third and fourth longitudinal veins of his *D. picta* as parallel, though they are evidently divergent in *D. macularis*, and that Zetterstedt did not mention the striking longitudinal stripes on the pleura of *D. macularis*. Furthermore Zetterstedt's description of the abdominal markings is a little ambiguous. Though *D. histrio* Meig. differs from *D. picta* as described by Zetterstedt

in having the third and fourth veins clearly convergent, Duda concluded that *D. picta* Zett. is a synonym of *D. histrio* Meig. Being ignorant of Villeneuve's description of 1921 he, in 1924, described *D. pleurofasciata* as new to science. In 1935 he retracted the latter name in favour of Villeneuve's name *D. macularis*.

Examination of the type of *D. picta* Zett. revealed that the dried specimen was in a miserable condition having no head and for most part overgrown with mould. In addition the left wing was broken and was therefore mounted in euparal to prevent further deterioration. The mounted wing is shown in fig. 1. The third and fourth veins are clearly divergent in spite of Zetterstedt's statement. Furthermore the pleura of the type specimen clearly show the brown longitudinal stripes so characteristic of *D. macularis* Villen. The type is also conspicuously smaller than any *D. histrio* Meig. seen by the present author. (The type was compared to specimens of *D. histrio* Meig. made available to the author by courtesy of Mr. F. Finsinger, Zürich). Comparison of the type with the three better preserved dried specimens of *D. macularis* collected by Lundbeck (see below) and with some Dutch specimens of *D. macularis* preserved in alcohol, and borrowed from Prof. J. Lever, Amsterdam, revealed no essential differences. It may thus be regarded as proved that *D. picta* Zetterstedt 1847 is identical with the species now commonly known as *D. macularis* Villeneuve 1921 and consequently the latter name is merely an invalid synonym of *D. picta*. On the other hand the investigation has shown that *D. picta* Zetterstedt 1847 is different from *D. histrio* Meigen 1830. Hence Duda's conclusion that *D. picta* is an invalid synonym of *D. histrio* Meigen can not be upheld.

A description of *D. picta* is given below. Unfortunately it has not been possible to obtain living specimens for dissection so the structure of the internal reproduc-

tive system and of the Malpighian tubes has not been investigated.

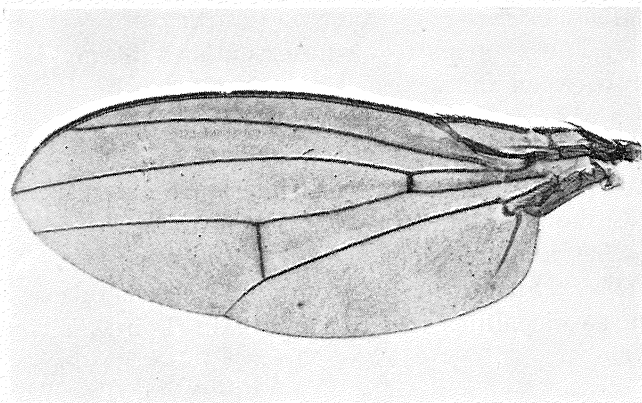
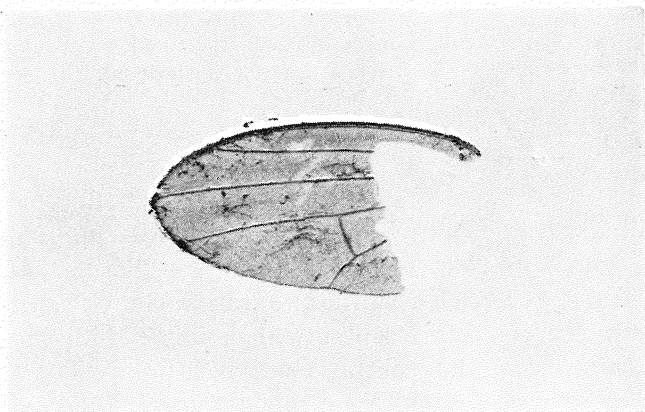
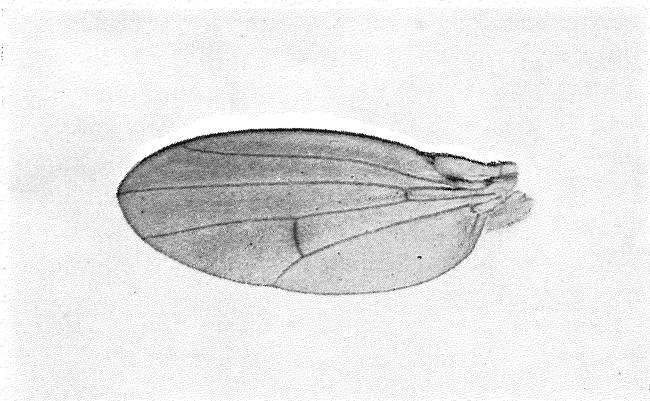
***Drosophila picta* Zetterstedt 1847.**

External morphology: ♂: Arista with 10 branches; two in the fork, five above and three below. Second antennal joint yellow, third also yellow though a little darker than the second one. Postfrons about one-half width of head, wider above, yellow. The anterior part of the yellowish orbits leaves the border of the eyes. Middle orbital bristle long, about one-half to three-fourths lower orbital. Prefrons, proboscis, and carina yellow. Carina broad and nose-like, with a median groove. Second oral bristle one-half first oral but conspicuously weaker. Greatest diameter of cheeks about one-fifth greatest diameter of eyes. Eyes with a short dense pale pile.

Mesonotum and scutellum yellow. Six rows of acrostichal hairs. Anterior scutellar bristles longer than the posteriors, reaching back to the ends of the posteriors. Anterior scutellars convergent. Pleura yellow with three brown longitudinal stripes. The most dorsal stripe passes from the limit between propleuron and humerus across mesopleuron just below the notopleural suture to the anterior end of base of wing. The middle stripe originates on the front of pteropleuron just below the end of the dorsal stripe, it crosses pteropleuron and closes around the base of haltere. The most ventral longitudinal stripe runs across the sternopleuron including the bases of the three sternopleural bristles.*)

*) The dorsal and the middle stripes may be regarded as a single somewhat broken stripe as was done by Villeneuve and Duda; from this point of view the pleura possess but two longitudinal stripes.

Fig. 1. Photograph showing the difference between the wings of *D. picta* and *D. histrio*. Above: Wing of one of Lundbeck's Danish *D. macularis* specimens. Middle: The broken wing of Zetterstedt's *D. picta* type specimen. Below: Wing of a swiss *D. histrio* specimen. (A. Øye fot.)



Sterno-index: 0.8—0.9. The legs yellow. Apical bristles on front and second tibiae; preapicals on all three tibiae.

Wings colourless to slightly yellowish. A pair of strong bristles at second costal breakage. Third and fourth longitudinal veins (radius₄₊₅ and media) strongly divergent. Costal-index: 2.9; 4th-vein-index: 1.3; 4-c-index: 0.7; 5-x-index: 0.9.

Abdomen yellow with a faintly brown median long-

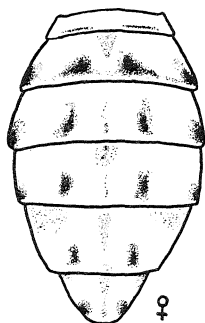


Fig. 2. Drawing of the abdomen of a female *D. picta* showing the position and extension of the abdominal markings. (After a Dutch specimen borrowed from Prof. J. Lever, Amsterdam).

itudinal stripe which may be more or less interrupted and with four rows of brown spots (see fig. 2).

Male genital apparatus (terminology from Hsu 1949): The primary claspers with a single row of 9—10 primary teeth, the ventral tooth a little weaker than the more dorsal ones. No secondary teeth. Close to the outer margin of the clasper a semicircle of about 10 marginal bristles, the inner ones strongest.

♀: There seems to be no essential difference in colour between the sexes. The ovipositor plate is yellow and rather pointed, with a row of small black spines on the border and a short weak bristle below.

Puparium: According to the figure given by Duda (1935) the horn-index is about one-fifth and the posterior spiracles are divergent.

Distribution: Villeneuve (1921) records this species from two localities in France: Blain (Loire inferieure)

and Ramboillet. According to Duda three specimens were caught by Oldenberg in the environs of Berlin, Germany. Duda (1935) mentions several specimens collected by him in Silesia (now Slask, Poland) and records three specimens from Hungaria and Austria. Zetterstedt's type specimen is from Denmark, no details of locality are given neither by Zetterstedt nor by Stæger in his collection. Examination of Lundbeck's collection in the Zoological Museum of Copenhagen showed that in August 1923 he reared three specimens from bur-reeds (*Sparganium*) gathered on Bjørnø, a small Danish island south of Funen. Finally Sobels et al. (1954) record it from four localities in the Netherlands. In spite of their intense collectings Burla (1951), Hadorn et al. (1952), Basden (1954), and Herting (personal communication) have not caught the species. Among 16.000 *Drosophila* specimens collected all over Denmark by the present author not a single *D. picta* appeared. It can be concluded that though *D. picta* is widely distributed over northern continental Europe, it always occurs in extremely small numbers and seems to be restricted to few localities.

Biological Notes: Duda and the three Dutch authors stress the fact that *D. picta* has been found by them in close association with reeds (*Phragmites communis*). Attention should be called to the equally striking fact that *D. picta* has been reared twice from bur-reeds (*Sparganium*; Reichert in Duda (1935) and Lundbeck).

Synonyms: *D. pleurofasciata* Duda 1924. *D. macularis* Villeneuve 1921. As far as known to the present author the former synonym has been used only by Duda (1924). The species is mentioned under the latter synonym by Duda (1935), Lever and Sobels (1951), and Sobels, Vlijm and Lever (1954).

In the same volume in which the description of *D. picta* was given Zetterstedt described a brown *Drosophila* species as *D. spurca*. The type of this species was also borrowed from Stæger, who had determined it as *D. tristis* Fallén 1823. The only difference between Stæger's specimen and *D. tristis* Fallén was that the former was darker than the latter. Zetterstedt nevertheless described it under the name *D. spurca* as new to science. The type specimen was returned to Stæger and is now in the possession of the Zoological Museum of Copenhagen. Duda already in 1924 had expressed the opinion that *D. spurca* was nothing but a synonym of *D. tristis* Fallén. He regarded *D. tristis* as a variety of *D. obscura* Fallén, but Pomini (1940) has since reestablished it as a species.

Duda based his statement on the literature only, as he had never seen the type of *D. spurca*. It was therefore considered worth while to examine the type. It was found to be in the same poor condition as that of *D. picta*, having also lost its head. Though this was not of great importance in the former case, it was very unfortunate here since it was impossible to check the presence of the two equally strong bristles on the palps which is the best distinguishing mark of *D. tristis*. The type being a male, it was nevertheless possible to verify Duda's statement. The wings were shaded over an area anterior to a line running from the middlepoint of the second costal segment to the tip of the third longitudinal vein which is so characteristic for *D. tristis*. Two fifths of the third costal segment were covered by the stronger costal fringe. The greyish brown mesonotum showed two unclear but unquestionable longitudinal stripes. In addition the tarsal combs were in accordance with those of *D. tristis*. There is therefore no question about Duda's statement that *Drosophila spurca* Zetterstedt 1847 is a synonym of *Drosophila tristis* Fallén. One may wonder

why Zetterstedt described *D. tristis* twice in the same volume. This may be due to the fact that his *tristis* specimen was immature and therefore unusually pale. Cain, Collin and Demerec (1952) have recorded such an immature *D. tristis* from Zetterstedt's collection and they regard this specimen as the type. This may also be the reason why Zetterstedt in his key has placed *D. tristis* among the lighter species whereas *D. obscura* and *D. spurca* are placed among the darker ones.

Acknowledgements.

Professor J. Lever, Amsterdam, has kindly lent me some of his "*D. macularis*" specimens. Professor C. H. Lindroth, Lund, has informed me that no specimens of the disputed species are present in Zetterstedt's collection in Lund. Dr. S. L. Tuxen, Copenhagen, has given much valuable advice on various nomenclatorial problems and has permitted me to study the types belonging to the Zoological Museum of Copenhagen. Mr. R. H. Pritchard has kindly corrected the English of the manuscript.

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Anmeldelse.

Die Schmetterlinge. Grosse Sowjet-Enzyklopädie, übersetzt. Jena (G. Fischer) 1954 36 pp., 2.50 DM.

Denne tyske Oversættelse af Sommerfugleafsnittet i den store Sovjet-Encyclopaedi er sendt til Anmeldelse. Det er mig en Gaade, hvorfor det er oversat. Det er en almindelig Lexikon-Gennemgang af Sommerfuglene uden ukendt Stof, men med mange Fejl, der nok væsentligst skyldes Oversætteren, der ikke er Entomolog (Holzmotte for Tineola biselliella; galt stavede Forfatternavne p. G. a. den russiske Transkribering af vesteuropæiske Navne; hvad er Anilinhaar?), men vel ogsaa skyldes Forfatteren (om Høreorganerne f. Ex.). Oversætteren er navngiven, Forfatteren anonym. Den synes mig uden politisk Tendens!

S. L. Tuxen.

The first record of Canadian Protura.

With systematic notes on *Acerentulus*.

By
S. L. Tuxen.

Through the courtesy of Dr. Marie Hammer, of Strødam, Denmark, I have had the opportunity of studying a collection of Protura from northern Canada made by her in 1948 and now forwarded to the Zoological Museum of Copenhagen. The material consists of well over a hundred individuals of the genus *Acerentulus* and one immature specimen of the genus *Eosentomon*. The *Acerentulus* specimens belong to two hitherto undescribed species which I describe below; however, in order to decide whether they were in fact new I had to investigate some of the species already known of this genus. Dr. F. Bonet, Mexico, sent me specimens of *A. tropicum* Bon., Dr. K. H. Forsslund, Stockholm, the four specimens of *A. trågårdhi* Jon. already examined by Condé, Dr. Grace Glance, Washington, Ewing's five species, and Dr. H. Gisin, Genève, three of his own determinations from Switzerland. The Carlsberg Fund enabled me to examine the types of Berlese and Silvestri which will be treated in separate papers. To the direction of the Carlsberg Fund, to the above colleagues, and to Mr. N. D. Riley, British Museum (Nat. Hist.), who corrected the language I tender my warmest thanks.

Acerentulus canadensis n. sp.

Length of body in adult about 0.9 mm. Length and breadth of head $150\ \mu$ and $100\ \mu$. Length of foretarsus $75\ \mu$, of claw $30\ \mu$, $TR = 2.5$. Length of middle and hind tarsus $30\ \mu$, their claws $20\ \mu$.

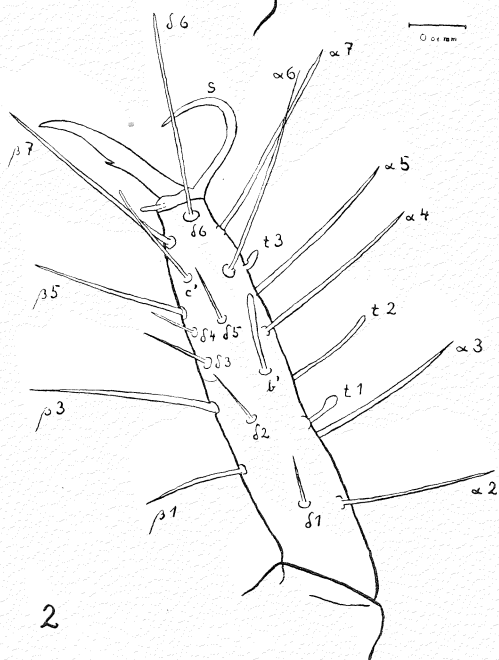
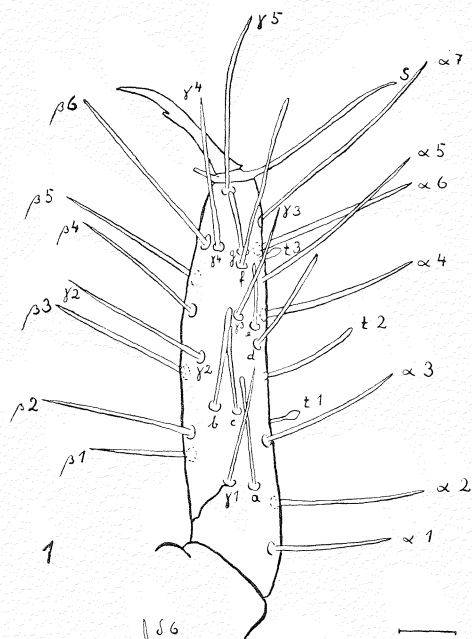
The foretarsus. Condé was the first to realize the systematic importance of the sensillae on the foretarsus which since 1945 he has figured and numbered in every species he has described, and later authors have followed him. Mostly seven sensillae are present on the exterior (posterior) surface of the tarsus, two to three on the interior (anterior) surface, and three dorsally. They were numbered by Condé a—g, a'—c', and t 1—3, respectively. It may, however, sometimes be difficult to distinguish between the setae and the sensillae, and I here propose, therefore, a system for numbering the setae as well. In all species of *Acerentulus* hitherto seen by me (15) the number and position of these setae have been identical. I illustrate the system on a foretarsus of *A. danicus* Condé (figs. 1—2) for direct comparison with the figures 24—25 in my paper from 1949.

The foretarsus is nearly cylindrical, but may be looked upon as foursided. Dorsally a zigzag row of seven setae, called α 1—7, surrounds the three dorsal sensillae t 1—3. Ventrally a zigzag row also of seven setae, called β 1—7. Exteriorly a zigzag row of five setae, γ 1—5, surrounds the seven sensillae a—g. And interiorly an irregular row of six setae, δ 1—6, surrounds the sensillae a'—c'; δ 1—4 is an oblique row of mostly very fine setae. The four setae α 7, γ 5, β 7, and δ 6 are long and form a ring round the praetarsus carrying the claw, the empodium, and the usually s-shaped seta called by Condé s and shown by him to belong to the praetarsus.

This only apparently complicated system of numbering in fact enables us to find and "determine" the sensillae in whatever position the tarsus is fixed on the slide.

In *Acerentulus canadensis* n. sp. the position of the sensillae is shown in figs. 3—5, the last figure showing the tarsus directly from above in which position the sen-

Figs. 1—2: *Acerentulus danicus* Condé. Foretarsus in exterior and interior view.



sillae on both sides are seen. It also shows that $t\ 1-3$ do not form a row, but $t\ 1$ and $t\ 3$ lie nearer the interior side of the tarsus, $t\ 2$ near the exterior side. This

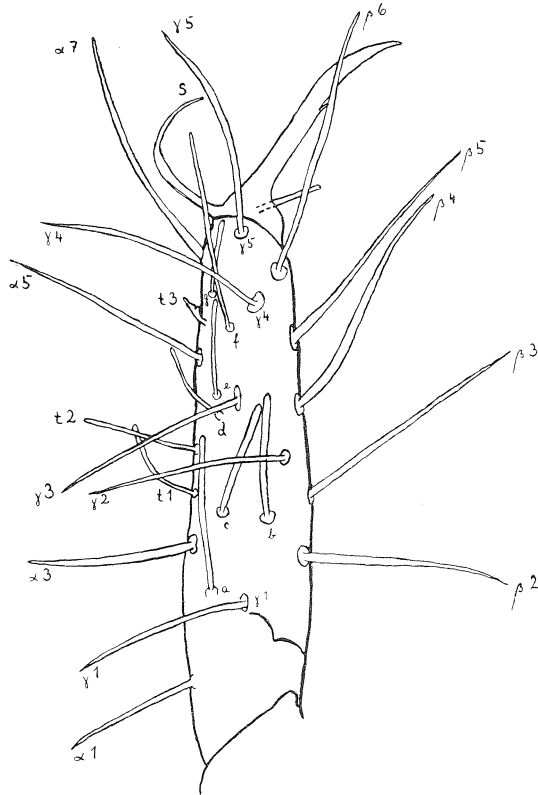
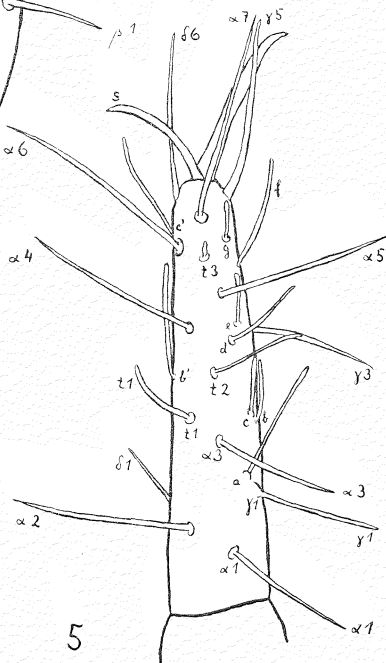
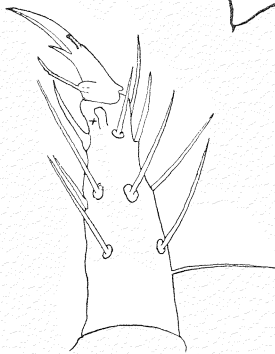
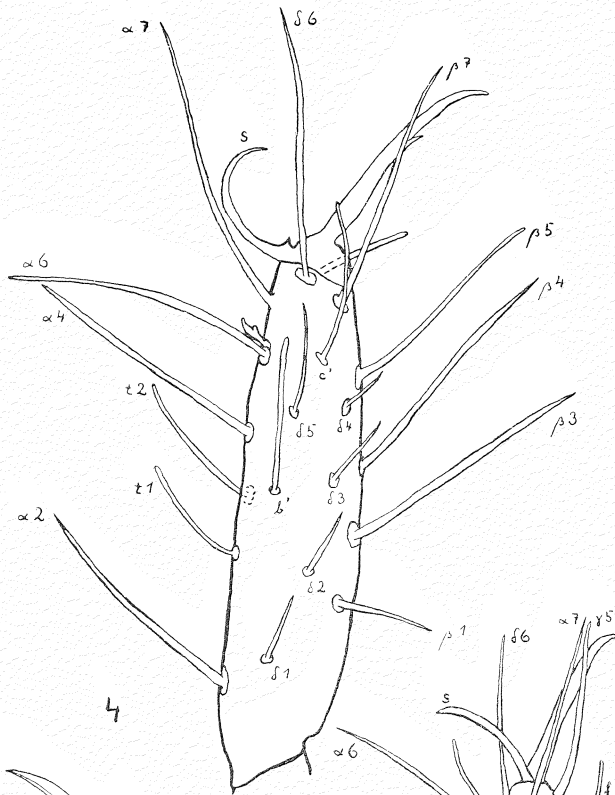


Fig. 3: *Acerentulus canadensis* n. sp. Foretarsus in exterior view.

fact often is useful in determining the orientation of a tarsus on a slide. $t\ 1$ is fairly broad and long, gently bowed, not clavate. $t\ 2$ is thinner, straight and a little longer. $t\ 3$ is short and lanceolate. The length and posi-

Figs. 4—6: *Acerentulus canadensis* n. sp. Figs. 4—5: Foretarsus in interior view and from above. Fig. 6: Middletarsus, exterior view.



tion of a—g are shown in fig. 3; characteristics: b and c equal in length, d and e near each other, f extremely long, surpassing the tarsus, g short. On the interior side b' and c' are long, a' is missing.

Middle and hind tarsus (fig. 6). Empodium more than half the length of the claw, claw with a large inner tooth which is always clearly visible, and a smaller one at the side of this, only seen "en face". On the inner side of the tarsus near the praetarsus a curious organ

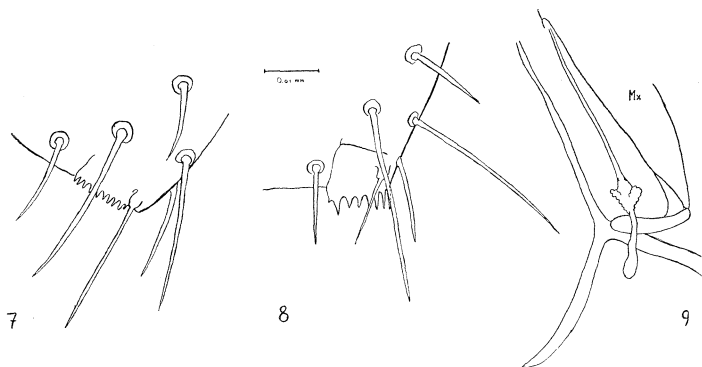


Fig. 7: *Acerentulus canadensis* n. sp. Comb of VIIIth abd. segment. — Fig. 8: *Acerentulus aureitarsus* Ewing, the same. — Fig. 9: *Acerentulus canadensis* n. sp. Filamento di sostegno.

is found, like a lid or a cave, of uncertain structure (x in the figure).

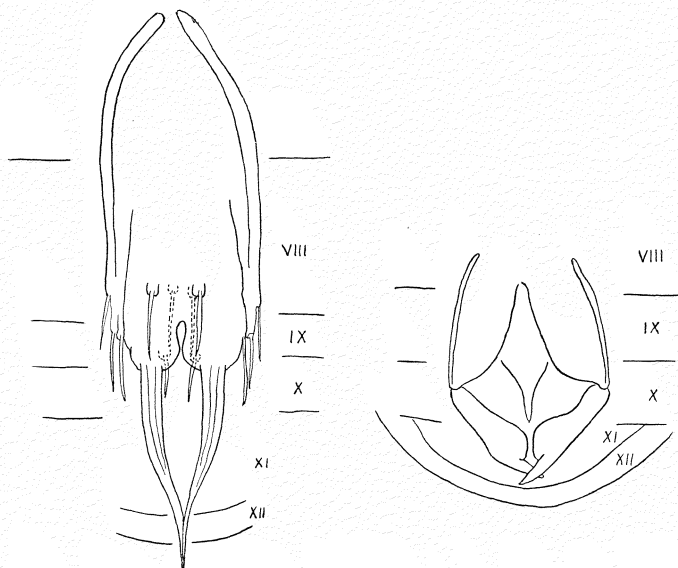
Comb of VIIIth abdominal segment (fig. 7). This comb looks very different in the species known to me and may prove a valuable distinguishing character. It consists in the present species of about 10 small equal-sized teeth.

The genitalia (figs. 10—11) may also prove of specific value though I have not been able to find distinguishing characters in them. Condé since 1947 has used their shape in distinguishing species of *Eosentomon*.

"Filamento di sostegno" of the maxilla (I use

Berlese's term of 1909) is figured in fig. 9. It is unbranched and the part behind the dilatation relatively short compared with e. g. *danicus* Condé (Tuxen 1952).

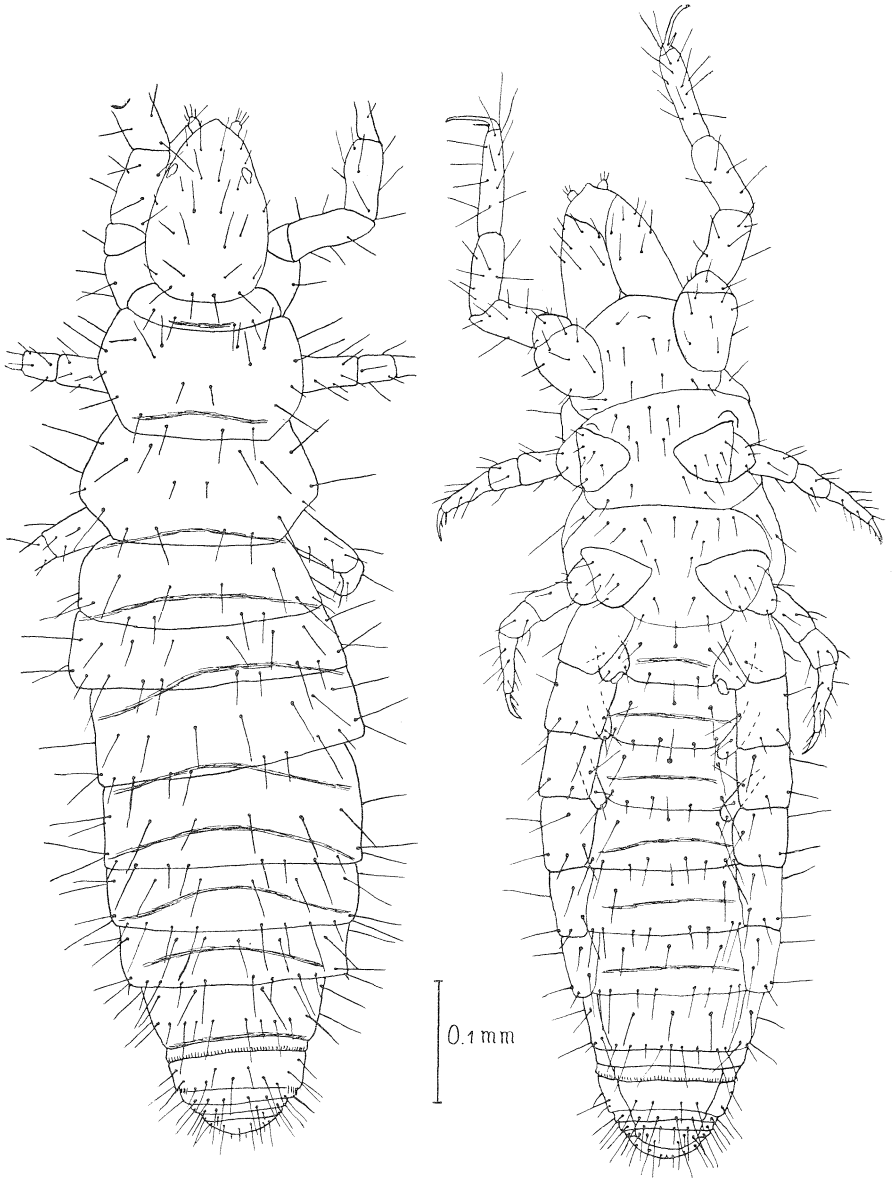
Chaetotaxy (figs. 12—13). The most outstanding feature in the chaetotaxy is the large size of the fine accessory setae in the posterior rows of the segments (1a,



Figs. 10—11: *Acerentulus canadensis* n. sp. Male and female genitalia.

2a) according to my numbering in 1949, fig. 19 p. 27); in most species known to me these setae are quite small, about one fourth of the principal setae, but in *canadensis* they are on all segments more than half the length of the principal ones, 1a often nearly as long as 1.

	Th. I	II	III	Abd. I	II-III	IV-VI	VII	VIII	IX	X	XI	XII
t	4	$\frac{6}{12}$	$\frac{6}{12}$	$\frac{4}{10}$	$\frac{8}{12}$	$\frac{8}{12}$	$\frac{6}{12}$	$\frac{4}{11}$	8	6	4	5
s	12	11	15	$\frac{3}{2}$	$\frac{3}{5}$	$\frac{3}{8}$	$\frac{3}{9}$	$\frac{4}{0}$	4	4	6	6
pl				1	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{1}$	1	1	1	



Figs. 12—13: *Acerentulus canadensis* n. sp. Dorsal and ventral chaetotaxy.

As in all known species of *Acerentulus* there is a certain variation in the chaetotaxy among specimens which must belong to the same species. In this case I have compared 14 specimens. In three of them the central seta in the posterior row of sternite VII ("s VII p c") was missing, in two of them five setae were found on sVIII. I should think that an even or uneven number of setae on these sterna would be good specific characters, but one must have a rather large material to avoid errors due to such individual variation.

Praelarvae and "larvae 1" (with 9 abdominal segments) are not found. In "larva 2" (with 10 abdominal segments) the anterior row on the abdominal terga is wanting as well as $\bar{1}_a$. In the matus junior (with 12 abdominal segments) likewise $\bar{1}_a$ in the abdominal terga is wanting, and also $\bar{3}$. The male praeimago is identical with the adult.

Holotype. ♀ Richardson Mountains, Canada, 25. 6. 1948; on the slide seen from the dorsal side. On the same slide another ♀ seen from the ventral side, a ♂, a ♂ praeimago, a matus junior, and a "larva 2". All drawings were made from specimens on this slide. The holotype and most of the material belong to the Zoological Museum of Copenhagen, some specimens, however, are being presented to U. S. National Museum, Washington, and to the Zoological Museum, Toronto.

For the characters distinguishing the species from the other species of *Acerentulus*, see the systematic chapter. It comes nearest to *aureitarsus* Ewing (a mounted specimen lent me by Dr. Grace Glance), the foretarsus of which is nearly identical with that of *canadensis*, but *aureitarsus* differs in the length of the accessory setae on the abdominal terga (quite small in *aureitarsus*), the chaetotaxy of sVIII ($\frac{4}{2}$ in *aureitarsus*), in tVI which has only six setae in the anterior row in *aureitarsus* (but this of course may be individual), in sVII where $\bar{c}$ is wanting

in *aureitarsus* (also possibly an individual variation), and in the shape of the comb (fig. 8), in which in *aureitarsus* the innermost tooth is broad and with a small accessory tooth, the comb consisting of about seven teeth of which the central ones are smaller than the outer teeth.

Localities and biotopes. Most of the specimens were found at Reindeer Station, northern Canada ($68^{\circ} 42' \text{ N. } 134^{\circ} 08' \text{ W.}$), June 9th to 13th, 1948, at about 130 m above sea level, in moist localities with moss, *Cladonia*, *Empetrum*, cowberries and *Betula nana*, in Berlese samples. Some specimens including the type were found at Richardson Mountains, $68^{\circ} 24' \text{ N. } 135^{\circ} 37' \text{ W.}$, June 25th, 1948, in drier localities with *Dryas* etc. at about 600 m above sea level, also in Berlese-samples. All collected by Dr. Marie Hammer. For a description of the localities vide Hammer 1952 p. 9—15.

***Acerentulus condéi* n. sp.**

The other species of *Acerentulus*, which is also new to science, and which I propose to name after Dr. B. Condé, Nancy, the discoverer of the most important specific criterium in Protura, the sensillae of the foretarsus, is only represented by six specimens. It resembles in many respects *Ac. canadensis*, but is easily distinguished from it in the samples by the clavate, not setiform, t1 of the foretarsus. Other distinguishing characters are the shape of the comb and the chaetotaxy, especially of sVIII.

Length of body in adult about 0.8 mm, length and breadth of head 140μ and 90μ . Length of foretarsus 95μ , of claw 38μ , $\text{TR} = 2.5$.

Foretarsus. The specimens are mounted so awkwardly, that the foretarsus could not be drawn from the exterior side, but more oblique (fig. 14). Still from a comparison with fig. 5 the very close resemblance in size, shape and position of the sensillae to *canadensis* will be

seen, the only difference being found in the shape of t1 which here is distinctly clavate (as in *Ac. danicus*, figs. 1—2).

The comb of abd. VIII (fig. 15) possesses about 7 long teeth.

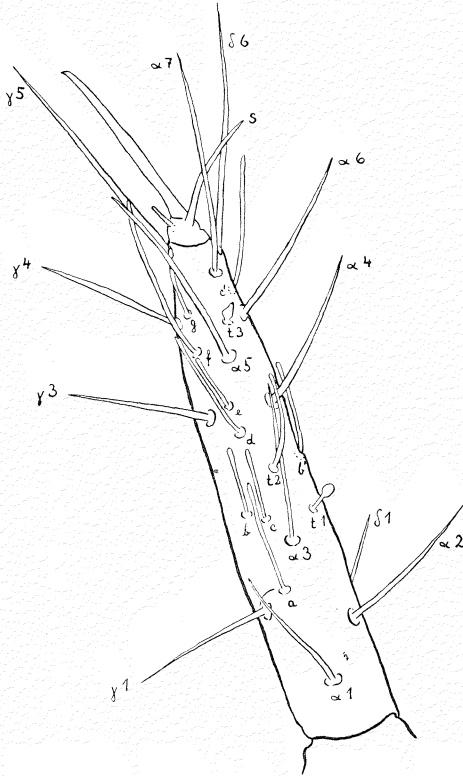


Fig. 14: *Acerentulus condéi* n. sp. Foretarsus obliquely from above.

Chaetotaxy (figs. 17—18). The fine accessory setae on the posterior rows of tergites and sternites are very small, about one fourth of the principal ones. Two setae in posterior row of sVIII; this row is entirely missing in *canadensis*. Otherwise as in *canadensis*.

Holotype. ♂ Richardson Mountains, northern Canada, $68^{\circ} 24' N.$ $135^{\circ} 37' W.$, 25. 6. 1948, on the slide seen from the dorsal side. On the same slide a maturus

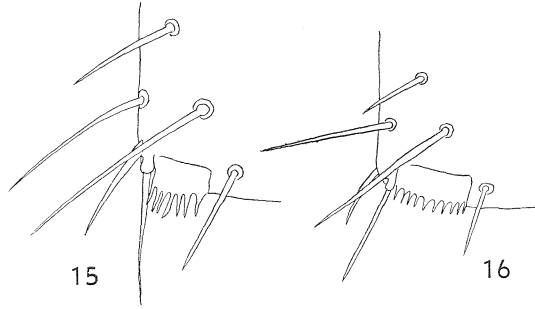
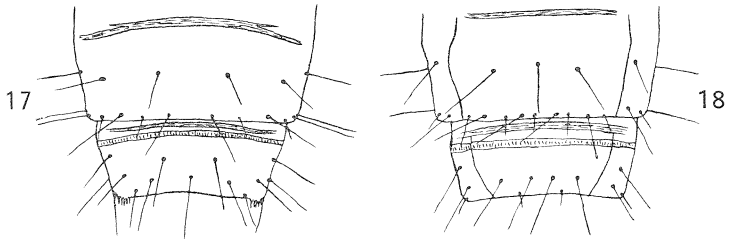


Fig. 15: *Acerentulus condéi* n. sp. Comb of VIIIth abd. segment. — Fig. 16: *Acerentulus danicus* Condé, the same.

junior. On another slide three "larvae 2" (one in moulting) and one maturus junior. All six specimens are from the same sample. Both slides belong to the Zoological Museum, Copenhagen. Nothing is known as to biotope.



Figs. 17—18: *Acerentulus condéi* n. sp. Dorsal and ventral chaetotaxy of VIIth—VIIIth abd. segments.

For the characters distinguishing *condéi* from the other *Acerentulus* species see the systematic chapter. It comes nearest to *danicus* Condé the sensillae of the foretarsus being in complete agreement; it differs, however in the chaetotaxy of sternite and tergite of abd. VIII (s_0^4 , t_{11}^2 in *danicus*; in my paper of 1949 I have given $\frac{2}{9}$, as I

had not reckoned the two setae outside the comb), and in the shape of the comb (fig. 16).

Eosentomon sp.

Finally one specimen of the genus *Eosentomon* was secured at Reindeer Station, Canada, June 9th, 1948, moist soil with lichens. It is, however, a "larva 2" (ten abdominal segments) and therefore indeterminable.

Systematic notes on *Acerentulus*.

In his catalogue of 1950 Rosas Costa mentions 30 species and 5 subspecies of *Acerentulus*. Of these *A. aubertoti* Condé must be deleted (Tuxen 1949) being a praelarva of an unknown species, whereas since then *A. confinis aureus* Jon. has come to be regarded as an independent species by Condé (1950 p. 2), 7 new species and one subspecies have been described by Condé and da Cunha, and *Acerentomon delamarei* Condé was shown by its author to be an *Acerentulus* (Condé 1949 p. 9). Accordingly 38 species and 5 subspecies of *Acerentulus* are known at present. The distinguishing characters of the two new species from the species already known will be given below, but first I should like to give reasons for deleting two of them, *A. americanus* Hilton and *A. insignis* Condé (= *trägårdhi* Jon.), and I may say already now, that a study of Berlese's types revealed that *A. cephalotes* Berl. is nothing but a ♂ praeimago of *A. confinis* Berl. which will be shown in a later paper.

Acerentulus americanus Hilton was described by Hilton (1943 p. 20); the description is, however, very incomplete and may fit many species, and the drawings are very sketchy. Prof. W. A. Hilton, Claremont, California, on request very kindly told me that he did not possess specimens of the species any more, but that some specimens might be in the U. S. Nat. Mus., Washington. Dr. Grace Glance, however, tells me that this is not the case, and so it will forever be impossible to characterize the species, which, therefore, should be deleted from the catalogues.

Acerentulus trågårdhi Jon. was described by Jonescu (1937 p. 110) on five specimens from Uppland, Sweden. In 1946 Condé investigated the four specimens present in Statens Skogsforskningsinstitut, Stockholm, and realized that two of them belonged to the species *insignis* Condé (1945) and the two others were indeterminate. I have now seen the four specimens in question and am able to say with certainty that also the other two specimens belong to *insignis* Condé, which is very well characterized by the extremely long and basally broad sensilla b on the foretarsus. By means of the above mentioned numbering system of the hairs I was able to find this sensilla b also in the specimens with "orientation défectueuse" of the foretarsus on the slides. There is, of course, the possibility that the fifth specimen which was not seen by Condé and is not in Stockholm, might belong to another species, but as the four specimens belong to one species the probability of the fifth being different is slight; unfortunately Dr. M. A. Jonescu in Bukarest has not answered my letters as to the whereabouts of this specimen. Yet I think it is safe to state that *Acerentulus trågårdhi* Jon. 1937 = *insignis* Condé 1945, and though the description of the former is most insufficient it has priority over *insignis*.

There remain 35 species of *Acerentulus*. From the literature it seems possible to group these species into three groups according to the sensillae t1—3 on the foretarsus, viz. 1° with t1 clavate, 2° with t1 long, thickly filiform and gently bowed, and 3° those in which we have no knowledge of the sensillae of the foretarsus. The last group contains a great number of species, but I have had the opportunity of seeing types of Berlese's and Silvestri's species (the description of which will be published in the nearest future) and paratypes of Ewing's and Bonet's species as well as specimens of *remyi* Condé v. *filisensillatus* Gisin, so I am able to reduce the number of species in this group considerably.

1°. Foretarsus known and t1 clavate. To this group belong 19 species, viz.

<i>berberus</i> Condé 1948	<i>confinis</i> Berl. 1908
<i>bicolor</i> Ewing 1921	<i>cunhai</i> Condé 1950
<i>caldarius</i> Condé 1945	<i>danicus</i> Condé 1947
<i>catalanus</i> Condé 1951	<i>floridanus</i> Ewing 1924

<i>gerezianus</i> da Cunha 1952	<i>populeus</i> da Cunha 1952
<i>gracilis</i> Berl. 1908	<i>seabrai</i> da Cunha 1952
<i>kenyanus</i> Condé 1948	<i>trägårdhi</i> Jon. 1937 =
<i>ladeiroi</i> da Cunha 1950	<i>insignis</i> Condé 1945
<i>meridianus</i> Condé 1945	<i>travassosi</i> Silv. 1938
<i>paulinoi</i> da Cunha 1952	<i>tropicum</i> Bonet 1942

To this group belongs also the new species *condéi* from Canada, distinguished from the other species by the mutual position, size and form of the sensillae b-g of the foretarsus (very often for instance c and d are near together, d and e far from each other), the relation claw: tarsus (TR) of the foretarsus, the chaetotaxy of abd. VII and VIII, sternites and tergites, and the number and shape of the teeth in the comb of abd. VIII.

2°. Foretarsus known, t1 long, thickly filiform and gently bowed. To this group belong 7 species, viz.

<i>aureitarsus</i> Ewing 1940	<i>remyi</i> Condé 1944
<i>barberi</i> Ewing 1921	<i>tiarneus</i> Berl. 1908
<i>delamarei</i> Condé 1946	<i>tristani</i> Silv. 1938
<i>oculatus</i> Ewing 1921	

To this group belongs also the new species *canadensis* from Canada, distinguishable from the other species by the length of the empodium, the position and size of the sensillae, especially d and e, and the tarsal ratio, TR, of the foretarsus, the chaetotaxy of sternites and tergites of abd. VII and VIII, and the shape of the comb of abd. VIII. From *tiarneus* and *remyi* also by the "filamento di sostegno" which in these two species has an appendix in the form of a bunch of grapes.

3°. Foretarsus unknown. To this group belong 9 species, viz.

<i>aureus</i> Jon. 1930	<i>occidentalis</i> Wom. 1932
<i>australiensis</i> Wom. 1932	<i>sexspinatus</i> Wom. 1936
<i>capensis</i> Wom. 1932	<i>tillyardi</i> Wom. 1932
<i>macrocephalus</i> Jon. 1933	<i>westraliensis</i> Wom. 1932
<i>muscorum</i> Jon. 1930	

The distinguishing characters for the two new species must be sought in the tarsal ratio, TR, of the fore-

tarsus and the sternal and tergal chaetotaxy of abd. VIII, but with every reservation for the variability of these two characters.

Summary.

Two new species are described, the first Protura known from Canada. A system is proposed for numbering and thus identifying the setae on the foretarsus. *Acerentulus americanus* Hilton, *insignis* Condé and *cephalotes* Berl. are proposed to be deleted from the catalogues for different reasons and the species known till now arranged after the sensillae t1—3 on the foretarsus.

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Odonata from South Shensi (North China) in the Collection of the Zoological Museum, Copenhagen

by

Syoziro Asahina

Totsuka, III-123, Shinjuku-ku, Tokyo.

Through the kindness of Dr. S. L. Tuxen I had an opportunity to study a fine series of dragonflies collected by Mr. E. Suenson in the southern part of Shensi Province, North China, and now preserved in the Zoological Museum, Copenhagen. Though the specimens are not so plenty in the number of species yet they apparently represent a very valuable material from this neglected, but very interesting locality. Before going further, I wish to express my cordial gratitude to Dr. Tuxen and Mr. Suenson who most kindly answered me in detail on the localities surveyed. I also thank the authorities of the Museum of Zoology, Copenhagen, of the British Museum (N. H.), London, and of the U. S. National Museum, Washington, for the privilege of studying the related material in their charge.

I. *Calopterygidae*.

1. *Mnais tenuis* Oguma.

123 ♂♂ 43 ♀♀ VI-VII. 1936.

Chinese species of the genus *Mnais* appear still in a chaotic condition. It seems, however, that there is only a single species inhabiting a greater part of China excluding southwestern subtropical provinces. This species is usually dimorphic for each sex in the wing colouration, being represented by either hyaline or orange forms. Among the present material 42 males are hyaline while 81 are orange-winged; 30 females hyaline while 13 fe-

males pale-orange. This seems a parallel phenomenon with Japanese *Mnais strigata*. Of the latter species I hope to publish a more detailed discussion in a later occasion. The true *Mnais andersoni* Mac Lachlan from Yunnan is quite different from the present species. This was ascertained when I examined the type specimens in the British Museum (N. H.). *Mnais tenuis* was first named by Oguma for Formosan specimens. Its most noticeable character is the entirely yellow metathoracic epimeron.

2. ***Matrona basilaris basilaris*** Selys.

18 ♂♂ 9 ♀♀ VI-VII. 1936.

Apparently these are typical *basilaris*. In the males the wing apices are becoming hyaline. The basal area of the wings covered by the minute azure cross veinlets extends only slightly beyond the nodus. In the females the pseudopterostigma are medium sized, 3 mm in the fore-wing, 2.5 mm in the hind-wing; the ventral side of the female pterothorax is for the most part yellow.

3. ***Calopteryx atrata*** Selys.

1 ♂ 2. VII. 1936 Chin sa gong, 800-900 m.

II. ***Megapodagrionidae***.

4. ***Mesopodagrion tibetanum*** Mac Lachlan.

1 ♂ 12. VII. 1 ♂ 13. VI. 1 ♀ (teneral) 15. VI. 1936 Ho ping tse, 1100-1200 m.

Mesopodagrion tibetanum Mac Lachlan, Ann. Mag. Nat. Hist., (6), 17, p. 372 (1896) "Moupin, one male; Siao-Lou, one female".

Mesopodagrion tibetanum Morton, Trans. Ent. Soc. London, 1928, part 1, p. 112 (1928) "1 ♂ ad., 2 ♂♂ juv." (North-west Yunnan).

Mesopodagrion tibetanum Needham, Zool. Sinica, 11, (1), p. 239 (1930) "Thibet" [cited from Mac Lachlan (1896)].

Mesopodagrion tibetana [!] Fraser, J. Bom. Nat. Hist. Soc., 34, (4), p. 972 (1931) "Tibet and South-east [!] China".

Mesopodagrion tibetanum Fraser, Fauna Brit. India, Odonata, 1, p. 96 (1933) [cited (?) from Fraser (1931)].

Mesopodagrion tibetanum Lieftinck, Ark. f. Zool., 41 A, (10), p. 7 (1948) "5 ♂ 3 ♀ N.E. Burma, Kambaiti 2000 m, 2-11. VI."

This is a thick bodied, medium-sized Megapodagrionid species, striped with black and yellow*. It seems advisable to give the figures of the wing venation, body markings and the male caudal appendages, based upon the present material in order to help further recognition of this species. There is another pair of specimens from Tien-mu-shan, Chekiang Province, taken by Mr. E. Suen-son, 1-3. VII. 1937, which are nearly same size with the

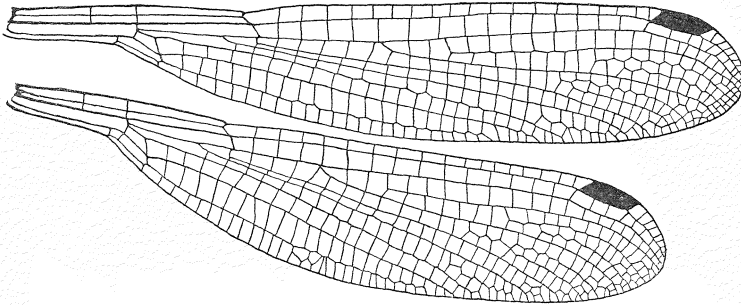


Fig. 1: *Mesopodagrion tibetanum* MacLachlan. Wing-venation, ♂, Tien-mu-shan, Chekiang, Central China.

Shensi specimens, but the black body-patterns are slightly more extended and the distal half of the male superior appendages being more slender.

I have compared these Chinese specimens with the types in the British Museum (N. H.), the type male is from Moupin, eastern Tibet, the type female (teneral) is from Siao Lou, Szechuan, both came from the MacLachlan collection. In the type male the yellow patterns are more extended than those of the Chinese ones; i. e., the posterior border of the postocular lobe being paler, the antehumeral band broad and complete, the yellow of the metepimeron broader, the lateral yellow stripe of the third abdominal segment distinct. In the type specimen,

* Fraser supposed that the pale markings of the male will be "blue" when alive, but I am unable to agree it.

the minute notched process at the posterior end of the tenth abdominal tergite is rather broadly triangular and

black except the sides, whereas it is wholly yellow and acutely pointed in the Chekiang male, or rather intermediate of the former two, in the Shensi male*.

There are several other specimens in the British Museum collection: 5 ♂♂, Yunnan, 1918, G. Forrest; M. J. Mansfield [same origin with the Morton's specimens (?), two males are teneral, two males lack abdominal end]; 2 ♀♀ Upper Burma, Seinghku Valley, 5000', 17. V. 1926, F. Kingdom Ward [the abdomen of one specimen broken].



Fig. 2: *Mesopodagrion tibetanum*. Head and thorax, ♂, South Shensi.

Mesopodagrion tibetanum was described, as cited above, from East Tibet and Szechuan, but its range is now ex-



Fig. 3: *Mesopodagrion tibetanum*. Abdomen, ♂, South Shensi.

Fig. 4: The same, ♀, South Shensi.

tended as far as Upper Burma (B. M. specimen), N. E. Burma (Lieftinck, 1948), Yunnan (Morton, 1926; B. M. specimens) and North and East China (Shensi, Chekiang).

* This process is entirely lost in Fraser's figures (1931, p. 971, fig. 7; 1933, p. 97, fig. 45).

Lieftinck (1948) stated that he has "a series of both sexes from South Shensi which do not differ structurally from western specimens, but are much larger in size". His material may come from the same origin with mine, but the present material is not so large in size as compared with the type specimens. (Types: Abd. ♂ 33 ♀ 35, H. W. ♂ 30 ♀ 34; Shensi specimens: Abd. ♂ 34 (incl. app.) ♀ 31, H. W. ♂ 28.5 ♀ 31; Chekiang specimens: Abd. ♂ 36 ♀ 33, H. W. ♂ 29.5 ♀ 31).

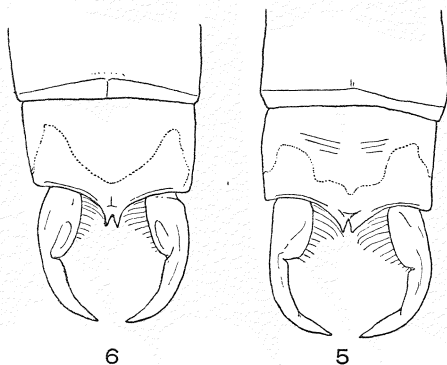


Fig. 5: *Mesopodagrion tibetanum*. Superior caudal appendage, ♂. South Shensi.

Fig. 6: The same, Tien-mu-shan, Chekiang.

There is a male specimen of *Mesopodagrion* in the U.S. National Museum taken by Graham in Seh Luh Din, 6000 ft., Szechuan, China, 12-20. VI. 1936. This is large in size and bears a label written by Dr. Chao as "*Mesopodagrion* sp. nov."

III. *Platycnemididae*.

5. *Platycnemis foliacea foliacea* Selys.

48 ♂♂ 2, 3, 4, 8. VI. 1936 Chin sa gong, 800-900 m; Tsi chia kai, 700 m.

These are the typical North Chinese *foliacea*. The aged specimens are conspicuously pruinosed. In a male the

black markings are much more extended as those of *P. foliacea sasakii* Asahina from Japan (cf. Asahina: Odonata of Shansi Province, North China, Mushi, 20, (2), 1949).

IV. *Libellulidae*.

6. *Lyriothemis pachygastra* Selys.

3 ♂♂ 1 ♀ 22-29. VII. 1936.

3 ♂♂ 3 ♀♀ 8. VI.—9. VII. 1936.

7. *Orthetrum albistylum speciosum* Uhler.

5 ♂♂ 3 ♀♀ VI, VII, 1936.

A common North Asiatic species.

8. *Orthetrum brunneum brunneum* Fonscolombe.

5 ♂♂ 14. VI. Ho ping tse, 1100-1200 m; 4. VII. Chin sa gong, 800-900 m; 6. VII. Tsi chia kai, 700 m; 16. VII. 1936 Chin sa gong, 800-900 m.

In North China this species is known to occur in "Peitaiho and Schan-si" (Sjöstedt, 1932), Jehol (Kinoshita et Asahina, 1939), Kalgan (Mori et Cho, 1939[?]), Shansi (Asahina, 1949).

9. *Orthetrum lineostigma* Selys.

8 ♂♂ 6 ♀♀, VI-VII, 1936.

This is an endemic species to North China, recorded from: Pekin (Selys, 1886), Pekin & Wei-hei-wei (Ris, 1911), Pekin (Liu, 1929), Yenching, Kansu, etc. (Needham, 1930). The pruinosed male is closely allied to the male of the preceeding species, but the distinctly bicoloured pterostigma of the former will make the separation readily.

10. *Sympetrum striolatum imitoides* Bartenef.

1 ♀ (teneral). 23. VI. 1936 Chin sa gong, 800-900 m.

