The Distribution and Ecology of Trichoptera in the Faroe Islands

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In his contribution to the second volume of "Zoology of the Faroes", Henriksen (1928) wrote: "In the Faroes some caddisflies [he listed eight species] occur on most of or all the islands from North to South... All the other Faroese species [eight are listed] do not occur in the northern islands, but are restricted to the southern ones." If we examine a map of the Faroe Islands

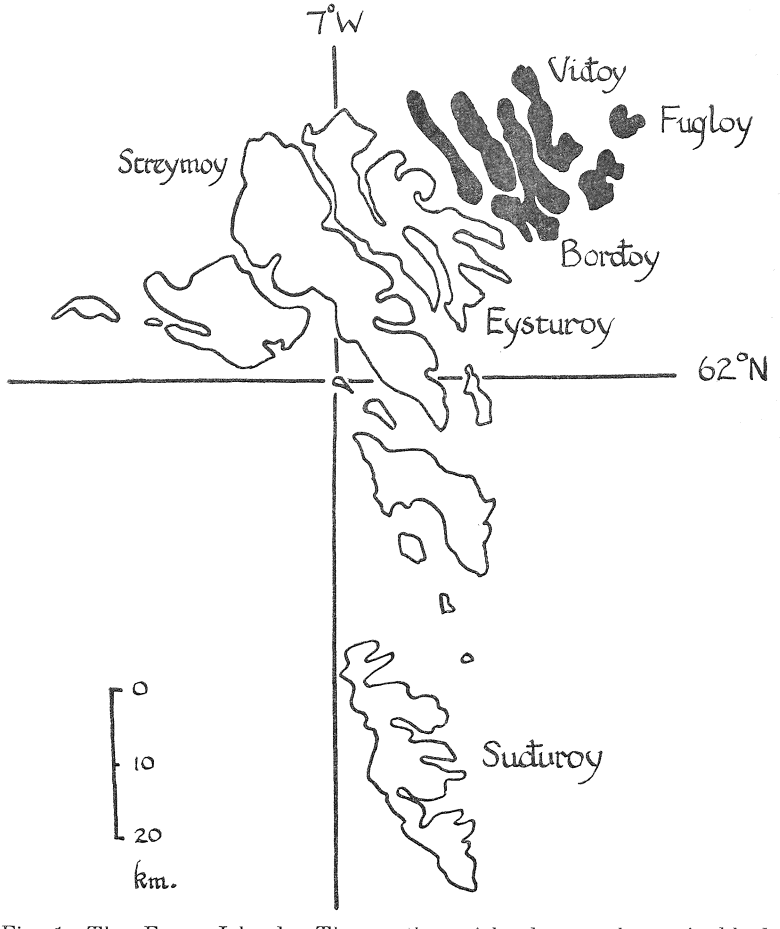

Fig. 1. The Faroe Islands. The northern islands are shown in black and the southern ones in outline.

and note his division into northern and southern islands (Fig. 1) such a distribution at once seems curious. The so-called northern islands are not significantly north of some of the southern ones, and the channel between the groups is narrower than that between some of the individual islands within each group.

When we had an opportunity to visit the Faroe Islands for biological work in the summer of 1962, we decided to look into this curious distribution and to try to find out what factors determine the occurence of caddis-flies in the Faroes. To this end, between 19 June and 27 July 1962, we collected larval, pupal and adult Trichoptera at sixty-two stations on six islands; 27 stations were in the northern islands and 35 in the southern islands.

A summary of these collections is given in Table I. The Table shows, first, a complete list of seventeen species recorded by

Table I. *The occurrence of Trichoptera in the Faroe Islands.*

		Previous records		1962	
		S.	N.	S.	N.
Rhyacophilidae:	*Rhyacophila dorsalis* (Curtis)	*	*	*	*
Hydroptilidae:	*Oxyethira costalis* (Curtis)	*	*		
Polycentropodidae:	*Polycentropus flavomaculatus* (Pictet)	*	*	*	*
	Plectrocnemia conspersa (Curtis)	*	*	*	*
Phryganeidae:	*Phryganea obsoleta* McL.	*	*	*	*
Limnephilidae:	*Limnephilus vittatus* (Fabricius)	*	*	*	*
	L. griseus (L.)	*	*	*	*
	Potamophylax latipennis (Curtis)	*	*	*	*
Hydroptilidae:	*Hydroptila femoralis* (Eaton)	*			
Psychomyiidae:	*Tinodes waeneri* (L.)	*		*	*
Limnephilidae:	*Limnephilus rhombicus* (L.) (1 only)	*			
	L. marmoratus Curtis	*		*	
	L. affinis Curtis	*			
	L. sparsus Curtis	*		*	*
	Mesophylax impunctatus McL. (1 only)	*			
	Halesus radiatus (Curtis)	*		*	*
	+*Apatania muliebris* (McL.)	*		*	*
Polycentropodidae:	*Plectrocnemia geniculata* (McL) (1 only)				*
Psychomyiidae:	*Tinodes pusillus* McL.			*	*
	++*Tinodes* sp. (1 locality)				*

+: Previously recorded as *A. arctica.* The only localities quoted for it were in the south though it was not claimed to have a restricted distribution.

