

Relative abundance and flight periods of some caddis flies (Trichoptera) from the Faroes

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Light trap and malaisentent catches in four localities in Streymoy in 1990, gave a total of 916 specimens of Trichoptera of 10 species in 4 families. In light trap catches at a small lake *Limnephilus vittatus* (Fabricius, 1798), *L. sparsus* Curtis, 1834 and *Potamophylax cingulatus* (Stephens, 1837) were the three most abundant species. In light trap catches at a small stream *Rhyacophila dorsalis* (Curtis, 1834), *P. cingulatus* and *L. sparsus* dominated, while in two malaisentents situated at two different streams *L. sparsus*, *R. dorsalis*, *Tinodes waeneri* (Linnaeus, 1758) and *Plectrocnemia conspersa* (Curtis, 1834) were the most abundant species.

Limnephilus ignavus McLachlan, 1865 is recorded for the first time from the Faroes.

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Introduction

A total of 19 Trichoptera species have so far been recorded from the Faroes (Andersen & Wiberg-Larsen, 1987). Two species, *Rhyacophila dorsalis* (Curtis, 1834) and *Plectrocnemia geniculata* McLachlan, 1871 are not taken elsewhere in Scandinavia or Denmark; they are both distributed in the British Isles and in Central and South Europe (Botosaneanu & Malicky, 1978). *Tinodes maclachlani* Kimmins, 1966 has a similar distribution, but is also taken in Bornholm in Denmark (Stoltze, 1985). The majority of the species, however, have a wide distribution in NW Europe, and several are common in southwest Norway.

Crichton et al. (1978) demonstrated a progressively shorter flight period of many non-limnephilid caddis flies when advancing northward in the British Isles. The same also holds for many limnephilid species (Crichton, 1971). However, when comparing the duration of the flight period between

species with different feeding behaviour, Otto (1981) found that species which have larvae feeding as shredders, i.e. most of the limnephilids, have longer flight periods in South Norway than in South England and in North Sweden. On the other hand, Gislason (1977) recorded comparatively long flight periods for some limnephilid species in Iceland, compared to the flight periods in North Sweden.

The Faroes is situated on the same latitude as southwest Norway and has an atlantic climate comparable with the outermost parts of the Norwegian coast. Like in Iceland the number of species is low; only 11 species of caddis flies are recorded from Iceland (Andersen & Wiberg-Larsen, 1987). In contrast, more than 100 Trichoptera species have been taken in the outer parts of southwest Norway. Even though freshwater habitats are more diverse in southwest Norway, the number of species inhabiting each habitat is higher and competition between

the species undoubtedly stronger. The aim with the present study was to compare the relative abundance of caddis flies in the Faroes with the fauna in similar habitats in southwest Norway and to elucidate if some species had more extended flight periods. Unfortunately, the windy and rainy climate in the Faroes made trapping difficult and the catches were low.

Study area

The Faroes consists of 18 larger and numerous smaller islands situated in the North Atlantic at approximately 62°N, 7°W, at a distance of 300 Km NW of Shetland, 450 Km SE of Iceland and 675 Km W of Norway. The climate is atlantic with mild winters and cool summers, heavy rainfall and frequent, strong wind (Bengtson, 1981). The temperatures of the warmest and coldest months are 11.1°C (August) and 4.1°C (February), and there is an annual average of 280 days with rain.

The trapping sites were all situated on Streymoy, the largest of the Faroe islands. At Nipa a light trap was placed close to a small lake with stony and muddy shores and little vegetation. At Stidin a light trap was located near a 2 m wide, rapidly running stream. At Kaldbak and Kvikvik malaisentents were situated close to 3-4 m wide streams, both rapidly running with bottom substratum consisting of stones and gravel.

Methods

The light traps used were modified Robinson traps fitted with mercury vapour bulbs (Philips HPL - comfort 125W) and equipped with roofs. The malaisentents were light coloured. The catches were preserved directly in aethyleneglycol and later transferred to alcohol.

The trapping was initiated in early July 1990, and with shorter periods for repair, continued until late November. The trapping periods were 5-15 days.

Results and discussion

Light traps are extremely efficient in assembling large quantities of Trichoptera, while malaisentents often yield relatively many specimens of fewer species (e.g. Svensson, 1972). Ten species in 4 families, or 50% of the species so far known from the Faroes, were caught during the present survey (Table 1). However, the total number of specimens taken only amounts to 916. Trapping success is dependent on the weather conditions (e.g. Williams, 1940). Strong winds and heavy rainfall, as is prevailing in the Faroes, might have reduced the catches.