1 ♀ (teneral). 10. VII. 1936 Tsi chia kai, 700 m.

11. *Sympetrum eroticum eroticum* Selys.

2 ♂♂ 4 ♀♀ 6-15. VII. 1936 Tsi chia kai (700 m) & Ho ping tse, 1100-1200 m.

Notes on Icelandic and Greenlandic Chalcidoideous Hymenoptera.

By

O. Bakkendorf, C. L. B.

Icelandic Chalcids have only been treated by J. F. Ruthe (1859), who determined the material collected by O. Staudinger in 1856, and by C. H. Lindroth (1931), who registered a material collected by himself and determined by L. Bíro, Budapest.

Ruthe (1859 p. 311) mentions five species. Two of them — “Ein Pteromalide” and “Ein Entedonide” — were borrowed from the Naturhistorisches Museum in Wien, partly through the kind help of S. Novicky, who has also seen some of the Icelandic Chalcids in the Zoologisk Museum, Copenhagen, and treated some species in notes, to which I have had access (see p. 149). The material of the other three species may be considered to be lost, and because of the very short descriptions it has only been possible to identify one of the species, namely “2 Exemplare eines Miscogastriden” = *Cryptoprymna ater* Walker. As the hymenopterous fauna of Iceland is very poor, it may be supposed that the other two species will prove to belong to some of the species treated below, thus “Ein sehr kleiner Encyrtus” may belong to *Doliphoceras* sp. and “Ein Lamprotatus Walk.” may belong to *Lamprotatus parviclava* Thoms.

Lindroth (1931 p. 343—345) mentions 16 species, besides one of Ruthe's species, some of them, however, only determined to tribus. Except for the Mymarid mentioned as “Gen. sp.” (Lindroth 1931 p. 343), now undoubtedly lost and thus quite indeterminable, all the material collected by Lindroth was borrowed from the Naturhistoriska Museet in Göteborg through the courtesy

of Dr. H. Lohmander. The collection contained in all 47 specimens, which proved to belong to 13 species.

In addition to these materials, I have also had the opportunity of seeing in all 99 specimens collected in recent years by Danish collectors, especially S. L. Tuxen, and by the Icelandic collectors Geir Gígja, Reykjavík, and Hálfðán Björnsson, Kvísker. In this material 17 species were represented, 10 of them not formerly recorded from Iceland. One species was new to science.

Apart from brief notes on their biology and distribution outside Iceland the present paper will be devoted only to the identification, in part the description and figuring, of the species in the abovenamed material. All the figures except fig. 10 are drawn from dried specimens, and the chaetotaxy, especially of the antennae, is therefore shown only in a general way. The localities of the species within Iceland as well as a discussion of the zoogeographical and faunistic aspects of the species are omitted from the present paper because these subjects will be treated by Børge Petersen in The Zoology of Iceland III pt. 49—50, a paper which has been nearly finished.

The total number of Chalcidoidea at present known from Iceland is 25, as seen from the list below, which also gives the synonymic names used by Ruthe and Lindroth.

Chalcididae

Encyrtinae

1. *Doliphoceras* sp.

Miscogasterinae

2. *Halticoptera festiva* (Dalm.) Thomson.
= Gen. sp. (Pteromalini) pro parte (Lindroth 1931 p. 344).
3. *Ormocerus vernalis* Walker.
4. ?*Seladerma* sp.
5. *Lamprotatus parviclava* Thomson.
= *Lampronotus splendens* Thoms. (Lindroth 1931 p. 343).
= *Lampronotus* sp. (Lindroth 1931 p. 343).

6. *Lamprotatus* sp.
= "Ein Pteromalide" (Ruthe 1859 p. 311).

Pteromalinae

7. *Dirhicnus sublaevis* Thomson.
= Gen. sp. (Pteromalini) pro parte (Lindroth 1931 p. 344).
8. *Meraporus graminicola* Walker.
9. *Psychophagus omnivorus* Walker.
= Gen. sp. (Pteromalini) (Lindroth 1931 p. 343)
= *Psychophagus* sp. pro parte (Lindroth 1931 p. 344).
10. *Callitula bicolor* Spinola.
= *Micromelus rufomaculatus* Wlk. (Lindroth 1931 p. 344).
11. *Asaphes vulgaris* Walker.
12. *Pachyneuron* sp.
13. *Cryptoprymna ater* Walker.
= "2 Exemplare eines Miscogastriden" (Ruthe 1859 p. 311).
14. *Cyrtogaster vulgaris* Walker (sens. lat.)
= *Polycystus scapularis* Thoms. (Lindroth 1931 p. 344).
15. *Eurydinota leptomera* Förster.
= *Psychophagus* sp. pro parte (Lindroth 1931 p. 344).
16. *Pteromalinae* sp.

Eulophinae

17. *Cirrospilus vittatus* Walker var. *novickyi* n. var.
= "Ein Entedonide" (Ruthe 1859 p. 311).
18. *Diglyphus chabrias* Walker.
19. *Secodes* sp.
= *Euderus viridis* Thoms. (Lindroth 1931 p. 345).
20. *Tetrastichus dubius* n. sp.
= *Ceranisis pacuvius* Wlk. (Lindroth 1931 p. 344).
21. *Tetrastichus brachycerus* Thomson.
22. *Tetrastichus thysanotus* Förster.
= *Tetrastichus* sp. (Lindroth 1931 p. 345).
= *Geniocerus charoba* Wlk. (Lindroth 1931 p. 345).
= *Geniocerus clavicornis* Thoms. (Lindroth 1931 p. 345).
23. *Tetrastichus* sp.

Mymaridae

Mymarinae

24. *Polynema atratum* Haliday.
25. *Anaphes* sp.
= *Mymar* sp. (Lindroth 1931 p. 343).

In connection with the study of the Icelandic Chalcids it was of interest to examine also the Greenlandic

species available, and a revision of the material found in the Zoologisk Museum, Copenhagen, formerly treated by Lundbeck (1897), was therefore undertaken.

Greenlandic Chalcids are very little known; only 9 species have been recorded from the vast area of Greenland. Eight species are listed by Henriksen (1939 p. 59), and one species was described by Kryger (1942 p. 260).

The revision of Lundbeck's material showed that two of his species, *Dicyclus* sp. (Lundbeck l. c. p. 248) and *Sphegigaster* sp. (Lundbeck l. c. p. 247), actually belong to one and the same species, namely *Cryptoprymna ater* Walker, and the total number of Greenlandic Chalcids is thus reduced to the following 8 species.

Chalcididae

Encyrtinae

1. *Encyrtus interpunctus* Dalman.
2. *Encyrtus tessellatus* Dalman.

Miscogasterinae

3. *Lamprotatus pilicornis*? Thomson.

Pteromalinae

4. *Asaphes vulgaris* Walker.
5. *Habrocytus* sp.
6. *Pachyneuron groenlandicum* Holmgren.
7. *Cryptoprymna ater* Walker.

Eulophinae

8. *Tetracyclos boreios* Kryger.

It is seen from the two lists given above that Iceland and Greenland have only two species in common, namely *Asaphes vulgaris* Walker and *Cryptoprymna ater* Walker.

A comparison with the Chalcid fauna of the Faroes treated by Kryger & Schmiedeknecht (1938) shows that Greenland and the Faroes have no species in common, whereas three Icelandic species are also recorded from the Faroes, namely *Meraporus graminicola* Walker

(= *alatus* Walker), *Cyrtogaster vulgaris* Walker, and *Tetrastichus thysanotus* Förster.

Synopsis of the species.

***Encyrtus interpunctus* Dalman.**

The determination by Lundbeck (1897 p. 246) of a single female seems to be correct. The female is different from *Encyrtus tessellatus* Dalman recorded from West-Greenland by Carpenter (1938 p. 542).

Known from Greenland, Finland, Sweden, Norway, the Kola peninsula, and North America.

***Doliphoceras* sp.**

(fig. 27)

One rather much shrunk male specimen may be referred to *Doliphoceras* Mercet on account of its haired eyes and the scales on the sixth funicle joint (fig. 27), while the number of joints of the palpi was not visible. It seems to be allied to *Dol. laevis* Mercet (1921 p. 686), but the colour, though no doubt faded, is a brown yellowish, with the middle of the abdomen dark and the legs and lower part of the face yellow; in *laevis* the body is black, blueish, the legs yellow with the hind femora dark.

***Halticoptera festiva* (Dalm.) Thomson.**

One damaged female specimen may, with some doubt, be referred to this species, which was described by Thomson (1876 p. 250). The specimen was captured in the locality Barkarstaðir and mentioned as "Gen. sp. (Pteromalini)" by Lindroth (1931 p. 344). Known from Iceland and Sweden.

***Ormocerus vernalis* Walker**

(figs. 1, 15, 28).

Thirteen specimens may be referred to this species, described by Walker (1834 p. 169). In this species the

hind tibiae should have two spurs and the abdomen be flat above and a little convex below (Thomson 1876 p. 242—243 “supra planiusculum” ... “ventre subconvexo”), in *Isoplata geniculata* Förster (1856 p. 60, 62) the abdomen is described as compressed from the sides, and by later authors the genus is placed in the section with one spur. In this case I found only one spur, but the species agrees well with the description by Thomson, and I have seen some specimens in the collection of Thomson in Lund which gave me the impression that the species was conspecific with them. One specimen in Lund was labelled “*Isoplata geniculata* F. V. Delucchi det.” I am not able to judge as to this synonymy, but it is mentioned by Schmiedeknecht (1909 p. 359) that the Isoplatina have no trace of a median keel on the propodeum, as was found by me in the present species.

Known from Iceland, Sweden (Öland, rare), England.

?*Seladerma* sp.

(figs. 2, 16, 29, 30).

Seven males and one female are referred with some doubt to the genus *Seladerma* Walker (1834 p. 289). The short petiole points to the genus *Terobia* Förster (1878 p. 64) of the Tridyminae, but in this genus the scutellum has no cross line before the apex.

The body of the female is green, tinged with copper, antennae and legs blackish, knees and tarsi lighter, scape short, 2 anelli, funicle inner joints quadrate, outer joints broader, transverse, club 3-jointed, broader and short, both mandibles 3-dentate, parapsidal furrows entire, deep, scutellum with a cross-line before apex, propodeum rather polished, with a median keel, abdomen keeled beneath, hollowed or shrunk above, hind tibiae with 2 spurs. The male antennae have the funicle joints quadrate, nearly equal, club abruptly broader than funicle and apparently having a fourth very small end

joint, the petiole a little more conspicuous than in the female.

The species differs from *Sel. saurus* Walker (1844 p. 338) by the colour, which in this species is blue with the legs yellow. In the two species *Sel. mazares* Walker (1844 p. 337) and *Sel. laetum* Walker, Thomson (1876 p. 238) the males have the funicle joints long, filiform, and the legs in both sexes yellowish-brown, in *laetum* the scape of female yellow. In *Terobia dispila* Förster (1878 p. 64) the spurs on the middle tibiae are white and the fore wings with two shadings, in the present species the spurs are yellowish and the wings hyaline.

Lamprotatus parvielava Thomson

(figs. 3, 17, 31).

Of the five specimens referred to this species one was labelled "*Lampronotus splendens* Th." (cf. Lindroth 1931 p. 343); it does not seem to belong to this species, which according to Thomson (1876 p. 222) has the club of the radial vein 3-dentate, while in the present species it is rounded, oblong. The species is determined after Thomson as *parvielava*, though it is rather small, ♀, 2.5 mm, ♂, about 1.5 mm. *Lampronotus* sp. mentioned by Lindroth (1931 p. 343) is also referred to *parvielava* Th.; it is a smaller specimen, and the club of the radial vein seems to be a little smaller. Only one spur (and a short hair) on the hind tibiae was seen, but the two spurs on the hind tibiae of *Miscogasterinae* are not easy to observe, and moreover it does not seem to be a stable character (cf. Schmiedeknecht 1930 p. 406). A specimen labelled "*parvielava*" was examined for comparison in the collection of Thomson in Lund.

Known from Iceland and Sweden (rare).

Lamprotatus pilicornis? Thomson.

Ten Greenlandic specimens examined differ from the description of *pilicornis* (Thomson 1876 p. 229) in

being dark green all over the body instead of green with a golden petiole, and in having the petiole punctate instead of smooth.

Known from Greenland and Sweden.

Lamprotatus sp.

The female mentioned as "ein Pteromalide" by Ruthe (1859 p. 311) together with seven other Icelandic specimens seem to represent another species of *Lamprotatus*, or possibly more than one species. The joints of the funicle of the antennae are shorter than in *parviclava* Thomson.

Dirhicnus sublaevis Thomson

(figs. 4, 18, 32).

Two specimens may be referred to this species proposed by Thomson (1878 p. 172). One of the specimens is mentioned by Lindroth (1931 p. 344) as "Gen. sp. Pteromalini"; it is the specimen found in the locality Slúttnes, Mývatn. Some differences from the description were found, as the radial vein and the middle tibiae were nearly straight, and the femora almost totally dark. In the collection of Thomson in Lund I have seen a specimen labelled "Bl." and "sublaevis Ths." which agrees in the beautiful blue colour and the thickened legs.

Known from Iceland and Sweden.

Meraporus graminicola Walker.

Two brachypterous males of *graminicola* Walker (1834 p. 299) (= *alatus* Walker l. c. p. 300), of which the male bears a lyre-shaped polished line on the face, were already referred to this species by Lindroth (1931 p. 343). This common species was also described by Förster (1856 p. 65) as *Peridesmia* sp. The species has been confused with *Lariophagus distinguendus* Förster, a parasite of *Calandra oryzae* (cf. Kurdjumov 1913 p. 18).

Known from Iceland, the Faroes, Norway, Sweden, Denmark, England.

***Psychophagus omnivorus* Walker**

(figs. 5, 19, 33).

Eleven female specimens are referred to this species, which was proposed (as *Pteromalus*) by Walker 1835 (p. 204); synonyms are *Pter. processione* and *rotundatus* Ratzeburg 1844 (p. 194) and *saltans* Ratz. 1852 (p. 232). The genus *Psychophagus* was proposed by Mayr 1904 (p. 598); synonymic with it is also *Diglochis omnivorus* Thomson (1878 p. 156) nec Förster (1856 p. 65); and the descriptions of *Diglochis omnivorus* Schmiedeknecht (1909 p. 357 and 1930 p. 435) may have reference to this species. The species is mentioned by Lindroth (1931 p. 344, specimens from Akureyri only) as *Psychophagus* sp. and (p. 343) as "Gen. sp. (Pteromalini)".

In the collection of Thomson in Lund I have seen a lectotype labelled "*Diglochis omnivorus* Th. det. A. Jansson". I found but small deviations, the second segment of the abdomen reaching about $\frac{1}{3}$ the length of the abdomen, in the present specimens it is shorter, 9:34, and the hind border of the segment with a very slight incision in the middle, while in the present specimens it is evenly rounded.

Known from Iceland, Sweden, Germany, England, Belgium (Crèvecoeur & Maréchal 1933 p. 382), "Europa bor. et centr." (Schmiedeknecht 1909 p. 357).

In Europe bred from lepidopterous pupae.

***Callitula bicolor* Spinola.**

Two females of this common species are mentioned by Lindroth (1931 p. 344) as "*Micromelus rufomaculatus* Walker" (1833 p. 371, 464), a synonym of *Callitula bicolor*, which is proposed by Spinola (1811 p. 151); another synonym is *Bæotomus* Förster (1856 p. 145) with the species *Bæotomus plagiatus* Thomson (1878 p. 61).

Known from Iceland, Sweden, Denmark, Germany, England, Belgium (Crèvecoeur & Maréchal 1933 p. 382), "Europa bor. et centr." (Schmiedeknecht 1909 p. 363).

An allied species, *Callitula pyrrhogaster* Walker, was bred by me from a cecidomyid puparium in a stem of Gramineae, and another species closely related to *Callitula elongata* Thomson, but with only the base of the female scape light, I have likewise bred from an undetermined host in a grass stem, both from Denmark.

Asaphes vulgaris Walker.

Ten Icelandic females and 4 Greenlandic specimens may be referred to this common species proposed by Walker (1834 p. 151) and synonymous with *Isocratus* Förster (1856 p. 53, 58). Synonyms are also *Eurytoma aenea* Nees (1834 p. 42), *Chrysolampus suspensus* and *altiventris* Nees (1834 p. 127), *Chrys. aphidiphagus* Ratzeburg (1844 p. 181), *Chrys. aeneus* Ratzeburg (1848 p. 185), and *Pteromalus concolor* Förster (1841 p. 28). The species was mentioned as *Asaphes vulgaris* by Lindroth (1931 p. 344) and as *Isocratus vulgaris* by Lundbeck (1897 p. 246).

In one specimen collected by Fristrup the legs are whitish, faded, which seems to be due to a special killing medium.

Known from Iceland, Greenland (Lundbeck 1897 p. 246), Sweden, Finland (Forsius 1925 p. 69), Denmark, Germany, England, Italy (Europe, Asia, America, Schmiedeknecht 1909 p. 371).

Bred as hyperparasite of the *Aphididae*, irrespective of species (Hincks 1946 p. 7).

Pachyneuron groenlandicum Holmgren.

Three female specimens from Igaliko 30. 8. 1889, bred from a syrphid puparium. The species seems to be related to *formosum* Walker, but the colour is nearly black,

tinged with blue, and the ocelli are placed in a curved line or flat triangle; in *formosum*, as described by Thomson (1878, p. 28), the colour is metallic greenish and the ocelli are placed in a triangle. To the description of Holmgren (1872 p. 100) I may add the following details. Scape and pedicel slender, 1st joint of funicle quadrate, following joints lengthened, no large punctures on mesonotum, scutellum convex, propodeum punctate, spiracles large, ovate, the neck of propodeum rather large with the base of petiole hidden, 2nd segment reaching half the length of abdomen, marginal vein broadened towards apex, as long as radial vein; in *grande* Thomson the 2nd segment short, reaching only one-third the length of the abdomen; in *gibbiscuta* Thomson with large punctures on mesonotum, propodeum nearly plain, spiracles small, roundish, funicle joints transverse; in *planiscuta* Thomson scutellum flat, scape short, flagellar joints transverse; in *aphidis* Bouché first funicle joint small, flagellar joints transverse; in *coccorum* L., *picea* Ratzeburg and *solitarius* (Hartig) Ratz. the marginal vein of equal width along the whole length; in *flavipes* Förster (= *syrphi* Ratz. acc. to Kurdjumov 1913 p. 24) the 2nd segment reaches only one-third the length of the abdomen and the marginal vein is longer than the radial vein.

Known from Greenland.

Pachyneuron sp.

(figs. 6, 20, 34).

The only specimen is a male about 2 mm in length, bright green, metallic, tinged with blue, the vertex is narrow, with the ocelli placed in a curved line, the funicle joints are oblong, thrice their breadth and a little shorter towards apex, the scape is linear, second segment of abdomen longer than broad. The species does not seem to be identical with any of the 5 species described by Thomson (1878 p. 27), but allied to *formo-*

sum Walk., which species differs by the ocelli being placed in a triangle. The female of *grande* Th. is larger, 4 mm, and *gibbiscuta* Th., *planiscuta* Th. and *aphidis* Bouché have the funicle joints broad or subquadrate. In *syrphi* Ratz. (cf. Kurdjumov 1912 p. 233) the second segment of the abdomen is short and the scape dilated. It has been compared with 3 specimens of *groenlandicum* Holmgr. from Zool. Mus., Copenhagen (cf. Lundbeck 1897 p. 248), but this species is smaller, almost black, tinged with blue.

The species of *Pachyneuron* Walk. were bred from Aphids and from puparia of Syrphids, probably as hyperparasites.

***Cryptoprymna ater* Walker**

(figs. 7, 21, 35).

One Icelandic male and two Greenlandic males, mentioned as *Sphegigaster* sp. and *Dicyclus* sp. by Lundbeck (1897 p. 247, 248), are here referred to *Cryptoprymna ater* Walk. Of the type species *Prosodes ater* Walker (1833 p. 371) I have only seen the figures of the female in Walker (1842, Plate C, Figs. 3, 3a). In the present specimens the ocelli are placed in a rather flat triangle, though not quite as flat as figured, and the petiole has a row of 3-4 anteriorly directed bristles on the sides, but I think that these deviating characters are only of minor importance.

The specimen of the *Dicyclus* sp. mentioned by Lundbeck now lacks the abdomen, but fortunately it is stated by Lundbeck that the specimen agreed with the description of a "Miscogastride" from Iceland (Ruthe 1859 p. 311) and here it is stated that the petiole is moderately long and segment 2 cup-shaped and longer than the following segments together; on account of this appearance of the abdomen and the characteristic shell-formed cave at the mouth as well as characters of

the thorax and the wings, the Greenlandic "*Dicyclus* sp." is, no doubt, referable to *Cryptoprymna ater* Walk.

The "2 Exemplare eines Miscogastriden" mentioned from Iceland by Ruthe (1859 p. 311) may also be referred to *ater* Walk., though Ruthe's description is very brief; but I am not aware of any other Chalcid with "der Stiel mässig verlängert, das zweite Segment länger als die folgenden zusammen, fast becherförmig", and with common characters as described.

Known from Greenland, Iceland and Sweden.

***Cyrtogaster vulgaris* Walker (sens. lat.)**

(figs. 8, 42, (43)).

In a manuscript key by Förster mentioned by S. Novicky (*in litt.*) two species are distinguished for the male as follows: Antennae brown, middle tibiae entirely black = *vulgaris* Wlk.; antennae reddish-yellow, middle tibiae black at the tip = *rufipes* Wlk. The present material, 29 ♂♂, 11 ♀♀ from different localities, may not be referred strictly to any of these groups, partly because the tibiae are black with more or less of the base light, partly because some of the specimens are faded, the legs and antennae being whitish, only with slight shadings left, and the abdomen and the large penultimate joint of the maxillary palpi with a brown ground colour tinged with green metallic. The colour of the body unchanged. Further, from Denmark I have taken specimens with both dark and light legs together, and I am inclined to regard them merely as variations, of which the Icelandic material comes nearest to the *rufipes* group. Lindroth's material (1931 p. 344) was determined to be "*Polyctus scapularis* Th.", but in this species the last joint of the maxillary palpi in ♂ is large (fig. 43, Danish material), not small and petiolated as the last joint in *vulgaris* (fig. 42). The species was proposed by Walker (1833 p. 382).

Known from Iceland, the Faroes, Sweden, Denmark, Germany, England, Italy, U.S.A., St. Vincent.

In Denmark bred from dipterous puparia in flood-refuse, one specimen from each puparium (Henriksen 1918 p. 164).

Eurydinota leptomera Förster

(figs. 9, 22, 36).

Two females from the locality Kollafjörður mentioned as *Psychophagus* sp. by Lindroth (1931 p. 344) may be referred to this species proposed by Förster (1878 p. 42). In one of the hind tibiae only one spur was found, and previously Schmiedeknecht (1909 p. 381 and 1930 p. 439) transferred the genus to the Pteromalinae, tribe Sphegigasterini. The median keel on the propodeum in one of the specimens is concealed among the rough punctuation of this sclerite. On the abdomen no coppery spots were found, but some red reflexes were shining through. Characteristic is the slightly projecting corners of the propectus, and I may add that the second (foremost) joint of the abdomen bears, on each side, a protuberance ending in a circular ring, as seen in some petiolate species, probably formed as a consequence of the diminution of the first segment, the petiole, which is somewhat hidden in the neck of the propodeum and seems to bear a pair of side lobes. In one of the specimens the uncus is punctiform as originally described, and shorter than in the specimen figured.

Known from Iceland and Germany.

Pteromalinae sp.

A specimen which lacks the antennae, the abdomen, and most of the legs could not be determined at present; it has the clypeus 2-dentate, left mandible 4-dentate, eyes bare, parapsidal furrows only distinct anteriorly, scutellum with a cross line before the apex, propodeum

polished, with a median keel and lateral folds, grooves at base, spiracles small, roundish; it may just as well belong to the genus *Trichomalus* Thomson as to *Halticoptera* Spinola of the Miscogasterinae, but it is not conspecific with *H. festiva* (Dalm.) Thoms. mentioned above, differing by having more robust wing veins and a more golden-green colour.

***Cirrospilus vittatus* Walker var. *novickyi* nov. var.**
(figs. 10—11).

A single female specimen collected by the late Dr. Otto Staudinger has been handed over to me from the Museum of Natural History in Vienna, and a preliminary manuscript on this new variety has been written by Mr. S. Novicky, to whom its name is gratefully dedicated by the present author. The specimen is mentioned by Ruthe (1859 p. 311) as "Ein Entedonide". According to his manuscript, Novicky has seen more variations of the species; it concerns mainly the breadth of the metallic green longitudinal stripes occupying more or less of the fundamental lemon-colour of the head and thorax. In a variety known by Förster and bred from *Elachista argentella* in Aachen, the central green stripe of the prescutum does not continue across the scutellum; in another variety from Turuń (Thorn), Poland, Aug. 1931 the green stripes are nearly wanting. In contrast to the two last-named varieties, the female from Iceland represents the extreme development of the coloration, i. e. the abdomen is entirely green, except some yellowish markings laterally in the basal half. The thoracic dorsum is metallic green, pronotum with diverging narrow triangular marks along the margins, which are continued by curved converging yellow lines following the parapsidal furrows on the prescutum, and continued on the scutellum by 2 narrowing lines following the scutella grooves. Extreme apex of parapsides with the tegulae

yellow. Axillae green with a narrow yellow margin posteriorly. Postscutellum green, margined with yellowish on each side. Propodeum entirely green. Upper face and occiput green, ocelli on the yellow vertex connected by a green transverse line. All coxae green, femora and tibiae brownish. One dusky apical joint on the fore and middle, and two joints on the hind tarsi. Figures of the colour design of the thorax of the nominate form from a Danish specimen mounted in balsam and the same of the dried specimen are given in figs. 10—11.

The nominate form of the species was proposed by Walker (1838 p. 308). Synonyms are *Eulophus lineatus* Förster (1841 p. 41) and *Entedon lineatus* Ratzeburg (1852 p. 209).

The nominate form is known from Sweden, Denmark, Germany, Switzerland, England, "Europa bor. et centr." (Schmiedeknecht 1909 p. 399).

The nominate form has been bred from foliage with *Lyonetia clerckella* L. (cf. Kemner 1926 p. 35) from different mining insects, *Orchestes*, *Nepticula*, and *Agromyza* spp. In addition I may mention a case of breeding as larval ectoparasite on *Nepticula obliquella* (det. A. G. Carolsfeld-Krausé) on *Salix* from Denmark.

Diglyphus chabrias Walker

(figs. 12, 23, 37).

Two males and 2 females from Iceland have been determined by S. Novicky, who had examined a female in the Vienna Museum of Natural History identified by Walker himself. The differences between the species from Iceland and this co-type were only slight. Novicky gives an account of the synonymy of the group, based on an unpublished manuscript by Arn. Förster, which ought to be published separately. The species was proposed as *Cirrospilus* by Walker (1838 p. 451) and later altered to *Diglyphus* by the same author

(1848 p. 236). By Förster (1856 p. 144) it is proposed as a synonym of *Asecodes* Förster; this view is followed by Dalla Torre (1898 p. 46), who is cited by Gahan and Fagan (1923 p. 45); however, this is inadmissible, because 1) *Diglyphus* has a priority of 8 years and 2) *Asecodes* belongs to another subfamily, i. e. *Entedonidae* (Förster 1856 p. 79), if the placing of *Diglyphus* in the *Eulophinae* by Erdös (1951 p. 196) is correct. Novicky (*in litt.*) remarks that Förster himself seems to have changed his mind after 1856 as to the independence of *Asecodes* and *Diglyphus*. He described (1861 p. 37, 38) species of both genera independently, with *Diglyphus* included in the *Entedonidae*, too.

In the collection of Thomson in Lund I have seen a specimen of *Solenotus viridis* Thomson (1878 p. 237) not *Sol. vir.* Förster (1856 p. 74, 76) labelled "Lund". This species is transferred by Erdös (l. c.) to *Diglyphus*. I found it to agree with the specimens of *Diglyphus chabrias* from Iceland in the colour designs, the knees being broadly yellowish, and with the characteristic rounding of the inner limit of the discal hairs in the fore wings. The parapsidal furrows were observed to be short, reaching almost to the middle, though Thomson (l. c. p. 237) states, "mesonoto sulcis nullis". In the description of *Diglyphus chabrias* Walker (l. c.) says "parapsides bene determinatæ". In the specimens from Iceland the mesonotum is very much shrunk and the furrows difficult to observe, but the shrinking causes a deep cleft at the place of the furrows, which may explain the above-mentioned disagreements. Five other specimens in the collection of Thomson were likewise very much shrunk, as also the face of the specimens from Iceland, as indicated in the present figure 12. Thomson remarks that the tibiae are sometimes 3-annulated, i. e. with a light band on the middle; only this form is cited by Erdös (l. c.).

Known from Iceland, Sweden, Norway (Alten, Finmark), England.

The species are parasites of the leaf-mining Diptera of the family Agromyzidae, in temperate Europe particularly inhabiting Gramineae (Novicky *in litt.*).

Secodes sp.

(figs. 24, 38).

One female specimen may be allied to *Secodes coactus* (Ratz.) Thomson (1878 p. 270); it differs from this species by its rather long 2-jointed funicle, the following antennal joint is connected with the two terminal joints to form a slender 3-jointed club, as in *Secodes clypealis* Thomson, of which I have a specimen from Denmark; in this last species the clypeus is yellow and the radial cell not indicated by a row of hairs, as in the present specimen. In the collection of Thomson I have seen two female specimens of *coactus* labelled "Astorp", which agreed in the subsessile radial knob and with the radial cell indicated by a hair line. The present specimen labelled "*Euderus viridis* Th." is mentioned as such by Lindroth (1931 p. 345). The type species *coactus* was bred from *Mikiola fagi* Hartig.

Tetrastichus dubius n. sp.

(figs. 13, 25, 39).

One male specimen labelled "*Ceranisis pacuvius* Walker" is mentioned by Lindroth (1931 p. 344), but may not be referred to this species, having only 2 joints in the funicle of the male (cf. Walker 1840, pl. N, fig. 2). In the description of the genus *Ceranisis* Walk. by Schmiedeknecht (1909 p. 469) it is erroneously mentioned that the funicles are 4-jointed. The present specimen may belong to the genus *Tetrastichus* Haliday, probably a new species, of which the description follows below.

Male: Length 1 mm, wing expanse 2.25 mm. Head light yellow, eyes and ocelli brownish, stemmatum dark brown; thorax black tinged with blue, metallic, tegulae and a mesopleural spot below the fore wings yellow, under side not visible; abdomen blackish with more than the basal third yellowish and a dark groove at base, petiole and legs light yellow, hind coxae blackish, except the apex, last joint of tarsi brownish, antennae light brown, scape and pedicel slightly darker, wing veins nearly colourless.

Head collapsed, antennae seem to be inserted rather close together at the middle of the face, composed of scape, pedicel, 3 anelli, 4 funicle joints, and a 3-jointed club; scape large, collapsed, without sense organs, but possibly a sensory area at inner apex, which is slightly darker, pedicel subconical, anelli small, funicle joints oblong, rounded, the second longest, club a little broader with an apical tap, flagellum sparingly haired with long hairs. Prothorax large, conical, slightly incurved behind, parapsidal furrows entire, scutellum with 2 parallel lines and 2 side lines hardly visible from above, metathorax large, propodeum with a slight, dark, median keel, divided posteriorly, spiracles oblong, petiole subtransverse, second segment of abdomen with the groove has a pointed margin or collapsing fold behind, the middle segments indistinctly margined, ratio of fore wing, 74:25, of longest cilia :6, subcosta with 2 distinct bristles on left wing, one bristle on right wing, which is broken, 8-9 long hairs along marginal vein, continuing in a fringe of lighter and rather long cilia along the broad rounding, shortening along the hind border; ratio of subcosta, marginal vein, postmarginal vein and radius: 17:26:1:6, subcosta overlapping marginal vein :2, disc of wing evenly haired, with about 20 lines across, an oblique line of 4-5 hairs at base of prestigma and from this a line along the anal margin,

with a naked line between this and the submarginal line; hind wings pointed, evenly haired with 4-5 lines across, costal fringe short, anal fringe of long cilia, as long as the wing at its broadest.

Female unknown.

Holotype: a male mounted flat on a piece of card, the pin bearing a label with the locality number, 175, for Slútnes in Mývatn, North Iceland, Aug. 20th, and another label, green, with the former determination, *Ceranisus pacuvius* Wlk. The specimen belongs to the Iceland collection of Lindroth in Naturhistoriska Museet, Göteborg, Sweden.

Further a slide with a male from Denmark, Fortunens Indelukke, Sjælland, May 20th, in my own collection. From this specimen it is stated that the anelli are 3-jointed; the inner joints of the funicle are a little longer than figured, and I found here only one bristle dorsally on the subcosta of both fore wings; I am therefore in doubt as to the normal number of bristles, which determine the subfamily.

The species may be distinguished from other male *Tetrastichus* by its colour design, the large scape without conspicuous sense organs, and by its long marginal cilia.

Known from Iceland and Denmark.

Of the species mentioned above, *Ceranisus pacuvius* Walker, I have 2 slides in my collection, a male from Ryget Forest 6. 6. 1926 and a female 23. 5. 1926, same locality, Sjælland, Denmark.¹⁾

***Tetrastichus brachycerus* Thomson.**

One dark olivaceous female with the antennae somewhat thickened, præclava hardly $1\frac{1}{2}$ times as long as

¹⁾ During the printing I have got some new material, showing that *dubius* may vary with small, slender wings, and that *Ceranisus pacuvius* has only vestigial mandibles. These finds will be treated in a later publication.

broad, hind and middle tibiae fuscous in the middle, the median line of mesonotum only visible in oblique light from the front. Proposed by Thomson (1878 p. 296).

Known from Iceland and Sweden.

***Tetrastichus thysanotus* Förster**

(figs. 14, 26, 40, 44).

Twenty-seven females varying in length from 2 to 1.25 mm are referred with some doubt to this species. In the key of Kurdjumov (1913 p. 247) subg. *Geniocerus*, the only difference between this species and *inunctus* Nees is that in the former, as in the present material, the body has a darker copper tint, while in *inunctus* it is entirely black, without any metallic tint. The original description of *thysanotus* Förster (1861 p. 38) is not accessible here. The description of *inunctus* by Thomson (1878 p. 295) is arranged in a section i, with no median line on the mesonotum; in the present material this line may be wanting, but in most of the specimens a slight line can be seen in a certain oblique light from the front; in the collection of Thomson in Lund I have seen a specimen of *inunctus* labelled "Ld.", which had the same yellow colour of the trochanters, knees and tibiae as in the present species; probably the two species are synonyms, but I have no further notes about the specimen in Lund. In the present material the tegulae are yellow or sometimes a little fuscous, the lines on scutellum parallel, nearer each other than the parapsidal furrows, contrary to *populi* Kurdjumov (1913 p. 251), and subcosta with 4-5 bristles or, in small specimens, only 3. The species is mentioned by Lindroth (1931 p. 345) as *Tetrastichus* sp., *Geniocerus charoba* Walker, and *Geniocerus clavicornis* Thomson, but in *charoba* (= *punctiscula* Thoms.) the body is green and in *clavicornis* olivaceous according to Kurdjumov and Thomson.

Known from Iceland, the Faroes and Switzerland.

Tetrastichus sp.

One undeterminable male is of a faded, but rather dark colour, the thorax broader than in *thysanotus* Förster, the fore wings resembling this species, but broader and with the fringe longer at the anal rounding, subcosta with 2 bristles in right, 3 in left wing, possibly some bristles broken off, scape somewhat dilated, funicle 4-jointed with long hairs, more than twice as long as their joints, inner joint short, as long as pedicel.

Polynema atratum Haliday.

One female specimen was compared with a Danish specimen of *Polynema ovulorum* Bakkendorf (1934 p. 81) (nec Haliday), which according to Hincks (1950 p. 199) is synonymous with *atratum*; it had the fore wings a little smaller and more parallel-sided, thus resembling *Polynema microptera* Bkdf., which was considered by Hincks as merely a short-winged form of *atratum*. The ratio of body, wing length, and wing breadth is 30:26:5, in the Danish specimen 31:30:8. The colour had faded, thus the legs were light and the body brownish, though with the darker parts marked. The species was proposed by Haliday (1833 p. 348), but no lectotype could be fixed by Hincks (l. c.); it may be regarded as synonymous with *Polynema ovulorum* (L.) (Hal.) Debauche (1948 p. 212), but the difficult synonymy will not be discussed on the basis of this aberrant specimen.

The nominate form of the species seems to be very common all over Europe. It is known as a parasite of Jassid eggs (*Acocephalus* sp.) in *Juncus effusus* and *conglomeratus* (Bakkendorf l. c.).

Anaphes sp.

(fig. 41).

One female specimen, though it lacks the club of both antennae, may be referred with a certain probability to the subgenus *Anaphes* Haliday on account of its general

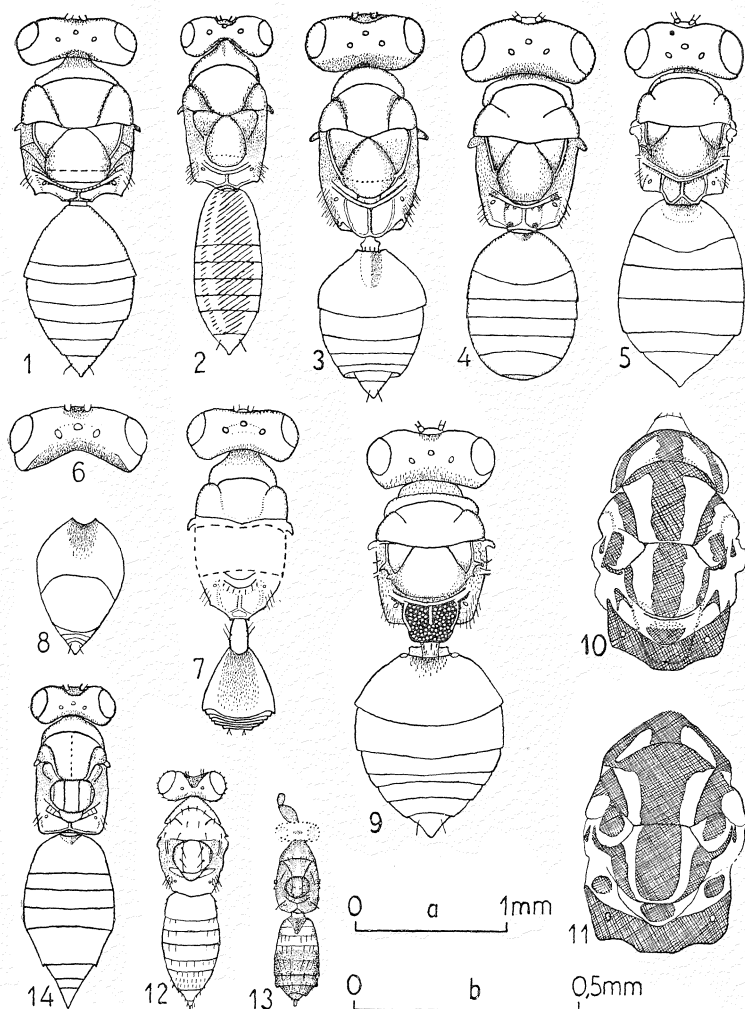


Fig. 1. *Ormocerus vernalis* Wlk. ♀, body. — 2. *Seladerma* sp. ♀, body. — 3. *Lamprotatus parviclava* Th. ♀, body. — 4. *Dirhicnus sublaevis* Th., body. — 5. *Psychophagus omnivorus* Wlk. ♀, body. — 6. *Pachyneuron* sp. ♂, head. — 7. *Cryptoprymna ater* Walk. ♂, body. — 8. *Cyrtogaster vulgaris* Wlk. ♀, abdomen. — 9. *Eurydinota leptomera* Först. ♀, body. — 10. *Cirrospilus vittatus* Wlk. ♀, colour design of thorax. — 11. *Cirrospilus vittatus* Wlk. var. *novickyi* nov. var., do. — 12. *Diglyphus chabrias* Wlk. ♀, body. — 13. *Tetrastichus thysanotus* Först. ♀, body. — 14. *Tetrastichus dubius* n. sp. ♂, body. — a, scale of figs. 1–9, 12–14. b, scale of figs. 10–11.

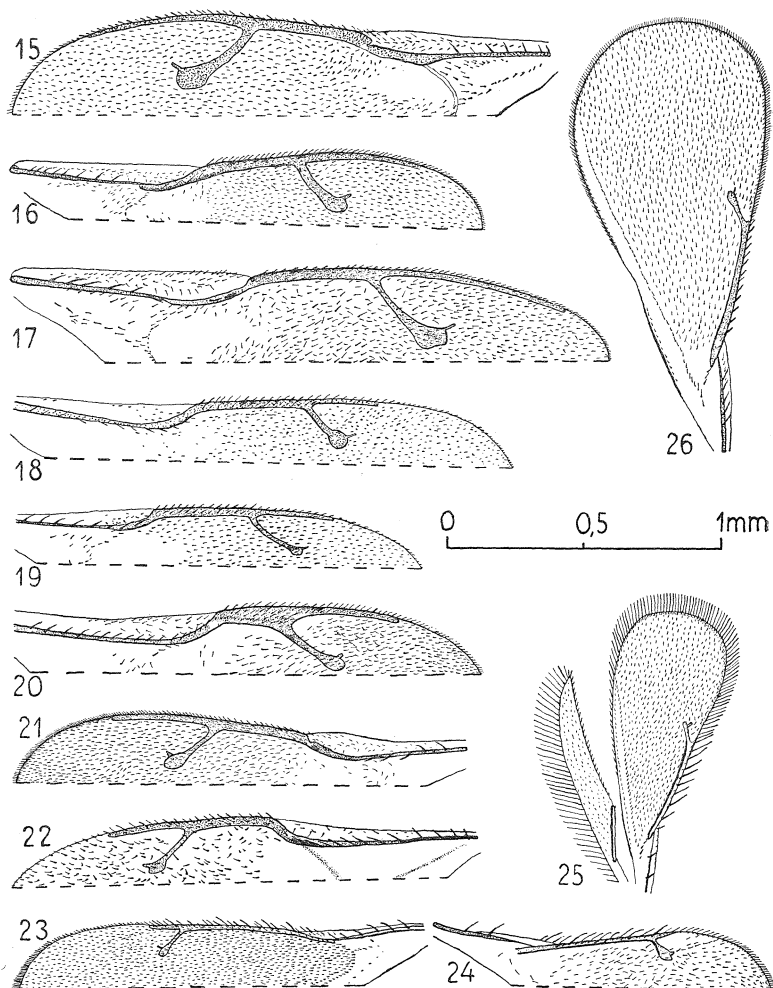


Fig. 15. *Ormocerus vernalis* Wlk. ♀, venation. — 16. *Seladerma* sp. ♀, venation. — 17. *Lamprotatus parviclava* Th. ♀, venation. — 18. *Dirhichnus sublaevis* Th., venation. — 19. *Psychophagus omnivorus* Wlk. ♀, venation. — 20. *Pachyneuron* sp. ♂, venation. — 21. *Cryptoprymna ater* Walk. ♂, venation. — 22. *Eurydinota leptomera* Först. ♀, venation. — 23. *Diglyphus chabrias* Wlk. ♀, venation. — 24. *Secodes* sp. ♀, venation. — 25. *Tetrastichus dubius* n. sp. ♂, wings. — 26. *Tetrastichus thysanotus* Först. ♀, fore wing.

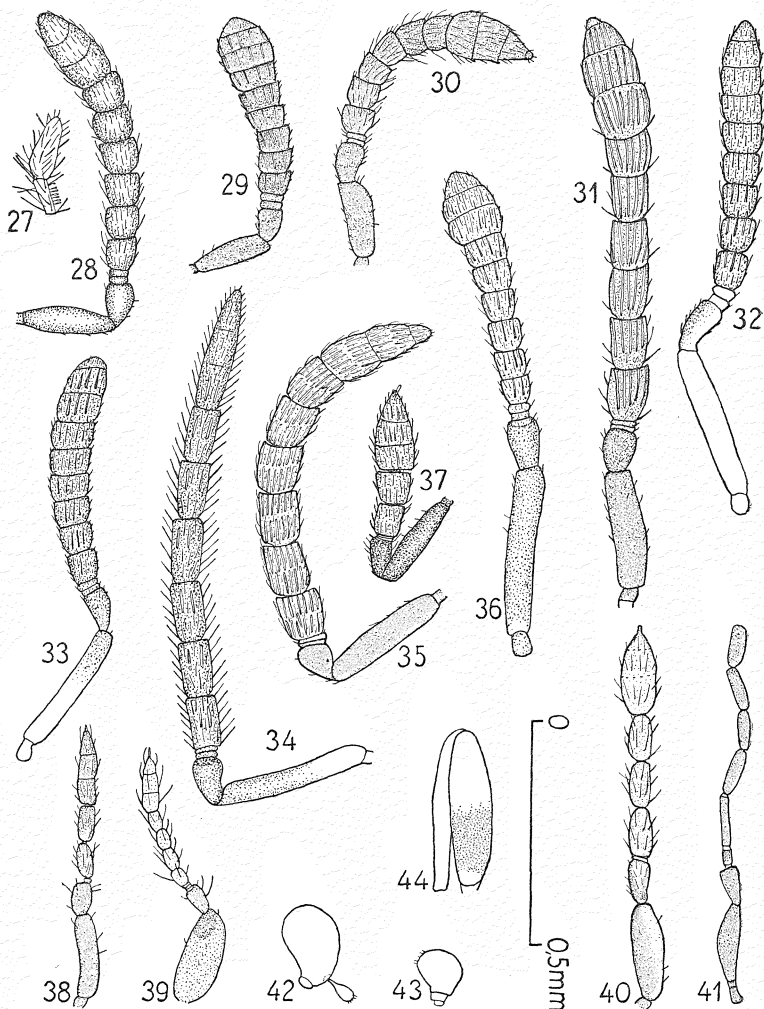


Fig. 27. *Doliphoceras* sp. ♂, 2 last antennal joints. — 28. *Ormoceris vernalis* Wlk. ♀, antenna. — 29. *Seladerma* sp. ♀, antenna. — 30. do. ♂, antenna. — 31. *Lamprotatus parviclava* Th. ♀, antenna. — 32. *Dirhicnus sublaevis* Th., antenna. — 33. *Psychophagus omnivorus* Wlk. ♀, antenna. — 34. *Pachyneuron* sp. ♂, antenna. — 35. *Cryptoprymna ater* Walk. ♂, antenna. — 36. *Eurydinota leptomera* Först. ♀, antenna. — 37. *Diglyphus chabrias* Wlk. ♀, antenna. — 38. *Secodes* sp. ♀, antenna. — 39. *Tetrastichus dubius* n. sp. ♂, antenna. — 40. *Tetrastichus thysanotus* Först. ♀, antenna. — 41. *Anaphes* sp. ♀, antenna, club wanting. — 42. *Cyrtogaster vulgaris* Wlk. ♂, last joints of maxillary palp. — 43. *Polycystus scapularis* Th. ♂, do. — 44. *Tetrastichus thysanotus* Först. ♀, colour design of femur and tibia.

characters, 1 mm long, with rather long tarsal joints, fore wing long, fumated, broadened in distal third, slightly pointed, evenly haired with about 12 rows across, ratio of wing length and breadth 72:14, longest fringe more than half of wing breadth, but broken off at apex of wing. Mentioned by Lindroth (1931 p. 343) as "Mymar sp.".

The species known as egg-parasites, for instance in coleopterous eggs.

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Anmeldelser.

Heqvist, K.-J., Lekander, B. og Palm, T.: "Skogsinsekter", Lärkurs för Statens Skogsskolor. 78 s., shirt. 1954. Pris sv. kr. 5.00.

Denne lille forstentomologi er beregnet som lærebog ved den lavere skovbrugsundervisning i Sverige. Uden at forudsætte forudskaber af nogen art præsenterer den de vigtigste af skovens insekter og skitserer ganske kort deres biologi. Gennemgangen af insekterne er delt i 3 kapitler: skadelige, nyttige og indifferente arter, og hovedvægten er lagt på de første. Ialt omtales ca. 90 af de vigtigere arter. Resten af bogen behandler kortfattet insekternes betydning for skoven, forudsætningerne for insektangrebets opståen og mulighederne for dets forebyggelse og bekæmpelse. Bogen indeholder en nøgle til bestemmelse af de omtalte arter efter skadens udseende, og den er rigt og til dels udmærket illustreret; den yder derfor en god hjælp til bestemmelsen af disse ganske almindelige skovinsekter.

De snævre rammer for bogen har naturligvis medført, at mange almindelige arter har måttet udelades; dette gælder f. eks. *Hylurgops palliatus* så vel som de andre indifferente barkbiller. Alligevel er det de almene afsnit, der forekommer mest beskåret, men disse kan jo også lettere gives i forelæsningsform.

For den, der ønsker et elementært kendskab til forstentomologien uden at ville binde an med de større skandinaviske bøger over emnet (Boas: "Dansk Forstzoologi" og Trägårdh: "Sveriges Skogsinsekter"), kan denne lille og billige bog absolut anbefales.

B. Beier Petersen.

F. W. Bræstrup: *Dyrenes udvikling*. Kbh. 1954 (Hans Reitzels Forlag), 96 Sider, 14.75 Kr. — Sven Segerstråle: *Det forunderlige liv*. Kbh. (Gyldendal) 1954, 264 Sider, 18.50 Kr.

To Bøger om "Liv" er modtaget, meget forskellige; da begge ofte drager Entomologi ind i deres Bevisførelse, skal jeg gerne fortælle om dem.

Bræstrups Bog er en Oversigt over vort nuværende Syn paa Udviklingen, dens genetiske, palæontologiske, systematiske Grundlag og dens formodede Aarsager, skrevet af vor fineste Kender af Literaturen derom, i et charmerende, lunefyldt, ofte inciterende, omend enkelte Steder lidt vaklende Sprog. Ogsaa opbygget med stor pædagogisk Sans. Han begynder og ender med Darwins Finker, til Belysning af Isolationens Betydning for Artsdannelsen, og faar derindimellem belyst en lang Række grundlæggende Spørgsmaal. Et Kapitel er helliget Arvelighed, et andet Udvælgelse, kunstig og naturlig, et Tilpasning, og et langt et Racer, geografiske og fysiologiske (herunder studser man over en Skildring af fysiologiske Racer hos Eddikefluen, kaldet "en asiatisk-europæisk bananflue", et tæt skraveret Kort bygget paa nogle faa Punkter, nemlig nogle faa Landes Hovedsteder). Og derefter kommer vi til Kærnen i det hele, Udviklingen baseret paa Mutationers Opstaaen, Dyrenes Vandringer og eventuelle Isolation, og Selektionens Virkning. Herunder belyser Bræstrup med megen Lærdom den moderne Dyrepsykologi, en mærkelig Blandingsvidenskab af Humanisme og exakt Videnskab, hvor disse ligesom bekriger hinanden, men i Virkeligheden en Videnskab, der er vel egnet til Belysning af Udviklingen og dens Aarsager. Under Palæontologien glæder man sig over den nye Opfattelse af "den gamle Traver", Hestens Udvikling, friskt og uortodox forklaret, Det er en meget lærerig Bog; Bræstrups Viden er en saadan, at han til Stadighed kan plukke den sidst udsprungne Gren til os paa Kundskabens Træ; mærkeligt blot, at han saa ofte gør Indtryk af at tro, Træet ikke kan skyde flere Skud.

Bræstrups Bog er monoteistisk: den store Pan er Selektionen. Den er almægtig, den kan lave alt ud af Mutationer. Bliver Dyrene ædt af deres Fjender er det nødvendigt, for ellers vilde de oversvømme Verden, bliver de det ikke (altsaa af deres supponerede Fjender) er det et Bevis for deres Beskyttelse, deres Egen-skabers "selektive Værdi". Det er forstaaeligt nok, for Balancen kræver, at et Forældrepar faar to Børn (færre ved Polygami) og faktisk faar de op til en Million. Det er en haard Opgave for Selektionen at opretholde denne fine Balance; men da Dyrene faktisk findes og Selektionen er den eneste Magtfaktor, har den altsaa

kunnet sit Job. — Bræstrups Syn er givet S. 69: "For biologen må det være en opgave at søge problemernes løsning gennem de kræfter som er tilgængelige for forskningen. Det bør ikke afskrække os at tilværelsen altid, i sin yderste årsag, vil frembyde gåder som vor nysgerrighed må gøre holdt overfor." Et Knix for Den store uudgrundelige og saa væk med ham for at vi kan hellige os Forskningen. Men Forskning er ikke blot et mekanistisk Begreb, ogsaa hans imaginære Modstandere ønsker kun at bruge Forskning som Middel til Maalet, men de begrænser ikke Forskningens Virkefelt. Bræstrups Livssyn er en Tro som al anden Tro, agtværdig som al Tro; men det er Uret af ham, for Hoben haanende at slaa om sig med det tvetydige Ord mystisk, for de vitalistiske Tanker han vil til Livs er ikke mystiske i Betydningen fantastiske, men de bygger i nogen Grad paa det filosofiske Begreb, der hedder Mystik.

Bræstrups Bog er en smukt udstyret Bog, Segerstråles er alt andet. Gyldendals Forlag kan slet ikke være bekendt at udsende en Bog med saa slet reproducerede Figurer, med en saa grim og uoverskuelig Sats, hvor endog Figurunderskrifterne er med samme Sats som Teksten, hvor Figurerne er saa ubogmæssigt placerede. Da Underskrifterne til Figurerne (hvis Proveniens ofte ikke angives) er Resumé'er af Teksten, da Overskrifterne selv over korte Afsnit foregriber disses Indhold, og da desuden undertiden rigtige Resumé'er forekommer, bliver Bogen et 4-dobbelt Resumé til Skade for den lette Tilegnelse. Og det er Synd, for Bogen er en meget nyttig Lærebog, især vel for Skolerne, ved sine Forsøgsanordninger etc. Den giver en Oversigt over alle biologiske Processer, klart og anskueligt opstillet, fra Cellen over Planterne til Dyrene og Mennesket, og er skrevet i en rolig, forstaaende Stil, overbærende over for de Fejltagelser Menneskene i Tidens Løb har gjort sig Skyld i (det er Bræstrups Bog ikke). En Mængde Viden faar man ind, godt oversat af Elise Wesenberg-Lund fra den svensksprogede finske Original; undertiden synes man, at man burde mærke den skandinaviske Proveniens lidt mere, som f. Ex. naar det fortælles, at man i New York sliber fossile Fisk for at studere deres Anatomi; Stockholm og København er dog Hovedcentrerne for denne Forskning.

Selvfølgelig ender ogsaa denne Bog i Spørgsmaalet Udvikling og Liv, men det er klart, at efter hele den nænsomme Maade, hvorpaa Livsprocesserne er skildrede i Bogen, maa den tendere i Retning af at anerkende noget fra de fysiske og kemiske Kræfter principielt forskelligt. Det er den ældres forstaaende Holdning: Segerstråle kan ikke tænke sig Rembrandts Selvportræt eller Beethovens Niende som Resultat blot af Æggehvidemolekylernes forskellige Sammensætning; for Bræstrup er det altsammen Kromosomer.