++: A third species, neither *T. waeneri* nor *T. pusillus.*

Henriksen from the southern islands, and the eight known from the northern group. Set against these previous records are the results of our collections. We collected twelve of the seventeen species previously known. We failed to discover either of the two small hydroptilids previously previously recorded; this may have been due to inadequacies in our collecting techniques. Of the other three species that we did not find, two were entered in Henriksen's list on the basis of single individuals and must be very rare. What is more important is that four species hitherto known only from the southern islands were represented in our collections from the northern islands. Moreover, all of them were present in the northern islands in considerable numbers.

The table also shows that our collections contained three species not previously reported from the Faroes. One, *Plectrocnemia geniculata*, was represented by only one specimen, collected at Viðareiði on Viðoy. Another, *Tinodes pusillus* was common at all of the three localities at which we found it. The third, *Tinodes* sp., of which we found only the larval stages, is not the same as either of the two other species of the genus in the list. We collected seven specimens of it from one station at Torvadalsá on Borðoy, where it was locally abundant. With these additions, 20 species of Trichoptera are now known to occur in the Faroe Islands; 18 species in the southern and 15 in the northern islands.

The collections we made in 1962 show clearly that Henriksen's statement about the geographical distribution of Trichoptera in the Faroes needs modification. Twelve of his seventeen species are now known to occur in both groups of islands. Only five species are now known from the southern islands that are not known from the northern and two of them are reported from the southern islands on the basis of one specimen each. In addition, two species are known from the northern that are not yet known from the southern islands. It seems clear, on the basis of these new collections, that it can no longer be maintained that the Faroe Islands are divisible into two groups, northern and southern, markedly different in their trichopterous fauna.

Of the species previously found only in the southern islands, *Tinodes waeneri* was collected in considerable numbers on Borðoy, *Limnephilus sparsus* at several localities on both Borðoy and Viðoy, and *Halesus radiatus*, of which we found only the larvae,

on Borðoy. The observations of previous collectors suggest that the adults of this species appear only after the middle of August in the Faroes, that is, later than we collected. We found *Apatania muliebris* on Borðoy, Viðoy and Fugloy.

Within any island the distribution of each species is determined by its ecology. We distinguished four main classes of aquatic habitat and allocated our sixty-two stations to these classes. The first class was made up of nineteen stations which were all in mountain streams, fast-flowing with stony beds. Eleven stations were slow-flowing streams, usually broader than those of the first group. The eighteen tarns forming the third class had stony or sandy bottoms and ranged from fifty to one thousand meters across. There were nine stations in our last class, comprising shallow pools with peat bottoms and banks and between three and twenty-five meters in diameter. These four classes account for fifty-seven of our stations. Three of the remaining five were pools on the high shore. The two other stations were on open heathland, where we caught adults only.

When we examined the habitat distributions we found marked differences from species to species. The habitat preferences of ten species of Trichoptera, as seen in collections of immature stages, in the Faroes are shown in Figure 2. The diagram also gives some indication of the relative abundance of each species. *Plectrocnemia conspersa* and *Potamophylax latipennis* were the commonest species. In general the distribution of the adults followed that of the larvae. We caught adults of *Limnephilus griseus, L. sparsus* and *Potamophylax latipennis* on open ground as well as close to the larval habitats. The imagos of these species had begun to emerge before we arrived and that probably accounts for their wider distribution.

When the habitat distribution of the immature stages (Fig. 2) is considered in more detail, it can be seen that there is a range of species from *Rhyacophila dorsalis,* which is only found in running water, to *Phryganea obsoleta* which we found only in standing water. Another species, *Limnephilus marmoratus,* not shown in the diagram, is an extreme example of habitat restriction, since it was found only in tarns, never in peat pools or in running water. *Apatania muliebris,* which was only found in running water, prefers small streams, where the water percolates between the stones of the bed. The two commonest caddisflies on