Limnephilus ignavus McLachlan, 1865 is recorded for the first time from the Faroes; altogether 25 specimens were caught in the light traps at Stidin and Nipa. The species inhabits shallow pools and marshes with flowing water (Wallace et al., 1990). *L. ignavus* is distributed in most parts of Europe (Botosaneanu & Malicky, 1978). In the British Isles it is widespread but local, being most frequent in Scotland (Wallace et al., 1990). In Norway it is only taken in the southeastern parts of the country (Andersen, 1975; Andersen et al., 1990; Brekke, 1946; Solem, 1977). *L. ignavus* is a relatively large, easily recognizable species, and it might have colonized the Faroes quite recently. If so, the species has probably reached the Faroes from the south.

RELATIVE ABUNCANCE

When considering adult caddis fly communities based on light trap or malaisentent catches, it is important to bear in mind that many caddis flies, particularly among the limnephilids, are strong flyers (e.g. Crichton, 1960; Svensson, 1974). Thus, the presence of a species does not necessarily mean that it has originated in the nearest freshwater locality. Further, light traps only catch species that fly at night and are attracted to light. Some Trichoptera are often sparsely taken in light traps, although rich larval populations occur close to the trap site

Table 1. Caddis flies (Trichoptera), as males/females, collected in light traps at Nipa and Stidin and in malaisetents at Kaldbak and Kvivik in the island Streymoy, the Faroes in 1990.

Vårfluer (Trichoptera), som hanner/hunner, indsamlet i lysfælder ved Nipa og Stidin og i Malaise-fælder ved Kaldbak og Kvivik på Streymoy, Færøerne i 1990.

Species	Nipa	Stidin	Kaldbak	Kvivik
RHYACOPHILIDAE				
<i>Rhyacophila dorsalis</i> (Curtis, 1834)	12/8	353/95	17/5	9/1
PSYCHOMYIIDAE				
<i>Tinodes waeneri</i> (Linnaeus, 1758)	-	1/-	2/5	-/6
POLYCENTROPODIDAE				
<i>Plectrocnemia conspersa</i> (Curtis, 1834)	9/2	12/7	5/2	3/2
<i>Polycentropus flavomaculatus</i> (Pictet, 1834)	7/2	-	-	-/2
LIMNEPHILIDAE				
<i>Limnephilus griseus</i> (Linnaeus, 1758)	-	-	2/2	-/1
<i>L. ignavus</i> McLachlan, 1865	2/1	18/4	-	-
<i>L. sparsus</i> Curtis, 1834	36/-	29/7	18/9	8/7
<i>L. vittatus</i> (Fabricius, 1798)	90/12	4/-	-	-/1
<i>Halesus radiatus</i> (Curtis, 1834)	-	1/-	-	-
<i>Potamophylax cingulatus</i> (Stephens, 1837)	24/2	65/1	3/2	-

(e.g. Roy & Harper, 1981). In the present material species with an early flight period, particularly the non-limnephilids, are certainly underrepresented as the trapping in the Faroes first started in early July.

In the light trap situated at the small lake at Nipa a total of 207 specimens belonging to 7 species were caught. The three most abundant species made up 79% of the catches at this locality. In the light trap at the small stream at Stidin a total of 597 specimens belonging to 8 species were caught. The three most abundant species made up 92% of the catches. In the malaisetent situated at the stream at Kaldbak a total of 72 specimens belonging to 6 species were caught, while in the tent at Kvivik a total of 40 specimens belonging to 7 species were taken. The ranking of the four most abundant species was the same at both localities, and the three most abundant species made up 78% of the material in both localities.

Rhyacophila dorsalis (Curtis, 1834) was the most abundant species at Stidin constituting 75% of the catches, and it ranked second at Kaldbak and Kvivik with 31% and 25%, respectively. The species is distributed throughout the British Isles where the larvae

is commonly found crawling about on the under surface of stones at the bottom of quickly running streams and brooks (Hickin, 1967). The species is not found in Norway; here the closely related *R. nubila* (Zetterstedt, 1840) is common in the same type of habitats.

Tinodes waeneri (Linnaeus, 1758) ranked third at Kaldbak and Kvivik with 10% and 15% of the catches, respectively. In the British Isles *T. waeneri* is widely distributed and abundant in lakes and rivers (Hickin, 1967; Jones, 1976). In southwestern Norway the species is frequent in rivers, lakes and ponds with stony bottom, particularly near the coast (e.g. Andersen, 1976).

Plectrocnemia conspersa (Curtis, 1834) ranked fourth in the catches at Kaldbak and Kvivik with 10% and 13%, respectively. The species is widely distributed in the British Isles, inhabiting small streams with a preference for head streams, and it may also be found in pools (Edington, 1964; Hickin, 1967). In southwestern Norway it is common and widespread and can be dominant in light trap catches in heathland areas on the coast (Andersen, 1974).