S. L. Tuxen.

James G. Needham & Minter J. Westfall jr.: **A Manual of the Dragonflies of North America (Anisoptera) Including the Greater Antilles and the Provinces of the Mexican Border.** University of California Press. 1955. VII+615 s. 2+341 figs. \$ 12.50.

Bogens første afsnit (s. 2—48) giver en almindelig beskrivelse af guldsmedene og deres nymfer. En insektmorfolog kunde nok finde eet og andet at indvende mod fremstillingen, men der gøres i hvert fald rede for de bygningstræk, som anvendes ved bestemmelse af dyrene. Skildringen af vingernes ribbenet er fortrinlig. Nogle flere henvisninger på de ledsagende figurer vilde have lettet tilegnelsen. Der gives også en del biologiske oplysninger. Herved er der ikke undgået et par småfejl. Når det siges, at alle guldsmede lever i vand i nymfestadierne, er det ikke helt korrekt. På Hawaii kendes terrestriske guldsmedenymfer. Og når det siges, at halebladene hos nymferne af Zygoptera tjener åndedrættet, er det endnu mindre korrekt. Et kapitel om jagttagelser i naturen og indsamling af guldsmede vil være både nyttigt og inspirerende for begyndere.

Bogens hovedafsnit (s. 62—603) bringer en systematisk gennemgang af de nordamerikanske Anisoptera (ægte guldsmede). Dette afsnit gør et særdeles solidt indtryk og vil utvivlsomt blive uundværligt for alle, som beskæftiger sig med denne verdensdels guldsmedefauna. Nøglerne er gode, og beskrivelserne — der også omfatter analvedhængene og parringsorganet hos hannen — er udførlige. Der er også nøgler til nymferne, så vidt disse er kendte. Arternes udbredelse er angivet. I denne forbindelse kunde anm. have ønsket noget udførligere økologiske oplysninger.

De allerfleste illustrationer er fotografier. Det er gode fotografier, men i mange tilfælde vilde anm. dog have foretrukket en tegning.

Anker Nielsen.

S. H. Skaife: **African Insect Life.** 387 sider, 5 farveplancher, 70 sorthvide plancher, 190 textfigurer. Longmans Green & Co, Cape Town 1954. Pris 63 sh.

Det er i virkeligheden en overmenneskelig opgave, forfatteren af denne bog har påtaget sig: At skildre Afrikas insektliv i populær form. En hel verdensdels entomologi, med hele dens myldrende mangfoldighed af former, hvis udforskning endnu i dag kun er i sin vorden, presset sammen på små 400 sider. Det er et arbejde, som må aftvinge een den dybeste beundring, men samtidig en angst for, at stoffet skulle have overmandet forfatteren, således at

man risikerede at skulle grave sig igennem en tæt sammenpresset dyng af facts, som hurtigt ville kvæle læseren. Det skal siges med det samme, at denne frygt er helt ubegrundet.

Men man opdager til gengæld også, at forf. med sin titel: *African Insect Life* har tilladt sig en let overdrivelse. Fremstillingen er næsten udelukkende baseret på den sydafrikanske fauna. Og det giver bogen en skævhed, der kunne være undgået, hvis forfatteren havde føjet det lille ord "South" foran bogens titel. Ved at begrænse stoffet på denne måde undgår han let og behændigt at komme ind i en vildsom jungle, hvor han meget let kunne køre uhjælpeligt fast. Den afrikanske regnskov, hvis insektafauna endnu er meget ufuldstændigt kendt — hvorfra det zoologiske system hver dag beriges med et utal af nye arter, hvis livsbetingelser og adfærd vi praktisk talt intet kender til — den lades helt ude af betragtning. Det giver visse steder anledning til misforståelser. Bl. a. oplyser forf., at der i Afrika ikke findes eghjorte med enormt udviklede mandibler, som hos vor egen *Lucanus cervus*. De nævnte former findes nemlig i stor mangfoldighed i det store kontinents regnskovsområder.

Ser man bort fra bogens lidt pretentiøse titel, er den dog usædvanligt velskrevet og god at blive klog af. Insekterne gennemgås orden for orden, og på grund af den store rigdom på former har forf. valgt nogle få typiske repræsentanter ud fra hver familie, som så gennemgås i detaljer. I enkelte tilfælde har han dog måttet ty til at berette om europæiske formers biologi, hvor de afrikanske arters liv er helt ukendt. Forf. har et udtømmeligt forråd af viden at øse af. Hans pen løber let, og han forstår den kunst at gentage sig selv uden at man trættes af gentagelserne.

Der er lagt vægt på at gøre rede for Sydafrikas almindelige forråds- og landbrugsskadedyrss biologi. Mange af disse vil være en udenlandsk læser velbekendte p. g. a. deres kosmopolitiske udbredelse (husbuk, melskrubbe, korn- og rissnudebille, kakerlakker, *Lepisma* etc.). Man får et udmærket indtryk af de anstrengelser, Sydafrikas regering gør sig for at komme de værste skadedyr til livs, bl. a. ved indførelse af biologiske bekæmpelsesmetoder (indførsel og masseopdyrkning af et importeret skadedyrss naturlige fjender).

Forf. omgås dog lidt letsindigt med de systematiske principper. Han indleder med at oplyse, at han benytter den samme systematiske inddeling som Imms i *Textbook of Entomology*. Imms anbringer her *Diptera* og *Aphaniptera* som de højst udviklede af alle insekter. Men, siger Skaife, "efter min mening fortjener disse ubehagelige insekter ikke at indtage denne ophøjede plads", så derfor anbringer han *Hymenoptera* der i stedet for!

I grel modsætning til den udmærkede og fyldige text står forf.'s illustrationsmateriale, og det gælder i særdeleshed de sorthvide fotografiske tavler. Af titelbladet fremgår det, at forf. selv har fremstillet illustrationerne. Blot han havde allieret sig med en ordentlig fotograf, så vi var blevet skånet for disse over- eller underbelyste, grå, uskarpe og flade fotografier. I adskillige tilfælde har billedet været så dårligt, at han har måttet trække dyrets konturer op med tusch, hvilket gør et dårligt fotografi endnu dårligere. Endvidere er disse tavler (der er 70 af dem!) anbragt i en syndig uorden og følger absolut ikke den systematiske inddeling af bogen. Da texten ydermere savner enhver antydning af figurhenvisninger må tavlernes eventuelle støtte for texten betragtes som spildt. — Textfigurerne er meget hæderlige, de giver i de fleste tilfælde det rette indtryk af dyrene. — Et lille lyspunkt er de få farvetavler, de er virkeligt smukt udført.

Det forekommer anm. mærkeligt, at en bog som denne, der ifølge forf. skulle være skrevet for at vække den læge læsers interesse for insekternes myldrende verden, mangler enhver form for litteraturvejledning for den, der vil fortsætte på egen hånd. Særlig da netop den sydafrikanske fauna er een af de bedst kendte på det afrikanske kontinent. Så var bogen i højere grad blevet den ledetråd, som dens forfatter har tilsigtet. Jørgen Dahl.

R. F. Lawrence: The Biology of the Cryptic Fauna of Forests. With special reference to the indigenous forests of South Africa. Cape Town (Balkema) 1953. 408 pp. Pris: 50 sh.

Dette er en meget indholdsrig, meget velovervejet og ofte inspirerende Bog. Den har stillet sig som Opgave at belyse de i Jordbunden levende Dyrs Kaar og deres Udseende og Levevis i Sammenhæng dermed. Det er altsaa ikke en "Økologi", hvor de "fysisk-kemiske" Faktorer er i Højsædet, men en "Biologi", som dens Titel siger, hvor Dyrenes Ydre og deres Levevis har været Forfatterens Inspirationskilde. Forfatteren er Leder af Museet i Natal, og Forholdene i Sydafrika er derfor dem, han kan give med størst personlig Erfaring; men hans Belæsthed er meget stor og hans Evne til at udnytte det læste ligeledes. I Modsætning til Delamars Afrika-Økologi i Vue et Milieu 1952 virker Henvisningerne til europæiske Forhold ikke paaklistrede, men Dyrenes Levevis i Troperne og de tempererede Egne er ligeligt belyst.

Det er jo Skovens Jordbundsfauna, der skal belyses, og der indledes derfor med et Afsnit om den sydafrikanske Urskov som

den var og som den er nu: Menneskets hæmningsløse Ødelæggelse af den og dermed af Bundfaunaen til varig Skade faar en Omtale fortiter in re omend ikke altid suaviter in modo! Derefter omtales S sammensætningen af Skovbundsfaunaen, som han fremhæver har en lang Række Karakterer fælles, til Adskillelse fra andre Jordbundssamfund; han hævder ogsaa, vel lidt hasarderet, at Skovbundens Dyresamfund er en Enhed (p. 58). Et andet tankevækkende Postulat er dette, at dyrket Lands Jordbund har flere Individer, men færre Arter, end Skovbundens; det sidste er vel rigtigt, men det første? Næppe i Danmark. Desværre. Han opfatter ligeledes Skoven som en Slags Overgangsbiotop fra Vandliv til Liv paa aabent Land; først dette sidste, mener han, kunde medføre den uhyre Artsdannelse inden for Pterygoterne og Blomsterplanterne, som fandt Sted i Kridttiden; Skovens mere betryggede Forhold gav ikke Anledning til den barske Kamp, som er en Forudsætning for Artsdannelsen. Tankevækkende Synspunkt fremført i et smukt Sprog.

I mange Afsnit belyses den "cryptiske" Faunas Egenskaber: Form, Farve, Bevægelighed, Sanser, Vaaben, Føde etc. etc., hist og her ren Fysiologi (hvorfor man undrer sig over, at Wigglesworth's store Haandbog ikke er citeret); særlig morsomt er det, at Peripatus stadig er med i Omtalen; stykket sammen har man her en hel Peripatus-Biologi. Ogsaa i disse Afsnit er nyeste Literatur oftest medtaget, hvor Anm. har kunnet kontrollere det; at han kun nævner et enkelt Sanseorgan paa Proturernes som Antenne benyttede Fortarse, skønt der faktisk er op mod en Snes, skal ikke bebrejdes ham; deres Betydning er endnu aldeles ukendt.

Oribatiderne giver han en udførlig Omtale, og han gaar saa vidt som til at tillægge dem en Betydning frem for alle andre Skovbundsdyr til zoogeografiske Studier; mulig har han Ret, men der mangler vist endnu for meget i Kendskabet til Oribatidernes Systematik til at vidtgaaende Slutninger kan drages.

En inspirerende Læsning, en nyttig Haandbog.

S. L. Tuxen.

Notes on some species of *Hylastes* Er. and *Trypophloeus* Fairm. (Coleopt. Scolytidae).

By
Victor Hansen.

While working up the Danish Scolytidae for "Danmarks Fauna" I made a few observations which might be of further interest and therefore are mentioned below.

For loan of material, especially from Norway, Sweden, Finland, and the vicinity of Hamburg I am much indebted to Mr. L. R. Natvig, Univ. Zool. Museum, Oslo, Mr. Andr. Strand, Oslo, Mr. O. Lundblad, Naturhist. Riksmuseum, Stockholm, Mr. V. Butovitsch, and Mr. K.-J. Heqvist, Statens Skogsforskningsinstitut, Sweden, Mr. Thure Palm, Uppsala, Messrs. Wolter Hellén, Uuno Saalas, Gunnar Stenius, and Sten Stockmann, Univ. Zool. Mus. Helsingfors, Mr. G.-A. Lohse, Hamburg, Mr. H. Freude, Zoologische Sammlung des Bayerischen Staates, Munich, and Mr. K. Delkeskamp, Zoologisches Museum in Berlin.

My best thanks are also due to Mr. Hans Johansen, Zoological Museum, Copenhagen, who has translated different paragraphs in V. Stark's work.

1. *Hylastes* Er.

A. *H. cunicularius* Er., *brunneus* Er., and *ater* Payk.

Of *Hylastes* species with a median carina in front of the rostrum three species occur in Denmark: *cunicularius* Er., *brunneus* Er. and *ater* Payk. The two last species have here — as well as in Sweden — hitherto been confused under the name *ater* Payk. In Norway *ater* Payk. has not been found, but *brunneus* Er. has been named *ater* Payk.¹⁾ From Finland both *brunneus* and *ater* have

¹⁾ Strand, 1953, pp. 61—62.

been recorded¹⁾, but according to my examination of Finnish material it seems that *ater* is also wanting in this country. This is in good agreement with the information received from England, according to which *brunneus* in this country is a northern, *ater* a southern species²⁾.

The three species vary considerably in several respects. The colour of the body varies from black to brown, and the names *ater* and *brunneus* are not appropriate, since *ater*, as a rule, is not darker than *brunneus*, rather the opposite. The micro-reticulation on the elytral interstices in *ater* is somewhat variable in extension, although it seems, that it can always be used for separating the species from the two others. The front-carina is, as a rule, short in *cunicularius*, and behind — on the back — not exceeding the two front-impressions, contrary to what is the case in *brunneus* and *ater*, but *cunicularius* is considerably variable in this respect, and the length of the carina is therefore inapplicable for separating *cunicularius*. The determination of the three species can therefore be difficult in diverging specimens. The late Hans Eggers (*in litt.*) segregated some new species: *subalpinus*, *intermedius* and *pupillatus*, but did not describe them (*nomina nuda*)³⁾. Dr. G.-A. Lohse, Hamburg, has been good enough to send me specimens of these three forms, determined by Eggers, as well as a specimen of *aterrimus* Eggers³⁾, also determined by Eggers. After examination of this collection I came to the result that *subalpinus* and *intermedius* are identical with *cunicularius* Er.⁴⁾, and that *pupillatus* and *aterrimus* are identical with *brunneus*.

1) Hellén, 1939, p. 117.

2) Blair, 1949, p. 89; Duffy, 1953, p. 12.

3) Horion 1951, p. 509. *H. aterrimus* is not — as stated here — a *nomen nudum*. It is described in Entom. Blätter 1933, p. 3.

4) Cf. Blair, 1949, p. 89.

In order to verify these results I examined the ædeagus of the acquired material, and this examination just

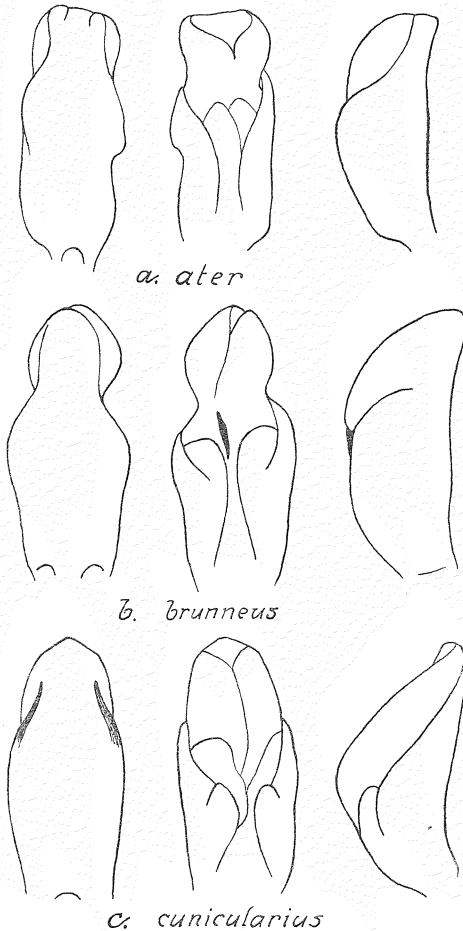


Fig. 1. Ædeagus of *Hylastes ater* Payk., *brunneus* Er., and *cunicularius* Er. from below, from above and from the side.

confirms the results. The ædeagus shows three distinctly different forms corresponding with the three species, see fig. 1. The ædeagus of *cunicularius* differs especially

from the two other species by the shape seen from the side. The ædeagus of *brunneus* is distinguished by a strong constriction of the apical part and the very dark, oblong, tapering part in the middle, seen from above. The ædeagus of *ater* is, among other things, characterized by the rounded tubercle in the middle of the right side, seen from below.

Key to the species.

1. Body broader. Pronotum not quite as long as broad, very closely punctured, rather shining, often — at least behind — feebly micro-reticulate. Elytra not quite twice as long as together broad, without micro-reticulation on the interstices. Ædeagus see fig. 1, c 1. *cunicularius*.
- Body more slender. Pronotum at least as long as broad, rather closely punctured, very shining, usually without micro-reticulation. Elytra at least about twice as long as together broad. Ædeagus see fig. 1, a and b 2.
2. Elytral interstices dull, entirely or chiefly micro-reticulate. Pronotum distinctly longer than broad. Ædeagus see fig. 1, a 3. *ater*.
- Elytral interstices shining, without micro-reticulation. Pronotum usually as long as broad. Ædeagus see fig. 1, b....
..... 2. *brunneus*.

1. **H. cunicularius** Er., Balachowsky p. 129, Stark p. 214; *subalpinus* Eggers, *intermedius* Eggers, nomina nuda.

Separated from the two following species by the characters given in the key. Further the rostrum is slightly broader, the sides of pronotum somewhat more rounded, scutellum a little broader and more closely punctured, the basal line of elytra a little curved backwards towards the scutellum, the interstices a little more raised, somewhat more strongly rugose, the striæ usually a little stronger and the scale-like clothing on the declivity slightly stronger and denser. Length 3.5—5 mm. — ♂: Ædeagus, see fig. 1, c.

The species is generally distributed in Fennoscandia and Denmark.

2. **H. brunneus** Er., Reitter, Balachowsky p. 128, Duffy; *aterrimus* Eggers, Stark p. 213; *pupillatus* Eggers, nomen nudum.

The basal line of elytra almost straight towards the scutellum. Length 3.5—5 mm. — ♂: Ædeagus, see fig. 1, b.

By the courtesy of Dr. K. Delkeskamp, Zoologisches Museum in Berlin, I have been able to examine the type of *brunneus* Er. It is, as indicated in Erichson's description, a reddish-brown specimen, and this made him give this species, which is normally deep black and not at all lighter than *ater*, a misleading name and erroneously state the lighter colour to be a feature distinguishing it from *ater*. The name *aterrimus* given by Eggers is much more characterizing but must be superseded by Erichson's older name.

The species is generally distributed in Fennoscandia and Denmark. In Denmark it is less common than *cunicularius*.

3. **H. ater** Payk., Reitter, Eggers, Blair, Balachowsky p. 128, Stark p. 212, Duffy.

Separated from *brunneus* by the characters given in the key. In addition, pronotum is more parallel-sided, the elytra a little more elongate and their striæ slightly weaker. The decisive character is the micro-reticulation of the elytra, and for the male the shape of the ædeagus. Length 3.5—5 mm. — ♂: Ædeagus see fig. 1, a.

The species has been found in a few localities in Denmark, but is undoubtedly here much rarer than the two preceding species. In Norway it has not been found, probably also not in Finland. In Sweden, where it has been found e. g. in Scania, it is presumably a southern species.

The type specimen (in Naturhistoriska Riksmuseum in Stockholm) has been examined by Andr. Strand¹⁾.

¹⁾ Strand, 1953, p. 62.

**B. *H. attenuatus* Er., *angustatus* Hbst., *opacus* Er.,
and *plumbeus* Blandf.**

H. attenuatus, *angustatus* and *opacus* are closely allied. Typical specimens are easy to distinguish, but since the species are subject to great variation the determination may sometimes be difficult. The difference in the ædeagus

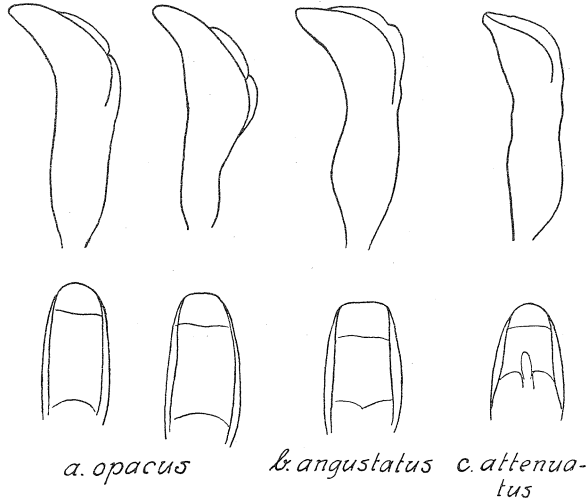


Fig. 2. *Hylastes opacus* Er., *angustatus* Hbst., and *attenuatus* Er. Ædeagus seen from the side (above) and from above.

gus confirms that they are really good species, see fig. 2. On *H. plumbeus* some remarks are made below p. 175—176.

Key to the three species.

1. The elytral interstices also in front with a single row of hairbearing small tubercles, the hairs rather long, also in front distinctly raised. Elytra as a rule brown and lighter than head and pronotum. Length 2—2.5 mm. 1. *attenuatus*.
- The elytral interstices at least in front with an irregular double row of hairbearing, small tubercles, the hairs rather short, in front very short and recumbent. Elytra as a rule black or brownish-black and not lighter than head and pronotum. Length 2.5—3.4 mm. 2.

2. Pronotum at least as long as broad. The rostrum as a rule with a short narrow longitudinal furrow at the base. Body narrower 2. *angustatus*.
- Pronotum not quite as long as broad. The rostrum without a furrow at the base, exceptionally with a little, weak point in the middle. Body broader 3. *opacus*.

1. **H. attenuatus** Er. A little narrower than *angustatus* and considerably narrower than *opacus*. The rostrum as a rule with a short longitudinal furrow at the base. Pronotum at least as long as broad. The elytral interstices generally a little narrower than in the two following species. — ♂: Ædeagus, see fig. 2, c.

The species has been found in Finland, in South Norway, and in Sweden (a single specimen from Gotland), but not in Denmark.

2. **H. angustatus** Hbst. Somewhat narrower and on an average slightly smaller than *opacus* with a little less rounded sides of pronotum and slightly narrower elytral interstices, especially the sutural interstice. Length 2.5—3.2 mm. — ♂: Ædeagus, see fig. 2, b.

The species has been found in South Norway, in Sweden (Gotland), and in Denmark (South Jutland), but not in Finland.

3. **H. opacus** Er. The biggest and broadest of the three species. Length 2.7—3.4 mm. — ♂: Ædeagus, see fig. 2, a.

The species is distributed in Fennoscandia and Denmark.

4. **H. plumbeus** Blandford, 1894; *obscurus* Chapuis, 1875; *?septentrionalis* Eggers, 1923, 1933.

In the original description given by Chapuis (1875, p. 197) it is said that the species is so closely allied to *opacus* that it can only be distinguished from this species by a very careful examination, and that it is separated from *opacus* by having the interstices, which are very finely punctured and scarcely visibly granulated, nar-

rower than the striae, while the interstices in *opacus* are said to be distinctly broader than the striae.

Stark, 1952, p. 210 and pp. 217—219 says that *plumbeus* has deeper striae than *opacus* and smooth interstices with a single row of small tubercles, while the interstices in *opacus* are finely granulated and have two rows of small tubercles. Further the front in *plumbeus* is indistinctly and rugosely, in *opacus* distinctly punctured.

Blandford, 1894, pp. 56—57, says that *plumbeus* is somewhat variable in the depth of the elytral striae, and that the interstices have an irregular double row of bristles from the base to the middle, thence single.

As the bristles are placed on the small tubercles, and as in *opacus* the interstices are furnished with small tubercles, which are chiefly arranged in a single row, but in a varying degree, especially anteriorly, in an irregular double row, it will be seen that there is a considerable amount of uncertainty concerning the characters of *plumbeus*.

Eggers says 1933, p. 55 that his *septentrionalis* is identical with *plumbeus*, but in his description, 1923, pp. 135—136 it is said that *septentrionalis* stands between *H. angustatus* and *attenuatus*, while *opacus* is not mentioned at all. Further, that the interstices are "alle fein einreihig punktiert und fein gekörnt und mit einer Reihe gelber, fast anliegender Haare besetzt, nur der zweite Zwischenraum trägt eine unregelmässige doppelte Reihe".

These remarks do not help to clear up the matter, and as I have only seen a single specimen of *plumbeus* from Vladivostok I cannot say anything definite about this species. An examination of the aedeagus in *plumbeus* is undoubtedly necessary. In the material examined from Fennoscandia and Denmark I have not seen any specimen which could be a true *plumbeus*.

2. *Trypophloeus* Fairm.

The literature on this genus seems to be insufficient. The determination of the only species found in Denmark caused me trouble. I therefore obtained specimens of some species from Fennoscandia and the vicinity of Hamburg. The result of the examination of this material and of some specimens from Central Europe and Russia showed that — besides *alni* Lindemann¹⁾ — four species: *asperatus* Gyll., *grothi* Hagedorn, *bispinulus* Eggers, and *palmi* n. sp. occur in Fennoscandia and Denmark. *Tr. granulatus* Ratz. does not seem to have been found in the said countries and is perhaps a more southern species.

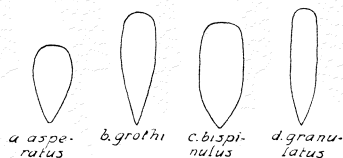


Fig. 3. Scales of species of *Trypophloeus*.

The species vary considerably in size and colour and also in other respects. Still the colour is perhaps in reality not so varying in fully mature specimens, but mature and immature individuals often occur together, and the colour of body, legs and antennæ is therefore inapplicable for determination²⁾. The best distinguishing characters seem to be the puncture of the hind part of the pronotum, the puncture and striæ on the back of the elytra, and the shape of the elytral raised setæ and of the recumbent scales on the back of elytra from the base to the beginning of the declivity. These scales are often somewhat varying within the same specimen, but by

¹⁾ This species is recorded from Finland (Karelia borealis) and North Norway. It is easily recognizable e. g. by the very elongate form with the elytra almost twice as long as together broad, and is not discussed in this paper.

²⁾ See J. Klimesch, 1913, pp. 112—114.

closer examination it is as a rule not difficult to recognize the typical scale-form of the specimen, see fig. 3.

In the male the elytral declivity bears a small tooth on each side. These teeth vary considerably in size, and sometimes there are 2 or 3 teeth on each side (one behind the other). The teeth are apparently not usable for determination. On the other hand, the shape of the end of the ædeagus is of interest as first pointed out by J. Klimesch (1914, pp. 234—239), see below fig. 4.

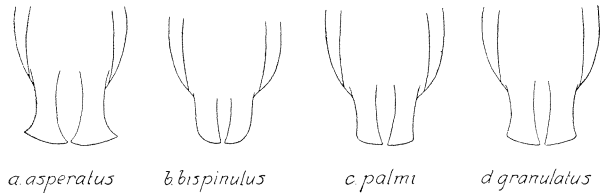


Fig. 4. Ædeagus of species of *Trypophloeus*.

Key to the five species.

1. The second row of raised setæ on the elytra interrupted or almost interrupted on the declivity until a little before the hind edge. Elytra very finely punctured, in front of the back (apart from the sutural stria) only with very indistinct, short rows of coarser points, in the scutellar region not distinctly coarser rugose or rugose-punctured; the recumbent scales short, broad, gradually tapering (fig. 3, a). Base of pronotum very finely punctured. Ædeagus see fig. 4, a 1. *asperatus*.
- The second row of raised setæ on the elytra not interrupted behind. Elytra at least in front on the back with distinct rows of coarser points, in the scutellar region rather strongly rugose or rugose-punctured; the recumbent scales of different form (fig. 3, b—d) 2.
2. Base of pronotum on each side near the median line rather finely and diffusely punctured. Elytra on the back only in front with rows of coarser points, the recumbent scales on the front part of the back rather narrow, gradually tapering (fig. 3, b). Ædeagus as fig. 4, a 2. *grothi*.
- Base of pronotum strongly and closely punctured. Ægeagus see fig. 4, b—d 3.

3. The recumbent scales on the front part of elytral back long, narrow, hairlike (fig. 3, d), the raised setæ long and narrow, the punctured striæ feebly impressed, continued to the apex 5. *granulatus*.
 — The recumbent scales on elytra rather broad (fig. 3, c) ... 4.
 4. Elytra rather dull, the punctured striæ on the back continued to the apex, distinctly impressed, the interstices feebly raised, the raised setæ rather short and fairly broad, scarcely tapering towards the end, which is somewhat truncate. Length 1.6—2.2 mm. 4. *palmi*.
 — Elytra rather shining, the punctured striæ on the back (apart from the sutural stria) distinct only in front and not distinctly impressed, the interstices flat, the raised setæ longer and narrower, somewhat tapering towards the end. Length 1.4—2 mm. 3. *bispinulus*.

1. **Tr. asperatus** Gyll., Hagedorn (1904—1906, pp. 230—231), Klimesch (1913, p. 112, partim), Reitter (1916, p. 289), Palm (1950, p. 142), Stark (1952, p. 289); *binodulus* Ratz.; ?*granulatus* Balachowsky (1949, pp. 214—216).

Characterized by the features given in the key, especially the fine puncturation of the pronotum and the elytra and the posteriorly interrupted, or nearly interrupted second row of raised setæ on the elytra. Pronotum broader than long. On the elytra the raised setæ are short, and the suture behind somewhat elevated, on each side limited by a rather broad longitudinal impression. Length 1.2—1.6 mm. — ♂: The hind outer-angles of the endplates ("die Endplatten", Klimesch) of ædeagus acutely prominent, somewhat variable in shape (fig. 4, a).

Found in Norway and Sweden, but hitherto not in Denmark, presumably not in Finland either.

This species is identical with Klimesch's *asperatus*, see his fig. 9, p. 238, except that I consider *grothi* a good species, see below. It is also identical with Stark's *asperatus*, of which I have seen specimens from Briansk, determined by Stark¹). On the other hand, it cannot be

¹) *Tr. berezinae* Stark l. c. p. 281 and p. 285 has the base of the pronotum finely punctured, the recumbent scales of elytra short

identical with Balachowsky's *asperatus* according to the characters (second row of raised setæ uninterrupted, recumbent scales narrow, see fig. 206, B, p. 216) given by him in the key and in the description. His *granulatus* might rather be identical with *asperatus* Gyll. On Balachowsky's fig. 201 (p. 210) it is stated in the legend to the figure p. 211 that the figure refers to *granulatus*, but on p. 215 that it refers to *asperatus*.

The type of *binodulus* Ratz. has been examined and described by Hagedorn (p. 231). This type, as well as the type of *asperatus* Gyll., no longer exists according to information given me by Mr. Heinrich E. Wichmann, Munich, and by Mr. Bertil Kullenberg, Uppsala, respectively.

I have seen specimens of the species from Kirtorf, Oberhessen (in coll. U. Saalas) determined by Eggers as "*grothi* Hag. = *asperatus* Gyll. = *binodulus* Ratz."

2. **Tr. grothi** Hagedorn (1904—1906, p. 232); *discedens* Eggers, nomen nudum.

Closely allied to *asperatus*, but distinguished by the following characters: Elytra in front on the back with distinct rows of coarser points, in the scutellar region rather strongly rugose or rugose-punctured, the raised setæ somewhat longer and the second row not interrupted behind, the recumbent scales on the front part of the back longer, narrower and more gradually tapering (fig. 3, b), the suture behind less elevated, the impressions on each side weaker or indistinct. Further, the body is somewhat more slender, the pronotum usually only a little or scarcely broader than long. In fully mature specimens the colour of the body is shining black or brownish black, the legs, especially femora, relatively

and broad, absence of striæ also in the front part of elytra, and the second row of raised setæ interrupted on the declivity of elytra. It seems therefore somewhat doubtful, whether *berezinae* is specifically different from *asperatus* Gyll.

dark, and the club of the antennæ dark. Length 1.2—1.8 mm. — ♂: The end of the ædeagus as in *asperatus*, see fig. 4, a.

The species is described from Osdorf near Hamburg. It has been found also in Denmark and Sweden.

Since the appearance of J. Klimesch's paper *T. grothi* Hagedorn has been treated as synonymous with *asperatus* Gyll. by the authors (Reitter, Balachowsky, Stark etc.), but it is undoubtedly a good species. That the proventriculum ("der Kaumagen") and the ædeagus, as pointed out by Klimesch, do not present any difference in the two forms can not of course be decisive, and the abovementioned differences, especially in regard to the elytral scales and setæ whose characters are not at all mentioned by Klimesch must certainly justify the view that *grothi* is a good species. The objections raised by Klimesch to Hagedorn's description of *grothi* are undoubtedly right, but nevertheless it seems correct to use his name, *grothi*, for the species, since there is no doubt about the identity of his species. Indeed, according to the information given me by Mr. G.-A. Lohse, Hamburg, the type specimen no longer exists, but I have examined specimens (labelled "Osdorf, 5, 1904") from Hagedorn's material.

A description of *discedens* Eggers has not been published, so that the name is a nomen nudum, but from Statens Skogsforskningsinstitut in Stockholm I have seen specimens of *grothi* from Kalmar labelled by Eggers 1933 as *discedens* type ♂, cotype ♀. From Prof. O. Lundblad, Stockholm I have seen specimens of *grothi* (found near Bosjökloster, Scania, Sweden) determined by K. E. Schedl as *asperatus* Gyll. As mentioned above *asperatus* Balach. must be a species different from *asperatus* Gyll., and it is not likely that it is identical with *grothi*, as the figure of the recumbent scales (fig. 206, B, l. c. p. 216) does not agree with *grothi*.

3. **Tr. bispinulus** Eggers (1927, pp. 121—122), Palm (1950, p. 142), Stark (1952, p. 288); *granulatus* Sahlb. 1919.

Characterized by the following features: Base of pronotum strongly and closely punctured. Elytra only in front of the back with distinct rows of coarse points, in the scutellar region strongly rugose, the recumbent scales fairly broad, longer and more abruptly tapering than in *asperatus* (fig. 3, c), the raised setæ somewhat longer than in *asperatus*, rather narrow, somewhat tapering towards the end, the second row not interrupted behind. The body is fairly broad, rather shining, black or brownish black, legs and antennæ brown or yellowish brown. Pronotum broader than long. Length 1.4—2 mm. — ♂: The ædeagus is quite different from the ædeagus of the two preceding species, the hind outer angles of the endplates being rounded (fig. 4, b).¹⁾

Norway, Sweden, Finland, Russia, but hitherto not in Denmark. Probably the records of *granulatus* Ratz. from Northern Europe refer to *bispinulus* (see Stark, 1952, p. 288).

The collection of Eggers is now in the U. S. A., and I have not seen the type of *bispinulus*. But by the courtesy of Prof. U. Saalas, Helsingfors, I have been able to examine specimens (labelled "Helsinki, U. Saalas"), that have been found together with the type, and a specimen (labelled "Lojo", 23. 7. 18, Håkan Lindberg), which according to his statement can be regarded as a cotype. I have also seen a Swedish specimen (from Statens Skogsforskningsinstitut, Stockholm) determined by Eggers in 1933. It appears from a correspondence between Eggers and U. Saalas that Eggers has been in great doubt as

¹⁾ The shape of the hind angles seems to be very similar to that of *rybinski* Reitter, see Klimesch 1914, p. 239, fig. 11, but *Tr. bispinulus* cannot be confounded with *rybinski* which has a much longer and slender form, and whose male has no teeth on the hind part of the elytra.

to this species which he first determined (1914) as *granulatus* and later (1919—20) as *grothi*.¹⁾

4. **Tr. palmi** n. sp.; *discedens* Th. Palm, 1950, p. 142 (nec Eggers, see above p. 181).

Very closely allied to *bispinulus* but separated by the characters given in the key. From *granulatus*, which also has the elytral striæ complete (not shortened behind), it is easily distinguished by the broad recumbent scales on the front part of the back of the elytra and the much shorter, rather broad and somewhat truncate raised setæ. Length 1.6—2.2 mm. — ♂: The shape of the endplates of ædeagus intermediate between *bispinulus* and *granulatus*, the sides being a little less convex than in *granulatus*, and the hind outer-angles a little less rounded than in *bispinulus*, very slightly obtuse-angled.

Sweden: Östergötland (Omberg, leg. Palm), Uppland (Fiby Urskog, leg. Lundblad), Jämtland (Fors, leg. Palm). The specimens from Fiby Urskog were determined by K. E. Schedl as *granulatus* Ratz. Breeding in *Populus tremula*, often together with *bispinulus* Eggers and *asperatus* Gyll. (Palm, 1950, p. 142).

I have named this species after my friend, the distinguished Swedish coleopterist, Dr. Thure Palm of Uppsala, who first noticed the species. The type and allo-type are in my collection.

5. **Tr. granulatus** Ratz., Hagedorn (1904—1906, p. 229), Klimesch (1913, p. 106, 1914, p. 237), Reitter (1916, p. 290), Stark (1952, p. 288), nec Balachowsky (1949, p. 214 and pp. 215—216), nec Saalas.

Closely allied to *palmi* and like this characterized by the complete, feebly impressed elytral striæ, but easily distinguished by the quite different shape of the elytral scales (fig. 3, d) and setæ. The setæ are somewhat taper-

¹⁾ As mentioned above p. 181, Eggers in 1934 called the true *grothi*: *discedens* n. sp.

ing towards the end. The elytral striæ are not quite so coarsely punctured as in *palmi*, and the interstices are flat or almost flat. Length 1.4—2.2 mm. — ♂: The end-plates of ædeagus with obtuse-angled hind outer angles and slightly convex sides (fig. 4, d).

The species has not been found in Fennoscandia and Denmark, and is probably a more southern species, see above p. 182.

This species is identical with Klimesch's *granulatus*, but it cannot be identical with *granulatus* Balachowsky according to the characters (second row of raised setæ interrupted behind, recumbent scales short and broad, see fig. 206 C, p. 216) given by him in the key and description. Also *asperatus* Balach. must be a different species since it has the base of pronotum very finely punctured (p. 215 in the key). The type of Ratzeburg has been examined and described by Hagedorn (pp. 229—230), but unfortunately, he does not mention the shape of the scales and setæ. According to information given me by Mr. Heinrich E. Wichmann of Munich, this type no longer exists. I have only seen specimens from Moravia, collected and determined by Klimesch and labelled: "Hradisch Mor. Sept. 1912. Johs. Klimesch"¹). Some of these specimens have been determined also by Eggers as *granulatus* Ratz.

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¹) See Klimesch, 1913, p. 105 and 1915, pp. 6—7.

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Ny dansk Storsommerfugl: *Arenostola extrema* Hb.

Af E. Pyndt.

(Hertil tavle V—VI)

(With an English summary)

En stor fortjeneste ved biskop Hoffmeyers sommerfuglebøger er, at han deri gør os samlere opmærksom paa arter, som vi kunne vente at finde herhjemme og derfor bør have opmærksomheden henvendt paa. Flere af disse er fundet i de senere aar, og nu kan en ny føjes til, nemlig ovenstaaende *Arenostola extrema* Hb.

Sidst i juni 1955 samlede jeg en del ved Sillestrup strand paa østkysten af Falster, og en aften— $22/6$ —havde jeg paa sukkerlokning nogle dyr, der paa afstand i lygte-skæret syntes mig at være *Aren. morrisii* Dale, som netop findes paa denne lokalitet, men ved nærmere eftersyn viste sig ikke at være denne, men — mente jeg — *Aren. fluxa* Hb., blot i lysere og mindre eksemplarer end nominatformen, hvorfor jeg lod dem sidde, da jeg havde nok af denne art.

Senere paa aaret læste jeg i Hoffmeyers: "De danske Ugler" om *Aren. fluxa* Hb. og *extrema* Hb., og det stod mig pludselig klart, at beskrivelsen af *extrema* godt kunne passe paa de dyr, jeg havde set hin aften. En gennemgang af mine *fluxa* viste, at 5 af disse maatte være *extrema*. For at være sikker i min sag, sendte jeg 4 af mine dyr til ingeniør Wolff og bad ham se paa dem og genitalundersøge dem, og kort efter modtog jeg svar, dyrene var alle *Aren. extrema* Hb., de forskelle, jeg havde gjort opmærksom paa, passede, og genitalorganerne var — hvad omstaaende fotografi ogsaa klart viser — meget forskellige. Endvidere meddelte Wolff mig, at hans egen samling af *fluxa* alle var denne, men at en gennemgang

af Zoologisk Musæums exemplarer af *Aren. fluxa* havde vist, at 6 af disse var *extrema* Hb., nemlig 3 stk. fra Kjærs samling (1 stk. Bøtø $\frac{3}{7}$ -40, 2 stk. Mellemskoven $\frac{13}{7}$ og $\frac{14}{7}$ -45) og 3 stk. fra Thirslunds — alle Sillestrup strand $\frac{1}{7}$ -44.

Mine fund er — bortset fra exemplaret øverst paa tavlen, der er fra Lindeskoven ved Nykøbing, taget i udkanten af skoven mod Hasselø nor $\frac{16}{6}$ -46 — alle fra Falsters østkyst, nemlig Bøtø $\frac{19}{7}$ -48 og Sillestrup strand $\frac{14}{6}$ -54. — Bedst trives arten sikkert i digeområdet fra Sillestrup til Bøtøgaard, hvor larvens næringsplante — Rørhvene (*Calamagrotis*) — findes i mængde, men er — som exemplaret fra Lindeskoven viser — altsaa ikke knyttet til kysten alene.

Med vanlig hjælpsomhed har ingeniør Wolff fotograferet 3 af mine *extrema* og 2 *fluxa* til sammenligning og desuden fremstillet genitalpræparater af de to arter, og det smukke resultat ses paa omstaaende tavle.

En beskrivelse af dyrene turde være overflødig, da de klare fotografier, der viser dyrene i dobbelt maalestok, siger mere end mange ord, men jeg vil lige kort fremhæve de vigtigste forskelle:

<i>Aren. extrema</i> Hb.	<i>Aren. fluxa</i> Hb.
Ribberne i sømfeltet hvidt bestøvede	Ribberne i sømfeltet mørkt bestøvede
Sømlinien en afbrudt, sort punktrække	Sømlinien mørk, hel og fin
Ydre mellemlinie i reglen tydeligt angivet ved sorte punkter	Ydre mellemlinie svagt antydet eller manglende
Forvingespidsen afrundet	Forvingespidsen skarpere
Mindre end <i>fluxa</i> , benfarvet, mere el. mindre brunligt bestøvet, men mere hvid end <i>fluxa</i>	

Med hensyn til flyvetiden er *extrema* tidligere end *fluxa*, herhjemme begynder den sikkert at flyve først i juni (Sillestrup 14/6), *fluxa* fra sidst i juni til ind i september (jeg har *fluxa* fra 29/6), en tid flyver de altsaa sammen paa samme biotop (samme næringsplante: Rørhvene), og her skal man altsaa være opmærksom paa de særlig lyse (hvide) exemplarer.

Aren. extrema Hb. er fra udlandet kun sparsomt kendt — Rhinomraadet, Sydtyskland, Pommern, Borkum, England og i nyere tid fra Finland — men forholdet er sikkert det samme som tilfældet har været i Danmark, den er forvekslet med *fluxa*, og ovenstaaende vil maaske gøre sit til, at kendskabet til artens udbredelse øges.

Sluttelig beder jeg ingeniør Wolff modtage min bedste tak for fremstillingen af genitalpræparater og fotografier og hjælp iøvrigt, ligesom jeg takker fotograf H. V. Christensen, Zoologisk Museum, for fotograferingen af genitalpræparaterne.

Summary.

On the 22nd june, 1955, I was collecting moths at a locality named Sillestrup Strand at the east coast of the Danish isle of Falster. On the sugar I observed some moths which at some distance looked like *Arenostola morrisii* Dale (*bondii* Knaggs) — a species previously known to occur in this locality. When I approached the patches and more closely inspected the specimens, I found that I had been wrong, and thinking that the moths in question were, not *morrisii*, but small light coloured specimens of *A. fluxa* Hb. (*hellmanni* Ev.) I left them on the sugar.

Later on I happened to study the description of *Arenostola extrema* Hb. in Hoffmeyer (De Danske Uglar) in which hand-book this species is mentioned among other species which probably may occur in Denmark, and at once it struck me that the moths which I had seen on the 22nd june, 1955, could be nothing but *A. extrema*.

Looking over the series of *fluxa* in my collection I found 5 specimens which seemed to me to be *extrema*. To be safe I sent 4 of them to Niels L. Wolff in Hellerup, asking him to examine the genitalia. Shortly after he replied that my supposition was correct and, in addition, he informed me that he had now under-

taken a revision of the Danish material of *A. fluxa* preserved in the Zoological Museum of Copenhagen, proving that 6 of these specimens also were *extrema*. The 11 Danish specimens of *extrema* known at present all originate from Falster, 10 of them having been taken at the east coast. The captures date from 14th june (1954) until 19th july (1948).

The main differences between the two species are as follows. The veins crossing outer area of the forewing in *extrema* whitish, in *fluxa* dark, terminal line in *extrema* broken, forming a series of black points, in *fluxa* a fine narrow dark line, apex of forewing in *extrema* rounded, in *fluxa* pointed. As a whole *extrema* is smaller, and appears earlier in the season (from the beginning of june) than *fluxa* (late june until first in september). The larva of both species lives in stems of *Calamagrostis*.

No doubt the two species have been confused, not only in Denmark but also in collections abroad.

Anmeldelse.

PALLE JOHNSEN: **Honningbiens fjender**. Kbh. 1955. Dansk Videnskabs Forlag. 80 sider, 12 tekstfigurer, 6 tavler. Pris: 10 kr.

Bogen er skrevet for biavlere, som en håndbog vedrørende de dyr (og planter), der kan være skadelige for bierne eller som optræder i bistaderne. Langt det meste af bogen handler om insekter og rummer meget stof af interesse for entomologer. Til glæde for samlerne har forf. således søgt at give en så fuldstændig liste som muligt over de mange insekter, der kan findes i bistader eller kan genere bierne. Også udenlandske arter, der kan tænkes fundet hos bierne, er omtalt. For hver art er der angivet størrelse, farvetegninger og andre kendetegn, som i forbindelse med tavlernes habitusfigurer skulle gøre en bestemmelse mulig i mange tilfælde.

Hovedparten af teksten er iøvrigt livlige skildringer af dyrenes biologi og relation til bierne, og her omtales mange interessante forhold. Jeg kan nævne omtalen af bimyren (*Mutilla*) og den ayindvandrede biulv (*Philanthus triangulum*), oliebillernes og Strepsipterernes mærkelige udvikling, voksmøllene, der er tilpasset til at leve af det ellers så ufordøjelige bivoks, og den sjældne luseflue, *Braula coeca*, bilusen.

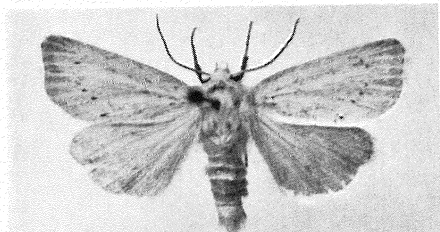
Overalt i bogen er der givet henvisninger til håndbøger og originalafhandlinger, og der er registre over danske og svenske navne samt latinske slægtsnavne.

Prisen kan synes høj, men de tæt trykte sider rummer ca. dobbelt så meget tekst som siderne i Ent. Medd.

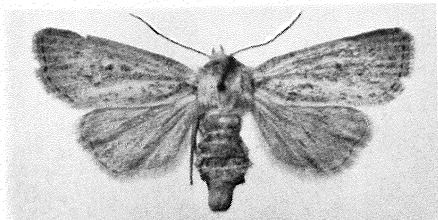
J. Keiding.



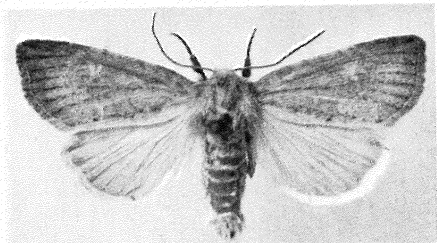
Arenostola extrema Hb. ♂
(× 2)
Lindeskoven, Falster
16.6.1946



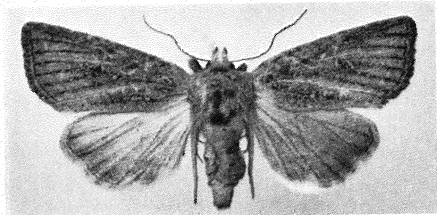
Arenostola extrema Hb. ♂
(× 2)
Bøtø, Falster
19.7.1948



Arenostola extrema Hb. ♀
(× 2)
Sillestrup Strand, Falster
14.6.1954

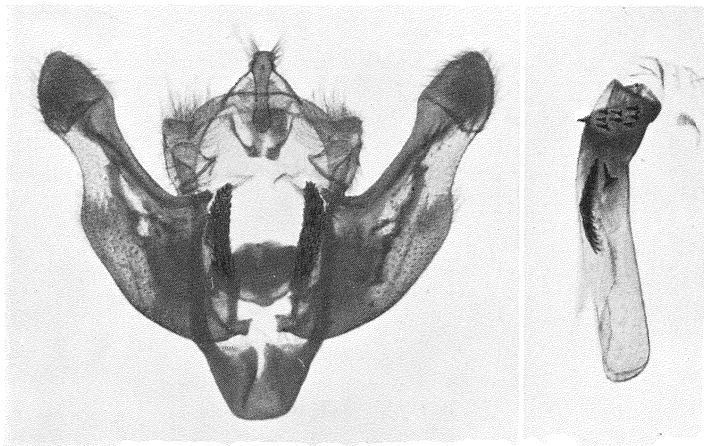


Arenostola fluxa Hb. ♂
(× 2)
Holte, Sjælland
6.9.1921

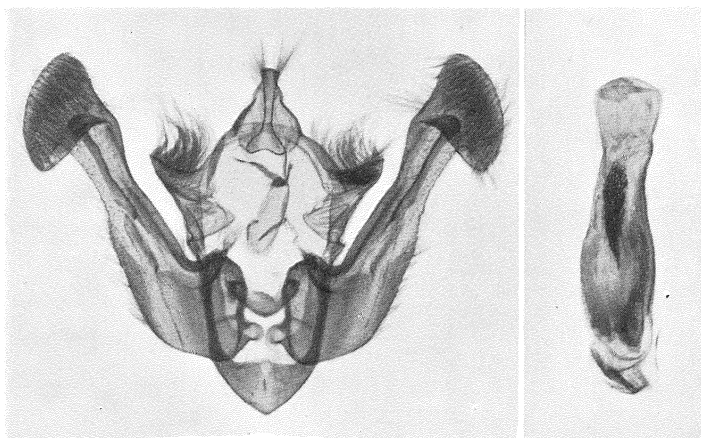


Arenostola fluxa Hb. ♀
(× 2)
Mellemskoven, Falster
15.7.1941

Niels L. Wolff fot.



Arenostola extrema Hb. ♂-genitalapparat ($\times 17$)



Arenostola fluxa Hb. ♂-genitalapparat ($\times 17$)

Niels L. Wolff præp., H. V. Christensen fot.

Nye og sjældne danske Sommerfugle fra Nordbornholm 1955.

Af

Niels L. Wolff.

(Hertil tavle VII—VIII)

Enhver sommerfuglesamler, som gennem en længere sammenhængende periode har samlet natsommerfugle ved hjælp af sukkerlokning, lyslokning eller anden metode, hvis resultat er betinget af dyrenes større eller mindre flyvelyst ("aktivitet"), vil have gjort den erfaring, at udbyttet er meget stærkt svingende fra nat til nat. Varmt, overskyet vejr giver større udbytte end køligt vejr med klar himmel, men også nætter, hvor vejrforholdene tilsyneladende er ganske ens, kan give højt forskelligt resultat. Den meget store tilflyvning vil dog altid være koncentreret om ganske få nætter.

I 1954 lyslokkede jeg hver nat i perioden $^{20}/_7$ — $^{29}/_7$ på samme sted på Bornholm (i nærheden af Ølene). Kun to af de ti nætter ($^{24}/_7$ og $^{25}/_7$) var gunstige, og i disse to nætter trak lyset langt flere dyr end i alle de øvrige tilsammen. En art som *Plusia bractea* F. kom kun $^{24}/_7$, og af *Dasychira abietis* Schiff., der det år blev taget forskellige steder på Bornholm i tidsrummet $^{10}/_7$ — $^{5}/_8$, kom $^{24}/_7$ syv eksemplarer og $^{25}/_7$ tolv eksemplarer, hvorimod den de øvrige nætter kun viste sig i ialt ét eksemplar.

I 1955 lyslokkede jeg i perioden $^{21}/_7$ — $^{8}/_8$ hver nat på Nordbornholm og oplevede her en endnu mere udpræget "artskoncentration". Lyslokningen gav nemlig 4 for den danske fauna nye arter, som alle 4 kom samme nat ($^{28}/_7$), medens ingen af disse viste sig de øvrige 18 nætter¹⁾.

1) Det bemærkes, at de anførte datoer efter den af sommerfuglesamlere anvendte praxis er at forstå således, at f. ex. $^{28}/_7$ betyder natten mellem $^{28}/_7$ og $^{29}/_7$ uanset, om dyrene måtte være taget før eller efter kl. 24, hvorimod ornitologer ved natlige iagttagelser (tilflyvning til fyrtårne) vilde have betegnet samme nat ved datoen $^{29}/_7$.

De nye arter, en agrotide (*Caradrina cinerascens* Tgstr.), en geometride (*Semiothisa loricaria* Ev.), en pyralide (*Eurhodope suavella* Zck.) og en oecophoride (*Agonopteryx hepatariella* Zell.) vil blive omtalt nedenfor tillige med en del andre fund fra samme periode, som fortjener omtale. Arterne er i det følgende ikke opført i systematisk orden, men rækkefølgen er den, i hvilken fundene skønnes at være af interesse. Hvor ingen lokalitet er nævnt, er denne kyststrækningen mellem Hammeren og Vang, og for udaterede fund er tidspunktet $^{21}/_7$ — $^{31}/_7$ 1955.

Billederne af genitalierne vist på tavle II er ikke mikrofotografier, men er fremstillet ved optagelse på plade gennem et almindeligt fotografisk forstørrelsesapparat og herefter ved forstørring af aftrykket på sædvanlig måde. Arbejdet er med megen omhu udført af fotograf H. V. Christensen, Zoologisk Museum, som bedes modtage min bedste tak.

1. ***Semiothisa loricaria*** Ev. En ♂ på lys $^{28}/_7$. Denne lokale og sjældne art var ikke ventet i Danmark. Dens udbredelse strækker sig fra Sibirien gennem Estland og Finland ned gennem Sverige, hvor det sydligste kendte findested er beliggende i Uppland. Fornylig er arten også konstateret i Norge. Syd for os er arten ikke fundet.