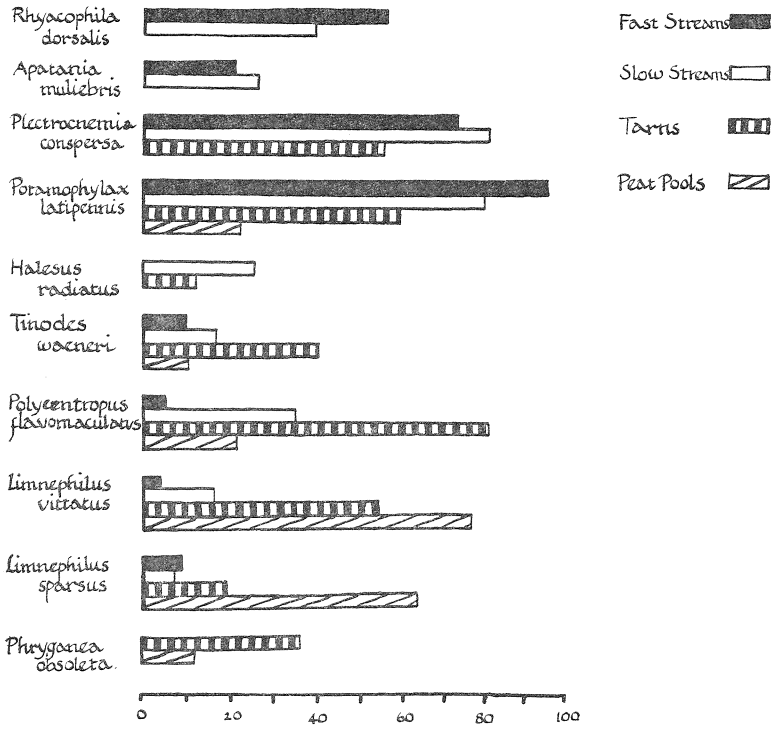

Fig. 2. Habitat preferences of the immature stages of Trichoptera in the Faroe Islands. The abscissa shows the percentage of stations in a habitat group at which immature stages were found.

the islands, *Plectrocnemia conspersa* and *Potamophylax latipennis* have similar habitat distributions except that the latter is occasionally found in peat-pools. Nevertheless they are distinguished in their microhabitats in that the larva of *Potamophylax latipennis* builds a case of pebbles and congregates under stones, while *Plectrocnemia conspersa* has a free-living larva which catches its prey in a silken net spun over the stony bottom. The other polycentropodid, *Polycentropus flavomaculatus,* appears to prefer tarns as a larval habitat. Its habitat distribution is similar to that of *Tinodes waeneri*, which has neither portable case nor net but builds a long tunnel of sand-grains on the upper surface of stones. *Limnephilus vittatus* and *L. sparsus* are most frequently found in standing water, *L. sparsus* being commonly found in peat-pools.

As well as the four types of habitat considered above, we

found that pools on the high shore had a distinct caddis fauna. These pools in the rock were small and shallow, and were probably in the splash-zone. Because of their position it is probable that they were slightly saline although we had no means of confirming this. We found the immature stages of *Tinodes pusillus* at two localities and adults at all three. At one locality we also found the tunnel-building larvae of the third species of *Tinodes*.

In the Faroes one habitat, the small peat-pools, disappears as summer progresses, and it is significant that one inhabitant of them, *Limnephilus sparsus*, had completed its larval and pupal stages by the end of June. The first adults of *L. vittatus*, which is common in the more permanent tarns, did not emerge until the second week of July. Species such as *Rhyacophila dorsalis* and *Plectrocnemia conspersa* whose larvae live in streams appear to have emerged as adults over a long period of time. 'Standing water' species, in particular *Limnephilus marmoratus*, appear to have emerged in large numbers over a short period of time. This may be due to the uniformity of tarns and pools as habitats, when compared with streams.

Our records suggested that most species had a vertical limit to their distribution. *Apatania muliebris* and *Potamophylax latipennis* were found in a small stream at an altitude of 800 meters on Viðoy. The highest point in the islands is 882 meters above sea-level. The altitude limits for all the other species, except *Limnephilus marmoratus*, appeared to be between 300 and 400 meters. However there are very few streams and no standing water above 400 meters and we feel that the absence of suitable habitats above this height is probably the limiting factor for most species. *L. marmoratus* appears to be an exception. We collected this species at two stations, both tarns and both below fifty meters. The localities from which it had previously been recorded are all lakes below 130 meters. The larval cases are very distinctive and it is unlikely that we would have overlooked them at other stations, had they been present. There are a large number of apparently suitable tarns above fifty meters which do not contain *L. marmoratus*. Low-lying tarns are absent from the northern islands, and *L. marmoratus* has not been recorded from this group of islands.

Two of the southern islands were investigated in detail, and we found thirteen species on Eysturoy and eleven on Suðuroy.

We found the following number of species on three northern islands: thirteen on Borðoy, nine on Viðoy and five on Fugloy. The map (Fig. 1) shows the relative sizes of the islands. In general the larger islands have a wider range of aquatic environments than the smaller ones and the occurrence of a species of caddis-fly on a given island depends on whether suitable larval habitats exist on the island. Further collecting would probably show that the two species at present reported only from the northern islands are present in the other islands as well.

Although systematics is not the main concern of this paper, the following notes may be of interest. In the Faroes the colour of adults of *Plectrocnemia conspersa* is very variable, ranging from a uniform grey to black speckled with gold. The adults of *Limnephilus sparsus* are a uniform brown, as are those found in the Shetland Islands. Those found in the rest of Britain have two yellow spots on the fore wing (Mosely 1939).

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Summary.

The larvae of the species of Trichoptera found in the Faroes show marked habitat preferences. The availability of suitable larval habitats determines the distribution of caddis-flies in the islands. We consider that the division of the Faroe Islands into northern and southern groups on the basis of their trichopterous fauna can no longer be upheld. *Tinodes pusillus* was collected from the high shore, a habitat probably hitherto overlooked. This species and *Plectrocnemia geniculata* are reported from the Faroes for the first time.

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