L. sparsus Curtis, 1834 was the most

abundant species both at Kaldbak and Kvivik constituting 38% of the catches in both localities. It ranked second at Nipa with 17%, and third at Stidin with 6%. In the British Isles the species inhabits temporary pools, even very small ones (Wallace et al., 1990). In southwest Norway it is frequently taken in light traps, and can be among the dominant species in coastal heathland areas rich in ponds and pools (Andersen, 1974). In Iceland, however, *L. sparsus* is found in streams, mainly run-off streams and in lagoons and estuaries with slightly saline water (Gislason, 1981b). The dominant position in the catches at Kaldbak, Kvivik and Nipa indicates that it also in the Faroes inhabits streams.

L. vittatus (Fabricius, 1798) was the most abundant species at Nipa constituting 49% of the material. In England the species inhabits sandy or silty areas of lakes, ponds and temporary pools (Wallace et al., 1990). In southwest Norway it is frequently taken in light traps at ponds and lakes, where it can be among the dominant species (e.g. Andersen & Klausen, in press).

Potamophylax cingulatus (Stephens, 1837) ranked second at Stidin with 11% and third at Nipa with 13%. The species inhabits streams and rivers and also occasionally lake shores on stony substratum (Wallace et al., 1990). The species is common and widespread in southwestern Norway and can be dominant in light trap catches at streams and rivers (e.g. Andersen et al., 1978). The species was first taken in Iceland in 1959, and according to Gislason (1981a) it presumably has colonized Iceland recently.

FLIGHT PERIODS

Non-limnephilids are mainly caught in the summer months and the median day, i.e. the day when 50% of the specimens are caught, are often progressively later when proceeding northward. An example of this is *R. dorsalis* in the British Isles (Crichton et al., 1978). In contrast, limnephilids are usually caught in highest number during autumn

and the median day are progressively earlier when proceeding northward (Crichton, 1971).

When considering the flight periods we have simply lumped the catches from all four traps and present the catches of the species taken in 25 specimens or more, in 15 day-periods, Fig. 1. Thus, we have not tried to account for the periods when some of the traps were out of operation. Further, as the trapping was initiated in early July, the early part of the flight period of some species is certainly left out.

R. dorsalis had the most extended flight period, as it was taken until late October with a maximum in late July-early August. In the British Isles *R. dorsalis* has a long flight period, from May to November; in Scotland with maximum catches in September and October (Crichton et al., 1978).

P. conspersa was trapped until early September, with a maximum in late July. In the British Isles *P. conspersa* flies from May to the end of October; in northern England and Scotland with a maximum in late July-early August (Crichton et al., 1978). In southwestern Norway the flight period covers June to late September-early October, with a maximum in late July-early August (Andersen, 1976).

L. ignavus was taken from early August to late September. Males were more abundant early in the flight period, while the females were mostly caught in September. In the British Isles the species flies from late July to mid October (Crichton, 1971). In southeastern Norway the species has been taken from early July to mid October (Andersen, 1975).

L. sparsus was caught until late September, with a maximum in late July. The species has an extended flight period with a diapause during summer (Novák & Sehnal, 1963). In the British Isles the species flies from late April to late October, with a second peak in late August (Crichton, 1971). In southwest Norway it has been taken from late July to mid September (Andersen, 1976). In Iceland the species has been taken

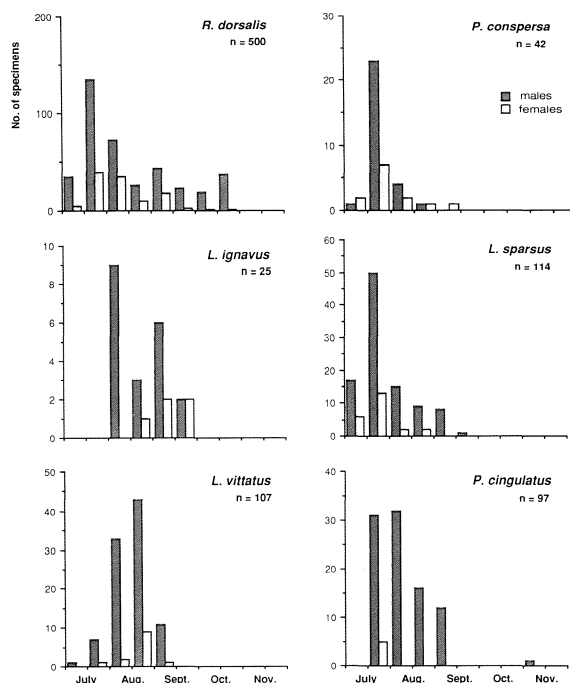


Fig. 1. Catches, in 15-day periods, of *Rhyacophila dorsalis* (Curtis, 1834), *Plectrocnemia conspersa* (Curtis, 1834), *Limnephilus ignavus* McLachlan, 1865, *L. sparsus* Curtis, 1834, *L. vittatus* (Fabricius, 1798) and *Potamophylax cingulatus* (Stephens, 1837) in the island Streymoy, the Faroes, in 1990.