Det danske exemplar (fig. 3) er noget tyndslidt, hvad arten iflg. W. Petersen (1924, Lepid.-Faun. Estl. p. 286) hurtigt bliver. Fig. 4 viser til sammenligning et friskt exemplar fra Nordsverige (I. Svensson leg.). Karakteristisk er hos hannen vingernes jævnt udbuede søm og mørke midtpletter. Forvingerne har lyst violetgrå grundfarve med et, hos friske eksemplarer tydeligt, gulbrunt, i brede, aflange pletter opløst, tværbånd på bølgeliniens plads og med tydelige sømpunkter. Bagvingerne er grå, fint mørkt prikkede, navnlig mod sømmen. Vingefanget angives (1941, Svenska Fjärilar, p. 301) til 24—30 mm; det danske exemplar ligger i underkanten: 24 mm. Antennerne er fjerformede med ret lange sidegrene (væ-

sentligt længere end hos *S. fulvaria* de Vill. (*brunneata* Thnbg.) og *S. wauaria* L.). Genitalierne og bugpladens kontur hos det bornholmske exemplar ses på fotografiet fig. 6.

Hunnen har stærkt reducerede vinger, omtrent som hos *Theria rupicaprararia* Schiff., en ejendommelighed ved denne nye art, som ellers har været forbeholdt enkelte af vore tidligste forårs- eller seneste efterårsmålere.

Larven, som meget ligner larven af *S. fulvaria*, lever på birk og beskrives som lys violetbrun med 5 mørkere dobbelte længdelinier, lysere bug med 6 brunlige linier og på segment 4—8 med gulhvid sidelinie, i hvilken der bag ved hvert åndehul findes en sortagtig, skråt fremadrettet tværstreg.

Systematisk anbringes arten sædvanligvis i slægten *Semiothisa* Hb., hvis danske arter herefter omfatter de hos Kløcker (1915, Danm. Faun. 17) i denne slægt placerede arter tillige med en repræsentant for hver af Kløckers slægter *Phasiane* Dup. og *Thamnonoma* Led. Rækkefølgen er i så tilfælde denne: *notata* L., *alternaria* Hb., *signaria* Hb., *liturata* Cl., *clathrata* L., *wauaria* L., *fulvaria* de Vill., *loricaria* Ev. Nok så naturligt forekommer det dog at samle de tre sidste af disse arter i én slægt: *Itama* Hb. (*Itame* auct.).

Imago flyver i juli og foretrækker (iflg. W. Petersen) steder, hvor lave birke og *Spiræa ulmaria* voxer.

Uden yderligere grundlag end fundet af en enkelt han af denne nordlige art, kan der ikke gives nogen holdbar zoogeografisk vurdering af den overraskende konstatering af arten på Bornholm, og de følgende betragtninger er fremsat med dette udtrykkelige forbehold.

Da exemplaret næppe kan formodes at være passivt "indslæbt", vil den første tanke være, at det kan dreje sig om en "strejfer", således som det må være tilfældet med de eneste kendte danske eksemplarer af arter som *Cosymbia puppillaria* Hb., *Plusia chryson* Esp. eller *Rhya-*

cia fugax Tr., for blot at nævne enkelte. Herimod taler dog, at *S. loritaria* på sine forekomststeder er en lokal art, som ikke vides at have strejfende tendenser.

Endvidere kan det tænkes, at den omstændighed, at der er omtrent 600 km i luftlinie fra artens nærmeste kendte findested til Bornholm, blot skyldes manglende eftersøgning, og at den også lever andre steder undervejs. Noget sådant var f. ex. tilfældet med det store fjermøl, *Platypilia capnodactyla* Zell., af hvilket der indtil fornyligt kun var kendt ganske få eksemplarer i hele Europa, men som nu, da biologien er bekendt (1953, Entom. Medd. 24, p. 469—474), kan findes talrigt mange steder (den er nu også konstateret i Sverige).

Endelig kan det vel ikke på forhånd helt afvises, at der her virkelig er mulighed for en reliktføremkomst, da det nordbornholmske landskab — med klipper og moser, med *Spiræa*, blåbær, enebær, birk og nåletræer — næppe er meget forskelligt fra den biotop, som synes at passe arten, medens de nu herskende klimatiske forhold er andre. En tilbagetrækning af arten i nordlig retning kan have efterladt en restbestand på Bornholm. At hunnen på grund af sine reducerede vinger ikke aktivt kan flyve, må vel betragtes som et minus for artens spredningsevne, omend det skal indrømmes, at det ikke er let at få øje på nogen principiel forskel mellem udbredelsesforholdene hos arter med og arter uden vingereduktion hos hunnerne.

Iøvrigt bør man dog være forsigtig med at fæste betegnelsen "relikt" på enhver art, hvis udbredelse forekommer noget særpræget. Dette er også nylig fremhævet af Andersen (1954, Flora & Fauna, p. 73—81), der bl. a. gennemgår nogle af de ikke så få arter, som Hoffmeyer i sine forskellige arbejder har betegnet som relikter. Andersen konkluderer, at med hensyn til senglacialrelikterne kan kun to af disse, nemlig *Carsia sororata* Hb. og *Isturgia carbonaria* Cl. regnes hertil. At

netop disse to tillades som relikter (for den ene arts vedkommende dog kun for dens jyske forekomst, men ikke for dens øvrige danske) motiveres af Andersen (l. c., p. 80) med, at der i begge tilfælde er tale om en måler, der "er en relativ dårlig flyver med svage vinger og kraftesløs flugt, der i hvert fald næppe magter at tilbagelægge hundrede km eller mere". Hertil må bemærkes, at uanset, om konklusionen er rigtig eller forkert, er præmisserne ikke rigtige. En måler som f. ex. *Xanthorhoe obstipata* F., der har betydeligt svagere vinger og mere kraftesløs flugt end de to nævnte, hører netop til de "klassiske" strejffere, som — sandsynligvis båret af luftstrømninger — formår at tilbagelægge distancer af ganske anden størrelsesorden end 100 km. Denne sydlige art nåede under et af sine fremstød (1947) endog til Island (1953, Entom. Medd. 24, p. 591—592), hvor den blev fanget nær kysten sydøst for Vatnajökull. Man kan slet ikke udfra en sommerfugls udseende bedømme, om den hører til de stationære arter, eller om den har strejffernatur; det kan kun et nøje kendskab til dens forekomstforhold belyse.

2. **Agonopteryx hepatoriella** Zell. (Af Hannemann 1954 opstillet som særlig Slægt: *Levipalpus*). En ♂ på lys ²⁸/₇. I vore omgivelser mangler arten i Nordtyskland; den findes længere mod syd i Tyskland, i Schweiz og Holland, men ikke i England. Nord og nordøst for os er den fundet i Estland, Finland, Norge samt i Sverige i flere landskaber fra Västerbotten til Öland, men ikke syd herfor, hvorfor det bornholmske fund er af zoogeografisk interesse.

Arten har et vingefang på ca. 21 mm og er kendelig fra de øvrige danske arter på de leverbrune forvinger, det smalle grå rodfelt, de små hvide midtpunkter, ensfarvede grå bagvinger, og på palperne, hvis næstyderste led er langt, og hvis yderste led er meget kort.

Genitalierne af det bornholmske exemplar er vist på fotografiet fig. 9. — Larven er ukendt.

3. *Caradrina cinerascens* Tgstr. En ♂ på lys 28/7. Arten har boreo-alpin udbredelse, og dens konstatering på Bornholm var ikke uventet. Nord for os forekommer den i Østbalticum (Estland), Finland, Sibirien (til Ussuri), det sydlige Norge og i Sverige gennem de fleste land-skaber fra Ångermannland til Skåne (incl. Öland), men regnes dog for en sjældenhed i Skandinavien. Det bornholmske fund betegner sydgrænsen for artens nordlige udbredelse. I sin nordlige forekomst har arten tidligere været kaldt *menetriesii* Kretsm., og i sin sydlige forekomst, som omfatter alpeområderne i Schweiz, Frankrig og Norditalien, *rougemonti* Spul., men begge disse anses for at tilhøre samme art, *cinerascens* Tgstr. (se f. ex. 1933, Entom. Tidskr. Stockh., p. 220—229).

Det bornholmske exemplar, som er en del affløjet, er afbildet på fig. 2. Habituel ligner arten nærmest *C. clavipalpis* Scop., men forvingernes grundfarve er klar askegrå uden brunt, og bagvingerne rent hvide, hos ♂ med sorte sømpunkter, hos ♀ med sort sømlinie og mørk sømskygge.

Som det fremgår af fotografierne fig. 7 og 8 er genitalierne af *C. cinerascens* og *clavipalpis* meget forskellige indbyrdes. Da Nordström i det ovenfor citerede arbejde i Entom. Tidskr. Stockh. nævner, at aedoeagus hos det af ham undersøgte materiale af *cinerascens* og *rougemonti* har haft henholdsvis 8 og 9-10 cornuti og tilføjer, at undersøgelse af et større materiale eventuelt vil kunne ændre dette resultat, skal her bemærkes, at det bornholmske exemplar af *cinerascens* har 10 større cornuti (og en del mindre). Dette ses ikke tydeligt på fotografiet fig. 7b, men er vist på hosstående fig. 1.

Larven lever formentlig, som de andre nærstående arter, på diverse "lave planter".



Fig. 1. *Caradrina cinerascens* Tgstr. ♂. Bornholm 28/7 1955. Aedoeagus med cornuti (× 19).

4. **Hemistola chrysoprasaria** Esp. En ♂ på lys ²⁶/₇. Denne sarte blåligt-grønne måler blev først konstateret som dansk 2 år forinden (en ♀ Mellemskoven på Falster ¹⁴/₇ 1953) og var ikke fundet efter den tid.

Der kan her henvises til den omtale af det første danske fund, som er givet af finderen N. Ulrik Møller (1953, Flora & Fauna, p. 65) samt til afbildningen hos Nordström & Wahlgren (1941, Svenska Fjärilar, pl. 33, fig. 5 b), hvor artens farve er udmærket gengivet.

I England kan larven til stadighed findes på Clematis vitalba (se f. ex. 1902, J. W. Tutt: Practical Hints II, p. 28, 46, 64—65). Urbahn (1939, Schmett. Pomm., p. 663) nævner, at arten i Pommern særligt er fundet på Rügen, hvor Clematis enkelte steder voxer forvildet, medens Nordström (Sv. Fj., p. 223) ganske vist anfører, at larven lever på Clematis vitalba, men tilføjer "og sandsynligvis også på andre næringsplanter". De få eksemplarer, som er taget i Estland, er iflg. W. Petersen (1924, Lep.-Faun. Estl., p. 223) fanget på en lyngbevokset lokalitet. En nøjere eftersøgning på Bornholm på det nærmeste sted, hvor Clematis vitalba voxede, gav intet resultat. Skønt Clematis vitalba er en haveplante, tyder artens østlige fund ikke på haveforekomst. Min ven, skovridder Ingvar Svensson, Österslöv i Sverige, har taget adskillige friskklækkede eksemplarer af arten i Skåne og formoder, at den dér lever på Pulsatilla.

5. **Eurhodope (Rhodophaea) suavella** Zck. 2 ♂♂ på lys ²⁸/₇. I van Deurs' bearbejdelse af pyraliderne (1942, Danm. Faun. 48, p. 62) er denne art medtaget blandt de ikke-danske arter, som kunde forventes at blive fundet her i landet, hvilket altså nu er sket. I vore omgivelser er den fundet i Sydsverige (Skåne, Blekinge, Öland, Gotland), i Nordtyskland og i England, men ikke i Balticum eller i Finland.

Angående artens levevis og udseende henvises til omtalen i Danm. Faun., hvortil dog må føjes, at forvin-

gernes grundfarve ikke er rødbrun, men blåligt grå, hvilket gælder såvel de to bornholmske eksemplarer som en del eksemplarer, Worm-Hansen har taget i Italien. Det ene af de bornholmske eksemplarer ses på fig. 5.

6. ***Coleophora clypeiferella*** Hofm. Et eksemplar Vang, senere ($7/8$) desuden et eksemplar Onsbæk, begge på lys. Eftersøgning på næringsplanten, *Chenopodium*, som voxede talrigt ved Vang, var resultatløs.

Arten, som kun var fundet i ét dansk eksemplar (Hillerød $25/7$ 1949, van Deurs leg.), hører til en lille, meget ejendommelig gruppe indenfor slægten *Coleophora*, hvis larver i modsætning til alle de øvrige arters forlader sækken og forpupper sig i jorden. De to andre hertil hørende arter, *squalorella* Zell. og *salicorniae* Hein.-Wck. er fundet henholdsvis Hannenø, Falster 3 ex. $2/8$ 1952 og Fanø 1 ex. $26/7$ 1949 (begge N. L. Wolff leg.).

Col. clypeiferella er yderligere særpræget ved den mærkelige udformning af oversiden af første bagkropsegment, som både hos ♂ og ♀ i stedet for skæl bærer en række parallelle kitinribber dannende en skjoldformet figur, efter hvilken arten har fået navn. Også de følgende bagkropsegmenter bærer, omend i aftagende grad, rækker af kitinfremspring. Arten er fornylig fundet i Sverige (Skåne).

7. ***Tortrix diversana*** Hb. 3 eksemplarer på lys i de første dage af august. Det eneste hidtil kendte danske eksemplar var taget ved Teglkås ($3\frac{1}{2}$ km sydligere end Vang) $20/7$ 1954 (J. Chr. Jensen leg.).

Arten er ganskevist opført som dansk i C. S. Larsens fortegnelse (1927, Entomol. Medd. 17, p. 36), men det dér omtalte eksemplar er fejlbestemt og tilhører *Capua orana* F. (*reticulana* Hb.) (van Deurs verific.).

Såfremt man ikke opretholder kravet om, at slægten *Cacoecia* Hb. skal have costalfold hos ♂, passer *diversana* bedre ind i slægten *Cacoecia* end i slægten *Tortrix* L.

8. **Leioptilus osteodactylus** Zell. 2 exemplarer på lys. Af denne art, som er almindelig både i Sverige og i Finland, var hidtil mærkværdigvis kun kendt to danske exemplarer: Vorså, Jylland, $^{19}/_7$ 1939 (E. Kjær leg.) og Saltuna, Bornholm, $^{11}/_7$ 1949 (van Deurs leg.).

9. **Euergestis extimalis** Scop. 5 exemplarer på lys. Hidtil var kun kendt 3 danske exemplarer, taget henholdsvis: Jægersborg Dyrehave $^{12}/_8$ 1861 (V. Strøm leg.), Lumsås $^{29}/_6$ 1948 (Fl. Weis leg.), Dragør $^{20}/_6$ 1954 (E. Gümöes leg.). Af de 5 bornholmske exemplarer var det ene helt friskklækket.

10. **Platyedra malvella** Hb. 2 exemplarer på lys. Først konstateret 1954: Randkløve, Bornholm, $^{17}/_7$ og $^{28}/_7$ (N. L. Wolff leg.). Desuden taget: Gudhjem, Bornholm, $^{19}/_7$ 1949 (van Deurs leg.). Arten er også først fornylig fundet i Sverige. Larven lever på stokrose.

11. **Phalonia dipoltella** Hb. 1 exemplar på lys ved Finnedalen $^2/_8$. Indtil 1955 kun kendt i 4 danske exemplarer: Hundested, Sjælland, $^{17}/_7$ 1944 (N. L. Wolff leg.), Løvenholm, Jyll., $^{25}/_7$ 1946 (E. Kjær leg.), Stensbæk Plantage, Jyll. $^6/_7$ 1950, $^6/_8$ 1951 (Worm-Hansen leg.). I 1955 fundet på Bornholm: Boderne 2 ex. $^9/_7$ — $^{13}/_7$ (Lundqvist leg.).

12. **Batia (Borkhausenia) lambdella** Don. 17 exemplarer ($^{23}/_7$ — $^7/_8$), de fleste ved Vang, nogle i Finnedalen. Hovedsageligt på lys, enkelte om dagen på træstammer.

I Larsens fortegnelse (1916, Entom. Medd. 11, p. 160) meddeles, at Gudmann i 1894 og 1895 tog nogle få exemplarer af *Borkhausenia lunaris* Haw. ved Ringedal på Bornholm (altså i umiddelbar nærhed af ovennævnte findested) samt (ibid., p. 296), at Sønderup $^{16}/_8$ 1916 har taget et enkelt exemplar ved Rønne. I tillægget til fortegnelsen (1927, Entom. Medd. 17, p. 82) anføres, at H. Weis yderligere har taget et exemplar på Bornholm (Sandvig).

Efter at jeg har undersøgt genitalierne (fig. 10) såvel hos de i 1955 tagne exemplarer (♂ og ♀) som hos et af Gudmanns exemplarer (♂), har det vist sig, at det ikke drejer sig om *B. lunaris* Haw., men om den meget lignende art, *B. lambdella* Don., hvorfor førstnævnte art må udgå som dansk. Da Pierce (1935, Genit. Tin., p. 31, pl. 17) omtaler, at ductus bursæ hos *lunaris* ♀ har 6 eller 7 tænder, men ikke nævner udseendet af ductus bursæ hos *lambdella* ♀, skal her bemærkes, at de bornholmske hunner har ca. 13 små, tydelige tænder på ductus bursæ.

13. **Pyrausta flavalis** Schiff. 2 exemplarer på lys ²⁸/₇. Hidtil: Bøtø 1 ex. ³⁰/₇ 1940 (E. Kjær leg.), og Bornholm: Årdsdale 2 ex. ⁶/₇ 1948 (Traugott-Olsen leg.). Endvidere Knudsker 1 ex. ³¹/₇ 1955 (Preben Holst leg.), Saltuna 1 ex. ¹/₈ 1955 (E. Wilsund leg.).

14. **Eucosma simplana** F. R. 2 exemplarer ²⁸/₇ på lys. Arten blev her i landet først fundet (talrigt) ¹¹/₇—¹⁷/₇ 1942 i Mellemskoven, Falster (N. L. Wolff leg.), hvor den siden er taget af flere samlere. Endvidere er den senere taget Horreby Lyng, Sillestrup Strand, Bøtø (E. Pyndt leg.), men den var ikke kendt fra andre Steder i Danmark end Falster.

15. **Agonopteryx (Depressaria) astrantiae** Hein. 1 exemplar på lys ved Vang i begyndelsen af august. Gudmann tog det første danske exemplar ved Ringedal 1893, og der er herefter taget et ex. Snarup Mose, Fyn ¹/₈ 1924 (coll. C. S. Larsen) og senere (1948—1953) af flere samlere taget nogle exemplarer i Hannenov på Falster.

Arten angives i literaturen at leve på Astrantia, som ikke er vildtvoxende i Danmark, men i Sverige er den klækket fra larver taget på Sanicula af Benander (1955, Fauna och Flora p. 119).

16. **Pyrausta (Pionea) crocealis** Hb. Et par exemplarer på lys ved Vang. Senere (⁴/₈) tog jeg et par stykker flyvende om Inula i Åsedamsmosen (Gudmanns oprinde-

lige findested for det store fjermøl, *Oidematophorus lithodactylus* Tr., som stadig er talrig i Inula-bevoxningerne dér), og i 1954 fik jeg nogle eksemplarer på lys ved Ølene. Ellers er arten kun kendt fra Lolland, hvor Sønderup i 1941 og 1942 klækkede en del eksemplarer fra larver taget på Borgø i Maribo Sø, og hvor der siden er taget en enkelt imago i Roden Skov ^{14/7} 1945 (Worm-Hansen leg.) samt fra Falster: Hallerup Skov, 1 ex. ^{23/7} 1952 (E. Pyndt leg.).

17. **Salebria faecella** Zell. 4 eksemplarer på lys. Arten er i Danmark kun fundet på Bornholm. Den blev første gang taget ved Dueodde ^{30/7} 1934 (van Deurs leg.), hvor den senere er genfundet, også af andre samlere, og er endvidere fanget i et eksemplar ved Gudhjem (^{15/7} 1949, van Deurs leg.).

18. **Nephopteryx similella** Zck. 3 afføjne eksemplarer på lys. Arten var i Danmark kun kendt fra Lolland-Falster (Hamborgskoven, Mellemskoven, Hannenov), hvor den første gang blev taget af Kaj Pedersen (Mellemskoven, ^{31/7} 1950), og hvor der senere (^{30/6}, ^{2/7}, ^{5/7} 1952, ^{15/8} 1952) er taget ialt 12 ex. (Lundqvist, Pyndt, N. L. Wolff leg.) samt i et eksemplar fra Sydvestsjælland: Bildsø, ^{18/6} 1954 (P. K. Nielsen leg.).

19. **Pyrausta perlucidalis** Hb. Et meget afføjet eksemplar på lys. I 1954 tog jeg, ligeledes på lys, et par eksemplarer ved Ølene.

Denne ret store pyralide er først sent dukket op i Danmark-Sverige-Finland, hvor dens forekomst egentlig ikke var ventet. Her i landet toges det første eksemplar ^{14/7} 1949 ved Gudhjem, det næste ^{29/7} 1951 i Hannenov på Falster (begge W. van Deurs leg.). Derpå blev den taget af flere samlere i Hannenov og af E. Pyndt medio juni 1953 i stort antal i den med Hannenov sammenhængende Oustrup Skov. Genfundet på Bornholm (J. Chr. Jensen leg.) og taget i nogle eksemplarer ^{9/7} 1955 i Roden

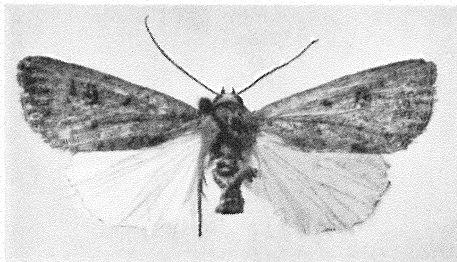


Fig. 2
Caradrina cinerascens
Tgstr. ♂
(× 2)
Vang, Bornholm, 28.7.1955

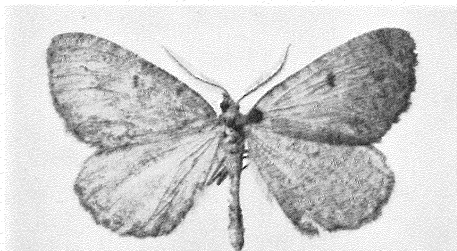


Fig. 3
Semiothisa loricaria Ev. ♂
(× 2)
Vang, Bornholm, 28.7.1955

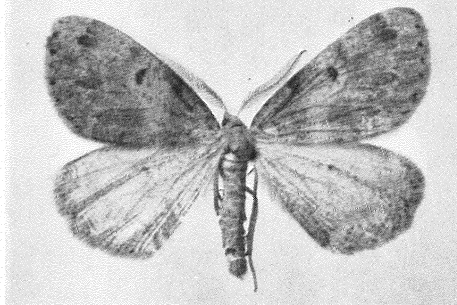


Fig. 4
Semiothisa loricaria Ev. ♂
(× 2)
Umeå, Sverige, 1.8.1952

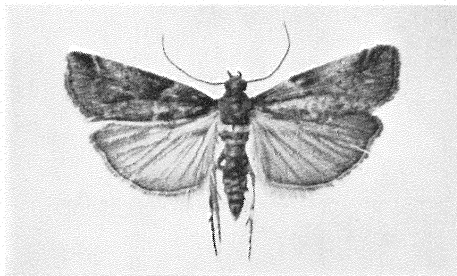
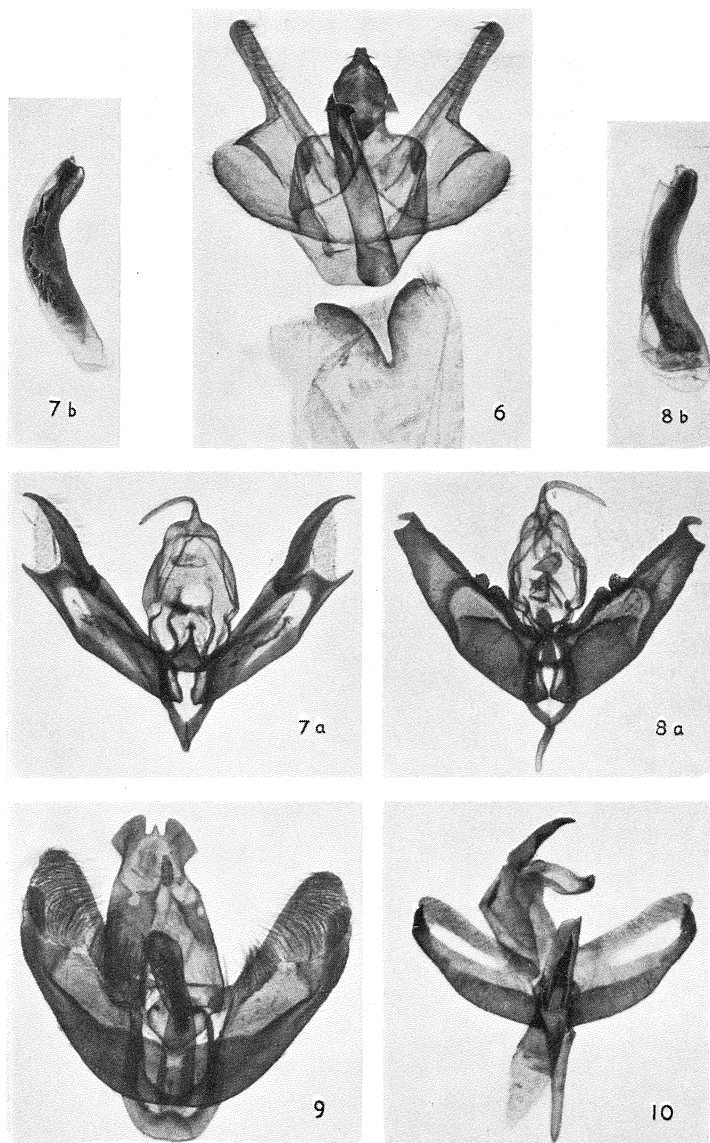


Fig. 5
Eurhodope suavella Zck. ♂
(× 2)
Vang, Bornholm, 28.7.1955

Niels L. Wolff fot.



♂-genitalier. Fig. 6: *Semiothisa loricaria* Ev. ($\times 21$). Fig. 7: *Caradrina cinerascens* Tgstr. ($\times 12$). Fig. 8: *Caradrina clavipalpis* Scop. ($\times 15$). Fig. 9: *Agonopteryx hepatoriella* Zell. ($\times 24$). Fig. 10: *Batia lambdella* Don. ($\times 42$).

Niels L. Wolff præp., H. V. Christensen fot.

Skov på Lolland (N. L. Wolff leg.) og et ex. i Nordsjælland, Vejby $12/7$ 1955 (Preben Holst leg.).

20. **Laspeyresia duplicana** Zett. 2 exemplarer på lys ved Vang $28/7$. Gudmann tog de første stykker af denne art ved Ringedal 1895, og senere er exemplarer fundet af Skarvig (Årsdale og Paradisbakkerne), men arten var ikke genfundet siden 1906. Det i Ent. Medd. 25 (1949) p. 329 publicerede fund af *L. duplicana* fra Tisvilde (E. Kjær leg.) beror på fejlbestemmelse; dette exemplar tilhører *L. coniferana* Ratzeb.

21. **Cacoecia histrionana** Froel. Et par exemplarer på lys. Udbanket om dagen i større tal af granbevoxninger syd for Vang. Senere sås et ex. ved Blemmelyng. I 1954 tog jeg en del exemplarer ved Ølene, hvor arten også er fundet 1955 (J. Lundqvist leg.).

Denne ret store og let kendelige vikler, som først sent har vist sig i Danmark, og som først er konstateret i Sverige i 1955, synes her i landet at have bredt sig stærkt. Blev først fundet 1951, dels Gentofte $25/7$, $1/8$ (W. van Deurs leg.), dels Bøtø $21/7$ (E. Pyndt leg.). 1952 toges den Hamborgskoven, Lolland $5/7$ (E. Pyndt leg.) og Hellerup $12/8$ (Forum Petersen leg.). 1953 atter Gentofte $30/7$ (N. L. Wolff leg.) og 1954—1955 som nævnt i adskillige exemplarer flere steder på Bornholm.

Arten har indirekte betydning for skadedyrsbekæmpelsen i Nordamerika, idet et dér alvorligt skadedyr, *Choristoneura (Tortrix) fumiferana* Clem. har vist sig at kunne angribes af samme parasitter, som *Cacoecia histrionana*, hvorfor dennes parasitter exporteres til Nordamerika fra Europa (1952, Bull. Ent. Res. 43, p. 1—19).

22. **Argyroploce siderana** Tr. Et par exemplarer på lys. I eftermiddagssolskinnet fløj denne smukke stjerneskinne art, der så godt svarer til sit navn, om en Spiræa-busk i en have i Vang.

Det første danske exemplar toges på Falster, Bøtø

$^{11}/_7$ 1940 (E. Kjær leg.). Derpå fundet i stort tal følgende steder: Fanø $^{20}/_6$ — $^3/_7$ 1948 (N. L. Wolff leg.), Asserbo juli 1950 og 1954 (flere samlere) og Dueodde $^{16}/_7$ 1951 (Traugott-Olsen), samt i enkelte eksemplarer Stensbæk, Jylland $^3/_7$ 1950 (Worm-Hansen leg.) og Birkerød juli 1954 (P. K. Nielsen leg.).

Larven lever i endeskuddene og forpupper sig i et skarpt ombøjjet blad på den i mange haver som prydbusk dyrkede Spiræa.

23. *Crambus heringiellus* H.-S. Arten kom til lys i hele perioden $^{21}/_7$ — $^7/_8$, men ikke hver nat, og sjældent i mere end få eksemplarer ad gangen, med undtagelse af $^{28}/_7$, da der kom ikke mindre end 27 eksemplarer til lyset.

Foruden fra Bornholm, hvor arten efterhånden er taget flere steder, har den her i landet kun været kendt fra Nordsjælland (Asserbo, få eksemplarer, Kregme, ét ex.), men i 1955 blev der taget 5 eksemplarer indenfor Slagelse byområde, heraf de 3 netop $^{28}/_7$ (P. K. Nielsen leg.) og et eksemplar på Lolland, Sundby, ligeledes $^{28}/_7$ (E. Pyndt leg.).

24. *Plusia interrogationis* L. 5 eksemplarer sidst i juli og først i august ved Vang (også ved Onsbæk), alle på lys.

Der blev i 1955 taget flere af denne art end normalt, også i den øvrige del af landet. På Bornholm var maximum på én nat 9 eksemplarer ($^{30}/_7$, E. Wilsund leg.).

Selv denne instabile art, som kendes fra alle vore omgivelser, og som sandsynligvis jævnlige får tilskud gennem indflyvning, omend den næppe er så afhængig heraf som *Plusia gamma* L., er blevet nævnt som "relikt" (1949, S. Hoffmeyer: De danske Ugler, p. 316; "en slags reliktforekomst").

25. *Callimorpha dominula* L. Et eksemplar ved Vang på lys $^{28}/_7$. Fundet nævnes her, fordi der kun foreligger yderst sparsomme oplysninger om artens forekomst på Bornholm.

Summary.

The paper records some interesting Danish Lepidoptera taken by the author during a stay (21st july—8th august 1955) on the Danish isle of Bornholm in the Baltic.

Most of the specimens were attracted by light (m. v.). On the night between the 28th—29th july 4 species were added to the Danish list, viz. *Semiothisa loricaria* Ev., *Agonopteryx hepatoriella* Zell., *Caradrina cinerascens* Tgstr., and *Eurhodope suavella* Zck.

1. *Semiothisa loricaria* Ev. is a species of decidedly northern distribution, which previously had not been known to occur more southerly than in the Swedish district of Uppland, approximately 600 kilometres north of Bornholm. Its occurrence on this island was most unexpected.

2. *Agonopteryx hepatoriella* Zell. occurs in the southern part of Germany, in Switzerland, and in Holland, but is missing in Great Britain as well as in northern Germany. North of Denmark it occurs in Norway-Finland-Esthonia, and in some districts of Sweden. The locality nearest to Bornholm is the Swedish isle of Öland, approximately 200 kilometres north of Bornholm.

3. *Caradrina cinerascens* Tgstr. has a boreo-alpine occurrence. Although Bornholm does represent the southernmost point of the northern distribution of the species, its occurrence on that island was expected since its range through the Scandinavian peninsula extend to Scania, less than 50 kilometres apart of Bornholm.

4. *Hemistola chrysoprasaria* Esp. (*Geometra vernaria* Hb.). A male attracted by the light on the 26th july. The only Danish specimen hitherto known was taken on the 14th july 1953 at the east coast of Falster.

12. *Batia lambdella* Don. 17 specimens. Examination of the genitalia has proved that not only these specimens but the old Danish material of "*B. lunaris* Haw." as well, belong to *lambdella*, and consequently *lunaris* has to be omitted from the Danish list. Since Pierce (1935, Genit. Tin. p. 31, pl. 17) mentions that ductus bursæ in *lunaris* female has 6 or 7 teeth, but gives no statement at all as to ductus bursæ in *lambdella* female, it may be added that the Danish specimens proved to have ductus bursæ set with about 13 small well defined teeth.

Dragonflies from West Tien-Mu-Shan, Central China.

By

Syoziro Asahina.

Totsuka, III-123, Shinjuku-ku, Tokyo.

In the Zoological Museum, University of Copenhagen, there is a fine series of Chinese Odonata from West Tien-Mu-Shan, Chekiang Province, collected by Mr. E. Suen-son during his excursion in the year of 1937. These are referable to twenty-seven species, of which one seems to be new to science.

Through the courtesy of Dr. S. L. Tuxen I had the privilege of studying this most interesting material, and a part of it were brought with me to compare with the type specimens preserved in several museums of the United States.

Before going further I should like to express my cordial gratitude to Dr. Tuxen and Mr. Suenson for their kind helps in completing this report. My thanks are also due to Dr. Erich Schmidt, Bonn a. Rh. who has given me valuable suggestions on the genus *Rhipidolestes*. Further, I must acknowledge my indebtedness to the authorities of the British Museum (N. H.), of the Cornell University, and of the California Academy of Sciences.

For a detailed explanation of the locality of Tien-Mu-Shan the reader should refer to Mr. Suenson's statement in the Lingnan Science Journal, 19, pp. 105—106, 1940. Mr. Suenson arrived at the foot of Tien-Mu-Shan on May 14, and collected until June 21 around the monastery there. From June 22 to July 3 he stayed at a temple up the mountain, 1050 m above sea-level. During this period he climbed up the summit which has an elevation of 1500 m.

I. *Calopterygidae*.

1. *Mnais tenuis* Oguma.

15 ♂♂ 14 ♀♀ 7. V.—9. VI. 1937.

Fourteen males have hyaline wings, while only one male has brownish orange ones. Among the females two are hyaline winged, the rest pale brown.

2. *Matrona basilaris* Selys.

1 ♂ 1. VI; 1 ♀ 4. VI; 1 ♂ 19. VI. 1937.

3. *Caliphaea consimilis* MacLachlan (plate p. 227, fig. 1; textfigs. 1, 2).

Caliphaea consimilis MacLachlan, Ann. Mag. Nat. Hist. (6) 13 p. 434, 1894. "Two adult males" [Ta-chen-lu].

Caliphaea consimilis MacLachlan, Ann. Mag. Nat. Hist. (6) 17 p. 371, 1896. "Four females, two from Siao-Lou and two from Moupin".

Caliphaea consimilis Needham, Zool. Sinica 11 (1) p. 211, pl. 16, fig. 4, 1930. "Kwangsi and Western China" [in Epalaginae].

9 ♂♂ 4 ♀♀ 19. VI. 1937. *)

Fraser has erroneously synonymized this species with *C. confusa* Selys from Nepal and Assam (J. Bomb. Nat. Hist. Soc. 33 (3) p. 595, 1929; Fauna Brit. India, Odonata, 2, p. 149, 1934).

The wings of *C. confusa* given by Laidlaw (Rec. Ind. Mus. 13 pl. 2, fig. 1, 1917) and Fraser (1929, 1934) seem excessively narrow. I shall give here a venation photograph of *C. consimilis* (p. 227, fig. 1). Fraser (1934 p. 148) mentioned that in the *Caliphaeinae* "mesothoracic triangle absent", but it is not the case so far at least *C. consimilis* is concerned.

The immature stage of *C. confusa* was described by Dr. Fraser (1943). His notes on the habits of this latter species are cited below.

"It breeds in small brooks meandering through march-

*) Navás described a new species *C. nitens* from "Tien-mou-chan, Chekiang" (Navás, L.: Musée Heude, Nat. Ent. Chin. 2 fasc. 1 p. 2, 1934).

es on steep, heavily wooded hill-sides. . .". He later said "the imago occurs in marshes where it has been seen to oviposit; it is the only species of the Agrioidea, I know of, which breeds in stagnant waters".

II. *Epallagidae*.

4. *Bayadera melanopteryx* Ris (plate p. 227, fig. 2; text-fig. 3).

Bayadera melanopteryx Ris, Suppl. Ent. 1 p. 49, 1912. "2 ♂♂ 3 ♀♀, Tsa-Yiu-San, 3., 15., 16., 25. VII. 1910, leg. Mell, Mus. Königsberg (Typen) und coll. Ris (Cotypen)." [Text-fig. 2, a b ♂ appendages].

Bayadera melanopteryx Fraser, J. Bomb. Nat. Hist. Soc. 33 (1) pl. 1, fig. 1, 1928.

Bayadera melanopteryx Needham, Zool. Sinica 11 (1) p. 216, 1930. "Szechuen and Kwangtung". "Two males from the U. S. Nat. Mus. collected by D. C. Graham in July near Washan, and a pair from Hsi San Lang(?)".

Bayadera melanopteryx Schmidt, Konowia 10 (3) p. 177, 1931. "1 ♂ West-Tien-Mo-Gebirge (Tsche-kiang), 7. VII. 1930 (T.)" [leg. Suenson].

4 ♂♂ 2 ♀♀ 21. VI. 1937*).

This is a remarkable species with the distal half of the wings coloured with dark brown, of which the extent seems considerably variable. Ris' original specimen taken from Tsa-Yiu-San, Kwangtung Province, has a dark area beginning at 2-3 cells distal from the nodus (♂) or at the middle between the wing base and nodus (♀). Needham (1930 p. 216) stated "...a brown band covering their apices and extending basalward beyond the level of the stigma, paler in the female." "Another pair (female from Yachow and a male from Behluhring near Chengtu, collected by D. C. Graham from the U. S. Nat. Mus.) having apparently identical genital characters, has a different distribution of the brown of the wings. A dif-

*) Navás described a new species *B. melania* collected from "Tien-mou-chan, Chekiang" (Musée Heude, Not. Ent. Chin. 2 fasc. 1, p. 3, 1934).

fuse wash of this color covers the base as far out as the end of quadrangle, extends out along the front beyond the nodus and covers the extreme tip beyond the stigma. Is it a different species?"

The same band of our male specimen is shown in the accompanying figure. The female has a quite similar band.

It seems worth noting to call attention in regard to the wings of this species which are considerably broad at their distal half with the broadly rounded wing apices (pl., fig. 2).

The male caudal appendages (text-fig. 3) are somewhat different from that of the figure of Ris or of Fraser (1928). There is a small process in addition to the basal one, which feature somewhat resembles that of *B. bidentata* listed below.

5. **Bayadera bidentata** Needham (text-fig. 4).

Bayadera bidentata Needham, Zool. Sinica 11 (1) p. 218, pl. 16, fig. 7, 1930. "A pair from Kwangsi by the National Research Institute, and a single male from Zakow, Chekiang, collected by Y. T. Chu. C. U. Type No. 959".

1 ♂ 19. VI. 1937.

Only a single specimen missing the head was studied. The caudal appendages are shown here (text-fig. 4), the wings are hyaline, with only the costal and the subcostal spaces tinged with palest yellow, the wings are of usual width.

III. *Megapodagrionidae*.

6. **Mesopodagrion tibetanum** MacLachlan.

1 ♂ 1. VII. 1937; 1 ♀ 3. VII. 1937, 1050 m.

For this species compare my paper on the Odonata from South Shensi.

7. **Rhipidolestes nectans** Needham? (plate p. 227, fig. 3; textfigs. 5—11).

Taolestes nectans Needham, Bull. Peking Nat. Hist. Soc. 2 (4) p. XI, 1928. "A single female specimen from Hangchow, China, collected May 18, 1928, and now in the Cornell University collection."

Taolestes nectans Needham, Zool. Sinica 11 (1) p. 227, pl. 16, fig. 13 [♂ app.], 1930. "A large number of specimens of both sexes collected in Hangchow the 15th of May, and several nymphs. One male in the Bureau of Entomology at Nanking. One from the California Academy of Sciences collected by E. C. van Dyke in Hangchow, May 19. C. U. Type No. 977."

?*Rhipidolestes bidens* Schmidt, Konowia 10 (3) p. 180, 1931. "1 ♂ adult, Hsüeh-Tau-Gebirge, Ninpo (Tsche-kiang), 5. VI. 1930 (T.)."

Taolestes nectans Needham, Peking Nat. Hist. Bull. 16 (2) p. 155 1941/42 (1948).

Taolestes nectans Needham, Bull. Mus. Comp. Zool. Harvard Coll. 94 (3) p. 162, 1944.

41 ♂♂ 13 ♀♀ 20. V., 7., 9., 19. VI., 3. VII. 1937.

Description:

♂ abd. 41—46 +1.5 H.W. 33—39, pt. (subcostal) 2.4—2.8.

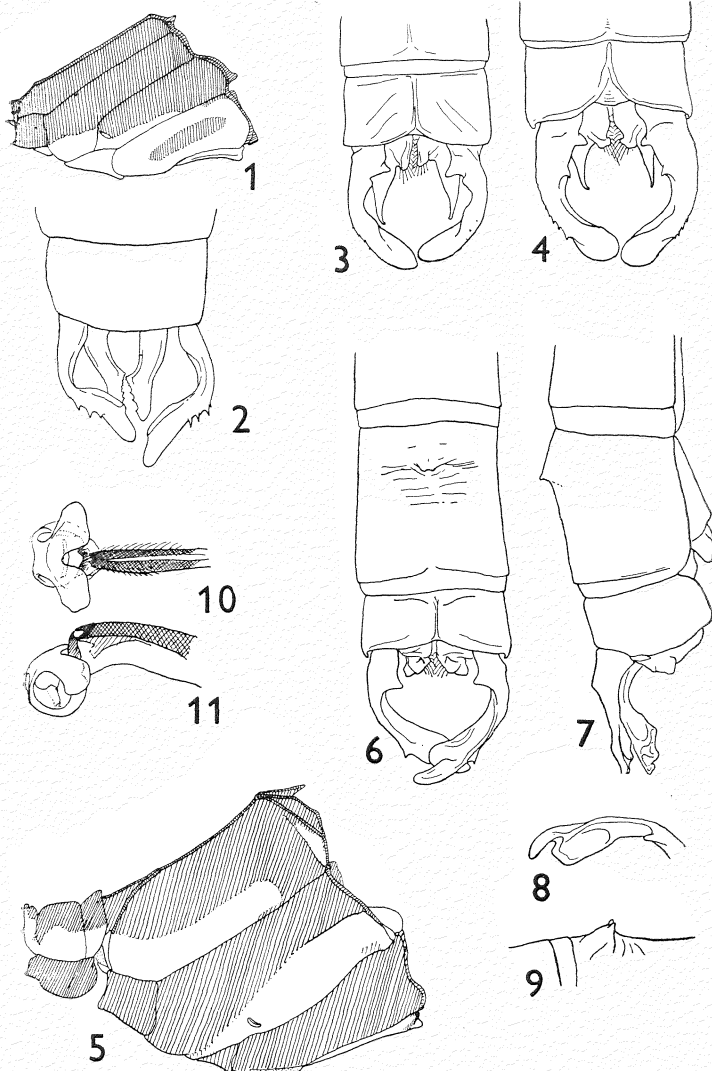
♀ abd. 36—38 H.W. 33—34, pt. 2.3—2.4.

Male: Body chocolate black with yellow stripes; in an aged insect front of head and sides of pterothorax heavily, dorsal side of 8—10 abdominal segments slightly pruinosed.

Head brownish black, labrum with bronze lustre (this cannot be designated as "greenish"); there is a broad yellowish band between the eyes covering postclypeus

Explanation of text-figures

1. *Caliphaea consimilis*, ♂ Pterothorax, lateral view.
2. " " , Caudal appendages, dorsal view.
3. *Bayadera melanopteryx*, ♂ Caudal appendages, dorsal view.
4. *Bayadera bidentata*, ♂ Caudal appendages, dorsal view.
5. *Rhipidolestes nectans*(?), ♂ Pro- and pterothorax, lateral view.
6. " " , Caudal appendages, dorsal view.
7. " " , The same, lateral view.
8. " " , Superior appendage, oblique inner view.
9. " " , Dorsal process of the ninth abdominal tergite, lateral view.
10. " " , Penis, ventral view.
11. " " , The same, lateral view.



and ventral half of the antefrons; antenna entirely dark; postocular lobe moderately protruded backward; posterior side of the head (= occiput) black.

Prothorax flat above, the posterior lobe rounded as a flat arc; a broad yellow lateral stripe covering the lateral margin of the tergite continues with the broad antehumeral stripe of the pterothorax.

Pterothorax short and rather globulous, the lower part of the mesepisternum expanded laterad; the broad antehumeral stripe interrupted at the dorsal $\frac{3}{4}$, leaving a yellow trace at the extreme top of the stripe just below the antealar ridge; the metepisternum almost entirely, the metapostepimeron, and the central portion of the metapoststernum yellow.

Legs brownish, all the trochanters and the extreme base of the femora yellow.

Wings (p. 227, fig. 3) hyaline; the extreme tip palely smoked, faintly in a teneral insect (probably hyaline just after the emergence!), becoming darker in aged ones, but the dark area varies to cover from twenty to fifty or more cells. The petiolation of the wing is situated well distal to Ac, which lies decidedly distal to the middle between the two primary antenodals; the starting point of R_{4+5} is situated well proximal to the middle between the arculus and nodus; there are usually three (often four for a short distance) cell rows posterior to 1A. Pterostigma long and broad, costal side conspicuously shorter than the radial side, pale brownish when teneral, deep chocolate brown in mature insects; the most of the costal cells distal to pterostigma duplicated.

Abdomen cylindrical, only slightly expanded at the second and the eighth and ninth segments. The dorsal process at the base of the ninth segment inconspicuous, slightly notched (text-fig. 9). Superior caudal appendages divided at the apex, with basal internal and distal external spines. The inferior appendages short, provided

with an acute spine directed upwards (text-figs. 6—8).

Penis as shown by the text-figs. 10, 11.

Female: Body characters as that of the male, but never pruinose. Wing apices always hyaline, pterostigma pale yellowish brown or pale brown excepting the bordering vein. Legs also pale brown. The lateral valvules of the ovipositor extend well beyond the apex of the cercus. (The stylus extends far distal to it).

Remarks: Of this East Asiatic genus the following eight*) species have been described:

R. aculeata Ris, 1912, Formosa, Japan (Kyusyu, Siko-ku); Fukien**).

R. aculeata yakushimensis Asahina, 1951, Japan (Yakushima).

R. okinawana Asahina, 1951, Okinawa Island.

R. nectans Needham, 1928, Chekiang (Hangchow) (as *Taolestes*).

R. bidens Schmidt, 1931, Chekiang (Ningpo).

R. truncatidens Schmidt, 1931, Kwangtung (Canton et Tsa-Yiu-San).

R. malaisei Lieftinck, 1948, N.E. Burma.

R. jucundus Lieftinck, 1948, Fukien.

R. flavostigma May, 1933, Kwangtung (Wen-tu-Wei) (as *Lestomima*).

The first two insular species may be eliminated here. Among the other six, *R. malaisei* from Burma is rather widely separated from the others in the body coloration and the habitat, the remaining five are recorded from a limited area of coastal China, viz., Chekiang, Fukien and Kwangtung.

*) Navás described two new species, "*Rhipidolestes apicatus*" from "Tien-mou-chan, Chekiang" (Musée Heude, Not. Ent. Chin. 2 fasc. 1 p. 4, 1934) and "*Taolestes rubripes*" from "Kuling, 9—26. VII. 1935" (ibid. 3 fasc. 4 p. 44, 1936).

**) Recorded by Needham (Peking Nat. Hist. Bull. 5 (4) p. 7, 1931).

R. jucundus is closely related to the present species in the structure of the male caudal appendages, but differs by its smaller size and strongly orange tinted coloration and venational characters. Also *R. truncatidens**) differs by its narrower wings and squarely cut dorsal process of the abdomen. As Dr. Schmidt has suggested (in litt.) *R. flavostigma* should be nearest (or synonymized) to *R. truncatidens*, but it differs so far as the shape of the penile organ is concerned.

R. bidens and *R. nectans* and our present material are all from Chekiang Province, the first coincides with ours in every described characteristics except the non-bifid tip of the superior appendages of the former. "*Taolestes nectans*" was first described by a single female specimen, the male was later made known with figures of the caudal appendages (Needham 1930 p. 227, pl. 16, figs. 13 & 13a).

Though Needham's descriptions and figures are rather inadequate to decide the identity, it seems highly probable that our specimens will belong to *nectans*. Dr. Schmidt is also of the opinion that his *bidens* will be the same as *nectans*.

Dr. Needham noted neither the dark area of the male wing tips, nor the pruinosity of the body, but as his material was collected in an early season, it may not be unreasonable to surmise that his specimens are teneral ones which has not yet become pruinosed on the body and not tinted with brown on the wing apices.

In the collection of the California Academy of Sciences there is one rather teneral female specimen, labeled "Hangchow, China, May 19, 1923, presented by E. C. Van Dyke collector". Doubtless this is the specimen Needham (1930 p. 228) mentioned at the end of his description. This specimen has an abdominal length of 38.5 mm,

*) Through the kindness of Dr. E. Schmidt I could study a male specimen from his collection.

and the hind wing 34 mm, its coloration and body markings are quite similar to our female specimens.

Here I should tentatively make our material belong to Needham's "*nectans*" and give the figures of the important body structures.

IV. *Synlestidae*.

8. *Megalestes suenisoni* n. sp. (text-figs. 12—14).

1 ♀ 1. VI. 1937.

Description: ♀, rather teneral specimen (holotype)*).

Abd. 50, hind wing 42.5, pt. 2,7 (f. w.) 3.0 (h. w.).

Ground colour yellow with ordinary Lestine metallic green patterns. Dorsal side of the head including the labrum metallic green, anteclypeus dull yellow with two blackish spots; lateral side of mandible, basimandibular sclerite, labium and postociput pale yellow.

Prothorax mostly yellow, a lateral dark band covers the lateral part of the tergite and the centre of the pleurite. The posterior lobe raised as an arc of which the centre depressed backward (text-fig. 13). The acrotergite of the pterothorax transversely narrow with the pit of the tergal apophysis 2.

Pterothorax mainly yellow, a broad greenish band covers the posterior half of the mesepisternum and a greater part of the mesepimeron. Thus a broad central yellow stripe runs throughout the prothorax and the mesothorax including the antealar triangles. Metathoracic pleurites yellow except a greenish area of metepisternum above and a dark streak at the top of metepimeron. Venter of thorax, coxae, a greater part of trochanters yellow, other part of the legs pale brown.

Wings narrow, petiolated well proximal to Ac, which is situated well distal to the middle of the two primary antenodals. 1 R_3 originates well proximal to the middle between arculus and subnodus. Postnodals 24—26 in

*) Preserved in the Zoological Museum, Copenhagen.

the fore wings, 10—22 in the hind wings. Pterostigma pale brown.

Abdomen cylindrical, distal three segments considerably dilated; dorsal side pale greenish, extreme bases of 3—7 very narrowly yellow. Last segment and the cercus entirely yellow, the latter is short, nearly half as long as the length of the former.

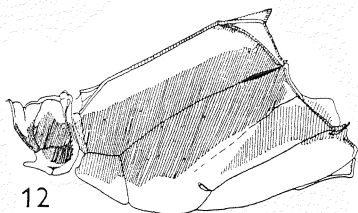
Remarks: I feel a little hesitation to describe a new species based upon a single teneral female specimen. From the Chinese area five species*) of *Megalestes* has been described, some of them are only briefly described upon rather insufficient material.

The present new species is most closely allied to *M. heros* Needham which was described on two rather incomplete specimens collected in Fukien and Szechuen (Needham, Zool. Sinica 11 (1) p. 229, 1930). Later, for this species, Dr. Chao supplemented the description by mature males and gave the description of allotype female.

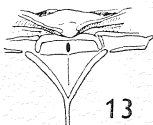
*) Navás described *M. ricci* from "Kuling (Kiangsi) ♀ 11. IX. 1934, ♂ 14. IX. 34" (Musée Heude, Not. Ins. Chin. 2 fasc. 5, p. 90, 1935).

Explanation of text-figures

12. *Megalestes suenisoni*, ♀ Thorax, lateral view.
13. " " , Posterior lobe of prothorax and mesothoracic acrotergite, dorsal view.
14. " " , Abdominal end, lateral view.
15. *Megalestes maai*, ♀ (Formosa) Posterior lobe of prothorax and mesothoracic acrotergite, dorsal view.
16. *Sinolestes edita*, ♀ Head, dorsal view.
17. " " , Thorax, lateral view.
18. " " , Abdomen, lateral view.
19. " " , Abdominal end, lateral view.
20. *Coeliccia cyanomelas*, ♂ Penis, lateral view.
21. *Ceylonolestes gracilis extraneus*, ♀ Thorax and basal three abdominal segments, oblique lateral view.
22. *Cercion v-nigrum*, ♀ Anterior part of the body, oblique lateral view.
23. " " , Posterior lobe of prothorax, dorsal view.
24. " " , Abdominal end, lateral view.



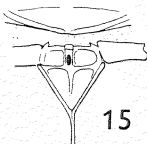
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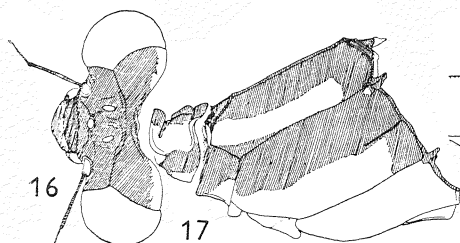
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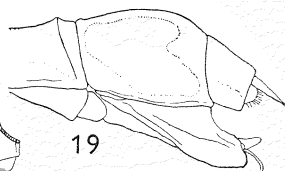


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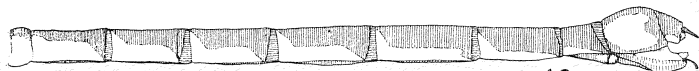


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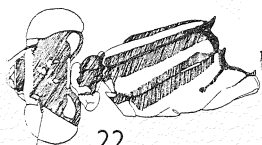
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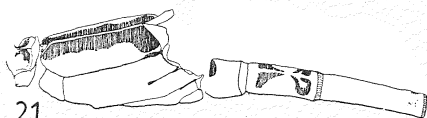
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20

His female specimen stated as teneral differs from ours: 1. "occiput with an obscure yellow band extending from eye to eye"; 2. "abdomen reddish, segments VIII-X with metallic lustre". I regret he did not give any description of the prothoracic tergite and the acrotergite of the mesothorax. Dr. Chao's figure of the abdominal end appears to be a simple sketch, but the short cercus resembles that of *suensoni*.

M. chengi Chao (1947) described from Fukien differs from *suensoni* by the smaller size ("hind wing 32"), the longer ovipositor and the fewer postnodal cross veins.

Another two Chinese species *M. micans* Needham and *M. distans* Needham have been described, the former on a male insect from Szechuen, the latter on several males and females from Szechuen and Kwangsi. Both are smaller in size (hind wing 35, 36—38 mm, respectively), and there are some differences in colour patterns, though these are described on mature males. (The description of the female *distans* is quite inadequate.)

M. suensoni is also clearly differentiated from Formosan *M. maai* Chen (Biol. Bull. Fukien Christ. Univ. 6, p. 27, 1947) by the structure of the prothorax and the cercus. The latter species was described on the male insect only, so I give here the description of the allotype female.

[*Megalestes maai* Chen.

Allotype female: 1 ♀ (ad.) Abd. 49, hind wing 36.5, pt. 2 (f. w.) 2.4 (h. w.).

Ground colour of the body yellow with bronze green markings.

Head metallic dark green, only the anterior border of labrum, lateral side of mandible excepting an anterior spot, perimandibular sclerite, labium, base of maxilla and postocciput yellow.

Prothorax bronze green, the anterior lobe, the median part of posterior lobe and a greater part of the pleurites

citron yellow. The posterior lobe is more or less raised, its ridge is interrupted at the centre. Acrotergite of the mesothorax transverse, three times as broad as long (four times in *suensoni*) (text-fig. 15).

Pterothorax yellow covered with bronze to the level of the first lateral suture. The second lateral suture is covered by a broad black stripe, broadened above and confluent with the bronze of the front.

Legs pale brown, coxae, trochanters and the extreme base of the femora yellowish.

Wings hyaline, venation and pterostigma dark brown, postnodals 19—23 in fore wings, 16—18 in the hind wings.

Abdomen bronze above, with terminal black ring on 1—7, which is becoming broader on 3—7; 8 very short, 9 swollen, almost bronze brown, 10 cylindrical and entirely yellow, half as long as 9. Cercus brownish, slender, longer than the half of 10. Ovipositor blackish, not reaching the end of abdomen.

The type specimen is deposited in my collection in Tokyo.]

9. *Sinolestes edita* Needham (plate p. 227, fig. 4; text-figs. 17—19).

Sinolestes edita Needham, Zool. Sinica 11 (1) p. 234, 1930.

♀ "Tien Tai, Chekiang".

Sinolestes ornata Needham, Zool. Sinica 11 (1) p. 244, 1930.

♂ "Pinglan, Shan-fang, Lo-chen-hsien, Aug. 26", "Kwangsi".

Sinolestes ornata May, Senckenbergiana 15 (3/4) p. 259, 1933.

"2 ♂ 1 ♀ Sui-Yün-San (Kanton); 1 ♂ Wen-Tung-Wei (Kanton); 1 ♂ Yan-San-Ta-Kan (Kanton)."

Sinolestes edita Chao. Biol. Bull. Fukien Christ. Univ. 6 p. 21,

1947. (Nymph) "Ta-Chu-Lan, Shauwo Hsien (Fukien)".

3 ♀♀ 16. V. 1937.

This is a bulky bodied and broad winged remarkable insect allied to the South African *Chlorolestes*, but much larger in size. Three species, *edita*, *truncata* and *ornata* were described by Needham, Chao synonymized the last to the first.

There is a possibility to synonymize even the second species, if considered from distribution and the only stated difference in the width of the brownish wing band. Such a band is very variable in the African akin, *Chlorolestes* spp.

A mature female insect has the abdomen 47, the hind wing 39, the pterostigma (costal) 3.5 mm. The posterior lobe of the prothoracic tergite is broad and flat, somewhat visor-like. The cercus black and spine-like.

V. *Lestidae*.

10. ***Ceylonolestes gracilis extraneus*** Needham (text-fig. 21).

Lestes extranea Needham, Zool. Sinica 11 (1) p. 233, 1930.
"Kiangsu(?)" [1 ♂].

Lestes gracilis extraneus Schmidt, Konowia 10 (3) p. 178, 1931. "1 ♀ Tien-Tun-Gebirge, Ninpo (Tsche-kiang), 30. V. 30. (T.)."

1 ♀ 24. V. 1937.

In this female specimen the dark markings of the thorax is conspicuously reduced, the middorsal stripe has no median lateral widening and there is only a single dark spot on the mesepimeron (text-fig. 21).

I have a male specimen taken by Mr. K. Shirahata in Hupeh Province, which has the median lateral widening and one more dark spot along the humeral suture. In this latter specimen, however, the width of the mid-dorsal dark stripe is considerably narrower than that of the Japanese race, *C. gracilis peregrinus* Ris, therefore I hope to retain *extraneus* for continental Chinese race after Schmidt.

VI. *Platycnemididae*.

11. ***Coelliccia cyanomelas*** Ris (text-fig. 20).

17 ♂♂ 7 ♀♀ 1., 4., 9., 20. VI. 1937.

In the body pattern, the structure of the caudal appendages and the penile organ, these agree quite well

with Formosan specimens. I did not attempt to compare them with *C. didyma* Selys, to which *cyanomelas* appears to be greatly allied.

VII. *Agrionidae*.

12. ***Ceriagrion fallax*** Ris.

6 ♂♂ 20. VI. 1937.

13. ***Cercion v-nigrum*** Needham (text-figs. 22—24).

Coenagrion v-nigrum Needham, Zool. Sinica 11 (1) p. 269, 1930. "1 ♂, Chungking, Szechuen".

Coenagrion barbatum Needham, Zool. Sinica 11 (1) p. 270. "2 ♂ 1 ♀ Chengtu, 1 ♂ Chungking, Szechuen; ♂♂♀♀ at the foot of Washan, Hopei". *Syn. nov.*

I have a long series of specimens of this species taken in Manchuria, which confirmed that *v-nigrum* and *barbatum* are conspecific. The former is a very pale form of the latter.

Here I shall give the figures of the body (text-figs. 22, 24) and the posterior prothoracic lobe (text-fig. 23).

14. ***Mortonagrion selenion*** Ris.

10 ♂♂ 18 ♀♀ 19. VI. 1937.

VIII. *Gomphidae*.

15. ***Sinogomphus peleus*** Lieftinck.

Gomphus peleus Lieftinck, Temminckia 4 p. 285, 391, 1939.

"2 ♂ (ad.) E. China, Fukien, near Kwa Tun, 2300 m alt., 31. V. & 1. VI. 1938 Klapperich leg."

Sinogomphus peleus Chao, Acta Ent. Sinica 4 (1) p. 48, 1954.

"♀ Allotype Ta-Chu-Lan, Fukien, 10. VI. 1942 leg. Maa; ♂ Ta-Chu-Lan, 3. VIII. 1940."

1 ♂ 20. VI; 9 ♂♂ 21. VI; 4 ♂♂ 1 ♀ 3. VIII. 1937.

Agree exactly with the description by both authors.

16. ***Stylogomphus tantulus*** Chao (text-figs. 25—28).

Stylogomphus tantulus Chao, Acta Ent. Sinica 4 (1) p. 62, 1954. "♀ (holotype) Shaowu, Fukien, 2. V. 1943, Chao leg.

in coll. Acad. Sin.; ♀ (paratype) Shaowu, Fukien, 7590 foot, 13. VII. 1938, Klapperich leg. in coll. Königl. Mus. Bonn."

1 ♂ 3. VII. 1937, 400 m.

Description of the allotype male.

Mature ♂ abd. 30+1.4 mm, hind wing 23, pt. 2.5 (f. w.), 2.7 (h. w.).

Head black, labium except the anterior border yellow; lateral side of the mandible and perimandibular sclerite pale yellow; labrum yellow with the narrow anterior margin and a broad triangular basal area black; anteclypeus dull yellow; postclypeus shining black with lateral yellow spot; antefrons black, with an ordinary anterodorsal yellow band, postfrons and antennae black, there is a short transverse ridge posterior to the lateral ocelli; the dorsal part of the occiput small, fringed with long black hairs, posterior side of the occiput entirely black, there is no peculiar structure on the postocciput, but its dorsal part is gently produced to make a short tongue.

Prothorax almost black; the apex of cervical sclerite 2, the anterior border of the anterior lobe finely so, and the lower part of the pleural sclerites yellow.

Front of the pterothorax black, the yellow collar stripe is very slightly interrupted by the dorsal carina; the oblique episternal yellow stripes short, divergent downwards; there is no pale antehumeral stripe. Sides of the pterothorax yellow, both the first and the second lateral stripes complete, running parallel. Ventral side of the pterothorax almost yellowish.

Legs black, coxae except their anterior side yellow. Metafemur short, its end reaching the distal border of the second abdominal segment.

Wings hyaline, basal half palely enfumed with yellow. Veins and pterostigma brownish black, antenodals 10—11, postnodals 7—9.

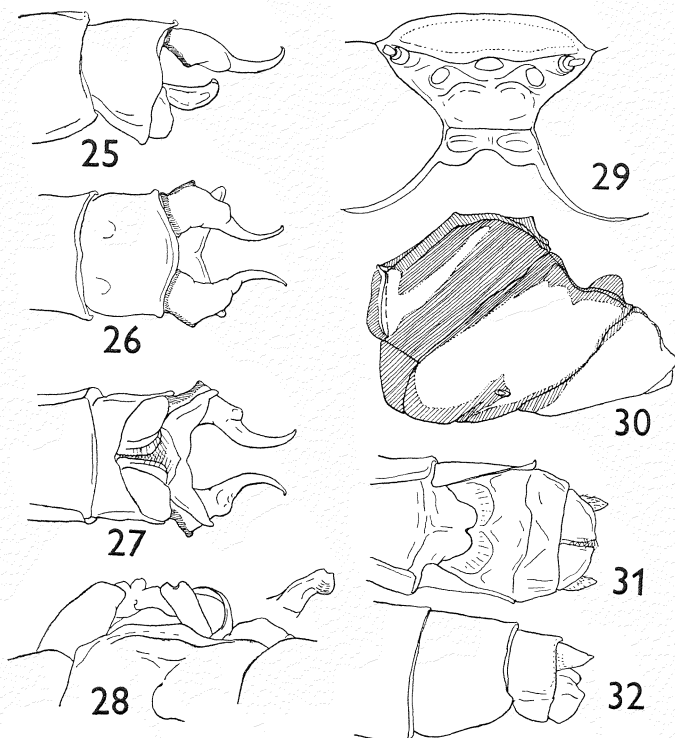
Abdomen mat black, with the lateral spots on 1 and 2, dorsal transverse line on 1, middorsal longitudinal stripe on 2, narrow basal ring on 3—7 yellow.

Accessory genitalia on 2—3 segment as the accompanying figure (text-fig. 28).

Superior appendages cream white, only the extreme base, covering the basal lateral callus, dark.

Inferior appendage black, broadly divergent.

Remarks: *Stylogomphus tantulus* was described on female insects, but it is highly probable that our specimen represents its male, which is easily separated from



25. *Stylogomphus tantulus*, ♂ Caudal appendages, lateral view.
 26. " " , The same, dorsal view.
 27. " " , The same, ventral view.
 28. " " , Accessory genitalia, lateral view.
 29. *Davidius fruhstorferi serenus*, ♀ Head, dorsal view.
 30. " " " , Pterothorax, oblique lateral view.
 31. " " " , Abdominal end, ventral view.
 32. " " " , The same, lateral view.

S. inglisi Fraser (Darjeeling district), *ryukyuanus* Asahina (Ryukyu) and *chunliuae* Chao (Fukien) by the broadly divided inferior appendage; from *S. suzukii* by the thoracic patterns and the presence of the median tubercle of the superior appendage.

17. **Davidius fruhstorferi serenus** Needham *) (text-figs. 29—32).

Davidius serenus Needham, Peking Nat. Hist. Bull. 16 (2) 154, 1941 (1948). "Single specimen [♀] collected at Kuling, China in July 1933 by Dr. Ting-Wei Lew".

Davidius serenus Needham, Bull. Mus. Comp. Zool. Harvard Coll. 94 (3) p. 161, 1944. "... a single specimen collected at Kuling, China in July 1933 by Dr. Ting-Wei Lew".

1 ♀ 19. V.; 1 ♀ 2. VII.; 1 ♀ 3. VII. 1937, 1050 m.

In the general body-markings these are allied to Tonkinese *fruhstorferi*, a comparison with three females in the British Museum (N. H.) confirmed this. The wings are, however, not tinted with pale brown as the Tonkinese ones.

Needham's *serenus* was described on a female insect, he said "the subgenital plate . . . about four fifth as long as the venter of the 9th segment." Two of our specimens agree with it, but another one has a very short valvula vulvae (subgenital plate) as shown in fig. 31.

As the other details of our specimens closely ally each other I shall tentatively leave all the material in a single subspecies *serenus*. For the same structure of Tonkinese *fruhstorferi* see my paper on the Odonata from Nepal (Fauna and Flora of Nepal Himalaya, vol. I, p. 297, 1955).

IX. *Cordulegasteridae*.

18. **Chlorogomphus suzukii** Oguma (text-figs. 33—41).

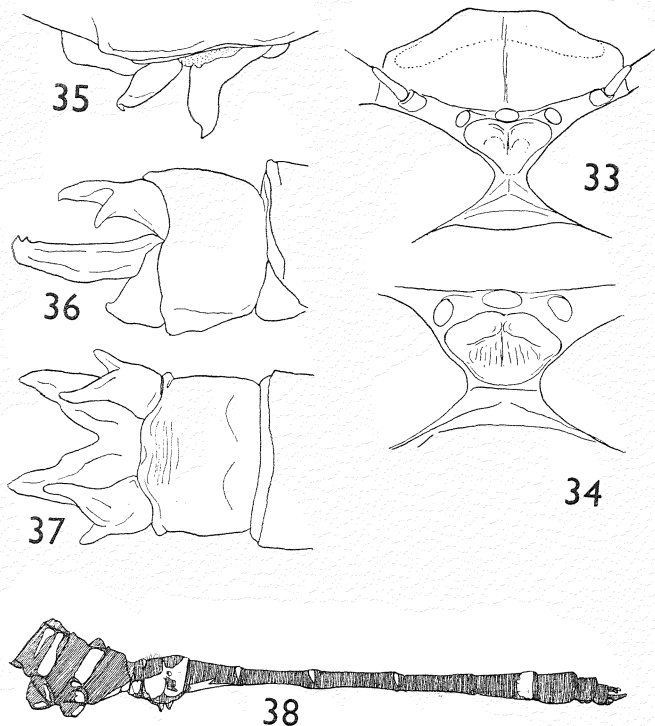
Orogomphus suzukii Oguma, Ins. Mats. 1 (2) p. 88, 1926. ♂ "Honshu (Kioto Suzuki)".

*) This is somewhat allied to "*Gomphus junior* Navás" ♂♀ from Kuling, Kiangsi (Mus. Heude, Not. Ent. Chin. 3 (4) 38, 1936).

Chlorogomphus suzukii Fraser, Mem. Ind. Mus. 9 p. 254, 1932
[citing Oguma, 1926].

Chlorogomphus suzukii Chen, Quart. J. Taiwan Mus. 3 (3)
p. 143, 1950. ♂♀ "Heng-Chun, Kauhsiung Hsien, 1 ♂; 1 ♂;
Pu-Li, Taichung Hsien 1 ♂ 1 ♀ (Allotype)." (Formosa).
1 ♂ 3. VII. 1937. 400 m.

Ch. suzukii was described on a single male specimen
labeled "Kyoto, Suzuki", but I feel much doubt of the
habitat. Chen recorded three males and one female from



33. *Chlorogomphus suzukii*, ♂ Head, dorsal view.
34. " " , ♀ (Formosa), Head, dorsal view.
35. " " , ♂ Accessory genitalia, lateral view.
36. " " , Caudal appendages, lateral view.
37. " " , The same, dorsal view.
38. " " , Body markings of thorax and abdomen, lateral view.

Formosa, I have studied one female from Formosa, preserved formerly in Suzuki's collection and now in the Takarazuka Insect Museum.

This is the first record of this species from the continental China. The present specimen agrees well with the male from Formosa except that there is no small yellow spot above in the black of the mesepimeron and the metepimeron.

Here will be given the figures of the caudal appendages of the type male specimen preserved in the Entomological Museum, Hokkaido University, together with the same of the type specimen of *Ch. nasutus* Needham (Kwangsi)* (text-figs. 42—45) to which *C. suzukii* is closely allied. Another interesting Chinese species, *C. tunti* Needham (Szechuen)* seems also allied to *suzukii*, its post-frontal region will also be illustrated here (text-fig. 46).

In the structure of the male antefrons *suzukii* will readily be differentiated from *nasutus* (see text-figs. 33 and 44).

X. *Aeschnidae*.

19. *Periaeschna magdalena* Martin (text-figs. 47, 48).

Periaeschna magdalena Martin, Cat. Coll. Selys, Aeschnines, fasc. XX, p. 157, 1909. "♀ Coll. R. Martin, Tonkin".

Periaeschna magdalena Laidlaw, Rec. Ind. Mus. 22, p. 81, 1921. "1 ♂ 1 ♀ Tura, Garo Hills, Assam."

Periaeschna magdalena Fraser, Bom. Nat. Soc. 28 p. 110, 613, 1922.

Periaeschna magdalena Laidlaw, Proc. U. S. Nat. Mus. 62 p. 11, 1923.

Periaeschna magdalena Needham, Rec. Ind. Mus. 34 p. 213, 1932.

Cephalaeschna magdalena Needham, Zool. Sinica 11 (1) p. 80, 1930. "One male . . . collected in Lo-Chen-hsien, June 4, [Kwangsi?]"

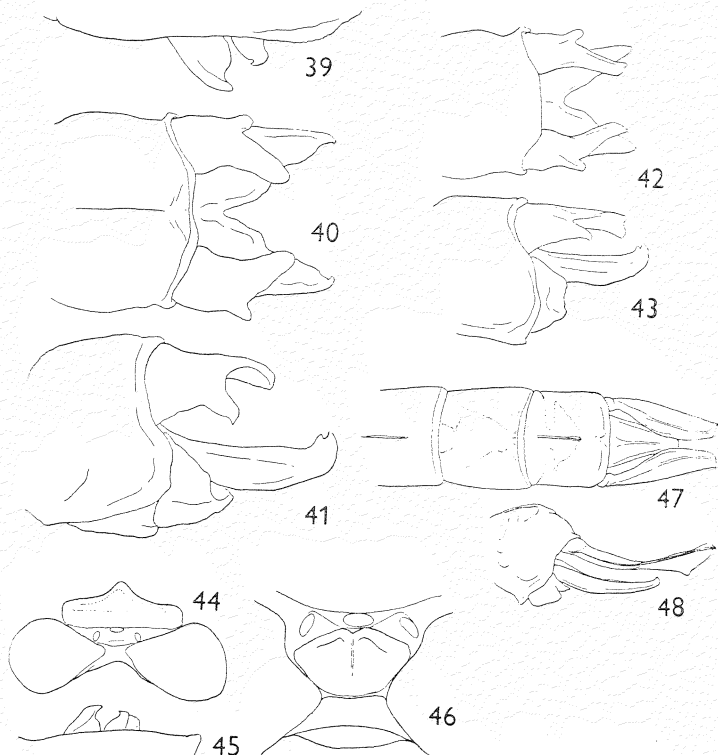
Periaeschna magdalena Fraser, Fauna Brit. India, Odonata 3, p. 82, 1936. "Bengal, Assam and Tong-king".

Gynacanthaeschna sikkima(?) Asahina (nec Karsch), Kontyu 14 (1) p. 24, 1940. "1 ♂ 1 ♀ Sozan, Formosa, 7. VIII. 1936".

*) Type specimen preserved in the Cornell University.

1 ♂ 17. VI. 1937.

This is a brownish species in the *Cephalaeschna* group, and may be characterized by the following points: 1. Body



39. *Chlorogomphus suzukii*, ♂ (Type specimen from Formosa) Accessory genitalia, lateral view.
 40. " " , ♂ (Type specimen from Formosa) Caudal appendages, dorsal view.
 41. " " , The same, lateral view.
 42. *Chlorogomphus nasutus*, ♂ (Type specimen from China) Caudal appendages, dorsal view.
 43. " " , The same, lateral view.
 44. " " , Head, dorsal view.
 45. " " , Accessory genitalia, lateral view.
 46. *Chlorogomphus tunti*, ♀ Head, dorsal view.
 47. *Periaeschna magdalena*, ♂ Abdominal end, dorsal view.
 48. " " , Caudal appendages, lateral view.

rather large in this group (h. w. 45 mm), 2. Pterostigma medium-sized covering about three and a half cells, 3. Basal space in the fore wing crossed by 6-7, and in the hind wing by 5-6 veinlets, 4. Triangle divided into 5-6 cells, 5. Anal triangle with three-cells, 6. Eyes broadly contiguous, 7. Antefrons, seen from the front, narrow, the top considerably pointed, without distinct black marking, 8. Superior appendage broad and pointed at the end; seen from the side, with a distinct apical ventral corner (text-fig. 47), 9. Female tenth abdominal sternite protruded backwards ending in two spines, ovipositor large. 10. Female cercus short and inconspicuous, nearly as long as the tenth segment, 11. Body dark brown striped with yellow, much yellowish when teneral, becoming darker with the age. The extreme base of the wings tinted with pale brown.

Now the range of distribution extends to: Tonkin, Assam, Bengal, Kwangsi(?), Formosa, Chekiang.

XI. *Libellulidae*.

20. *Libellula melli* Schmidt.

Libellula depressa Needham, Zool. Sinica 11 (1) p. 124, 1930.

"1 ♀ from 5 kilometers north-west of Chengtu, July 5, 1924, collected by D. C. Graham and belonging to the U. S. Nat. Museum, and 1 ♀ from Kuanhsien", "Szechuan".

Libellula melli Schmidt, Opusc. Ent. 13 p. 120, 1948. "1 ♂ Tsha-jin-san, 6. V. 1911; 1 ♂ China-Canton, Mell leg."

3 ♂♂ 20. VI. 1937.

This is an interesting species allied to the European "broadbodied *Libellula*" (*Libellula depressa*). As Schmidt has supposed Needham's "*depressa*" from Szechuen most probably belongs to the same species.

21. *Orthetrum testaceum testaceum* Burmeister.

1 ♀ 21. V. 1937.

In his monograph Needham recorded a male specimen of this species from Fukien, but he later changed the

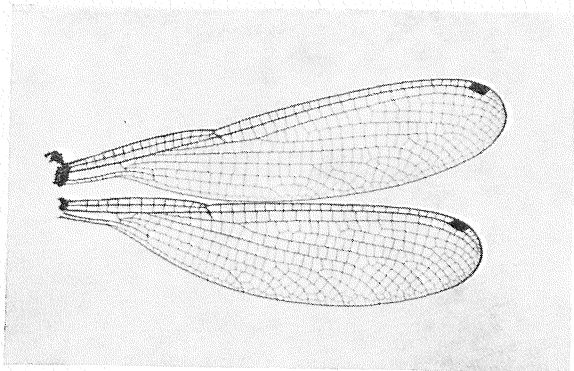


Fig. 1. *Caliphaea consimilis* ♂.

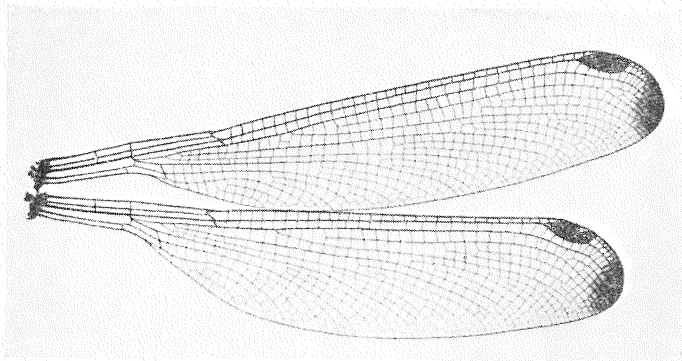


Fig. 3. *Rhipidolestes nectans* (♀) ♂.

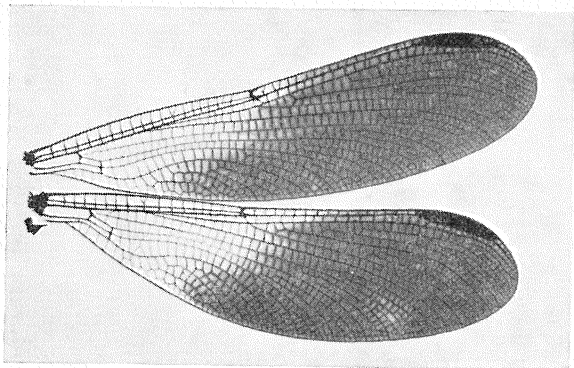


Fig. 2. *Bayadera melanopteryx* ♂.

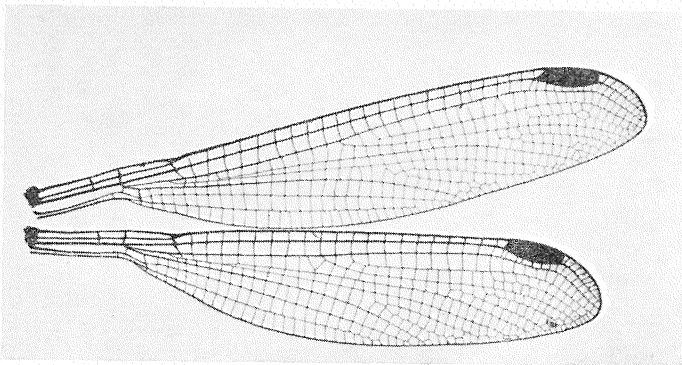


Fig. 4. *Sinolestes edita* ♀.

name to be *O. chrysis* Selys (Needham, Peking Nat. Hist. Bull. 6 (3) p. 1, 1932).

There is a "Navasian" record of "*O. testaceum*" from Yao-shan (Kwangsi) in Mus. Heude, Not. Ent. Chin. 3 fasc. 4 p. 42, 1936.

22. ***Orthetrum triangulare melania*** Selys.

5 ♂♂ 1 ♀ 10. VI.; 8 ♂♂ 3 ♀♀ 21. VI., 3. VII. 1937.

23. ***Orthetrum japonicum internum*** MacLachlan.

2 ♀♀.

24. ***Lyriothemis pachygastra*** Selys.

2 ♂♂ 7. VI. 1937.

25. ***Sympetrum infuscatum*** Selys.

1 ♂ 6. VI., 1 ♂ 9. VI., 2 ♀♀ 20. VI., 4 ♂♂ 2 ♀♀ 1., 19., 20. VI., 3. VII. 1937.

26. ***Sympetrum eroticum ardens*** MacLachlan.

6 ♂♂ 12 ♀♀ 17—21. VI. 1937.

27. ***Sympetrum risi*** Bartenef.

1 ♂ 19. VI. 1937.

This will be the first record of the species from Central China.

A Description of the mature larva of *Ptinus californicus* Pic.

and

A discussion about the justification of considering the Ptinidae as a valid family of beetles

by

Adam G. Böving

The present description of the mature larva of *Ptinus californicus* Pic. is based on a comparatively large series of material of this species in the collection of insects in the U. S. National Museum in Washington, D. C. The material is labeled:

"*Ptinus californicus* Pic.; from nests of *Osmia lignaria*; two miles west of Woody, Kern Co., California. 18-II-1944; E. G. Linsley and J. W. MacSwain coll." Many larvae together with numerous imagines.

The size of the larva is moderately large (c. 10 mm.). The *head capsule* (figs. 1 and 2) is hypognath and protracted, subcircular in outline, posteriorly slightly oval and widest near the middle. There is no frontal cleavage-lines, but a long epicranial sulcus, extending forward about to the middle of the cranium. The pigmented field behind the likewise pigmented *epistoma* (Est) is about twice as long sagittally as epistoma. The color of the pigment is brown-ochre. Epistoma is provided on each side anteriorly with two series of marginal, moderately long setae; the series near the sagittal line consists of five setae, the exterior series of about ten setae. Some setae are placed more rearward. The remainder of the cranial surface is covered with thin, blackish, moderately long and short setae. In the pigmented field the setal cups appear light colored.

The *antenna* (fig. 3) is inserted in a small, well sclerotized, ring-shaped socket located in the pigmented peri-

stoma exterior to the base of the rather low *catapophysis* (Cat). A triangular, thin casing projects from the peristoma on the ventral side of the socket. The antenna has no articles and the tactile appendix, which is about twice as long as wide, and the minute sensory setulae are borne by the dome-shaped membranous antennal base. The *anteclypeus* (Acl) (= clypeus auct.) (fig. 1) is membranous, colorless and lacks any plates or a sclerotized band at base near the *anteclypeal sulcus* (As). The *labrum* (fig. 4) is movably connected with the epistoma by *anteclypeus* (Acl). It is a transverse shield about three times as broad as long. The anterior margin is curved, medianly almost straight; it is generally yellowish and thinly sclerotized but with a pair of dark anterior marks on the other side of the shield. From each of these marks an almost colorless arm continues through the lumen of labrum to the beginning of the labral rod which forms the inner branch of the Y-shaped *torma* (Tor). The surface of labrum is densely set anteriorly with moderately long setae and is provided on each side, posteriorly at the margin, with a sensilla which is located in front of the space between the two branches of torma; a single, similar sensilla is found sagittally, and thus a transverse series of altogether three sensillae is formed.

The *epipharynx* (fig. 6) carries a group of about twelve short, slightly curved, stiff and pointed *coryphal setae* (Co) medianly in front of the *chaetoparial setae* (C); the number of the chaetoparial setae on each side is two or three; they form on each side an oblique series, and from the ends of the straight middle of the epipharyngeal front margin the two series which are located in the anterior half of epipharynx converge to the rear. A pair of minute setae is present posteriorly, in front of the space between the anterior ends of the tormal inner branches, and a group of altogether about fifteen similar, but mostly somewhat longer, setae are distributed without order in the

crepidal area (Cri) between the stems of the tormae. The *hypopharyngeal area* (Hphy) (fig. 11) lies behind the dorsal side of prementum and is located above the *mesomentum* (Msmt, fig. 16) which it covers. It reaches back to the beginning of *pharynx* (Phy), and on each of its lateral sides a *suspensorial bar* (= futura) (Su) is imbedded, which extends from the anterior part of the hypopharyngeal base obliquely upward to the entrance of pharynx. It is shaped somewhat like a golf club with the larger portion anteriorly, and the retractor muscle of the mouthcorner (Rtr) is attached to the end of the stick. The adoral surface of hypopharynx has on each side a large group of curved, fairly long setae (PgnS) and numerous sense-cones. Medianly between the fronts of the groups is a pair of moderately long, straight and stiff setae, and behind them is a pair of sensory pits.

The *mandible* (figs. 8 and 10) is roman-sepia colored, and equally long, broad and deep; the adoral surface (fig. 10) is concave all the way to the basal part which is convex; it lacks oblong grooves and keels; the aboral surface (fig. 8) is convex and bears a proximal group of ten to fifteen long, curved setae, a distal group of about six somewhat shorter setae and, near the middle of the inner mandibular margin, a circular pit without any sensory ovate setula. The distal part of the mandible projects into a single apical tooth and the inner margin is subapically built as a long, low, thin and rather straight wall extending down to a short tooth-shaped projection. There is no marginal brush of setae, and no arch-shaped thickening around such a brush. The proximal part of the mandible below the projection is simple, but more robust than the compressed distal part.

The *maxilla* (figs. 11, 12 and 13) is well developed; *cardo* (Cd) is a yellowish-brown, subtrapeziform shield, about twice as long as broad, and carries three moderately long setae; *stipes* (St) is also yellowish-brown, about

as broad as cardo but somewhat longer and carries many long setae. *Lacinia* (La) is vestigial, terminally armed with one strong spine and furnished with some setae. *Galea* (Ga) is well developed, is about three times as long as wide, is anteriorly rounded and extends as far forward as the base of the apical article of the maxillary palpus; the marginal setae are strong, and, adorally and aborally, the surface carries many setae, weaker adorally than aborally. The *maxillary palpus* (Plp) consists of three articles, which are approximately of the same lengths, but decreasing in width toward the apex in the proportion of 3:2:1. The apical article has no setae but one sensorial pore ventrally and externally, plus a setalike rod imbedded in a niche in the wall dorsally and externally. The subapical article has two setae and one sensory pore; and the proximal article carries altogether fourteen moderately long setae. The *maxillary articulating area* (Mxart, fig. 13) is fleshy, light colored and naked.

The *labium* (fig. 16) consists of *submentum*, *mesomentum* (Msmt) (= mentum auct.) and *prementum*. Submentum and mesomentum are separated by the transverse *labial sulcus* (Lbs). Both subdivisions are fleshy and large with curved sides; submentum somewhat broader than mesomentum; both carry a lateral group of about eight long setae and a few similar setae between the groups. *Premmentum* is transverse, has a ventral (Prmt-v, fig. 16) and dorsal (Prmt-d, fig. 11) surface, is about half as long as wide and a little less than half the width of mesomentum. It is ventrally limited posteriorly by a narrow, yellowish-brown, band-shaped, arched sclerotization, and bears a pair of medianly meeting lateral groups of densely set, some rather long setae; about ten setae present in each group. The dorsal premental surface carries medianly and anteriorly one pair of asymmetrically placed, moderately long, stiff setae, and on each side a group of about six setae. The *labial palpus* has two articles;

the apical article is similar to the apical article of the maxillary palpus, but is somewhat shorter. It is fully sclerotized, yellowish-brown, has a single sensilla, terminal sensory setulae, but no rod imbedded in a niche. The basal article is low, membranous and colorless. *Ligula* is absent. There are no gular area or gular sulcus.

The *tentorial bridge* (Tntb) (fig. 7) carries a pair of membranous, free, leaflike, short *anterior tentorial arms* (aTntAr).

The trunk of the body (fig. 2) is curved, subcircular in cross section, gradually increasing in size posteriorly, and the end of the body is rounded. The trunk consists of three thoracic and ten abdominal segments, which are soft, membranous and whitish. There are no urogomphi. The prothoracic and the last three abdominal segments are dorsally simple and entire, but the rest of the segments have each two distinct dorsal folds, named the prodorsal and postdorsal tergal areas. They are separated from each other by a laterally oblique transverse prodorsal sulcus. All the areas of the trunk have an abundance of densely set, rather short and very short, fine, soft setae, slightly longer and stronger on the ninth and tenth abdominal segments. Asperities are not found on any of the segments.

The *tenth abdominal segment* (10 abd) is small with a large, elongate, oval, bilobed anal cushion, named *nates* (Nat). This structure is located in the ventral portion of the segment, immediately in front of *anus* (An). It may possibly be interpreted as a special development of the lower anal lip. The arms of the cadmium-yellow, U-shaped *preanal sclerite* (fig. 15) anterior to the eversible lobes are approximately of equal lengths and embrace only the end of the lobes. A small triangular process with apex pointing away from the lobes extends forward from the inner margin of the preanal sclerite where the arms meet medianly. A continuous single series of setae is found on each arm close to the lobes.

The *spiracles* (figs. 2, 5 and 9) are located laterally; first thoracic anteriorly in prothorax and slightly lower than the abdominal ones. The eight abdominal spiracles have their place above the epipleural sulci. All the spiracles are regularly ring-shaped without spouts. The thoracic (fig. 5) is somewhat larger than the abdominal ones (fig. 9).

The *legs* (figs. 2, 14 and 17) are small but well developed, five segmented, thinly sclerotized and light yellow, but with dark-brown and hard ventral trochanteral plate, proximal dorsal end of *tibio-tarsus* and surface *claw*. The coxa is proximally enforced by a brownish basicoxal sclerotization. Trochanter is separated from femur; tibia and tarsus are united and fused into a single, gradually tapering segment (Tb-Ta) which is about as long as femur. *Pretarsus* (Ptar) consists of a membranous, low, basal part and a claw which is about three times as long as the basal part. The latter is armed dorsally with a single seta, and the claw is pointed, slender and curved. A soft *arolium* (ar) (= empodial lobe auct.) extends from the nethermore ventral portion of the basal part as far forward as to the end of the proximal fourth of the claw. The arrangement of the setae on tibio-tarsus is as follows: There are no setae on the proximal half of the dorsal (anterior) surface of the segment (fig. 17), but on its distal half are two setae located (exteriorly) near the base of pretarsus (1, 2), three exteriorly (ex) in a longitudinal, slightly oblique series extending from the beginning of the distal part to the middle of it (3, 4, 5), and three setae arranged in a triangle interiorly (in) in the middle of the distal half (6, 7, 8). On the ventral (posterior) surface (fig. 14) are found altogether eight setae as on the dorsal (anterior) surface, but they are arranged somewhat differently, namely, one seta (a) exteriorly (ex) in the proximal end of the distal part of the segment, three setae (b, c, d) across the middle of

the distal part in a slightly forward directed transverse row, three setae (e, f, g) in another transverse row; but this is sloping downward from near pretarsus exteriorly to the end of the former row interiorly and, finally, a single seta (h) sits interiorly near pretarsus where the dorsal and ventral surfaces meet.

The larva can be determined by inserting the following modification in Hall and Howe's revision¹⁾ of Dr. Manton's²⁾ very useful key to ptinid larvae in stored products:

1. Preanal sclerite small, variable in size and shape, the arms of the triangular or slightly U-shaped sclerite too short to embrace more than the extreme end of the anal groove... 7.
7. Claw with empodial lobe 9.
9. Arms of Y-shaped sclerites in the labrum approximately equal in length..... 11.
11. Distal margin of the epipharynx convex or straight in the middle line..... 12.
12. Epipharynx with setae lateral to the diverging rows, absent..... 12x.
- 12x. The upper side of the labium bearing no strong setae near and in addition to the pair near the middle line .. 13.
- The upper side of the labium bearing an abundance of long setae near and in addition to the pair near the middle line..... *Ptinus californicus* Pic.

In her key as well as in the rest of the text Dr. Manton has described and figured many anatomical details of twelve larval species belonging to the six genera, *Ptinus*, *Niptus*, *Trigonogenius*, *Gibbium*, *Tipnus* and *Stetho-merzium*. Later on Hall and Howe have bred the larvae of *Mezium affine* and *Eurostus hilleri*, thus being able to describe and figure the larvae of two more genera and include them in their revision of the Manton-key.

¹⁾ Hall, D. W. and Howe, R. W. (1953), A revised key to the larvae of the Ptinidae associated with stored products. — Bull. Ent. Res., vol. 44, pp. 85—96.

²⁾ Manton, S. M. (1945), The larvae of the Ptinidae associated with stored products. — Bull. Ent. Res., vol. 35, pp. 341—365.

In addition to these taxonomic contributions, an accurate and full anatomic account with excellent figures pertaining to the larva appears in Guido Grandi's "Nota sul *Ptinus bidens* Oliv."³). Several other papers have been published in the past about some of the now well described larval forms and need not be considered here.

Out of the nine ptinid genera listed in Leng's Catalogue⁴) seven are known in the larval stage, and only of the two genera *Niptinus* Fall from Texas, and *Ptinus* Gorb. from California have the larvae not been accounted for.

In view of the fact that so large a majority of the larval genera and their species have been satisfactorily treated both anatomically and taxonomically, it is feasible to present a series of characters by which the entire assemblage of larvae can be included in the same family. These defining characters are as follows:

Taxonomic Definition of the Larval Family Ptinidae.

The larvae are quite homogeneous. The ligula is absent. The preanal sclerite is either small, variable in size and shape, with the arms too short to embrace more than the extreme end of the nates, or the sclerite is large, U-shaped, with the arms reaching to about the middle of nates. In both cases a small, single process may be found where the arms unite sagittally. The thoracic spiracle is located anteriorly in prothorax; the spiracles are simple annular or annular with a single spout.

In addition to these individual characters the family displays an exclusive character-combination, not found in other families, and particularly, not in the Anobiidae,

³) Grandi, Guido (1937), Nota sul *Ptinus bidens* Oliv. — Bollettino dell'Istituto di Entomologia della R. Univ. di Bologna, vol. IX, pp. 95—103; figs. I—VIII.

⁴) Leng, C. W. and Mutcheler, A. J. (1920—1939), Catalogue of Coleoptera of America North of Mexico.

namely, a cranium without frontal cleavage lines, plus a mandible with only a single apical tooth and a sub-apical margin proximally produced into a small, sharp or obtuse process and no marginal brush, plus a vestigial lacinia represented merely by a strong spine, plus hairy prodorsal areas, never armed with asperities, plus an antenna without articles but with a tactile appendix on a membranous, dome-shaped antennal base.

The taxonomic arrangement of the families which are included in the well defined superfamily Bostrichoidea has not been completely settled, especially not as far as the validity of the family-rank of the Ptinidae is concerned⁵). For unquestionably, the ptinid larvae appear more closely related to the majority-type of the anobiid larvae than do the larvae of some of the anobiid genera, viz. the genus *Ptilineurus*, the *Dorcatoma* assemblage, the genus *Caenocara* and the genus *Ptilinus*. But when the larval form, figured and described as *Gastrallus* sp. in my just mentioned paper⁵), might have accounted for an anobiid larva with ptinid characters, the naked fact is that, in reality, it is a ptinid larva and not an anobiid larva. Unfortunately it has not been determined by rearing but, wrongly, associated with imagines of the anobiid *Gastrallus* sp. with which it was found together in the same lot. However, a true larva of the genus *Gastrallus* has been reared from dead wood of many species of trees in Dehra-Dun, India and has been described and figured by J. C. M. Gardner as *Gastrallus birmanicus* var. *insulcatus* Pic⁶) It is easily recognized as an anobiid larva belonging to the group which lack claws and instead have a soft bladder at the terminal part of the legs.

⁵) Böving, Adam G. (1954). Mature larvae of the beetle family Anobiidae. — Dan. Biol. Medd., vol. 22, pp. 1—298, 50 plates.

⁶) Gardner, J. C. M. (1937). Immature stages of Indian Coleoptera (22). Indian Forest Records, vol. III, No. 6, p. 134, pl. I, figs. 13—20.

Plate I — *Ptinus californicus* Pic.⁷⁾

- Fig. 1. Head capsule, dorsal view; Acl, anteclypeus; As, anteclypeal sulcus; Cat, catapophysis; Est, epistoma; O, ocellus (Zeiss ocular 3, objective a⁸; $\times 38$).
- Fig. 2. External structures of the body of *Ptinus californicus*; lateral view; An, anus; Nat, nates; 8, eighth abdominal segment; 10 abd, tenth abdominal segment.
- Fig. 3. Left antenna (Zeiss 3/C, $\times 180$).
- Fig. 4. Labrum, dorsal view; Acl, anteclypeus; Tor, torma (Zeiss 3/C, $\times 180$).
- Fig. 5. Thoracic spiracle (Zeiss 3/C, $\times 180$).
- Fig. 6. Epipharynx; C, chaetaparial setae; Cri, crepidal area; Co, coryphal setae (Zeiss 3/C, $\times 180$).
- Fig. 7. Tentorial elements and hypostomal articulating processes for cardines; aTnt Ar, anterior tentorial arm; Tntb, tentorial bridge (Zeiss 3/C, $\times 180$).
- Fig. 8. Left mandible, aboral surface (Zeiss 3/C, $\times 180$).
- Fig. 9. Third abdominal spiracle (Zeiss 3/C, $\times 180$).
- Fig. 10. Left mandible, adoral surface (Zeiss 3/C, $\times 180$).

⁷⁾ The illustrations are made by the author. All the figures, except the freehand-drawn figure 2, are delineated with camera lucida.

Plate I.

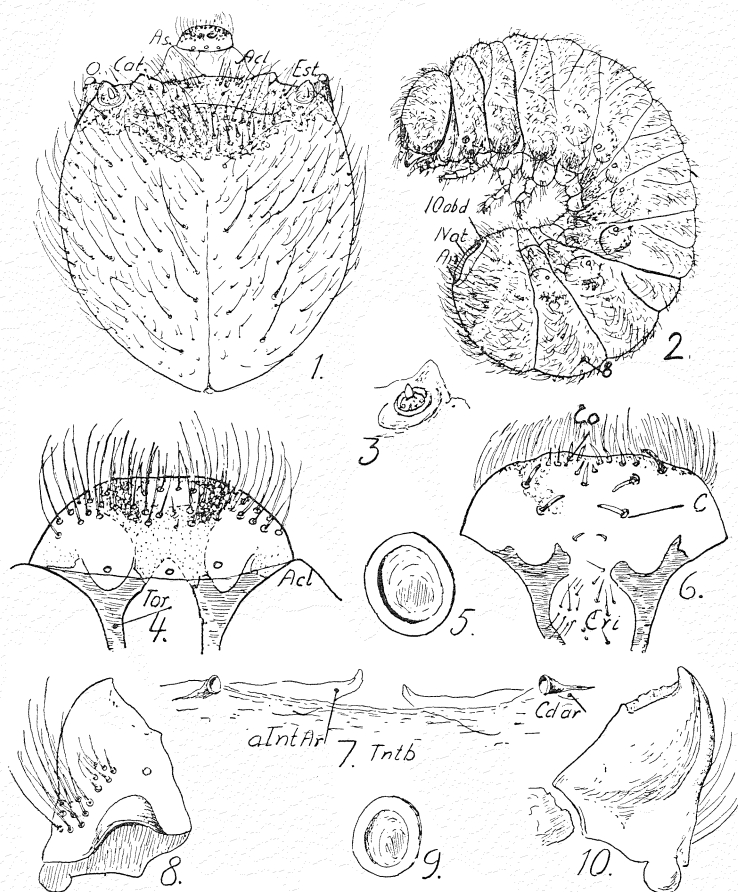
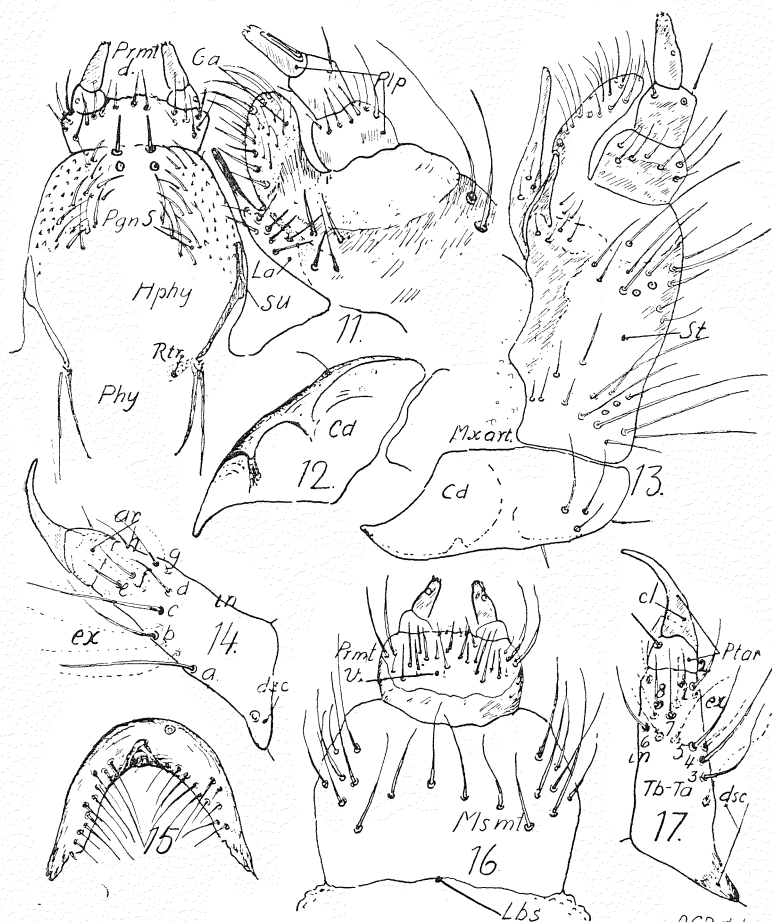
*Ptinus californicus*

Plate II — *Ptinus californicus* Pic.

- Fig. 11. Hypopharyngeal structure and dorsal, adoral side of prementum and dorsal, adoral side of maxilla; Ga, dorsal side of galea; Hphy, hypopharyngeal surface; La, dorsal side of lacinia; PgnS, paragnathal setae; Phy, entrance to pharynx; Plp, maxillary palpus; Prmt d., adoral, dorsal side of prementum; Rtr, retractor muscle from hypopharyngeal suspensorial bar; su, suspensorial bar of hypopharynx (Zeiss 3/C, $\times 180$).
- Fig. 12. Inner surface of left, shield-shaped cardo (Zeiss 3/C, $\times 180$).
- Fig. 13. Outer, aboral surface of left maxilla; Cd, cardo; Mx art, maxillary articulating area; St, aboral, outer surface of stipes (Zeiss 3/C, $\times 180$).
- Fig. 14. First leg, ventro-posterior view of right limb; setae of dorso-anterior side are indicated by dotted lines, ar, arolium (empodial lobe); dsc, dorsal sclerite of tibio-tarsus; ex, exterior surface; in, interior surface; a—h, setae on the ventro posterior side of the leg (Zeiss 3/C, $\times 180$).
- Fig. 15. Preanal sclerite of nates (Zeiss 3/C, $\times 180$).
- Fig. 16. Prelabium with mesomentum (= mentum auct.) and premental structures, ventral view; Lbs, labial sulcus; Msmt, mesomentum; Prmt v., prementum, ventral surface (Zeiss 3/C, $\times 180$).
- Fig. 17. First leg, dorso-anterior view of right limb; setae of ventro-posterior side are indicated by dotted lines; cl, claw; dsc, dorsal sclerite of tibio-tarsus; ex, exterior surface; Ptar, pretarsus; Tb—Ta, tibio-tarsus; 1—8, setae on the dorso-anterior side of the leg (Zeiss 3/C, $\times 180$).
-

Plate II.

*Ptinus californicus*

AGB del.

Two species of Empididae (Diptera) not previously recorded from Denmark

By B. R. Laurence

Freshwaterbiological Laboratory, University of Copenhagen
Hillerød.

Large swarms of male *Rhamphomyia* were flying, on 24th September 1955, at a height of 2—4 metres in the evening sunshine (16.30—17.00 hours), over the sandy paths between conifers in Nyrup Hegn, North Sealand. Very few of the males were carrying prey, fewer than is usual in these swarms of male Empididae. The flies were very numerous, resembling some swarms of Chironomidae, but they were not orientated in the manner of Chironomids and were flying randomly backwards and forwards, the movements resembling more the flight of male Muscidae. The males which were not carrying prey were seen to be flying with the legs extended out from the body. In this the flight resembled the predatory flight of *Rhamphomyia nigripes* Fabricius, although the species were obviously smaller. The species also resembled *R. nigripes* in that the mated pairs did not descend to the ground, or on the trees nearby, but continued to fly during mating. The mated pairs were also seen to separate in the air. About half the mated pairs collected were holding small male Chironomidae (*Cricotopus*, *Hydrobaenus trilobatus* Edw.) as prey. Apparently as in other species of *Rhamphomyia* the male presents the female with prey before mating with her.

It was thought at the time that only one species was present in the swarms, but later examination showed that males of two closely related species were present, *Rhamphomyia erythrophthalma* Meigen 1830 and *R. hirsutipes* Collin 1926. The first species was the most abundant and most observations were probably of this species. Both species are not mentioned by Lundbeck (1910, Diptera Danica III) as occurring in Denmark, and Dr S. L. Tuxen states (in litt.) that neither species is represented in the Zoological Museum Collection in Copenhagen. The related species, *R. gibba* Fallen 1816, is recorded by Lundbeck as rare in Denmark, the adults flying in July, August and September.

The three species, *R. gibba*, *R. erythrophthalma* and *R. hirsutipes*, are placed by Collin (1926, Ent. mon. Mag. 62: 216) in the subgenus *Amydroneura*, the species of which are characterised by the elongate discal cell in the wing, and by the indistinct anterior vein of this cell. Both *R. erythrophthalma* and *R. hirsutipes* may

be distinguished from *R. gibba* by the presence of yellow, not black, hairs on the disc of the thorax, and on the scutellum, and the presence of pale hairs on the abdomen. *R. hirsutipes*, in the male, has very long hairs on the front tibiae and tarsi, and the front tarsi enlarged and swollen, whereas the male of *R. erythrophthalma* has the front legs with hairs of more normal length and the tarsi are not obviously swollen. Specific differences between the females of *R. erythrophthalma* and *R. hirsutipes* have not been described.

It appears that there are at least two types of mating behaviour to be found in the genus *Rhamphomyia* which may indicate a separation of the genus into two phylogenetic groups. The species either mate in the air and continue to fly, or the species mate in the air and then settle, the male hanging by his front legs supporting the female. The first type of behaviour has been observed in *R. nigripes* and the species recorded here, and the second type in *R. sulcata* Meigen, *R. albohirta* Collin and *R. dentipes* Zetterstedt (Laurence, 1955, Ent. mon. Mag. 91: 220—224). It is interesting that these species represent different subgenera of the genus *Rhamphomyia* and further work may show that species in the same subgenus have the same type of mating behaviour.

Mr. J. E. Collin, Newmarket, has kindly confirmed the determinations of the two species of *Rhamphomyia* recorded here from North Sealand.

Nye og sjældne sommerfugle 1954.

Af Wilh. van Deurs.

Foruden fundene fra 1954 er medtaget enkelte fra tidligere år, som først nu er identificerede.

Nye arter:

Odonestis pruni L. 1 eks. på lys Saltuna (Bornholm) $7/8$ (E. Wilsund).

Drepana harpagula Esp. 1 eks. på lys Almindingen $10/7$ (E. Wilsund).

Diarsia sigma Schiff. 1 ♂ Sulbæk (Jyll.) $13/7$ (B. Johannesen). Se Ent. Medd. Bd. XXVII, side 53.

Cacoecia diversana Hb. Teglkås (Bornh.) $20/7$ (J. Chr. Jensen). Det i fortegnelsen publicerede tidligere fund beror på fejlbestemmelse.

Pammene trauniana Schiff. 3 eks. Strogneæs (Loll.) $\frac{3}{6}$ 39 (W. van Deurs); Ulfshale $\frac{9}{6}$ 41 (N. L. Wolff).

Bryotropha similis Stt. Fanø $\frac{29}{6}$ 52 (N. L. Wolff).

Platyedra malvella Hb. Randkløve $\frac{17}{7}$ og $\frac{28}{7}$ 54 (N. L. Wolff); Gudhjem $\frac{19}{7}$ 49 (W. van Deurs).

Coleophora hydrolapathella Her. Horreby Lyng, klækket i stort antal af sække taget $\frac{8}{6}$; Frederikslund ved Holte 3 sække $\frac{16}{6}$ (N. L. Wolff).

Coleophora albicornis Ben. Randkløve $\frac{19}{7}$ (N. L. Wolff).

Lithocolletis heegeriella Zell. Mellemskoven $\frac{4}{6}$, Hannenov $\frac{14}{5}$ 49 (N. L. Wolff).

Nepticula repentiella N. L. Wolff. Se Ent. Medd. bd. XXVII, side 82—90.

Trifurcula sp. Ubeskrevet art; Adserbo $\frac{30}{5}$ (N. L. Wolff).