Fangster, i 15-dages perioder, af *Rhyacophila dorsalis* (Curtis, 1834), *Plectrocnemia conspersa* (Curtis, 1834), *Limnephilus ignavus* McLachlan, 1865, *L. sparsus* Curtis, 1834, *L. vittatus* (Fabricius, 1798) og *Potamophylax cingulatus* (Stephens, 1837) på Streymoy, Færøerne i 1990.

from the beginning of June to early September (Gislason, 1977).

L. vittatus was taken until early September, with a maximum in August. In the British Isles the species flies from early May to mid October; in Scotland it has a maximum in late August-early September (Crichton, 1971). In southwest Norway it is taken from late July to late October, with a maximum in August (Andersen, 1976).

Most specimens of *P. cingulatus* were taken from late July to early September, but two males were trapped as late as early November. In the British Isles the species flies from early June to late October; in Scotland it has a maximum in late August (Crichton, 1971). In southwest Norway it has been taken from late July to late October (Andersen, 1976).

Conclusion

Although the number of species taken in the different localities in the Faroes is low, the dominant species are species which also take up dominant positions in similar habitats in southwestern Norway. The only exception is *L. sparsus* which also seems to inhabit lotic habitats in the Faroes, as it was abundant at the streams sampled. This preference for running water is in accordance with its habitat preferences in Iceland, but differs from its occurrence in the rest of Europe.

The flight periods of the species taken in the Faroes do not seem to differ from their flight periods in the British Isles or in West Norway. However, the trapping in the Faroes started late, and the catches were too

small to give a detailed picture of the flight periods.

Otto (1982) suggested that limnephilids inhabiting lentic habitats have a higher potential for distribution than species inhabiting lotic habitats, due to the more ephemeral character of these. A comparatively high proportion of the limnephilids occurring in the Faroes could thus be expected to inhabit ponds and pools. Of the limnephilids taken during the present study, *P. cingulatus* and *H. radiatus* have a preference for running water, while the larvae of the four *Limnephilus* species usually are found in lentic situations, although *L. sparsus* seemingly also utilize lotic habitats in the Faroes.

Sammendrag

Relativ hyppighed og flyvetider hos nogle vårfluer på Færøerne.

Vårfluer blev i 1990 indsamlet med lysfælder og Malaise-fælder på fire lokaliteter på Streymoy (Strømø). I alt blev der fanget 916 eksemplarer fordelt på 10 arter i fire familier. I en lysfælde placeret nær et vandhul ved Nipa blev der taget 207 eksemplarer af ialt 7 arter. *Limnephilus vittatus* (Fabricius, 1798), *L. sparsus* Curtis, 1834 og *Potamophylax cingulatus* (Stephens, 1837) var de tre dominerende arter. I en lysfælde ved en bæk ved Stidin blev der taget 597 eksemplarer af tilsammen 8 arter. *Rhyacophila dorsalis* (Curtis, 1834), *P. cingulatus* og *L. sparsus* var her de dominerende arter. I to Malaise-fælder placeret nær bække ved Kaldbak og Kvivik dominerede *L. sparsus*, *R. dorsalis*, *Tinodes waeneri* (Linnaeus, 1758) og *Plectrocnemia conspersa* (Curtis, 1834). Ved Kaldbak blev der fanget 72 individer fordelt på 6 arter, mens der ved Kvivik blev taget 40 eksemplarer af 7 arter.

Med undtagelse af *L. sparsus* synes samtlige arter at foretrække samme type habitater på Færøerne som på De britiske Øer og i Vest-Norge. Larven af *L. sparsus* lever sædvanligvis i stillestående vand, men på Færøerne var arten også talrig ved bække. Også på Island er arten rapporteret fra bække. Flyvetiden for de arter, der blev fanget i me-

re end 25 eksemplarer, lod ikke til at afvige fra arternes flyvetid på De britiske Øer og i Vest-Norge, men fangsterne var for små til at give et detaljeret billede af de forskellige arters flyvetid.

Limnephilus ignavus McLachlan, 1865 blev taget for første gang på Færøerne. Det er en ganske stor, let kendelig art, der muligvis er forholdsvis nyindvandret. Arten findes ikke i Vest-Norge, så den har sandsynligvis spredt sig fra De britiske Øer.

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