Sjældne arter:

Anthocaris cardamines L. Et stort, monstrøst eks., overvejende hunlig med enkelte stærke indslag af hanlig karakter; Roden Skov $\frac{5}{6}$ (N. L. Wolff).

Colias palaeno L. 1 eks. Rungsted golfbane $\frac{12}{7}$ (Torben W. Langer).

Apatura iris L. I antal Ølene (Bornh.) $\frac{2}{8}$ (J. Chr. Jensen).

Vanessa xanthomelas Esp. 3 eks. på lys natten $\frac{10-11}{7}$ og 1 eks. om dagen $\frac{11}{7}$, alle Saltuna (E. Wilsund).

Cyclopides silvius Knoch. Talrig i Roden Skov $\frac{1-11}{6}$ (flere samlere).

Hoplitis milhauseri F. 6 eks. Roden Skov på lys $\frac{1-10}{6}$ (Gorm Jacobsen og E. Gümoes).

Notodonta phoebe Sieb. 1 eks. på lys Saltuna $\frac{6}{8}$ (E. Wilsund).

Dasychira abietis Schiff. Almindingen, Saltuna, Ølene, flere eks. på lys $\frac{10}{7}$ - $\frac{5}{8}$ (E. Wilsund, N. L. Wolff).

Malacosoma castrensis L. Et albinistisk eks. Ulfshale (Forum Petersen).

Peocilocampa populi L. ab. albescens Heyne. 1 eks. Ulfshale (Forum Petersen).

Hyphilare albipuncta F. 1 eks. på lys Saltuna $\frac{25}{6}$ (E. Wilsund).

Conistra erythrocephala F. Adserbo $\frac{3}{5}$ (A. Dahlberg).

Conistra vau-punctatum Esp. 8 eks. Rø $\frac{23}{10}$ (J. Chr. Jensen).

Sedina büttneri Her. 1 eks. $\frac{28}{9}$ og 1 eks. $\frac{9}{10}$ Rønne (J. Chr. Jensen).

Melicleptria scutosa Schiff. Almindingen $^{10}/_7$ og Saltuna $^{7}/_8$ (E. Wilsund), Tisvilde $^{8}/_7$ (E. og M. Bloch), Amager $^{2}/_9$ (E. Gümoes).

Acontia luctuosa Esp. 1 eks. Teglkås (Bornh.) $^{10}/_8$ (J. Chr. Jensen).

Minucia lunaris Schiff. 1 ♀ på lys Mellemskoven $^{29}/_5$ (Henning Hansen).

Plusia bractea F. 1 eks. Ølene $^{24}/_7$ (N. L. Wolff).

Madopa salicalis Schiff. 1 eks. Roden Skov $^{11}/_6$ (E. Gümoes).

Cosymbia porata L. Meget talrig Kobæk Strand $^{8}/_8$ 53, $^{6}/_5$ og $^{20}/_5$ 54 (Kjeld Rasmussen, Lundforlund; dyrlæge Jensen, Hylinge).

Sterrrha marginepunctata Goeze. 6 eks. Sose (Bornh.) $^{12}/_6$ (J. Chr. Jensen), 1 eks. Mellemskoven $^{6}/_6$ (fotograf Jørgensen, Sorø).

Sterrrha subsericeata Hw. 10 eks. $^{11-15}/_6$ 53 Kobæk Strand (Kjeld Rasmussen), samme sted $^{10}/_6$ 54 (fotograf Jørgensen).

Xanthoroë fluctuata L. ab. *costovata* Hw. Dragør (E. Gümoes).

Euphyia polygrammata Bkh. Mellemskoven $^{29}/_5$ (Henning Hansen).

Euphyia luctuata Schiff. 1 eks. Kobæk Strand $^{18}/_6$ (gartner Nielsen, Sorø).

Pelosia obtusa H. S. 1 eks. på lys Ølene $^{10}/_7$ (E. Wilsund).

Coscinia cribraria L. Tisvilde $^{10}/_7$ (E. og M. Bloch), 2 eks. Skærby Strand $^{6-8}/_8$ (Frants Frederiksen, Henry Hansen).

Myelois cirrigerella Zek. 1 eks. $^{14}/_7$ 51 Stampen ved Rønne, 2. danske eks. (J. Chr. Jensen).

Euergestis extimalis Sc. 1 eks. på lys Dragør $^{20}/_6$ (E. Gümoes), 3. danske eks.

Eucnemidophorus rhododactylus F. 1 eks. Randkløve $^{24}/_7$ (N. L. Wolff), 4. danske eks.

Oxyptilus tristis Zell. Talrig Stampen ved Rønne $^{29}/_7$ (N. L. Wolff).

Cacoecia betulana Hb. Stensbæk Plantage (Jyll.), 4 eks. $^{28}/_7$ 48, $^{17}/_7$ og $^{19}/_7$ 50 samt $^{22}/_8$ 51 (J. G. Worm-Hansen), hidtil kun kendt i 1 eks.

Pammene germanana Hb. 1 eks. Storkevad i Grib Skov $^{15}/_6$ 40 (W. van Deurs), 2. danske eks.

Notes on the disastrous death of an ant population, described by J. P. Kryger in 1921.

By O. Bakkendorf.

Inspired by the discourse of Dr. Ole Hammer in Ent. For. 22. 2. 1956, where it was mentioned from Argentina, how the ants on their path perished in the increasing heat of the sun, I took before me the paper by the late J. P. Kryger: Den store Myredød ved Louisehøj i Tisvilde Hegn i Foraaret 1920 (Ent. Medd. 13. 1921, 289—292). Kryger describes the find on the 19th of June 1920 of a 36 m long stripe of dead ants, summed up to 20—25000 workers of *Formica rufa* L. var. *pratensis* Ratz. and about 1100 workers of *Formica fusca* L. all intact, but partly as dry as to be easily broken into pieces. The ants were found on the middle of a sandy slope exposed to the south. Kryger remarks that the cause of their death may not be traffic or rain in the wet spring, but leaves the question open without mentioning the temperature. However in the monthly summary of the meteorological institute (Met. Inst. Maanedsoversigt) we find a period from 11th—23rd of June 1920 with temperatures above the normal, culminating the 17—18th of June with 5° above the normal, the highest temperature 32.4° measured on the 18th at Birkebæk in Jutland. These two days had 15—16 hours of sun, and from the 12—20th no rain-fall was observed in the neighbourhood (Frederiksborg Amt). These facts may be taken into account with the abundant microclimatical investigations of the later years, of which I shall cite from E. Tetens-Nielsen (Moeurs des Bembex, Spol. Zool. Mus. Haun. VII, 1945, p. 50), who measured the 10. 7. 1941 in a neighbouring place in Tisvilde a temperature of 32.3° at a height of 2 m, but simultaneously on the surface of the earth above 60°, at a height of 5 cm more than 40°, and 5 cm below the surface 37°. If we remember that the ants following their path can not escape from this hot air layer by flight or digging, it is almost sure that they are perished by heat and loss of water. In the description by Kryger I have not found anything which conflicts with this conclusion, some few workers were engaged in removing the dead ants and on the 3rd of July all had disappeared, this rapid disappearing may show that the disaster was of freshly date, presumably the 17th and 18th of June. On the 3rd of July was also found a smaller stripe of a few hundred dead *Formica rufa* in the neighbourhood, the death of which may be ascribed to the same cause.

Anmeldelser.

Karl Viets: *Die Milben des Süßwassers und des Meeres. Hydrachnellae et Halacaridae (Acari.) 1. Teil: Bibliographie.* IV + 476 sider, 163 portrætter. Gustav Fischer Verlag, Jena 1955. Pris 47.— D.M. indb.

Selv om de fleste mider er landdyr, findes der dog en række familier med et stort antal arter inden for underordenen Thrombidiformes, der udelukkende lever i vand. Det er de livligt farvede, oftest røde "postbude", som man finder svømmende omkring i damme og søer, eller de mere adstadige mider, der kravler langsomt om på sten og planter i vandløb og på havbunden. De spiller vel en ubetydelig rolle i naturens husholdning og griber ikke ind i menneskenes interesser som så mange andre mider.

Vandmidernes farver og formrigdom har imidlertid skaffet dem en trofast menighed, der dyrker studiet af denne gruppe for dens egen skyld. Den flittigste og mest begejstrede i kredsen, vandmiddeforskernes "Altmeister" Dr. Karl Viets i Bremen har nu efter 50 års arbejde med Hydrachniderne påbegyndt udgivelsen af et stort opslagsværk om vandmider i 3 bind.

Det foreliggende første bind giver en fortegnelse over alt hvad der, Viets bekendt, er skrevet om vandmider til og med 1953. Med uhyre grundighed har Viets noteret ikke blot arbejder, hvor vandmidernes er videnskabeligt behandlet, men også artikler og bøger (lige bortset fra skolebøger, leksika o. lign.), hvori gruppen blot er omtalt. Bibliografien er ordnet alfabetisk efter forfattere, og inden for hver forfatter er publikationerne anført kronologisk.

Listen omfatter vel mellem 5000 og 6000 arbejder, hvoraf Viets selv har bidraget med 232. Oversigten over disse mange værker lettes ved, at der blandt forfatterne typografisk er skelnet mellem vandmidespecialisterne og de øvrige, ligesom de mange publikationer, der ikke bringer noget selvstændigt nyt, er anført med petit. Endvidere er indholdet af artiklen angivet (systematik, økologi, fysiologi etc.), hvor dette ikke fremgår af titlen. Endelig er der givet korte biografiske data for de egentlige vandmiddeforskere, samt portrætter (og autografer) af 163 af disse, således at man lettere kan komme i menneskelig kontakt med kollegerne, hvilket Viets lægger stor vægt på.

Med sin forening af grundighed og overskuelighed vil Viets' bibliografi være en uvurderlig hjælp for enhver, der har brug for literatur om vandmider, og værdien af bibliografien vil i høj grad øges, når de bebudede 2. og 3. bind af værket, omhandlende kata-

log over samtlige beskrevne vandmider og nomenklaturspørgsmål, udkommer i 1956.

I forvejen har Viets i sin behandling af gruppen i Tierwelt Deutschlands Bd. 31 og 32 (1936) givet os det hidtil bedste bestemmelsesværk for europæiske vandmider.

J. Keiding.

Joachim Illies: *Steinfliegen oder Plecoptera*. Tierwelt Deutschlands 43. 150 s., 156 figs. Pris DM. 14.60.

Selv om den tyske slørvingefauna er langt rigere end den danske, har denne bog dog også interesse for danske entomologer. Som de andre i serien er den et bestemmelsesværk, og hertil er den velegnet, ikke mindst takket være det righoldige og gode illustrationsmateriale. Det er lidt uheldigt, at der allerede i nøglen til familier er en trykfejl (henvisningerne til figs. 81 og 82A er byttet om). Der er også nøgler til bestemmelse af nymferne (af forfatteren kaldet larver), for så vidt disse er tilstrækkeligt kendt hertil. I den specielle del gives kortfattede biologiske oplysninger (biotop, flyvetid m. m.). Indledningen (s. 1—20) er noget ujævn. Der er mange interessante oplysninger, men også en del, som man kunde have været foruden. I det morfologiske afsnit s. (2—7) savner man en nærmere redegørelse for de bygningstræk, der anvendes til adskillelse af arterne. Som det nu er, kommer meget i den specielle del til at stå som udefinerede fagudtryk. Den overraskende oplysning, at bagkroppen indeholder 12 segmenter, hører til dem som man meget let kunde have undværet. Nomenclaturen er — med få og små undtagelser — den nu moderne. Den kommer man vel til at vænne sig til, selv om man ikke indser nytten af en sådan om-møblering. Forfatteren anbefaler at opbevare slørvinger (også imagines) i sprit. Det er et godt råd, men det vil vel næppe stimulere samlernes interesse for denne forsømte insektgruppe. Hvis man ønsker en traditionel samling, er der dog også den udvej at anlægge to parallelle samlinger, een på nål og een i sprit.

Anker Nielsen.

The Danish Species of *Drosophila* (Dipt.)

By

Ove Frydenberg.

Institute of Genetics, University of Copenhagen.

Introduction.

Since the appearance of Sturtevant's monograph in 1921 the North American *Drosophila* fauna has been the subject of intensive taxonomic and faunistic investigation by a great number of workers (for a general survey, see Patterson and Stone 1952), and later on similar investigations have been made in other parts of the world. Outstanding among these investigations of faunas outside North America are the studies of the Brazilian fauna (Dobzhansky & Pavan 1943, Pavan & da Cunha 1947, Pavan 1950). The immediate aim of these taxonomic and faunistic researches has most often been to make it possible to use the natural populations of *Drosophila* to investigate certain aspects of Population Genetics.

In the late forties similar taxonomic, faunistic, and ecological investigations based on extensive collectings were initiated in Europe. Burla's excellent pioneer work (1948, 1951) on the Swiss *Drosophila* fauna has since been followed by valuable investigations in Spain, Portugal, and France (Hadorn et al. 1952), the Netherlands (Lever et al. 1951, Sobels & Lever 1954), England (Collin 1952), Scotland (Basden 1954), Finland (Hackman 1954), and Western Germany (Herting 1955).

The aim of the work on the Danish *Drosophila* species presented in this paper has partly been to bring forth further evidences on the distribution of the genus *Drosophila* in Europe and partly to obtain sufficient information on the taxonomy and ecology of the Danish *Drosophila* populations to make these possible tools for future genetical research.

So far the Danish *Drosophila* species have been treated only by three authors. In 1844 Stæger, in a short paper in Danish, described a Danish *Drosophila* species, *Drosophila confusa* as new to science and he recorded *Drosophila fenestrarum* Fallén from Denmark. Three years later, in 1847, Zetterstedt mentioned all the Danish *Drosophila* species so far known which amounted to nine (*phalerata* being regarded as a variety of *transversa*), a knowledge due mainly to Stæger's diligent collectings now kept in the Zoological Museum, Copenhagen. Since Zetterstedt's publication, which is now more than a century old, no paper dealing with the Danish *Drosophila* fauna as a whole has been published. However, Lemche in 1949 found *Drosophila busckii* as a contaminant of milk bottles thus making a total of eleven species recorded from Denmark (table 1). The species identified as *D. graminum* Fallén by Fallén (1823) and by Zetterstedt (1847) has since been shown to comprise two distinct species which are now regarded as belonging to two different but closely related genera, *Scaptomyza* Hardy and *Parascaptomyza* Duda (Duda 1935). The present author has found that the same situation applies also to the specimens labelled *D. graminum* Fall. in Stæger's collection on which Zetterstedt based his statements on the Danish *Drosophila* species. It may be added here that both *Scaptomyza graminum* and *Parascaptomyza disticha* have been caught by the present author also. As regards *Drosophila flava* Fallén which is listed at the bottom of table 1 some doubt exists about the meaning of this name. According to Collin (1953) *D. flava* Fall. is a *Drosophila* species belonging to the *Fenestrarum* group, a statement Collin founds on an examination of coll. Fallén in Stockholm. The present author's examination of the specimens labelled *D. flava* in coll. Stæger showed, however, that these specimens do certainly not belong to the genus *Drosophila* as this genus is defined today.

They represent without any doubt a species of *Scaptomyza*; actually they are very much like *S. flaveola* Meigen as this species is described by Collin. Whatever Fallén's and Zetterstedt's original use of the name *D. flava* may have been, we can be pretty sure that the *D. flava* mentioned as Danish by Zetterstedt, who had his information from Stæger, was not a *Drosophila*. Only nine *Drosophila* species were therefore recorded from Denmark at the initiation of the present investigation. It ought to be mentioned, however, that the author's examination of W. Lundbeck's collection of *Drosophilidae* (see below) revealed that this collection contained Danish specimens of *D. melanogaster* Meig. and *D. deflexa* Duda, both collected and correctly determined by Lundbeck.

Materials and Methods.

The present records are based on material originating from two sources. A certain amount of faunistic information has been obtained by a study of W. Lundbeck's collection of *Drosophilidae* in the Zoological Museum of Copenhagen. From about the beginning of this century until his death in 1941 Lundbeck was mainly occupied in working on his great monograph: "Diptera Danica". During this work he built up what was then the most extensive Danish collection of *Drosophilidae*. But unfortunately Lundbeck died without having published anything on the *Drosophilidae*. The author has examined Lundbeck's collection and has found that it contains the following seven correctly determined *Drosophila* species: 1. *D. funebris* Fabr., 2. *D. transversa* Fall., 3. *D. fenestrarum* Fall., 4. *D. melanogaster* Meig., 5. *D. phalerata* Meig., 6. *D. deflexa* Duda, and 7. *D. confusa* Stæger. This last species was actually labelled *D. vibrissina* Duda but this is but an invalid synonym of *D. confusa*. Furthermore Lundbeck has labelled several specimens "D. obscura Fall.". The majority of these spe-

cimens were actually *D. subobscura* Collin, though a few were *D. obscura* Fall. s. str. A single specimen of *D. testacea* v. Roser was labelled *D. histrio* Meig.?. Finally three undetermined specimens turned out to be the very rare *D. picta* Zett.

The other and much greater part of the material on which this report is based has been obtained through the present author's own collecting. The collecting was mainly done in the summer of 1953 and 1954 though some *Drosophila* were collected during the colder months.

In the outdoor localities the flies were attracted by exposed fermenting banana bait as described by Patterson (1943). Ripe and overripe bananas were mashed by a meat-grinder and activated dry-yeast was added to the mass. After a lapse of about twenty-four hours the baits were exposed in open cans of about 10 liter capacity. One half to one kilo of bait was put into each can. In the first collecting year six cans were used, in the second year the number of cans was increased to twenty-five. The cans were emptied of flies by covering them with an entomological net fitted to the size of the cans.

It was impractical to expose banana bait indoors and so the flies were collected indoors by sweeping.

The flies trapped on bait were as a rule etherized immediately after the capture and determined with a binocular microscope in the field. In doubtful cases the specimens were transferred to culture vials with standard *Drosophila* medium and they were then identified later on in the laboratory. In a number of cases it was necessary to make preparations of the male genitalia to be sure of correct identification. A number of *D. obscura* strains, suspected to be *D. bifasciata*, were established and test-crossed (see below).

A total of 15,922 *Drosophila* specimens were collected and determined during the two years. Table 2 shows the number of each species collected.

In order to find out the distribution of the species in different habitats every locality visited was referred to as one of the following five types of habitat. The classification of localities was always done before the collecting was begun.

1. *Woods*: This comprises all localities more than 100 meters inside the edge of either broadleaf or coniferous woods.

2. *Edge of Woods*: This comprises all localities in the outer 100 meter zone of woods. Actually most habitats in category 1 were situated much more than 100 meters inside the edge of the woods and most of the habitats in category 2 were situated in the outer 10 meter zone of the woods. The species of trees in woods visited were recorded but in most cases there were no significant difference in the composition of the *Drosophila* faunas in the different kinds of woods.

3. *Small Tree-Groups*: This comprises small groups of trees surrounded by land without any trees. As a theoretical upper limit for the magnitude of these groups a maximum diameter of 100 meter was chosen. Actually all the tree groups investigated were considerably smaller.

4. *Domestic Habitats Out-of-Doors*: This comprises orchards, gardens, yards, etc., in other words all habitats with a purely cultivated flora or those very near human habitation.

5. *Indoor Habitats*: This comprises rooms such as kitchens, dining-rooms, and cellars in houses and green-houses. Fruit stores for newly imported fruits and other localities where foreign species were apt to be found were avoided.

For each species and for each type of habitat "the relative population density" and "the percentage-occurrence" were calculated. "The relative population density" for a species in a given type of habitat (such as "Woods") is the total number of specimens of the species

caught as percentage of the total of all *Drosophila* specimens caught in that type of habitat. "The percentage-occurrence" of a given species in a given type of habitat is the number of localities in that type of habitat in which the species was present as a percentage of the total number of localities of this type visited. The relative population densities and the percentages-occurrence are shown in table 3 and 4. The author is aware of the fact that the two above mentioned statistics tend to be correlated. As this correlation, however, is never complete some information is gained by considering both statistics. When, for example, a species shows both a high percentage-occurrence and a high population density this testifies that the species has large populations almost everywhere in that type of habitat (see for example *D. subobscura* in "Woods"), whereas a high percentage-occurrence together with a low population density indicates that the species occurs often in the type of habitat but that its populations there are most often very small (as for example *D. funebris* in "Woods"). The characterization of the ecological distributions of the species given in section 4 is based partly on the statistics discussed here and partly on additional notes made during the collecting.

Taxonomical Remarks and Keys.

The terminology used in this section is that generally accepted in the modern taxonomic literature on *Drosophila*. For a full account of this terminology which in most details agrees with that used by other dipterists, the reader is referred to the papers of Sturtevant (1921, 1942), Burla (1951), or Freire-Maia & Pavan (1950).

Among the Danish *Drosophilidae* the three genera *Parascaptomyza* Duda 1924, *Scaptomyza* Hardy 1843, and *Drosophila* Fallén 1823 are easily recognized by possessing the following complex of characters:

- 1) Eyes at least centrally with a short pile.
- 2) Postvertical bristles well developed, convergent, and crossed.
- 3) Three orbital bristles: foremost a proclinate (lower) orbital, backwards a posterior reclinate (upper) orbital, and between these and nearest to the lower an anterior reclinate (middle) orbital. The latter is always conspicuously shorter than the other two. The lower orbital may be as long as the upper one but usually it is shorter.
- 4) Two pairs of dorsocentral bristles. In *D. funebris*, *D. hydei*, and in the *Fenestrarum* group of *Drosophila* one or two pairs of acrostichal hairs placed in front of, and in the same rows as, the dorsocentral bristles may be somewhat lengthened.

The above three genera can be separated by means of the following key:

1. Only two rows of acrostichal hairs between the rows of the dorsocentrals. (The rows have to be counted just in front of the anterior pair of dorsocentrals). *Parascaptomyza* Duda 1924. More than two rows of acrostichal hairs 2.
2. Six or eight rows of acrostichal hairs *Drosophila* Fallén 1823, p. p. Only four rows of acrostichal hairs 3.
3. The middle of the three sternopleural bristles longer than the anterior one. *Drosophila* Fallén 1823, p. p. (*Fenestrarum* group)
- The middle of the three sternopleural bristles shorter than the anterior one. *Scaptomyza* Hardy 1843.

The genus *Parascaptomyza* Duda comprises only one species, *P. disticha* Duda 1924 which is common in Denmark though it has never been recorded from this country before. It is known from the following localities: Jylland: Sjørring (Aug. 1906, Lundbeck); Brøns (July, 1953, O. F.); Linnerup (Aug. 1953, O. F.); Hattenæs (Aug. 1953, O. F.). The Islands: Fanø (Aug. 1953, O. F.); Lohals, Langeland (July, 1913, Lundbeck); Tangeskov, Fyn

- (July, 1953, O. F.); Engestofte, Lolland (July, 1953, O. F.); Egebækssvang, Sjælland (July, 1915, Lundbeck); Tystrup, Sj. (July, 1953, O. F.); Allindelille, Sj. (Sept. 1953, O. F.); several localities in the environs of Copenhagen, Sj. (May—Oct., Lundbeck); Rø, Bornholm (July 1889, H. J. Hansen, coll. Lundbeck).

The genus *Scaptomyza* Hardy 1843 is made up of several European species and it has representatives in North America too. The relation between the European and the North American species is not clear and the definitions of the genus seem also to differ in the two parts of the world. A recent revision of the European species has been carried out by Collin (1953). The author's material of this genus has not yet been worked out in detail but it definitely includes *S. graminum* which was mentioned already by Zetterstedt and which is most probably very common all over the country.

The genus *Drosophila* Fallén includes more than 600 species from all parts of the world. The species hitherto found in Denmark may be determined by means of the following key. The determination of the members of the *Obscura* group is specially difficult and requires some practice. A biometrical study of the morphological characters used in the taxonomy of this group has recently been published by Dyson-Hudson (1954). This paper may be a valuable help in the determination.

Key to the Danish Species of the Genus *Drosophila*.

1. Only four rows of acrostichal hairs between the dorsocentral rows just in front of the anterior pair of dorsocentrals. Three sternopleural bristles, the middle one the longest. No carina..... *Fenestratum* group 2.
- Six or eight rows of acrostichal hairs. Two or three sternopleural bristles. If three then the middle one is always conspicuously shorter than the anterior 3.
2. Primary forceps in the males very big, broadest ventrally. The ovipositor plate with a row of small teeth, all of the same size..... *D. fenestrarum* Fall.

The primary forceps smaller, but still prominent, pointed ventrally. The ovipositor plate with 5 to 7 teeth, two of which are obviously longer and stouter than the others.

- *D. forcipata* Collin.
 3. A pair of slender bristles, about three times the length of the acrostichal hairs, are situated on mesonotum between the dorsocentral rows in front of the transversal suture (see fig. 1). The colour of the mesonotum varies from purely yellow to red brown. Abdomen yellow, with two rows of black spots. Wings unclouded..... *D. testacea* v. Roser.
 Without a pair of slender bristles on mesonotum in the above position..... 4.

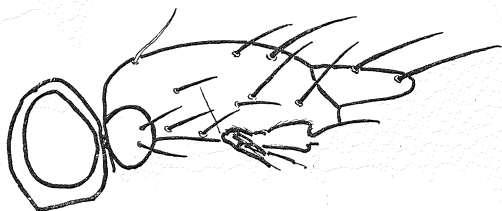


Fig. 1. Head, mesonotum, and scutellum of *D. testacea*, to illustrate the position and form of the presutural bristle which is shown in white.

4. Mesonotum gray, in living specimens with a greenish tinge. Almost all the bristles and hairs on mesonotum are inserted on a dark brown or black spot *D. hydei* Sturtevant.
 Mesonotum yellow, red brown, brown, or black. No special colour around the bases of the mesonotal bristles and hairs. 5.
 5. Mesonotum yellow, occasionally with a dark pattern..... 6.
 Mesonotum red brown, brown, or black, occasionally with a more or less distinct pattern..... 14.
 6. The first femur on the inner side with a row of about 10 small, pointed, black spines. The wings clouded apically and on the posterior transversal vein. Abdomen yellow with two big, dull, black triangles on each tergite
 *D. immigrans* Sturtevant.
 No row of spines on the inner side of the first femur 7.
 7. Mesonotum yellow with five black longitudinal stripes, of which the middle unpaired stripe is branched into two posteriorly. The yellow pleura also with two to three dark stripes. Wings unclouded, third and fourth longitudinal veins slightly divergent. Preapical bristles missing on first and second tibiae *D. busckii* Coq.

- Mesonotum without five distinct stripes, often without any pattern at all. Preapicals on all three pairs of tibiae. 8.
8. Third and fourth longitudinal veins in the wings strongly divergent. Pleura with two brown longitudinal stripes, the upper stripe running just below the wing, the lower one crossing the upper third of the sternopleural sclerite. *D. picta* Zett.
- Third and fourth longitudinal wing veins parallel or convergent. Pleura without stripes 9.

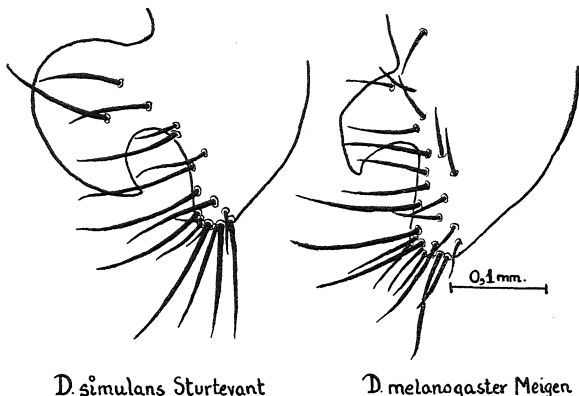


Fig. 2. Lower part of genital arch of *D. simulans* and *D. melanogaster*. The shape of the primary processes is the best distinguishing mark between these two species.

9. The yellow abdominal tergites with a black band along their posterior margins. These bands are never interrupted in the median line, on the contrary they are most often broadest there. Fifth and sixth tergites in the male all black. Males with sex combs. These consists of about ten strong black bristles of equal size placed in a row on the first metatarsus *Melanogaster* group. 10.
- The posterior bands on the tergites, at least on the four most anterior tergites, interrupted in the median line so that these tergites have each one or two pairs of black spots 11.
10. Males: the genital arch with a hook shaped process (see fig. 2). Both sexes: width of cheeks (measured vertically from the lowest point of the eye to the margin of the cheek) about one sixth of the greatest diameter of the eye.

Maxillary palps most often with three stouter bristles on their distal half..... *D. melanogaster* Meig.
 Males: genital arch with a clamshell shaped process (see fig. 2). Both sexes: width of cheeks less than one sixth of the greatest diameter of the eyes. Maxillary palps most often with only two stouter bristles on their distal half..

..... *D. simulans* Sturtevant.

11. Wings completely unclouded. Apical bristle on middle tibia exceptionally large. Large species *D. confusa* Stæger.
 Wings clouded on the two transversal veins. Medium sized species *Quinaria* group. 12.

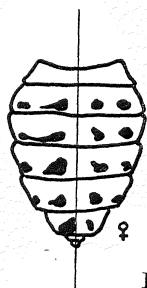
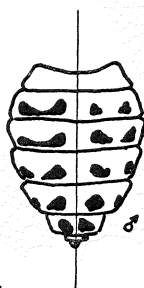


Fig. 3.



♂



Fig. 4.

Fig. 3. Abdominal pattern of *D. transversa*, male and female. Left side from a specimen with strongly developed spots, right side from a specimen with normally developed spots.

Fig. 4. The abdominal pattern of *D. limbata*. This species does not show any conspicuous sexual dimorphism.

12. The black bands on the posterior margins of the abdominal tergites interrupted both in the median line and laterally, thus each tergite has four black spots (see fig. 3). Eyes coral red. Second oral bristle at least half the length of the first *D. transversa* Fall.
 The posterior bands on the tergites interrupted only in the median line. The eyes more dingy red 13.
 13. The median interruption of the posterior bands just as broad as the lateral spots left. These spots are only thin, faintly coloured lines along the margin of the tergites (see fig. 4). Second oral bristle longer than one half the length of the first..... *D. limbata* v. Roser.
 The median interruption narrower than the lateral spots which have the shape of quadrangles whose anterior margins are more or less concave (see fig. 5). Second oral

- bristle shorter than one half the length of the first
 *D. phalerata* Meig.
 14. Lower part of carina bulbously swollen. A pair of small, inconspicuous prescutellar bristles present. A small, distinct bristle on propleuron. The tip of the abdomen in living specimens withdrawn so that the genitalia most often are invisible. Yellow wings which are relatively very short. *D. deflexa* Duda.
 Carina nose-shaped, never bulbous. No prescutellars nor a propleural bristle. The external genitalia usually well exposed and easily visible in living specimens. 15.

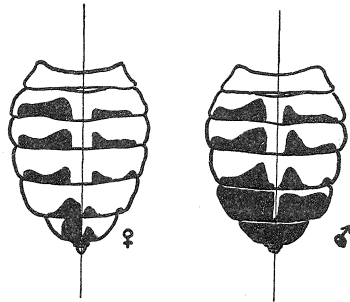


Fig. 5. The abdominal pattern of *D. phalerata*, male and female. Left side from a specimen with strongly developed spots, right side from a specimen with a weak development of the pattern.

15. Six rows of acrostichal hairs. Mesonotum grayish black. Posterior transversal vein intensely clouded. Carina with a longitudinal groove. Abdomen dark brown to black without any lighter markings *D. littoralis* Meig.
 Eight rows of acrostichal hairs. Posterior transversal vein unclouded (a trace of clouding may occasionally occur in *D. tristis*). Carina unsulcate. 16.
 16. Mesonotum light red brown. Two to three acrostichal hairs in the dorsocentral rows in front of the anterior pair of dorsocentrals, longer than the other acrostichal hairs. Three sternopleural bristles. Arista with 10—12 branches. Abdomen black, but with a yellow band along the anterior margin of each of at least the four first tergites. Yellow band broadest in the median line. Males without sex combs on the forelegs. Body length: 3—4 mm *D. funebris* Fabr.

- Mesonotum brown, black, or black with brown stripes. No prolonged acrostichal hairs. Only two sternopleural bristles. Arista with 7—9 branches. Abdominal tergites black without anterior bands. Males with two sex combs on each foreleg. Body length: 2—3 mm. *Obscura* group. 17.
17. Males 18.
Females 22.
18. Wings strongly clouded anterior to a line running from the middle of the second costal section to the apical end of the third longitudinal vein. Palps with two equally long bristles. Proximal sex comb with 9—12 teeth, distal with 8—11. Distal sex comb inserted almost parallel to the second tarsal segment, proximal comb slightly skewly inserted on the first tarsal segment. The length of first tarsal segment divided by the length of second tarsal segment gives about 1.1 *D. tristis* Fall.
Wings unclouded or only faintly clouded around the distal end of second longitudinal vein. Palps most often with only one strong bristle; if two bristles then of equal length.. 19.
19. Proximal sex comb with 4—6 teeth, distal sex comb with 3—5 teeth, arranged in an irregular row running at an angle to the length of the tarsus. Mesonotum dark brown without any pattern. First tarsal segment divided by second tarsal segment gives 1.4—1.9..... *D. silvestris* Basden.
Both sex combs with at least 6 teeth. With or without colour pattern on mesonotum 20.
20. Mesonotum with longitudinal stripes. Sex combs short, their length about one fourth of the length of the tarsal segments on which they are inserted. Proximal sex comb with 6—10 teeth, distal with 6—8 teeth. Palps observed from the side triangular in shape. One strong terminal bristle on the palps, often also a considerably smaller subterminal bristle present. First tarsal segment divided by second tarsal segment gives more than 1.4..... *D. obscura* Fall.
Mesonotum without any pattern. Sex combs very long. Proximal comb with at least 7, distal with at least 8 teeth. Palps observed from the side club-shaped. First tarsal segment divided by second tarsal segment less than 1.3 21.
21. Third costal section with heavy bristles on its basal $\frac{1}{2}$ — $\frac{4}{5}$. Sex combs inserted parallel to the tarsal segments, considerably longer than $\frac{1}{2}$ of these segments. Proximal comb with 10—15, distal with 9—13 teeth. Second tarsal segment clearly shorter than the first. Forceps with 6—8 primary teeth *D. subobscura* Collin.

- Third costal section with heavy bristles on its basal $\frac{2}{5}$ — $\frac{1}{2}$. Sex combs not completely parallel to the tarsal segments, about half as long as these. Proximal sex comb with 7—10, distal with 8—10 teeth. First tarsal segment hardly longer than second. Forceps with 7—10 primary teeth..... *D. ambigua* Pomini.
22. Palps with two equally strong bristles. Mesonotum with two unclear longitudinal stripes. Ovipositor plate narrow and very pointed. Abdominal tergites black, without any light spots *D. tristis* Fall.
Most often only one bristle on the palps. If two bristles occur, then the subterminal bristle is shorter than half the length of the terminal, or the subterminal bristle is $\frac{3}{4}$ — $\frac{1}{2}$ the length of the terminal but in this case the lateral areas of the abdominal tergites show light spots 23.
23. Mesonotum with distinct, longitudinal stripes. Fourth, fifth, and sixth tergites laterally with a more or less distinct yellow spot. Occasionally these spots are very faint, and rarely they are missing entirely. Ovipositor plate with one long bristle, approximately as long as the maximal breadth of the plate. Eyes dark red *D. obscura* Fall.
Mesonotum without pattern. If a trace of a mesonotal colour pattern occurs, then the tergites are without any light spots and the bristle on the ovipositor plate is very short. Eyes bright red 24.
24. Fourth, fifth, and sixth tergites laterally with a distinct white spot which may often occur also on the third tergite. Ovipositor plate with two long divergent bristles *D. silvestris* Basden.
No spots on the tergites. Only one ovipositor bristle and this is short..... 25.
25. Third costal section with heavy bristles on basal $\frac{1}{2}$ — $\frac{4}{5}$. Palps only with one long bristle but often with some small hairs in the subterminal position. The teeth of the ovipositor plate short and stout, all of the same size. Ovipositor bristle only about twice as long as the teeth..... *D. subobscura* Collin.
Third costal section with heavy bristles on basal $\frac{3}{5}$ — $\frac{1}{2}$, Palps very often with a subterminal bristle also, about half the length of the terminal bristle. The 4 to 5 most terminal teeth on the ovipositor plate longer and stouter than the rest. Ovipositor bristle about three times as long as the longest teeth *D. ambigua* Pomini.

Records of the Danish *Drosophila* species.

In the following are recorded the Danish *Drosophila* species listed in systematical order (see table 5). Under each species the *Synonyms* occurring in the more recent literature are mentioned first. For synonyms older than Duda's monograph (1935) the reader is referred to this work. Secondly references are given to recent *Complete*

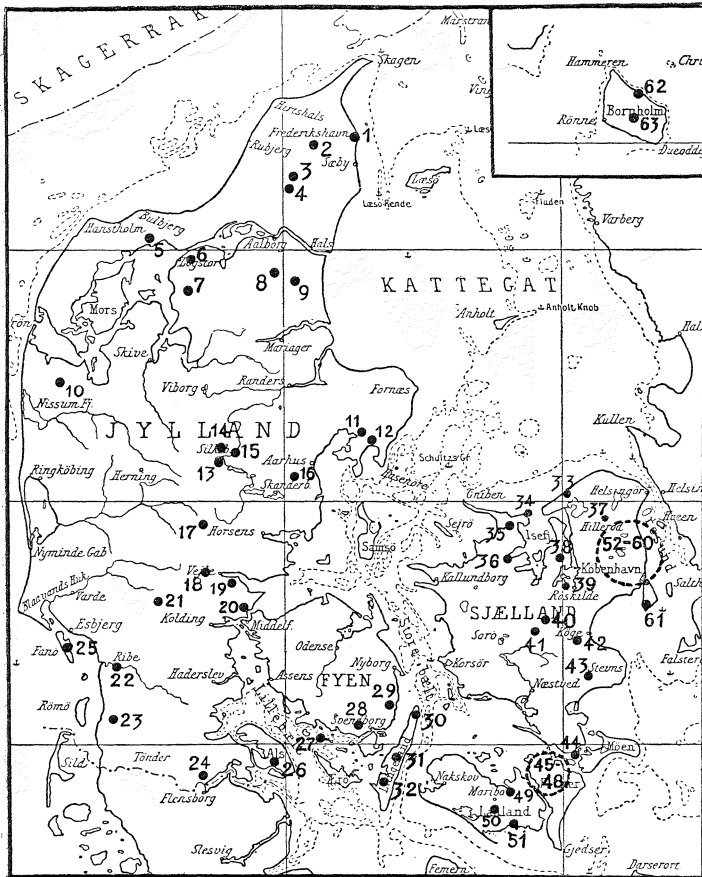


Fig. 6. Map of Denmark Proper, showing the localities mentioned in the text. List of localities see p. 264.

Jylland:

Brøndum (Mr. B. Christensen)	6
Brøns*	23
Estrup*	21
Fredericia (Lemche 1949)	20
Frederikshavn (Mr. B. Christensen)	1
Hattenæs*	15
Hulknøse (Mr. B. Christensen)	4
Jerslev skov (Mr. B. Christensen)	3
Kalø hestehave*	11
Klosterhede plantage*	10
Kollund*	24
Linnerup*	17
Mols Laboratory*	12
Munkebjerg*	19
Naaege*	14
Østerild plantage*	5
Overlade (Mr. B. Christensen)	7
Ribe*	22
Rold skov*	8
Silkeborg*	13
Sjørring (Coll. Lundbeck)	9
Stilling*	16
Tolne skov*	2
Vingsted*	18

The Islands:

Als: Sønderkov*	26
Amager: Kongelunden*	61
Bjørnø (Coll. Lundbeck)	27
Bornholm: Almindingen*	63
— : Rø (H. J. Hansen)	62
Bogø (Coll. Lundbeck)	44
Falster: Nørre Alslev skov*	45
— : Orehoved*	46
— : Orenæs skov*	47
— : Resle skov*	48
Fanø: Fuglekøjen and Statsplantagen*	25

Fyn: Skovbo*	28
— : Tangeskov*	29
Langeland: Aasø*	31
— : Faarevejle*	32
— : Lohals (Coll. Lundbeck)	30
Lolland: Engestofte*	50
— : Nysted (Coll. Lundbeck)	51
— : Saxkøbing (Lemche 1949)	49
Sjælland: Allindelille*	40
— : Boserup (Coll. Lundbeck)	39
— : Charlottenlund skov*	52
— : Egesbæksvang (Coll. Lundbeck)	53
— : Ermelunden (Coll. Lundbeck)	54
— : Frederiksberg*	55
— : Geels skov*	56
— : Hillerød (Lemche 1949)	37
— : Holbæk (Lemche 1949)	36
— : Hørsholm (S. L. Tuxen)	57
— : Lellinge*	42
— : Liseleje*	33
— : Lyngby (Coll. Lundbeck)	58
— : Nykøbing (Lemche 1949)	35
— : Østerbro*	59
— : Ringsted (Lemche 1949)	41
— : Rørvig*	34
— : Skuldelev (Mr. P. Eriksen)	38
— : Tystrup*	43
— : Utterslev*	60

*) Localities in which the author has collected.

Descriptions of the species. An account of the *Occurrence in Denmark* then follows. The localities mentioned under this heading are shown on the map in figure 6. After a brief account of the *Distribution* based on recent literature, aspects of ecology are discussed under the heading *Biological Notes*.

1. *Drosophila deflexa* Duda 1924.

New to Denmark.

Synonym: According to Herting (1953) *D. guyénoti* Burla 1948 is an invalid synonym of this species.

A complete description has been given by Burla (1948, 1951, under the heading: *D. guyénoti*).

Occurrence in Denmark: 1) The Zoological Museum collection: *The Islands*: Bogø (5 specimens, July 1917, Lundbeck). 2) The author's collection: *Jylland*: Kollund (July 1953); Estrup, Vingsted, and Stilling (Aug. 1953); Mols Laboratory and Kalø (July 1954). *The Islands*: Sønderkov, Als; Skovbo and Tangeskov, Fyn; Faarevejle, Langeland; and Engestofte, Lolland (July 1953); Almindingen, Bornholm (July 1954).

D. deflexa is not known from Jylland north of Kalø nor from Sjælland. The lack of the species among the flies collected from Jylland may be due to the fact that the weather was very unfavourable when the collecting was done. It is more difficult to understand why this species was not collected from Allindelille on Sjælland where 1204 specimens of *Drosophila* were collected in September 1953 and 3117 specimens were collected in June 1954. Taking into account the records from Fyn, Langeland, Lolland, and Bogø it is very unlikely that *D. deflexa* should not occur on Sjælland.

Distribution: Europe from Northern Spain (Haddon *et al.* 1952) to Scotland and Eire (Basden 1952), Poland and Hungaria (Duda 1935).

Biological Notes: This species has been caught

in Denmark most often in woods but it has also been found in small groups of very few trees whereas it seems to avoid human habitations. The relative population density is low in all types of habitats, reaching its minimum in "Woods" but the absolute population density in this type of habitats is probably not less than in the other two wild habitats where other species have less dense populations.

In the territory of the Mols Laboratory thirty *Drosophila* specimens were taken on a bleeding oak (*Quercus robur*) in July 1954. Twenty-eight of these were *D. deflexa* (14 ♀♀ + 14 ♂♂), the two remaining were a male *D. subobscura* and a female *D. tristis* respectively. The sap was highly fermented and there was a conspicuous white mass of yeast in the wound. *D. deflexa* then seems to be a sap feeder. Though very little is known about the biology of the species of the subgenus *Pholadoris* to which *D. deflexa* belongs, it is stated by Patterson & Stone (1952) that the type species *D. victoria* is a sap feeder too.

Near the above mentioned oak eighty-eight *Drosophila* specimens were trapped in the same time interval on ordinary banana bait. The composition of this sample was strikingly different from that of the sample caught at the sap. The trapped flies comprised only three specimens of *D. deflexa*. The dominating species was *D. phalerata* (52 specimens), followed by *D. subobscura* (19). It is evident that at least one of the two population samples is highly biased. It seems most probable to the author to assume that both samples are somewhat biased; it is at least difficult to exclude the possibility that the ordinary bait sample gives an underestimate of the population density of *D. deflexa*. Hadorn *et al.* (1952) have demonstrated that *D. deflexa* is attracted more efficiently by banana bait than by any other bait tried (apple, blackberry, and a mixture of various fruits naturally occur-

ring in the area). My observation indicates that *D. deflexa* may be more numerous than proved by samples trapped even on banana bait.

2. *Drosophila busckii* Coquillett 1901.

Complete descriptions have been published by Patterson (1943) in English and by Burla (1951) in German.

Occurrence in Denmark: 1) Lemche (1949) recorded this species from Copenhagen and the following provincial towns: Nykøbing, Holbæk, Hillerød, and Ringsted (all on Sjælland), Fredericia (Jylland), and Saxkøbing (Lolland). 2) The author's collection: *Jylland*: Kollund (July 1953). *The Islands*: Sønderkov, Als; and Engestofte, Lolland (July 1953).

Distribution: *D. busckii* is a very widely distributed, cosmopolitan species, recorded from all parts of the world. It has been found in all European countries recently investigated. The most northern records are from Scotland (Basden 1954), Norway, probably the southern part (Sturtevant 1921), and Finland (Hackman 1954).

Biological Notes: *D. busckii* is a synanthropous species found most abundantly in the neighbourhood of houses. At least in Northern Europe it seems to be mainly an indoor species (Basden 1954, Sobels *et al.* 1954). The few specimens collected by the author were all caught outdoors. The population on Als (July 1953) could be traced back to a pigsty. The two other catches were also taken in the neighbourhood of farms but it was not possible to locate the center of population density.

3. *Drosophila melanogaster* Meigen 1830.

New to Denmark.

Complete descriptions have been given by Patterson (1943) in English and by Burla (1951) in German.

Occurrence in Denmark: 1) Z. M. collection: Several specimens collected in Copenhagen and in the environs of this city in the first decade of this century

(Lundbeck). 2) Author's collection: *Jylland*: Ribe, Vingsted, Munkebjerg, Silkeborg, Hattenæs, Naaege, and Stilling (Aug. 1953); the Mols Laboratory, and Rold skov (July 1954). *The Islands*: Sønderkov, Als; Faarevejle and Aasø, Langeland; Engestofte, Lolland; Orenæs skov and Resle skov, Falster; Tystrup and Hørsholm, Sjælland (July 1953); Orehoved, Falster (July 1953, Febr. 1954); Allindelille, Sjælland (Sept. 1953, June 1954); several localities in the city of Copenhagen (June 1953 to June 1954).

Distribution: A cosmopolitan species known from all European countries recently investigated.

Biological Notes: This species is synanthropous. In Denmark it reaches its highest population densities indoors where favourable breeding conditions are available, and in gardens, orchards, etc. *D. melanogaster* was, nevertheless, caught in many woods at rather long distances from human habitations but then always in extremely low densities. It can be trapped indoors all the year round.

4. *Drosophila simulans* Sturtevant 1921.

New to Denmark.

Complete descriptions have been published by Patterson (1943) in English and by Burla (1951) in German.

Occurrence in Denmark: Author's collection: *Jylland*: A single female has been caught together with several specimens of *D. melanogaster* in August 1953 at Hattenæs in the neighbourhood of a house. *The Islands*: Three males have been trapped together with 21 male *D. melanogaster* and 16 females which were a mixture of the two species in a small garden in the city of Copenhagen (June 1954). Some specimens were reared from decomposing bananas collected in the spring 1951 on a ship unloading its cargo of bananas from the Canary Islands in the harbour of Copenhagen. This may be re-

garded as a direct evidence for the suggestion often made that *D. simulans* is continually introduced into Northern Europe from the warmer parts of the world.

Distribution: Worldwide. The number of specimens caught in Europe is small though the species is recorded from Portugal and France (Hadorn *et al.* 1952), Switzerland (Burla 1951), the Netherlands (Sobels *et al.* 1954), and Great Britain (Basden 1952).

Biological Notes: As demonstrated by Patterson (1943) this species is more thermophilous than *D. melanogaster*. In agreement with this statement *D. simulans* occurs very sparsely outdoors in Northern Europe. Though it may be rather numerous in natural habitats in the southern parts of its distribution, *D. simulans* is exclusively synanthropous in the more northern ranges of its distribution. Basden (1954) caught 315 specimens in fruit stores in Edinburgh but only three specimens outdoors in a garden. The Dutch and the Danish specimens were also caught in gardens.

5. *Drosophila obscura* Fallén 1823.

Complete descriptions have been published by Pomini (1940) in Italian and by Burla (1951) in German.

Occurrence in Denmark: 1) Previous records: Zetterstedt (1847), no details of locality mentioned. The specimen kept in Z. M. 2) Z. M. collection: Copenhagen (1 ♀ Aug. 1904, 1 ♀ Aug. 1923, Lundbeck). 3) Author's collection: *Jylland*: Kollund, Brøns, and Hulknøse (July 1953); Stilling, Hattenæs, Silkeborg, Linnerup, Munkebjerg, Vingsted, Estrup, and Fanø (Aug. 1953); Tolne skov, Østerild plantage, Rold skov, and Kalø hestehave (July 1954); Mols Laboratory (May and July 1954). *The Islands*: Sønderskov, Als; Skovbo and Tangeskov, Fyn; Aasø and Faarevejle, Langeland; Engestofte, Lolland; and Resle skov, Falster (July 1953); Orenæs skov, Falster (July and Oct. 1953); Allindelille, Sjælland (Sept. 1953 and June

1954); Geels skov and Utterslev, Sj. (Apr. 1953); Charlottenlund skov, Sj. (April and May 1953); Frederiksberg, Copenhagen (Apr., May, June, and Sept. 1953, May and June 1954); Østerbro, Copenhagen (June 1953); Kongelunden, Amager (Apr. 1953); Almindingen, Bornholm (June 1954).

Distribution: Europe. Known from Sweden (Zetterstedt 1847); Finland (Hackman 1954); England, Scotland, Eire (Basden 1952, 1954; Collin 1952); Holland (Lever *et al.* 1951); Germany (Duda 1935; Herting 1955); Switzerland (Burla 1951); Austria (Mainx *et al.* 1953); France, Spain, Portugal (Hadorn *et al.* 1952); and Italy (Buzzati-Traverso 1941). Duda states that this species occurs also in North America; it has, however, been demonstrated by Frolowa *et al.* (1929) that the American "*D. obscura* Fall.", mentioned by Sturtevant (1921), is another species, namely *D. pseudoobscura* Frolowa.

Biological Notes: *D. obscura* is very common all over Denmark. It occurs most constantly in woods where it quite often is the dominant *Drosophila* species. However, it is not strictly limited to wild habitats but is frequently found in rather dense populations near human habitation. For example it was found in several localities in the city of Copenhagen.

Remarks on the non-occurrence of *D. bifasciata* Pomini in Denmark.

Drosophila bifasciata Pomini is morphologically very similar to *D. obscura* Fallén but according to the literature available at the initiation of the present work (Pomini 1940; Burla 1951) females of *D. bifasciata* should differ from those of *D. obscura* by lacking yellow spots on the tergites. The males differ from the males of *D. obscura* only in a few quantitative traits, for example by having on the average a somewhat greater number of teeth in the sex combs, but the ranges of variation given in the literature overlap considerably. Attention was therefore concentrated on the females but it soon became obvious that the yellow spots on the tergites of the *D. obscura* females were not so clearcut as appeared from the existing descriptions of this species. On the contrary, a con-

tinuous variation from very big spots to no spots at all was observed, a fact which has also been recognized by Herting (1954, personal communication) and Basden (1954). Twenty-four strains originating each from one *D. obscura*-like female without any trace of spots were then established. Already in the first generation females which unquestionably showed yellow spots appeared in all the cultures. Test crosses to a *D. obscura* strain established earlier yielded progenies which were normal both as regards number, viability, and morphology. *D. bifasciata* has then not been found in Denmark yet, but it was demonstrated that the lack of yellow spots on the tergites is unsufficient to distinguish it from *D. obscura*.

6. *Drosophila silvestris* Basden 1954.

New to Denmark.

Synonym: This species was recognized already by Burla (1951) who mentioned it under the preliminary name *obscura-X*.

A complete description has been given by Basden (1954).

Occurrence in Denmark: Author's collection: *Jylland*: Kollund (July 1953); Estrup, Vingsted, and Munkebjerg (Aug. 1953); Mols Laboratory, Rold skov, Tolne skov, and Østerild plantage (July 1954). *The Islands*: Fuglekøjen, Fanø (Aug. 1953); Orenæs, Falster; Engestofte, Lolland; Faarevejle, Langeland; Skovbo and Tangeskov, Fyn (July 1953); Allindelille, Sjælland; Almindingen, Bornholm (June 1954).

Distribution: Northern Europe. Demonstrated in Switzerland (Burla 1951), Great Britain (Basden 1952, 1954), the Netherlands (Sobels *et al.* 1954), and North-western Germany (Herting 1953, personal communication). The recorded population densities indicate an Atlantic distribution.

Biological Notes: *D. silvestris* has been caught by the author in woodlands only. The highest relative population density, which was only a little less than 3 %, was found inside woods. The density was much less on the edge of the woods and the species was never taken outside woods.

7. *Drosophila tristis* Fallén 1823.

Synonym: Duda (1935) has suggested that *D. spurca* Zett. 1847 is a synonym of *D. tristis* Fall. This has been confirmed by Frydenberg (1955).

Complete descriptions have been given by Pomini (1940) in Italian and by Burla (1951) in German.

Occurrence in Denmark: 1) Previous records: Zetterstedt (1847), no exact date nor locality was given. The specimen is kept in Z. M. as type of *spurca* Zett. 2) Author's collection: *Jylland*: Kollund (July 1953); Mols Laboratory (May and July 1954); Tolne skov (July 1954). *The Islands*: Sønderkov, Als; and Skovbo, Fyn (July 1953); Allindelille, Sjælland (June 1954).

Distribution: Europe. The most southern localities are Pavia, Italy (Pomini 1940) and Northern Spain (Hadorn *et al.* 1952), the most northern localities are Scotland (Basden 1954) and Upland, Sweden (Zetterstedt 1847).

Biological Notes: The few Danish specimens collected indicate a low population density which is in agreement with the statements of most authors. Sobels *et al.* (1954) have recently recorded a dense population in the Netherlands. All Danish specimens were caught in woods and groves.

8. *Drosophila ambigua* Pomini 1940.

New to Denmark.

Complete descriptions have been given by Pomini (1940) in Italian and by Burla (1951) in German.

Occurrence in Denmark: Author's collection: *The Islands*: Utterslev, Sjælland (Apr. 1953); Frederiksberg, Sjælland (June and Sept. 1953, Apr., May, and June 1954); Østerbro, Copenhagen (June 1953).

Distribution: Europe. Known from Italy (Pomini 1940); Switzerland (Burla 1951); Spain, Portugal, and France (Hadorn *et al.* 1952); Austria (Mainx *et al.* 1953); the Netherlands (Lever *et al.* 1951), and Great Britain (Basden 1952).

Biological Notes: In the author's collectings this species appeared only in Copenhagen and the near environs of this city and always in the close neighbourhood of houses. Thus *D. ambigua* may be regarded as a mainly domestic species in Denmark. According to Haldorn *et al.* *D. ambigua* is a typical wild species on the Iberian peninsula.

9. *Drosophila subobscura* Collin 1936.

New to Denmark.

Complete descriptions have been given by Pomini (1940) in Italian and by Burla (1951) in German.

Occurrence in Denmark: 1) The Z. M. collection: Several specimens collected by Lundbeck have been reared from gooseberries at Lyngby, Sjælland (Oct. 1923). 2) Author's collection: *Jylland*: Frederikshavn, Hulknøse, Brøns, and Kollund (July 1953); Stilling, Naaege, Hattenæs, Silkeborg, Linnerup, Munkebjerg, Vingsted, Estrup, and Ribe (Aug. 1953); Tolne skov, Østerild plantage, Rold skov, and Kalø hestehave (July 1954); Klosterhede plantage (Aug. 1954); Mols Laboratory (March, Apr., May, and July 1954). *The Islands*: Fanø; Skovbo and Tangeskov, Fyn; Faarevejle and Aasø, Langeland; Engestofte, Lolland; Orehoved, Resle skov, and Nørre Alslev skov, Falster; Lellinge and Tystrup, Sjælland (July 1953); Orenæs skov, Falster (July and Oct. 1953); Kongelunden, Amager; and Geels skov, Sjælland (Apr. 1953); Allinde-lille, Sjælland (Sept. 1953, June 1954); Liseleje, Sj. (Apr. 1954); Charlottenlund skov, Sj. (May and June 1953); Østerbro, Copenhagen (June 1953); Frederiksberg, Copenhagen (June and Sept. 1953, June 1954); Almindingen, Bornholm (June 1954).

Distribution: *D. subobscura* is known from all European countries recently investigated, and it has been demonstrated also in Libanon (Pipkin 1952), Syria, and on the coasts of the Black and Caspian Seas (Buzzati-Traverso 1955).

Biological Notes: *D. subobscura* is the most common *Drosophila* species in Denmark, just as it seems to be in most European countries. It was taken in all out-of-door habitats, the population density being high almost everywhere. Accordingly it is the species which most often dominates the populations. It was caught only once indoors, namely in a greenhouse.

10. *Drosophila transversa* Fallén 1823.

A complete description has been given by Burla (1951).

Occurrence in Denmark: 1) Previous records: Zetterstedt (1847), no date nor exact locality is mentioned. The specimens kept in Z. M. labelled Frederiksberg, Stænger. 2) Z. M. collection: Boserup, Sjælland (Jan. 1916 in *Morchella esculenta*, Lundbeck). 3) Author's collection: *Jylland*: Tolne skov, Østerild plantage, Rold skov, Klosterhede plantage, and Kalø hestehave (July 1954); Mols Laboratory (Apr., May, and July 1954); Hattenæs, Linne-rup, and Vingsted (Aug. 1953); Kollund (July 1953). *The Islands*: Tangeskov, Fyn; and Engestofte, Lolland (July 1953); Allindelille, Sjælland (Sept. 1953 and June 1954); Rørvig, Sj. (Sept. 1953, reared from an undetermined toadstool); Skuldelev, Sj. (June 1954, reared from a *Poly-porus* species); Frederiksberg, Sj. (June 1953, June 1954); Almindingen, Bornholm (June 1954).

Distribution: This species is widely distributed over the Holarctic region. In Europe it has recently been recorded from Northern Spain, France (Hadorn *et al.* 1952), the Netherlands (Lever *et al.* 1951), Switzerland (Burla 1951), Great Britain (Basden 1952), and Finland (Hackman 1954). The species has been recorded from Japan (Kikkawa *et al.* 1938) and from China (Tan *et al.* 1949) and it occurs also in Eastern and Middle U. S. A. For all the author knows the conspecificity between the Nearctic and the Palearctic *D. transversa* has never been proved experimentally.

Biological Notes: *D. transversa* is a typical fungus-feeder. The population density has been found to be rather low all over Denmark. The species seems less strictly confined to woods and forests than the following species and than the species of the *Obscura* group. *D. transversa* seems to prefer more open localities such as moors with a few scattered trees and bushes.

11. *Drosophila phalerata* Meigen 1830.

A complete description has been published by Burla (1951).

Occurrence in Denmark: 1) Previous records: Zet-terstedt (1847) lists the species without exact locality as variety of *D. transversa*. The specimens are kept in Z. M., coll. Stæger. 2) Author's collection: *Jylland*: Kollund skov, Brøns, and Overlade (July 1953); Ribe, Estrup, Vingsted, Munkebjerg, Silkeborg, Hattenæs, and Stilling (Aug. 1953); Mols Laboratory (May and July 1954); Kalø hestehave, Rold skov, Tolne skov, and Østerild plantage (July 1954); Klosterhede plantage (Aug. 1954). *The Islands*: Fuglekøjen, Fanø (Aug. 1953); Orenæs skov, Falster (July and Oct. 1953); Resle skov, Falster; Engestofte, Lolland; Faarevejle, and Aasø, Langeland; Tangeskov, and Skovbo, Fyn; Sønderkov, Als; and Lellinge, Sjælland (July 1953); Al-lindelille, Sj. (Sept. 1953 and June 1954); Hareskov, Sj. (Sept. 1953, reared from an undetermined toadstool); Skuldelev mose, Sj. (June 1954, reared from a *Polyporus* species); Almindingen, Bornholm (June 1954).

Distribution: *D. phalerata* is widely distributed throughout Europe where it has been found in Spain, Portugal, France (Hadorn *et al.* 1952), Switzerland (Burla 1951), Germany (Duda 1935, Herting 1954, pers. comm.), Russia (Balkaschina *et al.* 1935), the Netherlands (Lever *et al.* 1951), Great Britain (Basden 1952), and Finland (Hackman 1954).

Biological Notes: *D. phalerata* which is regarded as a fungus-feeder is very common all over Denmark.

It occurs most constantly and with highest density inside woods where it quite often is the dominant *Drosophila* species. It seems to avoid open areas and the neighbourhood of human habitations more strongly than *D. transversa* does.

12. *Drosophila limbata* v. Roser 1840.

New to Denmark.

A complete description has been given by Burla (1951).

Occurrence in Denmark: Author's collection: *The Islands*: Allindelille, Sjælland (Sept. 1954, 1 ♀ + 3 ♂♂); Orenæs skov, Falster (Oct. 1953, 1 ♂).

Distribution: *D. limbata* is widely distributed over the European Continent. Duda (1935) records it from Germany, France, Hungary, Austria, and Russia. More recently this species has been caught in Switzerland (Burla 1951), the Netherlands (Lever *et al.* 1951), Northern Spain, France (Hadorn *et al.* 1952), Finland (Hackman 1954), and Western Germany (Herting 1954, pers. comm.).

Biological Notes: *D. limbata* seems everywhere to have very low population densities. Duda designates it "much more seldom than *D. transversa*" and the more recent authors agree to this statement. The five specimens caught by the author were trapped in mixed woods on a bait consisting partly of bananas and partly of fungi naturally occurring in the localities.

13. *Drosophila littoralis* Meigen 1830.

New to Denmark.

Complete descriptions have been given by Burla (1951) in German and by Patterson (1952) in English.

Occurrence in Denmark: Author's collection: *The Islands*: Sønderkov, Als; Tangeskov, Fyn; Engestofte, Lolland; Orenæs skov, Falster; and Tystrup, Sjælland (July 1953); Allindelille, Sj. (Sept. 1953 and June 1954).

Distribution: Widespread in Europe. Recorded

from Portugal, Spain (Hadorn *et al.* 1952), France (Duda 1935, Hadorn *et al.* 1952), Northern Italy (Patterson 1952), Austria (Patterson 1952), Switzerland (Burla 1951), Eastern and Western Germany (Duda 1935, Herting 1954, pers. comm.), the Netherlands (Sobels *et al.* 1954), Scotland (Basden 1954), and Finland (Hackman 1954). A closely related form, *D. imeretensis* Sokolov has been recorded from Georgian SSR by Sokolov (1948). *D. imeretensis* may well be only a geographical strain of *D. littoralis* (Patterson 1952).

Biological Notes: The connection between *D. littoralis* and fresh waters mentioned by Burla (1951) has been confirmed by the author's collectings. The specimens recorded above from Tangeskov and Tystrup were trapped on open lands quite near small ponds surrounded by a few bushes and low trees. The specimens from Engestofte were caught in a forest on the shore of a lake and the Allindelille specimens were trapped mainly around the bogs of the wood. An attempt to find the larvae in decaying wood, especially in *Salix*, in Allindelille proved unsuccessful.

14. *Drosophila testacea* v. Roser 1840.

New to Denmark.

Complete description has been given by Burla (1951).

Occurrence in Denmark: 1) Z. M. collection: Ermelunden, Sjælland (1 ♂, Sept. 1914, Lundbeck). 2) Author's collection: *Jylland*: Munkebjerg (Aug. 1953); Tolne skov, Østerild plantage, and Rold skov (July 1954). *The Islands*: Skovbo, Fyn (July 1953); Allindelille, Sjælland (Sept. 1953 and June 1954); Charlottenlund skov, Sj.; and Frederiksberg, Sj. (June 1953); Almindingen, Bornholm (June 1954).

Distribution: Europe and Eastern North America. European records from Northern Spain (Hadorn *et al.* 1952), France (Duda 1935, Hadorn *et al.* 1952), the Nether-

lands (Sobels *et al.* 1954), Germany (Duda 1935, Herting 1954, pers. comm.), Finland (Hackman 1954), and England (Basden 1952, Collin 1952).

Biological Notes: As found most commonly in other European countries, this species seems to be rather infrequent also in Denmark.

15. *Drosophila funebris* Fabricius 1787.

Complete descriptions have been given by Burla (1951) in German and by Patterson (1943) in English.

Occurrence in Denmark: 1) Previous records: Zetterstedt (1847), the specimens kept in Z. M. labelled Frederiksberg, Stæger, and Lemche (1949). 2) Z. M. collection: A great number of specimens from Copenhagen and the environs of this city. 3) Author's collection: *Jylland*: Hulknøse, Jerslev, Brøndum, Brøns, and Kollund (July 1953); Stilling, Hattenæs, Silkeborg, Linnerup, Munkebjerg, and Ribe (Aug. 1953); Tolne skov, and Rold skov (July 1954). *The Islands*: Sønderkov, Als; Skovbo, Fyn; Aasø, Langeland; and Engestofte storskov, Lolland (July 1953); Allindelille, Sjælland (Sept. 1953 and June 1954); Almindingen, Bornholm (June 1954). Besides more than 400 specimens collected mainly indoors in several localities in the city of Copenhagen.

Distribution: Worldwide. Recorded by all recent investigators in Europe. The only *Drosophila* species so far known from Greenland (Vibe 1950) and Iceland (Nielsen, Ringdahl & Tuxen 1954).

Biological Notes: This species is typically a domestic species in Denmark. Though only about 10 % of the total number of *Drosophila* specimens collected by the author were caught in Copenhagen, more than 75 % of the *D. funebris* specimens collected were taken in this city. However, as demonstrated by the above records the species can very often be met in wild habitats also but there it occurs always with an extremely low density.

16. *Drosophila hydei* Sturtevant 1921.

New to Denmark.

Synonyms: According to Wharton (1944) *Drosophila setosa* Dobzhansky & Pavan 1943 is identical with *D. hydei*. *D. repleta* as described by Duda (1924, 1935) comprises both *D. repleta* and *D. hydei*.

Complete descriptions have been given by Patterson (1943) in English and by Burla (1951) in German.

Occurrence in Denmark: Author's collection: *Jylland*: Østerild plantage, and Rold skov (July 1954); Linne-rup, Silkeborg, and Munkebjerg (Aug. 1953); Kollund (July 1953). *The Islands*: Sønderkov, Als; Tangeskov, Fyn; Faarevejle, Langeland; and Orehoved, Falster (July 1953); Frederiksberg, Sjælland (June 1953).

Distribution: Cosmopolitan. This species has often been mixed up with *D. repleta* by European authors and the records are, therefore, frequently unreliable. So far as is known to the author *D. hydei* has been demonstrated with certainty in the following European countries: Italy (Stone 1942), France (Hadorn *et al.* 1952), Switzerland (Burla 1951), Western Germany (Herting 1954, pers. comm.), the Netherlands (Lever *et al.* 1951), England (Basden 1952), and Scotland (Basden 1954).

Biological Notes: *D. hydei* is a domestic species all over the world. In the author's collectings the species was accordingly met frequently in the neighbourhood of houses. The few records farer away from houses, as for example in Rold skov and Østerild plantage, were all due to a single individual.

17. *Drosophila immigrans* Sturtevant 1921.

New to Denmark.

Complete descriptions have been given by Patterson (1943) in English and by Burla (1951) in German.

Occurrence in Denmark: Author's collection: *Jylland*: Brøns (July 1953); Ribe, Estrup, Vingsted, Munkebjerg, and Stilling (Aug. 1953); Mols Laboratory, Kålo

hestehave, and Rold skov (July 1954). *The Islands*: Skovbo, Fyn; and Sønderkov, Als (July 1953); Allindelille, Sjælland (Sept. 1953 and June 1954); Hareskov, Sj. (Sept. 1953); Frederiksberg, Sj. (June 1954); Almindingen, Bornholm (June 1954).

Distribution: Cosmopolitan. In his investigation of the Swiss fauna Burla (1951) found only very few specimens of *D. immigrans* north of the Alps. He considered these few individuals as recently introduced from the south and unlikely to establish themselves. So he regarded *D. immigrans* as restricted to the Mediterranean region in Europe. It was, therefore, somewhat surprising to find so many as 584 specimens of this species in Denmark, where it was trapped mainly in wild habitats. In Kalø hestehave *D. immigrans* was actually the dominating species in July 1954 and it reached a considerable population density also in Allindelille in June the same year. Herting (1955) has found *D. immigrans* dominant in some woods in Westfalen in spring time. There is then no reason anymore to regard *D. immigrans* as restricted to Southern Europe.

Biological Notes: *D. immigrans* is commonly regarded as a domestic species. It seems, however, as though it is able to establish rather stable and sometimes very dense populations in wild habitats in Denmark.

18. *Drosophila confusa* Stæger 1844.

Synonyms: An examination by the author has shown that *D. vibrissina* Duda 1924 and *D. grischuna* Burla 1950 are invalid synonyms of *D. confusa*. Details on this problem are to be published shortly.

Occurrence in Denmark: 1) The type series in coll. Stæger is from Denmark but no further locality is given on the labels. 2) Author's collection: The species has not been caught in *Jylland*. *The Islands*: Charlottenlund skov, Sjælland (April and May 1953); Allindelille, Sj. (June 1954); Sønderkov, Als (July 1953).

Distribution: *D. confusa* is known from Sweden (Zetterstedt 1847), Austria (Schiner 1864), Russia (Balkaschina *et al.* 1935, recorded as *D. vibrissina*), Spain, France (Hadorn *et al.* 1952, recorded as *D. grischuna*), Switzerland (Burla 1950, the description of *D. grischuna*). Duda (1935) using the synonym *D. vibrissina* recorded the species from Hungary and Eastern Germany. By the courtesy of Prof. W. Hennig, Deutsches Entomologisches Institut, Berlin, the author has been able to examine some of Duda's Hungarian specimens from the type series of *D. vibrissina*. Mr. E. B. Basden, Edinburgh, has kindly informed the author that the species occurs in England and by the courtesy of Mr. R. L. Coe, British Museum, the author has had the opportunity of examining several specimens from England. The species then appears to be widely distributed throughout Europe.

Biological Notes: The Danish specimens were caught exclusively in woods. Probably the species is confined to this type of habitat. *D. confusa* is most probably a fungus-feeder as several specimens in the collection of British Museum had been reared from toadstools.

19. *Drosophila picta* Zetterstedt 1847.

Synonyms: According to Frydenberg (1955) *D. macularis* Villeneuve 1921 is an invalid synonym of this species.

Complete descriptions have been given by Duda (1935, under the name *D. macularis*) in German and by Frydenberg (1955) in English.

Occurrence in Denmark: The Z. M. collection: The type specimen which Zetterstedt loaned from Stæger for the purpose of describing still remains in coll. Stæger. The type is without any doubt from Denmark, probably from Sjælland, but no exact locality is given either by Zetterstedt in the description or by Stæger on the label. Three undetermined specimens reared by Lundbeck from bur-reeds (*Sparganium*) collected on the island Bjørnø in August 1923 turned out to be *D. picta* Zett. Not a single spe-

cimen of this species was caught by the present author.

Distribution: Villeneuve (1921) recorded the species from two localities in France: Blain (Loire inférieure) and Rambouillet. According to Duda (1935) three specimens have been taken by Oldenberg in the environs of Berlin, Germany, and Duda himself has caught the species in Silesia (now Slask, Poland). Recently *D. picta* has been recorded from four localities in the Netherlands (Sobels *et al.* 1954). The species is then widely distributed in Northern Europe though it apparently always occurs with small population densities.

Biological Notes: Both Duda and Sobels *et al.* point out that the *D. picta* caught by them were all taken in localities where reed (*Phragmites communis*) was the dominant plant species. It is an equally striking fact that the species has been reared twice from bur-reed (*Sparganium*). These two plant species undoubtedly indicate the sort of localities where to look for this rare *Drosophila* species.

20. *Drosophila fenestrarum* Fallén 1823.

Complete descriptions have been published by Duda (1935) and Burla (1951) both in German but attention is called also to Collin's (1952) and Basden's (1954) papers which mention the characters in which *D. fenestrarum* differs from the two closely related species *D. forcipata* Collin and *D. acuminata* Collin.

Occurrence in Denmark: 1) Previous Danish records: Stæger (1844) and Zetterstedt (1847); the specimens kept in Z. M. 2) The Z. M. collection: *The Islands*: Geels skov, Sjælland (May 1909, Lundbeck); Ermelunden, Sj. (June 1906, May 1918, Oct. 1923, and May 1924, Lundbeck); Nysted, Lolland (July 1923, Lundbeck). 3) Author's collection: *Jylland*: Mols Laboratory (March 1954). *The Islands*: Fanø (Aug. 1953, 1 ♀); Orenæs, Falster (July 1953, 1 ♂); Allindelille, Sjælland (Sept. 1953, 1 ♂).

Distribution: Portugal (Hadorn *et al.* 1952), Switzerland (Burla 1951), Germany (Duda 1935, Herting, pers.

comm. 1954), the Netherlands (Sobels *et al.* 1954), England (Collin 1952), Scotland (Basden 1954), Sweden (Fälén 1823, Zetterstedt 1847), and Finland (Hackman 1954).

Biological Notes: The small number collected by the author indicates rather the inefficiency of the banana bait method for this species than a low population density. It is the author's impression that this species has a preference for habitats with less dense vegetation than that of woods.

21. *Drosophila forcipata* Collin 1952.

New to Denmark.

Complete description has been given by Collin (1952).

Occurrence in Denmark: 1) The Z. M. collection: Without locality among the specimens of *D. fenestrarum* in coll. Stæger. 2) Author's collection: Only a single individual (♂) of this species has been recognized among the *Fenestrarum* group specimens collected. It was caught at "Gyveldal" in the territory of the Mols Laboratory April 1, 1954. The separation from *D. fenestrarum* was based on the structure of the genitalia.

Distribution: This species which has only recently been separated from *D. fenestrarum* is recorded from Great Britain by Collin (1952). It is quite common in Westfalen, Germany (Herting 1955).

Comparison of the Danish Fauna with the Faunas of Other European Countries.

The Danish *Drosophila* species have been systematically arranged in table 5 in accordance with the modern taxonomy of the genus initiated by Sturtevant (1942). It appears from the table that four of the existing nine subgenera of the genus occur in Denmark. To this may be added the *Fenestrarum* group which undoubtedly constitutes a new subgenus.

In Denmark as elsewhere more species belong to the subgenus *Drosophila* than to any other subgenus. There are ten species of the subgenus *Drosophila* in Denmark, eight of these belong to known species groups but *D. confusa* and *D. picta* for the time being remain unassigned to a species group. The subgenus *Sophophora* has in Denmark two species groups, the richest of which is the *Obscura* group that is represented by five species. The *Melanogaster* group is represented by two cosmopolitan species only. The subgenera *Pholadoris* and *Dorsilopha* have one Danish species each.

Disregarding the domestic species *D. busckii*, *D. melanogaster*, *D. simulans*, *D. funebris*, *D. hydei*, and *D. immigrans*, which are all cosmopolitan, the Danish fauna is characterized by the dominance, both in number of species and in number of specimens, by the *Obscura* and the *Quinaria* groups. Another zoogeographically important trait of the fauna is the presence of two species of the *Fenestrarum* group which is unknown outside Europe. Of minor interest in the fauna are the subgenus *Pholadoris* and the *Virilis* and *Testacea* groups and the unassigned species *D. confusa* and *D. picta*.

Patterson and Stone (1952) estimated a total of 89 known species of *Drosophila* for the Palearctic region. This is a revision of the estimate of 92 species by Patterson and Wheeler (1949) who published a complete list of the known species. The *Drosophila* fauna of the Palearctic region is known mainly from investigations in Europe and in Eastern Asia (Japan and China). The fauna in between these two parts of the region is almost unknown. Europe and Eastern Asia have very few indigenous species in common. Europe is dominated by the species of the *Obscura* and the *Quinaria* groups which are very rare in Eastern Asia. But Eastern Asia is dominated by many indigenous species of the *Melanogaster* and the *Immigrans* groups which in Europe are repre-

sented only by domestic and cosmopolitan species. Furthermore the European fauna differs from that of Eastern Asia by the occurrence of the subgenus *Pholadoris*, of the *Fenestrarum* group, and of the species *D. confusa* and *D. picta*. Eastern Asia on the other hand has species of the *Robusta* and the *Bizonata* groups which do not occur in Europe at all.

Due to this clear difference in the composition of species in the two known parts of the Palearctic region, it seems practical to treat the two faunas separately, at least until more knowledge of the fauna of the central parts of the region is available.

In the following we shall therefore concentrate on the European fauna only in order to place the Danish fauna on a proper background. Patterson and Wheeler's list of the European species contains many names which are regarded as synonyms by European dipterists. And since their list was published new species have been added to the fauna and other synonyms have been revealed. A better estimate of the total number of European species of *Drosophila* can be obtained by starting with Duda's valuable monograph (1935) and correcting its records in accordance with later literature. Table 6 shows this revision from which it appears that a total of 43 species of *Drosophila* is known from Europe. Seven of these species have been recorded by Duda only (some of Duda's identifications of Finnish species have been confirmed by Hackman 1954).

Table 7 lists the remaining 36 species and shows their occurrence in the eight European countries recently investigated. The table also shows the total numbers of species known from these countries. These numbers vary from sixteen in Portugal to twenty-nine in Switzerland. The differences are due partly to real differences in the number of species in these countries and partly to differences in collecting activities. The latter plays a greater

rôle with the domestic species and with accidentally introduced species. This is because certain investigators (for example in France, Spain, and Portugal) have concentrated their collecting activity only on natural habitats. But others (for example in Scotland and in the Netherlands) have also collected in localities (such as fruit-stores near wharves) where rare domestic species and accidentally introduced foreign species are apt to be found. If we therefore from the numbers given in table 7 subtract a) the six common domestic species, *D. melanogaster*, *D. funebris*, *D. busckii*, *D. immigrans*, *D. simulans*, and *D. hydei* (which all occur in Denmark), b) the domestic *D. repleta* which in Europe is restricted to the southern parts, and c) the three accidentally introduced species, *D. buzzatii*, *D. ananassae*, and *D. polychaeta*, we are left with the numbers of indigenous species given in table 8.

It can be seen from this table that a total of twenty-six indigenous species of *Drosophila* is known from the whole of Europe. These species are marked by an asterisk in table 7.

As regards the number of species in each country there can be little doubt that the numbers given for Portugal, Spain, and France are less complete than those given for the other five countries in the table. This is a consequence of the fact that the collectings in these three countries were made in one month only and that fewer flies were collected than in the other countries.

The numbers of species in the five other countries agree well with the common experience from other parts of the world that the number of species decreases with increasing latitude. The Danish fauna occupies an intermediary position between the richer German and Dutch faunas (18 and 19 species respectively) and the poorer Scotch fauna (12 species), suggesting that the number of species found in Denmark is a reliable estimate. Future investigations will probably only reveal a few more indigenous species in Denmark.

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Table 1. The *Drosophila* Species Hitherto Recorded From Denmark.

Recorded as:	Recorded by:	Present name:
1. <i>D. confusa</i> Stæger 1844	Stæger 1844 Zetterstedt 1847	<i>D. confusa</i> Stæger
2. <i>D. fenestrarum</i> Fallén 1823	Stæger 1844 Zetterstedt 1847	<i>D. fenestrarum</i> Fallén
3. <i>D. obscura</i> Fallén 1823	Zetterstedt 1847	<i>D. obscura</i> Fallén s.str.
4. <i>D. spurca</i> Zetterstedt 1847	Zetterstedt 1847	<i>D. tristis</i> Fallén
5. <i>D. transversa</i> Fallén 1823	Zetterstedt 1847	<i>D. transversa</i> Fallén
6. <i>D. transversa</i> Fallén (= <i>phalerata</i> Meigen 1830)	Zetterstedt 1847	<i>D. phalerata</i> Meigen
7. <i>D. funebris</i> Fabricius 1787	Zetterstedt 1847 Lemche 1949	<i>D. funebris</i> Fabricius
8. <i>D. picta</i> Zetterstedt 1847	Zetterstedt 1847 Frydenberg 1955	<i>D. picta</i> Zetterstedt
9. <i>D. busckii</i> Coquillett 1901	Lemche 1949	<i>D. busckii</i> Coquillett
10. <i>D. graminum</i> Fallén 1823	Zetterstedt 1847	<i>Scaptomyza graminum</i> Fallén <i>Parascaptomyza disticha</i> Duda
11. <i>D. flava</i> Fallén 1823	Zetterstedt 1847	?

Table 2. The Numbers of *Drosophila* Collected from Denmark April 1953 to August 1954.

	♀♀	♂♂	Total		♀♀	♂♂	Total
1. <i>D. deflexa</i> *	50	54	104	11. <i>D. phalerata</i>	1142	2086	3228
2. <i>D. busckii</i>	6	7	13	12. <i>D. limbata</i> *	1	4	5
3. <i>D. melanogaster</i>	548	520	1068	13. <i>D. littoralis</i> *	36	35	71
4. <i>D. simulans</i> *	1	3	4	14. <i>D. testacea</i> *	6	10	16
<i>mel. and sim.</i>	16	—	16	15. <i>D. funebris</i>	271	279	550
5. <i>D. obscura</i>	840	1204	2044	16. <i>D. hydei</i> *	11	9	20
6. <i>D. silvestris</i> *	132	162	294	17. <i>D. immigrans</i> *	318	266	584
7. <i>D. tristis</i>	7	9	16	18. <i>D. confusa</i>	7	14	21
8. <i>D. ambigua</i> *	130	204	334	19. <i>D. picta</i>	0	0	0
9. <i>D. subobscura</i> *	1923	5447	7370	20. <i>D. fenestrarum</i>	17	27	44
10. <i>D. transversa</i>	61	58	119	21. <i>D. forcipata</i> *	0	1	1
*: New to Denmark.				Total :	5523	10399	15922

Table 3. The Relative Population Densities in the Five Types of Habitats.

Species	Woods	Edge of Woods	Tree-Groups	Domestic Habitats Out-of-Doors	Indoor Habitats
<i>D. deflexa</i>	0,4	0,9	0,9	—	—
<i>D. busckii</i>	0,0	0,2	—	0,2	—
<i>D. melanogaster</i>	0,2	1,2	6,4	34,2	25,5
<i>D. simulans</i>	—	0,0	—	0,2	—
<i>D. obscura</i>	14,5	11,4	2,0	18,7	—
<i>D. silvestris</i>	2,8	1,3	0,1	—	—
<i>D. tristis</i>	0,1	0,1	0,1	—	—
<i>D. ambigua</i>	—	—	—	17,8	—
<i>D. subobscura</i>	50,5	56,0	57,3	22,3	3,8
<i>D. transversa</i>	0,4	0,6	5,8	0,2	—
<i>D. phalerata</i>	28,0	16,0	19,4	0,2	—
<i>D. limbata</i>	0,1	—	—	—	—
<i>D. littoralis</i>	0,3	1,0	0,1	0,5	—
<i>D. testacea</i>	0,2	0,0	—	0,1	—
<i>D. funebris</i>	0,4	0,5	0,8	5,2	70,6
<i>D. hydei</i>	0,1	0,1	0,8	0,2	—
<i>D. immigrans</i>	2,0	10,4	1,2	0,5	0,2
<i>D. confusa</i>	0,2	0,2	—	—	—
<i>D. picta</i>	—	—	—	—	—
<i>D. fenestrarum</i>	0,0	0,0	4,8	—	—
<i>D. forcipata</i>	—	—	0,1	—	—
Total number of specimens collected in the habitat.....	8583	3751	846	1877	635

0,0 means that the species has been caught in the habitat but that it occurred with a density less than 0,05%.

— means that the species has not been caught in the habitat at all.

Table 4. The Percentages-Occurrence in the Five Types of Habitats.

Species	Woods	Edge of Woods	Tree-Groups	Domestic Habitats Out-of-Doors	Indoor Habitats
<i>D. deflexa</i>	29	23	15	—	—
<i>D. busckii</i>	7	10	—	5	—
<i>D. melanogaster</i>	25	43	23	80	55
<i>D. simulans</i>	—	3	—	5	—
<i>D. obscura</i>	89	83	38	65	—
<i>D. silvestris</i>	57	27	8	—	—
<i>D. tristis</i>	18	10	8	—	—
<i>D. ambigua</i>	—	—	—	60	—
<i>D. subobscura</i>	93	97	100	75	9
<i>D. transversa</i>	39	37	77	10	—
<i>D. phalerata</i>	86	63	38	5	—
<i>D. limbata</i>	7	—	—	—	—
<i>D. littoralis</i>	25	10	8	5	—
<i>D. testacea</i>	36	3	—	5	—
<i>D. funebris</i>	43	33	8	70	55
<i>D. hydei</i>	14	10	15	15	—
<i>D. immigrans</i>	39	27	23	15	9
<i>D. confusa</i>	11	13	—	—	—
<i>D. picta</i>	—	—	—	—	—
<i>D. fenestrarum</i>	7	3	23	—	—
<i>D. forcipata</i>	—	—	8	—	—
Total number of localities of each ecological type	28	30	13	20	11

Table 5. The Twenty-One Danish *Drosophila* Species Systematically Arranged.

Subgenus	Species Group	Species
<i>Pholadoris</i>		
Sturtevant 1942		<i>D. deflexa</i> Duda 1924
<i>Dorsilopha</i>		
Sturtevant 1942		<i>D. busckii</i> Coquillett 1901
<i>Sophophora</i>		
Sturtevant 1939. <i>Melanogaster</i> group.		<i>D. melanogaster</i> Meigen 1830 <i>D. simulans</i> Sturtevant 1919
	<i>Obscura</i> group	<i>D. obscura</i> Fallén 1823 <i>D. silvestris</i> Basden 1954 <i>D. tristis</i> Fallén 1823 <i>D. ambigua</i> Pomini 1940 <i>D. subobscura</i> Collin 1936

(Table 5 continued)

Drosophila

Sturtevant 1939...	<i>Quinaria</i> group		<i>D. transversa</i>	Fallén 1823
			<i>D. phalerata</i>	Meigen 1830
			<i>D. limbata</i>	v. Roser 1840
	<i>Virilis</i> group		<i>D. littoralis</i>	Meigen 1860
	<i>Testacea</i> group		<i>D. testacea</i>	v. Roser 1840
	<i>Funebris</i> group		<i>D. funebris</i>	Fabricius 1787
	<i>Repleta</i> group		<i>D. hydei</i>	Sturtevant 1921
	<i>Immigrans</i> group	...	<i>D. immigrans</i>	Sturtevant 1921
	Unassigned species..		<i>D. confusa</i>	Stæger 1844
			<i>D. picta</i>	Zetterstedt 1847
Unassigned group	<i>Fenestrarum</i> group..		<i>D. fenestrarum</i>	Fallén 1823
			<i>D. forcipata</i>	Collin 1952

Table 6. The Number of *Drosophila* Species Known from Europe.

Duda (1935) recorded		28
to this has been added		
by Collin (1936).....	<i>D. subobscura</i> n. sp.....	1
by Pomini (1940)	<i>D. tristis</i> Fall.	
	<i>D. ambigua</i> n. sp.	
	<i>D. bifasciata</i> n. sp.....	3
by Buzzati-Traverso (1948)..	<i>D. buzzatii</i> Wheeler.....	1
by Burla (1948)	<i>D. hydei</i> Sturtevant	
	<i>D. alpina</i> n. sp.	
	<i>D. simulans</i> Sturtevant	
	<i>D. helvetica</i> n. sp.....	4
by Burla & Gloor (1952)	<i>D. tsigana</i> n. sp.....	1
by Collin (1952).....	<i>D. forcipata</i> n. sp.	
	<i>D. acuminata</i> n. sp.....	2
by Sobels <i>et al.</i> (1954).....	<i>D. polychaeta</i> Patterson & Wheeler.	1
by Basden (1954).....	<i>D. ananassae</i> Doleschall	
	<i>D. silvestris</i> n. sp.....	2
Total number of European <i>Drosophila</i> species		43

Table 7. List of the Thirty-Six Species of *Drosophila* Recently Found in Europe. Their Occurrence in Eight Countries is Indicated.

	Portugal	Spain	France	Switzerland	Western Germany	The Netherlands	Scotland	Denmark
<i>D. rufifrons</i> *	+	+	+	+	+	+	0	0
<i>D. deflexa</i> *	0	+	+	+	+	+	+	+
<i>D. busckii</i>	+	+	+	+	+	+	+	+
<i>D. melanogaster</i>	+	+	+	+	+	+	+	+
<i>D. simulans</i>	+	+	+	+	0	+	+	+
<i>D. ananassae</i>	0	0	0	0	0	0	+	0
<i>D. obscura</i> *	+	+	+	+	+	+	+	+
<i>D. tristis</i> *	0	+	+	+	+	+	+	+
<i>D. bifasciata</i> *	+	+	+	+	0	+	0	0
<i>D. silvestris</i> *	0	0	0	+	+	+	+	+
<i>D. ambigua</i> *	+	+	+	+	0	+	+	+
<i>D. subobscura</i> *	+	+	+	+	+	+	+	+
<i>D. helvetica</i> *	0	+	+	+	+	+	0	0
<i>D. alpina</i> *	0	0	0	+	0	0	0	0
<i>D. transversa</i> *	0	+	+	+	+	+	+	+
<i>D. phalerata</i> *	+	+	+	+	+	+	+	+
<i>D. limbata</i> *	0	+	+	+	+	+	0	+
<i>D. kuntzei</i> *	0	+	+	+	+	+	0	0
<i>D. littoralis</i> *	0	+	+	+	+	+	+	+
<i>D. unimaculata</i> *	0	0	0	+	+	0	0	0
<i>D. testacea</i> *	0	+	+	+	+	+	0	+
<i>D. funebris</i>	+	+	+	+	+	+	+	+
<i>D. repleta</i>	+	0	0	+	+	0	0	0
<i>D. hydei</i>	0	0	+	+	+	+	+	+
<i>D. buzzatii</i>	+	0	0	0	0	0	0	0
<i>D. tsigana</i> *	+	0	+	0	0	0	0	0
<i>D. polychaeta</i>	0	0	0	0	0	+	+	0
<i>D. immigrans</i>	0	+	+	+	+	+	+	+
<i>D. picta</i> *	0	0	0	0	0	+	0	+
<i>D. confusa</i> *	0	+	+	+	0	0	0	+
<i>D. fenestrarum</i> *	+	0	0	+	+	+	+	+
<i>D. forcipata</i> *	0	0	0	0	+	0	+	+
<i>D. acuminata</i> *	0	0	0	0	0	0	0	0
<i>D. histrio</i> *	0	+	+	+	+	+	0	0
<i>D. cameraria</i> *	+	+	+	+	+	+	+	0
<i>D. nigrosparsa</i> *	0	0	0	+	0	0	0	0
Total number of species.	16	22	24	29	24	26	19	21

+: known from the country. 0: not recorded from the country.

* Species marked by an asterisk are regarded indigenous in Europe.

Table 8. The Total Number of Indigenous *Drosophila* Species
Known from Eight European Countries
Recently Investigated.

Portugal	10
Spain	17
France	18
Switzerland	22
Germany	18
The Netherlands	19
Denmark	15
Scotland	12
Europe	26

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The Synonymy, Relationship, and Distribution of *Drosophila confusa* Stæger 1844 (Dipt.)

by

Ove Frydenberg.

Institute of Genetics, University of Copenhagen.

In 1844 Stæger described a rather large, yellow species of *Drosophila* naming it *Drosophila confusa*. Stæger's description was written in Danish and has only been read by a few foreign dipterists, who mostly had their knowledge of *Drosophila confusa* from Zetterstedt's redescription in Latin (1847). Stæger chose the name *confusa* for his new species because he believed that it was identical with some specimens of *Drosophila* which had been wrongly identified as *Drosophila fenestrarum* Fallén by Meigen (1830). Furthermore Stæger held the opinion that his *D. confusa* was identical with the light variety of *D. funebris* Fabr. which Fallén had described in 1823. Whether the yellow species of *Drosophila* erroneously called *D. fenestrarum* by Meigen was actually Stæger's *D. confusa* and whether the latter is the same as Fallén's light variety of *D. funebris* Fabr. may perhaps never be settled and it is indeed a problem of minor interest.

Shortly after the publication of Stæger's paper Zetterstedt (1847) recorded *Drosophila confusa* from Sweden and in 1864 it was mentioned by Schiner from Austria. Later on, however, the name *D. confusa* became uncommon in the literature probably due to doubt about its identity. In the many important recent papers on the European fauna of *Drosophila* the name does not occur at all.

So far as the author knows, the most recent occurrence of the name in the taxonomic literature dealing

with the European species of *Drosophila* is in Duda's monograph from 1935. Duda accepted Stæger's point of view that *D. confusa* was identical with Fallén's variety of *D. funebris* Fabr. But contrary to Stæger, Duda did not regard it as a species different from *D. funebris* but merely as "young unhardened specimens of *funebris*".

The present author has had the opportunity of examining Stæger's collection of *Drosophilidae* which now belongs to the Zoological Museum of Copenhagen. This collection contains a series of specimens of *Drosophila* labelled *Drosophila confusa*. As was Stæger's custom, the series was not designated as a type series. It is, however, beyond reasonable doubt that the series really are the specimens on which Stæger based his description of *Drosophila confusa*. Thus it has been possible to determine the identity of this species.

Examination of the series showed that Stæger's *D. confusa* is clearly different from *D. funebris* Fabr. The two species are, however, of almost equal size and the shapes of the wings are very much alike, a fact to which Fallén paid much attention. Nevertheless, no modern observer would doubt that he was dealing with two different species. Firstly *D. confusa* is what in recent literature is called a yellow species whereas *D. funebris* is reddish brown. Secondly it may be mentioned that nothing like the curved teeth which are so conspicuous on the male anal plates of *D. funebris* occurs in *D. confusa*. On the basis of these two facts it is impossible to accept Duda's statement that the flies which Stæger called *D. confusa* were but young specimens of *D. funebris*. Furthermore Stæger explicitly characterized *D. confusa* as a forest species taken mainly on tree trunks in woods whereas *D. funebris* is a domestic species which is rather strictly confined to human habitation.

To the author Stæger's series showed a striking resemblance to *Drosophila grischuna* Burla 1950 which the

author had seen in Dr. Hans Burla's collection in Zürich. Stæger's specimens of *D. confusa* were therefore compared to Burla's description of *D. grischuna* and it was found that they agreed with this description on all points except two. The major disagreement was between the 4-c-indices, that of *D. grischuna* was stated to be 1.4 whereas that of *D. confusa* was about 0.7. The other and minor disagreement was in the colour pattern of the fifth and sixth tergites in the males. According to Burla's description *D. grischuna* has a dark marginal band on each of these two tergites whereas the specimens in Stæger's series show a variation from rather clearcut bands to almost completely yellow tergites.

At the author's request Dr. Burla kindly made new measurements of the 4-c-index in the type and syntypes of *D. grischuna* and found it to be about 0.7. The value 1.4 given in the original description is due to an error. Dr. Burla also kindly supplied the author with syntypes of *D. grischuna* for comparison with Stæger's *D. confusa*. This comparison disclosed no essential differences between the two species. The author was therefore of the opinion that they were identical, the continuous variation in the pattern of the two last tergites in males being of no consequence.

In order to test this statement Dr. Burla offered to examine the male genitalia of *D. confusa* and he has generously provided the author with the drawings shown in figure 2 and 3 of the genitalia of one of the specimens from Stæger's series. The preparations on which these drawings are based as well as the rest of the specimen are in the possession of the Zoological Museum of Copenhagen. This animal has now been chosen as a lectotype for *Drosophila confusa* Stæger 1844. In a covering letter Dr. Burla wrote that "Männchen von *grischuna* aus meiner Sammlung sind bis auf unbedeutende individuelle Abweichungen mit den Verhältnissen identisch, wie sie

in den Abbildungen zu sehen sind". Thus it has been demonstrated that *Drosophila grischuna* is but a re-description of *Drosophila confusa* Stæger.

The identity of *D. confusa* with *D. grischuna* having been proved, it became once more of importance to examine the difference between *D. confusa* = *D. grischuna* and *D. vibrissina* Duda 1924. Burla (1950) discussed the relation between *D. vibrissina* and his *D. grischuna* and reached the conclusion that they were two separate species. As *D. vibrissina* had been found only in Russia, Hungary, and Bohemia, Burla assumed that this species was confined to Eastern Europe only. This assumption was, however, invalidated when Basden found *D. vibrissina* in England (Basden *in litt.*). This information made it especially urgent to check once more the relationship between *D. confusa* = *D. grischuna* and *D. vibrissina* Duda.

Burla in comparing his *D. grischuna* with Duda's description of *D. vibrissina* from 1935 gave the following list of differences between the two species.

<i>D. vibrissina</i>	<i>D. grischuna</i>
1) Ocellar triangle lighter yellow than frons.	Ocellar triangle between the ocelli brown.
2) Middle orbital bristle very near to lower orbital.	Middle orbital relatively far behind the lower orbital.
3) Fifth and sixth tergites in ♀♀ completely yellow.	Fifth and sixth tergites with dark posterior bands.
4) Posterior margin of sixth tergite in ♂♂ with long black and strong bristles. In ♀♀ with fewer bristles.	The bristles on the posterior margin of sixth tergite in ♂♂ are not essentially different from those of the fifth tergite. There is no evident difference between ♂♂ and ♀♀ in this respect.
5) Ovipositor with basal dorsal indentation.	No indentation.
6) Second femur ventrally with a long thin bristle.	No such bristle.

The characteristics given above for *D. vibrissina* originate from Duda's description from 1935 which is more detailed than the original description from 1924.

In order to test the validity of these differences the author asked for the type of *D. vibrissina* Duda in "Deutsches Entomologisches Institut", Berlin. Prof. Dr. W. Hennig kindly send the author five specimens of *D. vibrissina* from Duda's collection. Two of these animals, a male and a female, were mounted together and labelled "Typus". It was not evident whether the male or the female was the type and they may therefore be regarded as syntypes. Besides the label which designated them as types they were labelled: "Mehadia 15. 7. 12, *D. vibrissina* n. nom. f. *histrion* Old. DET. Dr. O. Duda", "Coll. Oldenberg", and "Dtsch. Entomol. Institut Berlin".

Examination of the syntypes of *D. vibrissina* and comparison with Stæger's syntypes of *D. confusa* and with specimens of that species collected by the author revealed the following:

1) The ocellar triangle in *D. vibrissina* is not lighter than the frons. In the ♀ syntype it has almost the same colour as the frons whereas in the ♂ syntype it is brown and evidently darker than the frons.

2) The middle orbital bristle in *D. vibrissina* does not stand very near to the lower orbital. The position of the three orbitals is exactly the same as in *D. confusa*: the middle orbital stands slightly nearer to the upper orbital than it does to the lower orbital. It is worth mentioning that Duda in 1924 wrote that the position of the orbitals was normal. It was not before 1935 that he described the middle orbital as being very near to the lower.

3) The colour patterns on the fifth and sixth tergites in the ♀ syntypes of *D. vibrissina* are very weakly developed though it can be seen without doubt on the anterior of these two tergites. The colour pattern falls, however, well within the range of variation found in *D. confusa*. This variation is somewhat greater than it appeared from Burla's material. Again on this point there is a dif-

ference between Duda's two descriptions of *D. vibrissina*. In 1924 he described only the sixth tergite as definitely without posterior bands whereas he described 2nd—5th tergites as "dull yellow, bandless or with...black often very indistinct posterior bands" indicating a great variation.

4) There is no essential difference between the number and size of the bristles on the posterior margin of the sixth and fifth tergites in the ♂ syntype of *D. vibrissina*. Neither could any difference be seen between the ♂ and the ♀ syntypes in this respect.

5) The ♀ syntype of *D. vibrissina* shows a rather strong indentation in the ovipositor. This is, however, at least partly an artificial phenomenon due to shrinkage. All degrees of indentation can be seen among the specimens of Stæger's type series. Burla probably missed this "character" in his description of *D. grischuna* because he worked with relatively fresh material.

6) The syntypes of *D. confusa* — as well as the type and syntypes of *D. grischuna* (according to Dr. Burla) — possess the long thin bristle on the second femur mentioned by Duda. It is, however, often very difficult to see.

It appears that Burla (1950) was mistaken in supposing that there were differences between his *D. grischuna* and Duda's *D. vibrissina*. On the basis of the detailed comparison of *D. vibrissina* to the type series of *D. confusa* the author does not hesitate to consider that the two species are identical. Mr. E. B. Basden, of the Institute of Animal Genetics, Edinburgh, has kindly examined two specimens from Stæger's type series and the two syntypes of *D. vibrissina*, and has stated that "there is no doubt at all that *D. vibrissina* Duda is the same species as *confusa* Stæger. in Zett." (*in litt.*, May 4th, 1955).

Thus the following identity has been demonstrated:
Drosophila confusa Stæger 1844 = *D. vibrissina* Duda 1924
 = *D. grischuna* Burla 1950.

Below a full description of *D. confusa* is given.

***Drosophila confusa* Stæger 1844.**

The type series is kept in Coll. Stæger in the Zoological Museum of Copenhagen. A male specimen from the type series is designated *lectotypus* by me. The tip of the abdomen of this specimen has been removed in order to make a microscope preparation of the genitalia.

External Morphology of the Imagines: ♀, ♂: Antennae yellow, arista with 7—10 branches, 9 being the most frequent number. In this case occur, besides the end fork, 5 long bristles above and 2 below the stem. Frons mat yellow, broadest posteriorly. The distance between the eyeborders measured at the limit between the frons and the face is approximately one half the width of the whole head measured at the same level. The orbital stripes are paler yellow than the frons. Anteriorly they diverge strongly from the eye margins so that the ends are separated from the eyes by a distance equal the width of the stripes. Middle orbital bristle is about one third the length of the lower orbital and about one fourth the length of the upper orbital. Middle orbital is placed slightly nearer to the upper than to the lower orbital. The limit of the ocellar triangle is well defined; between the ocelli the triangle is light brown, slightly shiny. Face yellow, slightly darker than the frons and somewhat shiny. Carina well developed, nose-shaped, paler than the face. Cheeks pale yellow, their greatest width about one fourth the greatest diameter of the eyes. Eyes dark red with a short sparse yellowish pile.

Mesonotum, scutellum, and pleura yellow, the dorsum often slightly darker than the other parts and somewhat shiny at least centrally. Pleura and lateral parts of mesonotum dusted white. Acrostichal hairs in 8 somewhat irregular rows. Two pairs of dorsocentral bristles, the anterior about half the length of the posterior. The two pairs

of scutellar bristles are equally long; anterior scutellars parallel or a little diverging. Two strong humeral bristles of almost equal length, if any difference is visible, the upper is the longer. Sterno-index: 0.6—0.8. Legs yellow, except last joint of tarsi which is brownish. First and second femora bear ventrally at their base a very fine long hair, which is almost as long as the width of the femora. All three pairs of tibiae with very fine and indefinite preapicals. First pair of tibiae without apical bristle. Second and third pairs of tibiae with a strong apical bristle, especially that of second tibiae.

Wings yellowish, veins yellowish brown. The strong costal fringe covers from two fifths to one half of the third costal segment. Second costal break with two almost equally long bristles, the upper of which is the stronger. Costal-index: 3.5; 4th-vein-index: 1.5; 4-c-index: 0.7; 5-x-index: 1.2.

Abdomen yellow, slightly shiny. First tergite may be completely yellow or may show some darkening along the posterior margin. Second to fifth tergites with broad brown posterior bands which often are less distinct on second and fifth tergites than on third and fourth tergites. The posterior bands are centrally interrupted both in males and in females and in males they usually do not reach the side margins of the tergites which are left yellow. In the females the bands on second to fifth tergites are more or less clearly interrupted also laterally but the most lateral section of the bands reaches the side margin of the tergite. The sixth tergite in females is most often entirely yellow but it may occasionally show traces of a darker band. The small hidden seventh tergite in females is entirely dark. In males the sixth and seventh tergites are dark brown. The colour patterns of the tergites vary considerably and a broad variation may be seen in a sample of specimens from one locality. The margins of the tergites bear long marginal hairs of about equal size on all tergites.

Body length (living specimens): 4—5 mm, the female being the larger.

Wing length: 3.7—4.5 mm.

Ovipositor is normally strongly exerted. Rather slender, long triangular, narrowly rounded at apex. Distal half and the whole ventral edge shiny brown chitinised; basal half, especially dorsally, less strongly chitinised. Sometimes the ovipositor shows dorsally an indentation which is due to shrinkage of the softer parts and which is most common and most evident in dried specimens. 25—30 small teeth along the edge (see figure 1). On the side of the ovipositor a row of 4—5 somewhat longer but finer teeth or hairs. Ventrally with a single long hair (on each side) which projects from the inner side of the edge.

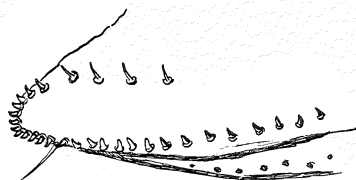


Figure 1: Ovipositor of *Drosophila confusa*, seen from the side and somewhat from below.

Male Genitalia are shown in figures 2 and 3. They have been considered from a comparative point of view by Nater (1953). In the following account the English terminology of Breuer & Pavan (1950) is used. The genital arch is drawn out ventrally in a pointed toe which possesses many long black bristles. The anal plates are completely free of the genital arch and their ventral corners are somewhat bluntly pointed. The forceps is halfmoon-shaped and bears a comb of about 8 primary teeth. Ventrally to the comb stands a cluster of about 14 strong teeth. The penis is almost three times as long as the apodeme. The arch of the hypandrium is rather slender, halfmoon-shaped. The shells of the hypandrium have each a strong hypandrial bristle.

Internal Characters of Imagines: Testes with three dark orange-coloured inner gyres and two and a half thicker orange-coloured outer gyres. The ejaculatory bulb without diverticulum.

Spermathecae small, yellowish brown. Ventral receptacle with three larger coils and a bulb of thinner coils.

The posterior Malpighian tubes fused, forming a loop around the gut.

The eggs have four thin filaments.

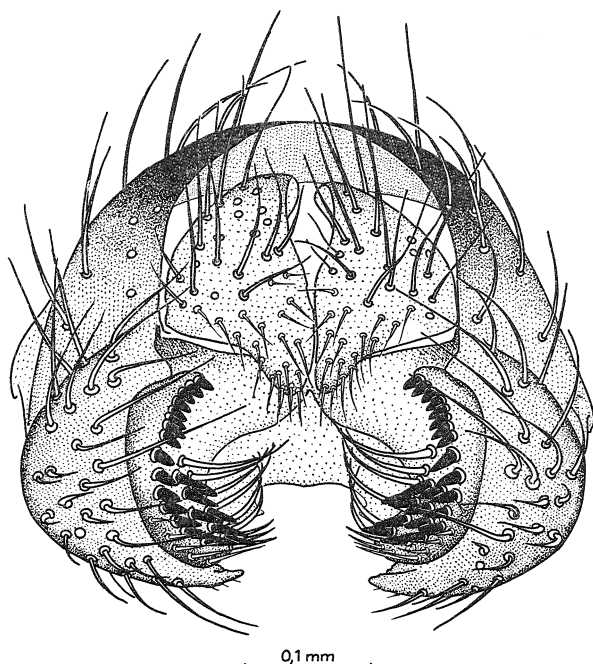


Figure 2: The dorso-terminal parts of the male genitalia of the lectotype of *D. confusa*: Genital arch, anal plates, forceps, and genital bridge. Preparation and drawing by Dr. H. Burla.

The puparium is brown. The length of the anterior spiracles is about one fourth the length of the puparium. The anterior spiracles bear each 16—18 branches.

Chromosomes: According to Burla (1950) the metaphase plate has five pairs of rods, one of which is the sex chromosomes, and a single pair of dots. The salivary gland chromosomes are made up of one very short and five very long arms.

Relationship: The following complex of characters indicates that *D. confusa* without any doubt belongs to the subgenus *Drosophila*: 1) four egg filaments, 2) long and coiled ventral receptacle, 3) spiral testes, 4) fused

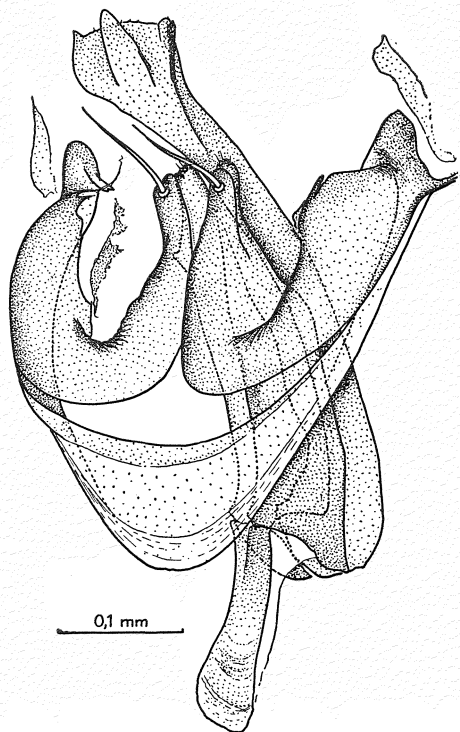


Figure 3: The ventral parts of the male genitalia of the lectotype of *D. confusa*: Penis, apodeme, arch of hypandrium, and shells of hypandrium. Preparation and drawing by Dr. H. Burla.

posterior Malpighian tubes, 5) centrally interrupted posterior bands on the tergites, 6) high sterno-index, and 7) long anterior spiracles on the puparium.

Inside the subgenus *Drosophila* it is, however, very difficult to fit the species into any of the existing species groups.

Nater (1953) has suggested a relationship with *D. pallida* Zett. based mainly on the ventral parts of the genitalia. Also the dorso-terminal genitalia of these two species have something in common, the toe of the genital arch is very pointed in both species and the dentation of the forceps of the two species may perhaps be homologous. On the other hand, *D. confusa* has no trace of the tooth-like bristles on the anal plates such as occur in *D. pallida*. Nater called attention also to the similarity of the anal plates of *D. confusa* to those of *D. emarginata* which, however, belongs to the *Saltans* group of the subgenus *Sophophora*.

The genitalia of *D. confusa* resemble most those described by Malogolowkin (1953) for the *Quinaria*, the *Guttifera*, the *Tripunctata*, the *Cardini*, the *Guarani*, and the *Calloptera* groups which constitute a cluster of closely related species groups in the subgenus *Drosophila*. Though it is not possible to fit *D. confusa* into any of these groups as they are defined today, it is most probable that *D. confusa* belongs to the same section of the subgenus *Drosophila*.

Distribution: *Drosophila confusa* is widespread over Europe where it is known from the following countries: Denmark (Stæger 1844, Zetterstedt 1847, Frydenberg 1956), Sweden (Zetterstedt 1847), Austria (Schiner 1864), Switzerland (Burla 1950, *D. grischuna*), Spain, France (Hadorn *et al.* 1951, *D. grischuna*), Hungary, Eastern Germany (Duda 1935, *D. vibrissina*), and England (Basden *in litt.*, several specimens in British Museum labelled *D. vibrissina*, examined by the author).

Biological Notes: In Denmark *D. confusa* has only been collected in woods. Several specimens in the collection of British Museum appeared to have been reared from fungi. Thus the species may be regarded as a fungus-feeder.

Synonyms: *D. vibrissina* Duda 1924 and *D. grischuna* Burla 1950. The former synonym has been used by Duda also in his monograph of 1935 and by Patterson & Stone (1952). The "*D. vibrissina*" treated by Balkaschina & Romaschoff (1935) and by Frolowa (1926) is most probably quite another species. The synonym *D. grischuna* Burla has been used by Hadorn *et al.* (1952) and by Nater (1953). The proper name *D. confusa* has been used erroneously quite often. This seems to be the case in the papers by Chatton (1912), Chatton & Alilaire (1908), Chatton & Léger (1911 a and b), and Delcourt (1909).

Acknowledgements.

The author is very much in debt to Dr. H. Burla, of Zürich University, and to Mr. E. B. Basden, of the Institute of Animal Genetics, Edinburgh, for their kind collaboration and advise. Prof. Dr. W. Hennig provided the author with the syntypes of *D. vibrissina* Duda from the collection of Deutsches Entomologisches Institut, Berlin, and Dr. R. L. Coe lent the author a sample of specimens of *D. vibrissina* collected in Great Britain and belonging to the British Museum (Natural History). Dr. S. L. Tuxen, of the Zoological Museum of Copenhagen, gave valuable advise and allowed the author to study Stæger's collection. Part of the manuscript was prepared in the "Departamento de Biologia Geral da Universidade de São Paulo", Brazil, while the author held a fellowship from that university, supplemented with a Rockefeller Travel Grant. Dr. L. C. Birch, of Sydney University, Australia, has kindly corrected the English of the manuscript.

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Ændringer i vor billefauna. 1955 ¹⁾.

Af Victor Hansen.

- 128 a. *Badister lacertosus* St. Arten har været sammenblandet med *B. bipustulatus* F. Eksemplarer foreligger fra Haderslev-egnen (J. A. leg. og det.) og fra Korselitze og Fuglsang park, juni, juli, sept. (V. H. leg. og det.) og Ledreborg, maj (V. H. det.). Jfr. Harald Lindberg i Not. Ent. 1948, p. 96 ff., J. Makolski i Ann. Mus. Zool. Polon. Tom XV (1952) p. 7 ff. Arten adskilles fra *B. bipustulatus* bl. a. ved bredere, på siderne mere rundede vingedækker, hvis sorte tegnings forrand er næsten retliniet, ikke konveks, afvigende penisform, mere eller mindre tydeligt mørk spids af 1. følehornsled og lidt betydeligere gennemsnitsstørrelse. Den foretrækker skygget, ikke for fugtig bund.
- 384 a. *Agabus melanocornis* Zimm. (Scholz i Col. Centralbl. 4. bind, 1929-30, p. 6—8; Bullock i Ent. Monthly Mag. 1930, p. 127). Hansted-reservatet, 2 stk. i vandhuller i indlandsklitten, aug. 1955 (Rudkøbing leg., V. H. det.); Fanø, i antal (F. Larsen leg., V. H. det.). Arten står *A. chalconotus* yderst nær, men adskilles fra denne ved lidt ringere størrelse, lidt smallere, på siderne mindre stærkt rundet krop, og lidt mørkere følehorn, idet endeledet er helt eller overvejende sort og de 3 eller 4 foregående led oftest mørke mod spidsen. Artsberettigelsen bekræftes ved fuldstændigt afvigende form og behåring af hannens paramerer.
- 560 a. *Choleva paskoviensis* Reitt. (Ho. p. 190 ff.). 1 ♂ i terrænet ved Strandkær (Mols), 13. 8. 43; på stedet var der enebærkrat og bevoksning af hedelyng og blåbær samt talrige musegange (Schjötz-Christensen leg., samme og V. H. det.). Formen af penis og baglårenes trochanter hos det danske stykke stemmer ikke helt overens med Jeannels tegninger (L'Abeille XXXII, 1923, p. 50), men efter brevveksling med K. Sokolowski, Hamburg, der har set tegninger af det danske stykke, må bestemmelsen anses for sikker. Arten er antagelig knyttet til musegange og -reder.

¹⁾ Jfr. Ent. Medd. XXV, p. 209—211, p. 326—327, p. 405—406 og p. 465—466, XXVI, p. 278—279 og p. 502—504 samt XXVII, p. 41—42 og p. 91—92.

591. *Colon dentipes* Sahlb. Var. *zebei* Kr. udgår, se nedenfor under 591 a.
- 591 a. *Colon dubiosum* Ihssen. Den hos os som *C. dentipes* var. *zebei* Kr. opførte form er *C. dubiosum* Ihssen, der er artsforskellig fra *C. dentipes*, hvilket bekræftes ved afvigende penisform. Også *C. zebei* Kr. må anses som en god art, men er endnu ikke konstateret hos os. Jfr. Ihssen i Ent. Bl. 1949-50, p. 108—112.
- 647 a. *Cephennium gallicum* Ganglb. (D. F. V, 50; Ganglb. III, p. 16; A. Horion, Faunistik, II, 1949, p. 180). 2 stkr. sigtet af løv, mos og hørester i Fuglsang park, 22. 7. og 23. 9. 55; senere smstds. i antal ved forårssigtning fra mosklædte, trøskede stubbe (V. H. leg. og det.).
- 1210 a. *Gyrophæna joyioides* Wüsth (D. F. XVII, 53). 1 stk. i en paddehat i Sundby Storskov, 3. 7. 55 (V. H. leg. og det.); Ulfsløst ved Haderslev, 6 stkr. i paddehatte, juli (Johs. Andersen leg. og det.).
1609. *Metacantharis hæmorrhoidalis* F. ændres til *M. decipiens* Baudi (V. H. det.). Jfr. Horion, Faunistik, III, 1953, p. 26—27 og G. A. Lohse i Ent. Bl. 1956, p. 85—86.
- 2025.¹⁾ *Atomaria attila* Reitt. (Ganglb. III, p. 734). Nogle stkr. sigtet i Engestofte mose i opskyl ved Maribo sø, juli 1950—55 (V. H. leg.; Sjöberg og V. H. det.).
- 2062 a. *Enicmus nidicola* Palm (D. F. XIV, 18). Dyrehaven, 4 stkr. sigtet fra en hul bøg med fugleredestof, 30. 5. og 1. 6. 1951 (V. H. leg. og det.).
2549. *Donacia antiqua* Kunze ændres til *D. brevitarsis* Thoms. (V. H. det.). Jfr. Tord Nyholm: Zur Systematik der nord-europäischen Donacien i 8th Internat. Congress of Entomology, 1950. Arten er i Sverige fundet på *Carex* sammen med *D. impressa* Payk.
2979. *Eremotes elongatus* Gyll. ændres til *E. nitidipennis* Thoms. (V. H. det.). Jfr. Thure Palm i Opusc. Entom. 1953, p. 201 ff.
2984. *Rhyncolus turbatus* Schönh. ændres til *Rh. thomsoni* Grill (N. A. Kemner og V. H. det.). Jfr. N. A. Kemner i Sv. Ent. T. 1919, p. 166—169.

¹⁾ Dette artsnummer er ledigt, jfr. Wests tillæg I, Ent. Medd. XXV, p. 78.

Nye og sjældne sommerfugle 1955.

Af Wilh. van Deurs.

På Entomologisk Forenings møde den 21. marts 1956 blev der givet meddelelse om følgende nye og sjældne lepidoptera. Hvor intet årstal er nævnt, er dette 1955.

Nye arter:

Gluphisia crenata Esp. 1 eks. på lys, Mellemskoven ¹⁷/₇ (G. Jørgensen).

Arenostola extrema Hb. 5 eks. på sukkerlokning, Sillestrup Strand ²²/₆ (E. Pyndt). Den var tillige fundet Bøtø ³/₇ 1940 og Mellemskoven ¹³/₇ og ¹⁴/₇ 1945 (E. Kjær), Sillestrup Strand ¹/₇ 1944 (Thirslund); se "Ent. Medd." 1956, side 186; samt Mellemskoven ¹⁹/₇ 1942 (Ib Norgaard).

Caradrina cinerascens Tgstr. 1 eks. på lys, Vang, Bornholm ²⁸/₇ (N. L. Wolff); se "Ent. Medd." 1956, side 190.

Semiothisa loricaria Ev. 1 ♂ på lys, Vang, Bornholm ²⁸/₇ (N. L. Wolff); se "Ent. Medd." 1956, side 190.

Eurhodope suavella Zck. 2 eks. på lys, Vang, Bornholm ²⁸/₇ (N. L. Wolff); se "Ent. Medd." 1956, side 190.

Myelois neophanes Durr. 1 eks. Asserbo ⁶/₉ 1949 (N. L. Wolff).

Pammene gallicolana Zell. 1 eks. Hannenov ¹⁶/₅ 1948 (N. L. Wolff).

Agonopteryx hepatoriella Zell. 1 eks. på lys, Vang, Bornholm ²⁸/₇ (N. L. Wolff); se "Ent. Medd." 1956, side 190.

Caloptilia suberinella Tgstr. 1 eks. Asserbo ¹⁴/₈ (N. L. Wolff).

Mompha subbistrigella Haw. Flere overvintrende eks. Knuds-
ker, Bornholm december 1954 (Prøben Holst).

Korrigeret bestemmelse:

Batia lambdella Don. 17 eks. Vang, Bornholm (N. L. Wolff)
Tidligere danske materiale hører hertil, men er publiceret som *B
lunaris* Haw.; se "Ent. Medd." 1956, side 190.

Sjældne arter:

Drepana harpagula Esp. 1 ♂ på lys, Holte ¹¹/₇ (F. Schepler).
2. danske eks.

Rhyacia alpicola Zett. 1 eks. Asserbo ¹⁴/₈ (H. Hendriksen).
2. danske eks.

Lithophane semibrunnea Hw. Vesterskov, Mellemskoven, Hamborgskoven, Hannenov (E. Pyndt).

Hoplodrina respersa Schiff. Hamborgskoven (E. Pyndt).

Hapalotis venustula Hb. 1 eks. Fortunbyen i Lyngby ¹⁴/₇ (Ib Norgaard), 1 eks. Ringe, Fyn ²⁰/₆ 1954 (Kaaaber), første gang på Fyen.

Hemistola chrysoprasaria Esp. 1 eks. Vang, Bornholm ²⁶/₇ (N. L. Wolff), 2. danske eks.; se "Ent. Medd." 1956, side 190.

Cidaria luctuata Schiff. 1 eks. Kobæk, Sjælland ²²/₆ (N. L. Wolff), hidtil kun kendt fra Bornholm.

Hibernia leucophaearia ab. *merularia* Weymer. Hallerup Skov (E. Pyndt), 2. danske eks.

Epischnia boisduvaliella Gn. Slagelse (P. K. Nielsen).

Nephopteryx similella Zck. 1 eks. Bildsø ¹⁸/₆ 1954 (P. K. Nielsen).

Euergestis extimalis Scop. 5 eks. Vang, Bornholm ²¹⁻³¹/₇ (N. L. Wolff), hidtil kun kendt i 3 eks.; se "Ent. Medd." 1956, side 190.

Pionea ferrugalis Hb. 1 eks. ¹⁶/₁₁ 1947 og 1 eks. ²¹/₉ 1955, begge Slagelse (P. K. Nielsen).

Oedematophorus lithodactylus Tr. Flere eks. Kobæk, Sjælland ¹⁶⁻¹⁷/₈ (P. K. Nielsen).

Leioptilus osteodactylus Zell. 2 eks. Vang, Bornholm ²¹⁻³¹/₇ (N. L. Wolff), hidtil kun fundet i 2 eks.; se "Ent. Medd." 1956, side 190.

Cacoecia diversana Hb. 3 eks. Vang, Bornholm (N. L. Wolff), hidtil kun kendt i 1 dansk eks.; se "Ent. Medd." 1956, side 190.

Coleophora clypeiferella Hofm. 1 eks. Vang sidst i juli og 1 eks. Onsbæk, Bornholm ⁷/₈ (N. L. Wolff), kun kendt i 1 eks.; se "Ent. Medd." 1956, side 190.

Anmeldelser.

Wilh. van Deurs: *Sommerfugle* 8. Viklere. Med 540 afbildninger. Danmarks Fauna bd. 61. København 1956. Pris Kr. 20.

Med denne bog er endnu en skanse faldet i forsvaret for kun at beskæftige sig med de større sommerfuglearter. Undskyldningen, at der ikke er dansk bestemmelsesliteratur, gælder ikke mere for

viklerne; enhver samler, som er nogenlunde fortrolig med "storsommerfuglene", vil nu efter denne bog også kunne bestemme tortriciderne. Da der i bogen er vedføjet et eller flere (for en enkelt art ikke mindre end 15) fotografier (i dobbelt størrelse) af samtlige 318 danske arter, kan man tilmed bestemme mange af dem alene ud fra fotografierne, men iøvrigt er der udmærkede bestemmelsestabeller og klare diagnoser til brug for hvem, der vil trænge dybere ind i problemerne. Er der mindste tvivl — hvad der ofte vil være, når exemplarerne er noget affløjne — bør dog genitalierne undersøges, og her har man god støtte af bogens 144 genitalfigurer. Disse viser i mange tilfælde blot den ene valve, hvilket for de fleste arter også er tilstrækkeligt. Ofte har man dog brug for at se noget mere, f. ex. hos arter som *Lipoptycha aeratana* og *saturnana* de for disse arter karakteristiske anellus lobes, hvis form ikke kan tydes på figuren af sidstnævnte, hvor de måske er vist.

I forf.'s to tidligere bøger i serien Danmarks Fauna (bd. 48, Pyralider; bd. 52, Fjermøl) var genitalierne af tilsammen 16 % af arterne afbildet, men kun af hanner, og intet nævntes om, at også hunnerne frembød systematisk lige så værdifulde genitalkarakterer. I denne bog afbildes han-genitalier af 139 arter eller 44 %, altså et betydeligt skridt hen imod de ønskede 100 %, og her vises tillige en oversigtsfigur med benævnelse af nogle af de vigtigste dele af genitalierne hos en hun. Men i bogens senere text afbildes for hunnernes vedkommende kun genitalierne af 2 arter tillige med en diminutiv detaille (et hjørne af en ostiumplade) hos endnu 2 arter, således at hun-genitalierne af tilsammen 5 (fem) arter eller 1½ %, kan siges at være afbildet. Også her er der altså endnu et godt stykke vej til anerkendelsen af kønnenes ligeberettigelse.

Sammenholder man denne bogs artsliste med den sidste fuldstændige danske liste, således som den fremgår af Larsens fortegnelse (Ent. Medd. bd. 11, 1916 og bd. 17, 1927) finder man ud af, at over 30 nye arter er tilkommet, samt at navnene på nogle af Larsens arter ikke forekommer i denne bog, uden at der her eller andetsteds ses at have været givet nogen begrundelse herfor. Det drejer sig om *Tortrix rogana* Gn., *Phalonia geyeriana* H. S., *Argyroplote oblongana* Hw., *Epinotia nitidulana* Zell., *Laspeyresia nebritana* Tr. og *Hemimene alpinana* Tr. Da en art ikke bør kunne forsvinde fra den danske liste helt uden kommentar, burde årsagerne til deres — iøvrigt velbegrundede — udeladelse have været anført i bogen.

I Larsens fortegnelse er optaget en art, *Pammene gallicolana* Zell. (samt varieteten *amygdalana* Dup.) med bemærkning om, af to af exemplarerne måske tilhører en anden varietet eller art. Forf.

anfører i stedet arten *amygdalana* Dup. (med *gallicolana* Zell. som synonym), hvilket kun er en rent nomenklatorisk ændring. En undersøgelse af de på Zoologisk Museum tilgængelige eksemplarer af "*gallicolana*" fra Larsens samling viser imidlertid, at det her hverken drejer sig om én eller to arter, men at der er sammenblandet hele tre forskellige arter, hvilket vilde have forøget bogens artstal fra 318 til 320. Anm. deler iøvrigt ikke forf.'s opfattelse af, hvilke af de danske arter, der hører hjemme i slægten *Pammene*, men pladsen i en anmeldelse tillader ikke at motivere dette nærmere.

Om larverne af 23 af de danske viklere oplyses, at de er ubeskrevne, og dette bør animere samlerne til specielt at eftersøge disse ukendte larver. Ved en del af de ubeskrevne larver, hvor foderplanten kendes, er denne nævnt; det kunde yderligere tilføjes, at f. ex. *Lozopera beatricella* lever i stænglen af plettet skarntyde, at *Hemimene obscuratana* er klækket fra roden af rejnfan, og at *Lipoptycha aeratana* og *Hemimene incognitana* må søges på rød-der af henholdsvis hvid oxeeje og almindelig røllike.

Da viklerne er "småsommerfugle" af et vist format (alle kan sættes på "lang" nål), hvis præparation ikke volder større bryderi, er der grund til at håbe, at denne bog må kunne få samlerne til at skænke disse sommerfugle deres opmærksomhed, hvad de ikke vil komme til at fortryde. Når man betænker, at dette bind er det 61' i serien Danmarks Fauna, og at de rammer for form og indhold, som fastlagdes for 50 år siden, har vist sig at kunne holdes så at sige uforandrede gennem årene, må man beundre den forudseenhed, som udvist, da denne fortræffelige serie blev startet.

Niels L. Wolff.

Carl Fiedler: Neue südamerikanische Rüsselkäfer aus der Subfamilie Cryptorhynchini. VEB Gustav Fischer Verlag, Jena 1954. Hefte DM. 7,70.

Bogen indeholder 15 Arbejder over sydamerikanske Cryptorhynchiner, en af de mest omfattende og vanskeligste Grupper af Snudebiller. Det er en erfaren Forskers Resultater, der fortsætter og afslutter et halvt Hundrede tidligere Publikationer af tilsvarende Indhold. Bogen er med sine Hundreder af Nybeskrivelser en uomgængelig Nødvendighed for ethvert entomologisk Museum, men har næppe speciel Interesse for danske Samlere. Det bør i høj Grad paaskønnes, at Gustav Fischers Forlag har villet paatage sig Udgivelsen af denne værdifulde Bog, der ifølge Sagens Natur kun kan have en meget lille Køberkreds.

Sv. G. Larsson.

Oversigt over Entomologisk Forenings møder og ekskursioner.

1953—56.

Medlemsmøder.

1953—54.

17. okt. 1953. I Zoologisk Auditorium. 36 medl. og 18 gæster til stede.

Mag. scient. Chr. Vibe foreviste en farvefilm fra Østgrønland og redegjorde derefter kort for den grønlandske insektfaunas fordeling.

Dr. S. L. Tuxen omtalte Islands insekter.

I diskussionen deltog J. Brændegaard, R. Späreck og P. Brinck.

Lundensiske entomologer var indbudt, og efter mødet samledes man til selskabeligt samvær i Bispekælderen.

Som nye medlemmer proponeredes: Zoologisk Laboratorium, Oslo, forstkand. B. Beier Petersen, seminarieelev Bent Madsen og cand. mag. Högni Böðvarsson.

28. okt. 1953. I Studenternes Spisestuer. 8 medl. til stede.

Aftenen var uden særligt emne. Ing. van Deurs foreviste sommerfugle fra Færøerne.

4. nov. 1953. I Zoologisk Museum. 14 medl. til stede.

1. klubaften.

11. nov. 1953. I Studenternes Spisestuer. 20 medl. til stede.

Mag. scient. Jørgen Dahl talte om: "Entomologiske iagttagelser fra et ophold i Fransk Cameroun".

25. nov. 1953. I Studenternes Spisestuer. 25 medl. til stede.

Dr. phil. Ellinor Bro Larsen talte om: "De tunnelgravende biller på Skallingen. Iagttagelser fra de senere år".

9. dec. 1953. I Studenternes Spisestuer. 17 medl. til stede.

Dr. phil. S. L. Tuxen talte om: "Islands Dipterfauna med undtagelse af Chironomiderne".

16. dec. 1953. I Zoologisk Museum. 7 medl. til stede.

2. klubaften.

13. jan. 1954. I Studenternes Spisestuer. 23 medl. til stede.
Dr. phil. P. Bovien talte om: "Skadedyrsangreb på kulturplanter i 1953".
27. jan. 1954. I Zoologisk Auditorium. 26 medl. til stede.
Dr. phil. H. Lemche fortalte om: "Ravet og dets dyreverden". I diskussionen deltog S. L. Tuxen, O. Bakkendorf, M. Rudkjøbing, E. Suenson, P. Bovien og R. Späreck.
3. febr. 1954. I Zoologisk Museum. 7 medl. til stede.
3. klubaften. Dr. phil. S. L. Tuxen foreviste sin portrætsamling af danske entomologer.
10. febr. 1954. I Studenternes Spisestuer. 11 medl. til stede.
Civiling. E. Suenson talte om: "Nordamerikanske Bembidier". Ved samme lejlighed demonstrerede civiling. E. Suenson sin specielle præparationsmetode for biller.
24. febr. 1954. I Zoologisk Auditorium. 27 medl. og 7 gæster til stede.
Cand. mag. Torben Wolff talte om: "Dyre- og folkeliv på Rennell-Øen i Salomon Øgruppen". Foredraget ledsagedes af lysbilleder og farvefilm.
Foreningens 86. fødselsdag blev derefter fejret på traditionel måde.
3. marts 1954. I Zoologisk Museum. 6 medl. til stede.
4. klubaften.
Som medlem proponeredes Frank Lynard.
9. marts 1954. I Zoologisk Auditorium.
Medlemmerne var af Universitetet indbudt til at overvære et foredrag af prof. dr. H.-J. Stammer, Erlangen: "Ökologische Beziehungen zwischen Insekten und anderen Tiergruppen".
10. marts 1954. I Studenternes Spisestuer. 18 medl. til stede.
Meddelelser om fund af biller i 1953 blev givet af Victor Hansen, Uffe Kornerup, Andreas Sørensen, Carl Strømberg, Mogens Rudkjøbing og F. Bangsholt. De sjældnere fund er nærmere omtalt i Ent. Medd. XXVII, p. 41—42.
24. marts 1954. I Studenternes Spisestuer. 32 medl. til stede.
Meddelelser om fund af sommerfugle i 1953 blev givet af N. Wolff, W. van Deurs, J. E. Gümoes, E. Wilsund, E. og M. Bloch, T. Feddersen, E. Pyndt og H. Rasmussen. De sjældnere fund er nærmere omtalt i Ent. Medd. XXVII, p. 51—52.
Som nyt medlem proponeredes gymnasiast Lars Mogensen.

7. april 1954. I Studenternes Spisestuer. 9 medl. til stede.

Meddelelser om fund af andre insekter end biller og sommerfugle.

O. Bakkendorf foreviste forskellige stadier af *Rhopalotomus*-arter og nogle af deres ægsnyltre.

Løvrigt diskuteredes præparationsmetoder for meget små insekter.

21. april 1954. I Zoologisk Museum.

5. klubaften.

28. april 1954. I Studenternes Spisestuer. 22 medl. til stede.

Ordinær generalforsamling. — 1. A. Gorm Jacobsen valgtes til aftenens dirigent. — 2. Formanden aflagde beretning. Der var afholdt 13 møder, 5 klubaftener og 2 ekskursioner. — 3. Kassereren forelagde de reviderede regnskaber for foreningen og dens fonds. — 4. Halvdelen af renterne fra Ent. Fond overførtes til Kongresfonden. — 5. Efter tur afgik formand, næstformand og kasserer. Alle genvalgtes med 22 stemmer. — 6. Revisorerne O. Schaltz og T. Feddersen genvalgtes enstemmigt. — 7. Afgørelsen om sommerens ekskursioner overlodes efter diskussion til bestyrelsen. — 8. Eventuelt. Redaktøren redegjorde for undersøgelsen af Hansted-reservatet. Der er hidtil fundet 204 billearter, 108 storsommerfugle, 65 småsommerfugle, 43 *Aculeata*, 9 bladhvæpse, 10 *Trichopterer*. Indsamlingerne fortsættes.

1954—55.

6. okt. 1954. I Studenternes Spisestuer. 9 medl. til stede.

Aftenen var uden emne.

Proponeret blev: Sproglærer E. Røen og Bent Rasmussen.

20. okt. 1954. I Zoologisk Auditorium.

Foreningen var af Dansk Naturhistorisk Forening indbudt til et foredrag af prof., dr. phil. R. Späreck: "Det videnskabelige naturfredningsarbejde i Danmark. En oversigt".

6. nov. 1954. Foreningen var af Entomologiska Sällskapet i Lund indbudt til at høre et foredrag af fil. dr. Lars Brundin, der talte om: "Søer og vulkaner i det sydlige Chile". Med lysbilleder. Efter mødet var der "enkelt samkväm".

10. nov. 1954. I Zoologisk Museum. 11 medl. til stede.

1. klubaften.

Som medlem proponeredes A/S Buch & Holm.

17. nov. 1954. I Studenternes Spisestuer. 17 medl. til stede.

Dr. phil. Anker Nielsen talte om: "Et lille træk af skovflåtens biologi og et formodet hygrosensorisk organ hos en vårfluelarve". I diskussionen deltog: E. Bro Larsen, O. Bakkendorf, J. Brændegaard, E. Suenson, S. L. Tuxen, J. Dahl, Børge Petersen.

1. dec. 1954. I Zoologisk Museum. 14 medl. til stede.

2. klubaften.

15. dec. 1954. I Studenternes Spisestuer. 19 medl. til stede.

Lektor, dr. phil. Ellinor Bro Larsen talte om: "Yngelplejen hos nogle tæger". I diskussionen deltog: P. Bovien, O. Bakkendorf, E. Suenson, R. Späreck, H. Friis-Jensen. Derefter aflagde næstformanden, ing. W. van Deurs beretning om sin deltagelse i Entomologiska Föreningens 75-års jubilæum i Stockholm.

12. jan. 1955. I Studenternes Spisestuer. 16 medl. til stede.

Dr. phil. P. Bovien gav sin årlige oversigt over: "Skadedyrsangreb på kulturplanter i 1954".

26. jan. 1955. I Zoologisk Museum. 12 medl. til stede.

3. klubaften.

9. febr. 1955. I Studenternes Spisestuer. 16 medl. til stede.

Meddelelse om fund af biller i 1954 blev givet af Victor Hansen, Uffe Kornerup og Andreas Sørensen.

De sjældnere fund er nærmere omtalt i Ent. Medd. XXVII p. 91—92.

23. febr. 1955. I Studenternes Spisestuer. 27 medl. til stede.

Meddelelser om fund af sommerfugle i 1954 blev givet af N. L. Wolff, W. van Deurs, E. Wilsund, J. E. Gümöes, E. og M. Bloch.

De sjældnere fund er nærmere omtalt i Ent. Medd. XXVII p. 243—245.

9. marts 1955. I Zoologisk Auditorium. 31 medl. og gæster til stede.

Fil. dr. Rolf Krogerus, Helsingfors talte om: "Rytmiske føreteelser hos insekterna." I diskussionen deltog J. Brændegaard, E. Bro Larsen, O. Bakkendorf, A. Hemmingsen.

Medlemmer af Dansk Naturhistorisk Forening var indbudt til mødet.

16. marts 1955. I Zoologisk Museum. 10 medl. til stede.

4. klubaften.

Proponeret blev: Sam Olof Larsson, Göteborg.

23. marts 1955. I Zoologisk Auditorium. 39 medl. til stede.

Dr. phil. E. Tetens Nielsen talte om: "Sommerfuglemigrationer i Florida". Med farvefilm. I diskussionen deltog N. Wolff, T. Feddersen, J. Brændegaard og O. Bakkendorf.

Efter mødet fejredes foreningens 87. fødselsdag på traditionel måde.

13. april 1955. I Zoologisk Museum. 9 medl. til stede.

5. klubaften.

27. april 1955. I Studenternes Spisestuer. 19 medl. til stede.

Ordinær generalforsamling. — 1. Civiling. N. Wolff valgtes til dirigent. — 2. Formanden aflagde beretning. Der var afholdt 8 møder, 5 klubaftener og 2 ekskursioner. 2 gange var medlemmerne indbudt af andre foreninger. — 3. Kassereren aflagde de reviderede regnskaber for foreningen og dens fonds. — 4. Halvdelen af renterne af Entomologisk Fond overførtes til Kongresfonden. — 5. Redaktøren og sekretæren genvalgtes begge med 18 stemmer. — 6. Som revisorer genvalgtes enstemmigt O. Schaltz og T. Feddersen. — 7. Det blev overdraget bestyrelsen at træffe afgørelse om eventuelle ekskursioner. — 8. Eventuelt. Redaktøren redegjorde for Hansted-undersøgelserne. I 1954 har reservatet været besøgt af 5 samlere.

1955—56.

12. okt. 1955. I Studenternes Spisestuer. 28 medl. og 2 gæster til stede.

Aftenens emne: "Hvilke samleredskaber er egnede?". Firmaet Buch og Holm foreviste forskellige hjælpemidler for entomologer.

Som nye medlemmer proponeredes: stud. mag. Kr. Arevad, skoleelev Dan Bruun, stud. mag. Ove Björklund, stud. mag. Erik Gettrup, laborant P. M. Petersen, bøssebager Sigurd Sjøholm, stud. odont. Sven Kaaber.

26. okt. 1955. I Zoologisk Museum. 10 medl. til stede.

1. klubaften.

12. nov. 1955. I Zoologisk Auditorium. 26 medl. og 16 gæster til stede.

Dr. phil. S. L. Tuxen talte om: "Taxonomist's Glossary of Genitalia in Insects".

Til mødet var indbudt medlemmer af Entomologiska Sällskapet i Lund. Samværet fortsattes senere i Bispekælderen.

23. nov. 1955. I Zoologisk Museum. 14 medl. til stede.

2. klubaften.

7. dec. 1955. I Studenternes Spisestuer, 15 medl. til stede.
Dr. phil. P. Bovien talte om: "Angreb af skadedyr på kulturplanter i 1955".
11. jan. 1956. I Zoologisk Museum. 17 medl. til stede.
3. klubaften. Civiling. E. Suenson udstillede biller indsamlet i U. S. A. i 1955.
25. jan. 1956. I Zoologisk Auditorium. 37 medl. til stede.
Prof. dr. phil. R. Späreck talte om: "Artsbegrebet". I diskussionen deltog V. Lauritzen, Victor Hansen, F. Søgaard Andersen, P. Bovien, S. L. Tuxen, N. Wolff, O. Bakkendorf, E. Suenson, J. Brændegaard.
8. febr. 1956. I Zoologisk Auditorium. 20 medl. til stede.
Docent Peder Hald talte om: "Burma i farver og lidt om insekterne". Med farvelysbilleder.
Som nyt medlem proponeredes: Cand. mag. Stig Askgaard.
15. febr. 1956. I Zoologisk Museum. 9 medl. til stede.
4. klubaften.
Som nyt medlem proponeredes: skoleelev Bent Strømberg.
22. febr. 1956. I Zoologisk Auditorium. 20 medl. og 8 gæster til stede.
Dr. phil. Ole Hammer talte om: "Dyre- og planteliv i Vest-Argentina". Med lysbilleder og farvefilm.
Efter mødet fejredes foreningens 88. fødselsdag på sædvanlig måde.
7. marts 1956. I Studenternes Spisestuer. 20 medl. til stede.
Cand. mag. Stig Askgaard talte om: "Døgnfluernes udviklingshistorie". I diskussionen deltog R. Späreck, Anker Nielsen, S. L. Tuxen, O. Bakkendorf, J. Dahl.
Som nye medlemmer proponeredes: Jens Jelnes, antikvitetshandler P. Kinch, landbrugskandidat J. Møller Nielsen.
14. marts 1956. I Zoologisk Museum. 10 medl. til stede.
5. klubaften.
21. marts 1956. I Studenternes Spisestuer. 30 medl. til stede.
Meddelelse om fund af sommerfugle i 1955 blev givet af N. Wolff, E. Pyndt, J. Lundqvist, F. Schepler, J. E. Gümöes, H. Rasmussen, P. K. Nielsen, I. Norgaard, M. Bloch og S. Kaaber.
De sjældnere fund er omtalt i Ent. Medd. XXVII p. 297—98.
11. april 1956. I Studenternes Spisestuer. 21 medl. til stede.
Meddelelse om fund af biller i 1955 blev givet af Victor Hansen.
De sjældnere fund er omtalt i Ent. Medd. XXVII p. 295—96.

25. april 1956. I Studenternes Spisestuer. 22 medl. til stede.

Ordinær generalforsamling. — 1. Civiling. N. Wolff valgtes til dirigent. — 2. Formanden aflagde beretning. Der var afholdt 9 møder, 5 klubaftener og 2 ekskursioner. — 3. Kassereren forelagde de reviderede regnskaber for foreningen og dens fonds. — 4. Halvdelen af renterne fra Entomologisk Fond overførtes til Kongresfonden. — 5. Efter tur afgik formand, næstformand og kasserer. De to førstnævnte ønskede ikke genvalg. Som formand nyvalgtes derefter dr. phil. Anker Nielsen med 18 stemmer. Som næstformand nyvalgtes skræder O. Bakkendorf med 19 stemmer. Kassereren genvalgtes med 20 stemmer. Den nye formand takkede dr. phil. P. Bovien for de 16 år, denne havde ledet foreningen. — 6. Revisorerne O. Schaltz og T. Feddersen genvalgtes enstemmigt. — 7. Det blev overdraget bestyrelsen at finde målet for eventuelle ekskursioner. — 8. Redaktøren meddelte, at der ikke var indkommet besvarelser af de tidligere udsatte prisopgaver. Der udsættes i stedet 2 nye: 1. En undersøgelse af insektangreb på rødeg. 2. En beskrivelse af en gruppe billelarvers bygning og udvikling, fortrinsvis en gruppe, der ikke er behandlet i Danmarks Fauna, baseret på egne klækninger. Besvarelserne indsendes inden 1. april 1958 og vil, hvis prisopgaveudvalget finder dem tilfredsstillende, blive belønnet med 500 kr.

Redaktøren redegjorde for Hansted-undersøgelserne. Reservatet har i 1955 været besøgt af 6 samlere.

16. maj 1956. I Zoologisk Museum. 18 medl. til stede.

6. klubaften.

Som nyt medlem proponeredes maskinarbejder Ole Bendtsen.

Ekskursioner.

1953—56.

30. maj 1954. Til Donse i Tokkekøb Hegn.

21.—22. aug. 1954. Til Mellemskoven på Falster.

18. maj 1955. Aftenekskursion til Sortemose ved Allerød.

28. aug. 1955. Til grusgrave ved Langesø.

3. juni 1956. Til Ganløse Ore.

26. aug. 1956. Til Nekselø.

Driftsregnskab for Entomologisk Forening for 1953.**Indtægt:**

Kassebeholdning pr. $\frac{1}{1}$ 1953	kr.	307,14
Renter (legat kr. 182,50, giro kr. 11,68)	"	194,18
Statsilskud (indgået efter regnskabsafslutning)	"	0,00
Kontingenter	"	2.246,83
Tilskud fra Rask Ørsted Fondet	"	1.500,00
Universitetsbiblioteket	"	800,00
Salg af hefter af Entomologiske Meddelelser	"	464,97
" " særtryk af " "	"	258,50
		<u>kr. 5.771,62</u>

Udgift:

Trykning af Entomologiske Meddelelser	kr.	3.493,51
" " særtryk	"	836,30
Meddelelser om møder samt porto	"	623,63
Repræsentation og diverse	"	315,95
Afholdelse af møder og ekskursioner	"	378,90
Kassebeholdning pr. $\frac{31}{12}$ 1953	"	123,33
		<u>kr. 5.771,62</u>

Status**Aktiver:**

Girokonto	kr.	876,13
Bankkonto	"	741,49
Kontant	"	437,08
		<u>kr. 2.054,70</u>
Kontingentrestancer (indl. kr. 215, udl. kr. 90)	"	305,00

Passiver:

Tilhørende Kongresfondet og Rasmussens Legat ..	kr.	1.452,98
" Entomologisk Fond	"	478,39
" Entomologisk Forenings driftskonto ..	"	123,33
		<u>kr. 2.054,70</u>

Driftsregnskab for Kongresfondet m. m. for 1953.**Indtægt:**

Kassebeholdning pr. $\frac{1}{1}$ 1953	kr.	1.240,01
Overført fra Entomologisk Fond	"	151,67
Renter	"	62,00
		<u>kr. 1.453,68</u>

Udgift:

Depotafgift.....	kr.	0,70
Kassebeholdning pr. ³¹ / ₁₂ 1953.....	"	1.452,98
		<u>kr. 1.453,68</u>

Status**Aktiver:**

Obligationsbeholdning nom.	kr.	1.400,00
Kassebeholdning pr. ³¹ / ₁₂ 1953	"	1.452,98
		<u>kr. 2.852,98</u>

Passiver:

Kongresfondet	<u>kr. 2.852,98</u>
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Driftsregnskab for Entomologisk Fond for 1953.**Indtægt:**

Kassebeholdning pr. ¹ / ₁ 1953	kr.	322,71
Renter	"	310,50
Udbytte af aktie	"	0,85
		<u>kr. 634,06</u>

Udgift:

Overført til Kongresfondet	kr.	151,67
Depotafgift.....	"	4,00
Til disposition for generalforsamlingens afgørelse..	"	151,67
Overført til fondets kapital	"	326,72
		<u>kr. 634,06</u>

Status**Aktiver:**

Obligationsbeholdning nom.	kr.	7.900,00
Aktie, pålydende	"	20,00
Kassebeholdning pr. ³¹ / ₁₂ 1953	"	478,39
		<u>kr. 8.398,39</u>

Passiver:

Entomologisk Fond.....	kr.	8.242,71
At overføre i ny regning	"	155,68
		<u>kr. 8.398,39</u>

Driftsregnskab for Oluf Jacobsens Legat for 1953.**Indtægt:**

Renter	<u>kr. 185,00</u>
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Udgift:

Depotafgift	kr.	2,50
Overført til foreningens driftskonto	"	182,50
	kr.	<u>185,00</u>

Status

Aktiver:

Obligationsbeholdning nom.	<u>kr. 5.000,00</u>
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Passiver:

Legatet	<u>kr. 5.000,00</u>
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Regnskabet revideret og befundet rigtigt. Bank- og girokontos samt kasse- og obligationsbeholdningens tilstedeværelse konstateret.

København 26. april 1954.

T. Feddersen.

O. Schaltz.

Driftsregnskab for Entomologisk Forening for 1954.

Indtægt:

Kassebeholdning pr. ¹ / ₁ 1954	kr.	123,33
Renter (legat kr. 184,75, giro kr. 3,56)	"	188,31
Statstilskud (1953 og 54)	"	1.200,00
Kontingenter	"	3.021,25
Universitetsbiblioteket for bytteforbindelser	"	800,00
Andre bytteforbindelser	"	130,00
Salg af hefter af Entomologiske Meddelelser	"	593,79
" " særtryk af " "	"	221,50
	kr.	<u>6.278,18</u>

Udgift:

Trykning af Entomologiske Meddelelser	kr.	3.617,06
" " særtryk	"	646,60
Meddelelser om møder samt porto	"	865,65
Repræsentation og diverse	"	449,55
Afholdelse af møder og ekskursioner	"	435,50
Kassebeholdning pr. ³¹ / ₁₂ 1954	"	263,82
	kr.	<u>6.278,18</u>

Status

Aktiver:

Girokonto	kr.	1.230,84
Bankkonto	"	1.082,80
Trsp.:	kr.	2.313,64

	Trsp.: kr. 2.313,64
Kontant	„ 266,71
	kr. 2.580,35
Kontingentrestancer (indl. kr. 210, udl. kr. 195) ..	„ 405,00

Passiver:

Tilhørende Kongresfondet og fuldm. Rasmussens legat	kr. 1.665,95
„ Entomologisk Fond	„ 650,58
„ Entomologisk Forenings driftskonto	„ 263,82
	kr. 2.580,35

Driftsregnskab for Kongresfondet for 1954.

Indtægt:

Kassebeholdning pr. $1/1$ 1954	kr. 1.452,98
Overført fra Entomologisk Fond	„ 151,67
Renter	„ 62,00
	kr. 1.666,65

Udgift:

Depotafgift	kr. 0,70
Kassebeholdning pr. $31/12$ 1954	„ 1.665,95
	kr. 1.666,65

Status

Aktiver:

Obligationsbeholdning nom.	kr. 1.400,00
Kassebeholdning pr. $31/12$ 1954	„ 1.665,95
	kr. 3.065,95

Passiver:

Kongresfondet m. m.	kr. 3.065,95
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Driftsregnskab for Entomologisk Fond for 1954.

Indtægt:

Kassebeholdning pr. $1/1$ 1954	kr. 478,39
Renter	„ 310,50
Obligation udtrukket	„ 100,00
	kr. 888,89

Udgift:

Depotafgift	kr.	0,45
Købt obligation Østf. $4\frac{1}{2}\%$	"	86,19
Overført til Kongresfondet	"	151,67
Til disposition for generalforsamlingens afgørelse ..	"	154,80
Kassebeholdning ÷ kr. 154,80	"	495,78
	kr.	<u>888,89</u>

Status

Aktiver:

Obligationsbeholdning nom.	kr.	7.900,00
Aktie, pålydende	"	20,00
Kassebeholdning pr. $31/12$ 1954	"	650,58
	kr.	<u>8.570,58</u>

Passiver:

Entomologisk Fond	kr.	8.415,78
Til disposition	"	154,80
	kr.	<u>8.570,58</u>

Driftsregnskab for Oluf Jacobsens Legat for 1954.

Indtægt:

Renter	kr.	<u>185,00</u>
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Udgift:

Depotafgift	kr.	0,25
Overført til foreningens driftskonto	"	184,75
	kr.	<u>185,00</u>

Status

Aktiver:

Obligationsbeholdning nom.	kr.	<u>5.000,00</u>
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Passiver:

Legatet	kr.	<u>5.000,00</u>
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Regnskabet revideret og befundet rigtigt. Bank- og girokontos samt kasse- og obligationsbeholdningens tilstedeværelse konstateret.

København, 21. april 1955.

T. Feddersen.

O. Schaltz.

Driftsregnskab for Entomologisk Forening for 1955.**Indtægt:**

Kassebeholdning pr. $\frac{1}{1}$ 1955	kr. 263,82
Renter (legat 180,00, bank 16,00, giro 7,10) ...	" 203,10
Statstilskud	" 600,00
Kontingenter	" 3.011,55
Rask-Ørsted Fondet	" 1.500,00
Universitetsbiblioteket for bytteforbindelser	" 1.500,00
Andre bytteforbindelser	" 60,00
Solgte hefter af Entomologiske Meddelelser	" 239,30
" særtryk af " "	" 206,55
Annonce	" 15,00
	<u>kr. 7.599,32</u>

Udgift:

Trykning af Entomologiske Meddelelser	kr. 4.040,81
" " særtryk	" 710,40
Meddelelser om møder samt porto	" 749,76
Repræsentation og diverse	" 301,60
Afholdelse af møder og ekskursioner	" 384,05
Kassebeholdning pr. $\frac{31}{12}$ 1955	" 1.412,70
	<u>kr. 7.599,32</u>

Status**Aktiver:**

Girokonto	kr. 1.744,88
Bankkonto	" 1.125,60
Kontant	" 619,15
	<u>kr. 3.489,63</u>
Kontingentrestancer (indenlandske)	" 258,75

Passiver:

Tilhørende Kongresfondet og fuldm. Rasmussens legat	kr. 1.881,65
" Entomologisk Fond	" 195,28
" Entomologisk Forenings driftskonto	" 1.412,70
	<u>kr. 3.489,63</u>

Driftsregnskab for Kongresfondet m. m. for 1955.**Indtægt:**

Kassebeholdning pr. $\frac{1}{1}$ 1955	kr. 1.665,95
Overført fra Entomologisk Fond	" 154,80
Renter	" 62,00
	<u>kr. 1.882,75</u>

Udgift:

Depotafgift.....	kr.	1,10
Kassebeholdning pr. ³¹ / ₁₂ 1955.....	"	1.881,65
		<u>kr. 1.882,75</u>

Status

Aktiver:

Obligationsbeholdning nom.	kr.	1.400,00
Kassebeholdning pr. ³¹ / ₁₂ 1955.....	"	1.881,65
		<u>kr. 3.281,65</u>

Passiver:

Kongresfondet m. m.	<u>kr. 3.281,65</u>
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Driftsregnskab for Entomologisk Fond for 1955.

Indtægt:

Kassebeholdning pr. ¹ / ₁ 1955	kr.	650,58
Renter	"	310,50
Obligation udtrukket	"	200,00
		<u>kr. 1.161,08</u>

Udgift:

Depotafgift.....	kr.	8,00
Købt obligation nom. kr. 1.000	"	803,00
Overført til Kongresfondet.....	"	154,80
Til disposition (155,25 ÷ 8,00).....	"	147,25
Kassebeholdning (195,28 ÷ 147,25)	"	48,03
		<u>kr. 1.161,08</u>

Status

Aktiver:

Obligationsbeholdning nom.	kr.	8.700,00
Aktie, pålydende	"	20,00
Kassebeholdning pr. ³¹ / ₁₂ 1955	"	195,28
		<u>kr. 8.915,28</u>

Passiver:

Entomologisk Fond	kr.	8.768,03
Til disposition	"	147,25
		<u>kr. 8.915,28</u>

Driftsregnskab for Oluf Jacobsens Legat for 1955.**Indtægt:**

Renter	<u>kr. 185,00</u>
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Udgift:

Depotafgift.....	" 5,00
Overført til foreningens drift	<u>kr. 180,00</u>
	<u>kr. 185,00</u>

Status**Aktiver:**

Obligationsbeholdning nom.	<u>kr. 5.000,00</u>
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Passiver:

Legatet.....	<u>kr. 5.000,00</u>
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Regnskabet revideret og befundet rigtigt. Bank- og girokontos samt kasse- og obligationsbeholdningens tilstedeværelse konstateret.

København 22. april 1956.

T. Feddersen

O. Schaltz

Entomologisk Forenings Medlemmer

1. December 1956.

Æresmedlemmer.

	Medl. Spec. siden
Bøving, Adam G., Dr. phil., 221 Rock Creek Church Road, Washington D.C., U.S.A.	1899 Col. Larv.
Hansen, Victor, Højesteretsdommer, Dr. phil., I. E. Ohl- sengade 4, Kbh. Ø.	1905 Col.

Medlemmer med Adresse i Danmark.

Aarhus Naturhistoriske Museum, Universitetsparken, Aarhus.	1924
Abrahamsen, S. E., Gedved Seminarium, Horsens,	1951 Hym. acul.
Allerup, Hans Georg, Stud. polyt., Strandvejen 132, Hell.	1953
Andersen, Arne, Kontorassistent, Postparken 25, Kastrup.	1944 Col.
Andersen, Egede, Viceskoleinspektør, Haabets Allé 5, Brh.	1945
Andersen, J., Advokat, Aastrupvej 31, Haderslev.	1921 Col.
Andersen, F. Søgaard, Dr. phil., Lyngbygaardsvej 114, Lyngby.	1937 Chir.
Anthon, Henning, Tegner, Kløvermarken 11, Espergærde.	1937
Arevad, Kristian, Cand. mag., Ehlers Kollegium, St. Kannikestræde, K.	1955
Askgaard, Stig, Cand. mag., Lundgaardsvej, Ribe.	1956
Bakkendorf, O., Skræder, Adelgade 96, K.	1921 Micro-Hym.
Bangsholt, Frits, Assistent, Gaaseholmvej 19, Herlev.	1952 Col.
Bendtsen, Ole, Maskinarbejder, Jespersvej 24, Hillerød.	1956
Berg, Kaj, Professor Dr. phil., Ferskvandsbiol. Lab., Hillerød.	1931 Ferskv. Biol.
Bisgaard, Charles, Kommunalærer, St. Kongensg. 96, K.	1941
Bjørklund, Ove, Stud. mag., Tokkekøb Hegn, Allerød.	1955
Bjørn, Preben, Repræsentant, Finlandsvej 8, Ørholm pr. Lyngby.	1942 Lep.
Bloch, Erling, Prof., kgl. Kapelmusicus, Gl. Strand 52, K.	1950 Lep.
Bloch, Michael, Arkitektstuderende, Gl. Strand 52, K.	1950 Lep.
Bolwig, Niels, Dr. phil., Ved Lindevangen 18, F.	1935 Hym. acul.
Bovien, P., Dr. phil., Ved Klostret 8, Ø.	1928 I. nox.
Brodersen, Poul, Kommunalærer, Mathilde Fibigersv. 15, F.	1945 Lep.
Brændegaard, Jens, Lektor, Dr. phil., Egernvej 73, F.	1920 Aran.
Bruun, Dan, Skoleelev, Toftevang 30, Kgs. Lyngby.	1955
Buch, William, Nørregaardsvej 73, Vanløse.	1952
Buch og Holm, A/S, Sølvgade 36, K.	1954
Bøggild, Ole, Stud. mag., Poppelhegnet 5, Lyngby.	1948
Bøggild, Bente, Frue, Poppelhegnet 5, Lyngby.	1953

- Carolsfeld-Krausé, A. G., Kommunalærer, Slotsherrens
Have 97, Vanløse. 1940 Lep. Nept.
- Christensen, B. Brorson, Konservator, Wolthersvej 7,
Allerød. 1941 Col.
- Christensen, Georg, Manuduktør, Parmagade 24, S. 1946
- Christensen, Johs., Lædervarefabrikant, Howitzvej 64,
Kbh. F. 1956
- Christensen, P. Holst, Dr. phil., Soph. Schandorphsvej 16,
Kgs. Lyngby. 1921 Embr. Lep.
- Christiansen, Johs., Journalist, Ringstedg. 52, Roskilde. 1949 Lep.
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Vanløse. 1956
- Christophersen, Erik, Fabrikant, Vældegaardsvej 55,
Gentofte. 1943 Lep.
- Dahl, Jørgen, Mag. scient., Carlshøjvej 56, Kgs. Lyngby. 1945
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Gentofte. 1918 Lep.
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Bolbro Villavej 14, Rungsted. 1945 Col.
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- Hansen, Aage, Ingeniør, Vesterprisvej, Tisvildeleje. 1935 Hym. acul.
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- Hjortaa, Harry, Konservator, Lundtofteparken 29, Lyngby. 1947
- Hjortsø, Poul, Civilingeniør, Møllestien 8, Lyngby. 1951
- Holst, Preben, Stud. polyt., Gothersgade 158, K. 1956
- Hornung, S., fhv. Fabrikant, Solskrænten 16, Valby. 1910 Lep.
- Jacobsen, Alfr. Gorm, Toldassistent, Tuborg Havn, Hell. 1932 Lep.
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- Jensen, Lissi, Stud. mag., Strandby Kirkevej 133, Esbjerg. 1946
- Jensen, Poul Erik, Valløvej 37, Brønshøj. 1952 Col.
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Het. Aq.
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vej 22, Rungsted. 1943 Col.
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Charlottenlund. 1945
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Virum. 1942 Col.
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 Pedersen, Kaj, Lærer, Orebyvej 16, Saxkøbing. 1939 Lep.
 Pedersen, Niels, Overlærer, Odensevej 48, Hjallese. 1953 Lep.
 Petersen, Axel, Overdyrlæge, Ringsted. 1909 Dipt.
 Petersen, B. Beier, Forstkandidat, kgl. Veterinær- og
 Landbohøjskole, Zoologisk Laboratorium, Bülowsv. 13, V. 1953
 Petersen, Børge, Cand. mag., Rudevang 33, Holte. 1944
 Petersen, P. Forum, Direktør, Egetoft 10, Hellerup. 1934 Lep.
 Petersen, Poul Martin, Laborant, Vesterbro 187,
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 Petersen, Johs., Lærer, Malmbergsvej 131, Holte. 1947
 Petersen, Metha, Frk., Orla Lehmannsgade 4, Vejle. 1939
 Pyndt, Erik, exam. pharm., Østerbro Apotek, Nykøbing F. 1938 Lep.
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 Rasmussen, Chr., Solvej 17, Nykøbing F. 1942 Lep.
 Rasmussen, Steen, Cand. mag., "Svinget", Rungsted. 1944
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 Rosenqvist, Henry, Blok A. Hillerødsholm, Hillerød. 1952 Form.
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 Späreck, R., Professor, Dr. phil., Zoologisk Museum,
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 Storm-Olsen, Johannes, Rødkildevej 14, F. 1952
 Strømberg, Carl, Dyrlæge, Brønshøjvej 26, Brønshøj. 1951 Col.
 Strømberg, Steen, Brønshøjvej 26, Brønshøj. 1956
 Stubbe-Teglbjærg, K., Cand. mag., Lindholmsvej 11, Brh. 1933 I. nox.
 Suenson, Eigin, Civilingeniør, Sverigesv. 12, Kgs. Lyngby. 1906 Col.
 Suenson, Gudrun Munk, Fru, C. F. Gardesallé 6, Hell. 1930

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| | pr. Rønnede. 1941 Hym. |
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| Thamdrup, H. M., Museumsdir., Dr. phil., Rislundvej 1, | |
| | Risskov. 1931 |
| Thomsen, Math., Professor, Dr. phil., Skt. Kjeldsgade 14, Ø. | 1919 |
| Tofte, Axel, Overlæge, Gyldenløvesgade 3, V. | 1939 Lep. |
| Traugott-Olsen, E., Fabrikant, Hersegade 5, Roskilde. | 1939 Lep. |
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