

First record of *Setodes punctatus* (Trichoptera: Leptoceridae) in NW Europe

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The caddisfly *Setodes punctatus* was recorded from the River Ätran at Falkenberg on the Swedish west coast. It was found in riffles of this only slightly polluted river. The record is also the first from NW Europe, bringing the number of Trichoptera species known from this region up to 246.

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Introduction

Caddisflies (Trichoptera) is faunistically a well studied group of aquatic insects in NW Europe, including Denmark, Sweden, Norway, Finland, Iceland and the Faroes. Thus, since the check-list by Andersen & Wiberg-Larsen (1987) only four species: *Glossosoma conformis* Neboiss 1963, *Ptilocolepus granulatus* (Pictet 1834), *Holocentropus varangensis* Mey 1987, *Stenophylax vibex* (Curtis 1834), have been added to this list, the total number of Trichoptera species known from the region being 245. The last two decades focus on environmental problems in freshwater habitats has resulted in sampling programs covering a large number of lakes and streams. In Denmark the effort has concentrated on organic pollution and nutrients, while the major problem in Norway and Sweden has been airborne acidification of low-buffered freshwaters. These studies have very much improved our knowledge of the distribution of freshwater invertebrates including Trichoptera.

A surprising record

During such an environmental study of River Ätran at Falkenberg (county of Halland) on the west coast of Sweden, a remarkable caddis larva was found (Ericsson et al. 1997). Six specimens were sampled 16.IV.96 constituting 0.4% of the total invertebrate fauna. They were easily identified as *Setodes punctatus* (Fabricius 1793) according to Wallace et al. (1990). Thus, it was easily distinguishable from *S. argentipunctellus* (Fabricius 1785), which is rather widespread in southern and south-central Sweden (see later). However, as another possible species of *Setodes*, *S. viridis* (Fourcroy 1785) is only poorly described (Kácalova 1972), it was necessary to confirm the identification by adults. Therefore, about ten larvae were collected live 12.V.97 and sent to PWL for rearing. This was done in a small glass tank supplied with continuously aerated tap water and a bottom substrate of cobbles, gravel and sand. Although the larvae turned out to be difficult to keep alive, a single female pupated and emerged 29.VI.97. It was easily identified as *S. punctatus* according to Malicky (1983).



Fig. 1. The estimated geographic distribution of *Setodes punctatus* in Europe based on data from Ulmer (1909), Káčalova (1972), Malicky (1974), Novák & Obr (1975), Botosaneanu & Malicky (1978), Kumanski (1981), Malicky & Sipahiler (1984), Cianficconi & Moretti (1991), Uherkovich & Nógrádi (1991) and Wallace (1991). Arrow shows the position of River Ätran at Falkenberg.

Distribution and habitat

S. punctatus is new both to Sweden and NW Europe. It is widely distributed in Europe and Asia Minor from the Iberian Peninsula in the west to Iran in the east (Fig. 1). However, the nearest known sites are situated near the Baltic Sea at least 500 km from River Ätran. Thus, its occurrence in Sweden is rather unexpected, not at least as the first record was on the west coast and not in one of the apparently suitable rivers in southeastern Sweden. *S. punctatus* is not the first Trichoptera for the which the distribution has been extended rather dramatically. Other examples are *G. conformis* (Solem 1991) and *S. vibex*, recorded from Southern Norway (Andersen et al. 1989), and *P. granulatus* from Denmark (Wiberg-Larsen et al. 1991), all having their nearest populations more than 500 km

away.

River Ätran at Falkenberg (National grid reference: 631335-129832) is a rather large (width about 40 m), moderately fast flowing stream bordered by riparian deciduous trees (Ericsson et al. 1997). The site is situated about 2 km upstream from the river mouth, 2 m above sea level. The bottom substrate is mainly stones and gravel, but includes also boulders and sand. The moss *Fontinalis* is found on the stones, whereas other submersed macrophytes are absent. Water temperature ranged 0.3-18.5 °C with a mean of 8.7°C (3 years monthly data).

Compared to the water quality of other Swedish streams, River Ätran is relatively rich in phosphorus and especially nitrogen (Table 1) as it partly drains farmlands. It is well buffered with a pH about neutral, but rather humic. The environmental impact due to heavy metals is relatively low in both water and river mosses (Ericsson et al. 1997).

S. punctatus was found together with 51 other invertebrate taxa, the dominant taxa being *Baetis rhodani*, *Cheumatopsyche lepida*, *Aphelochirus aestivalis*, *Limnius volckmari*, *Oulimnius* sp., Chironomidae and *Pisidium* sp. Invertebrate density was relatively high (2800 ind. m⁻²).

Based on measurements of the head capsule width on the larvae sampled on 16.IV.96, these were designated to be in the fourth and fifth instar according to Wallace et al. (1990). The flight period of the adults is reported to be June-September in Germany (Tobias & Tobias 1981), although continuously operated light traps revealed peak numbers in late July at River Severn,

Table 1. Water quality of River Ätran at Falkenberg, Sweden. Values are mean of 3 years monthly samples. Data from Ericsson et al. (1997).

Total phosphorus (mg/l)	23
Total Nitrogen (mg/l)	1295
TOC (mg/l)	11.6
Colour (P/l)	66
Alcalinity (meqv/l)	0.37
pH	7.1

U.K. (Crichton et al. 1978) and peak numbers in early July with small numbers caught until mid August in Austria (Waringer 1991). Thus, the species is no doubt univoltine like most other European Trichoptera. We expect Swedish adults to fly in July-August.

The habitat and biology of *S. punctatus* is poorly known. Wallace (1991) reports it from coarse gravelly riffles in British rivers, stating that this is an unusual habitat for a caddisfly. Accordingly, Tachet et al. (1994) using multivariate correspondence analysis in two upstream sites of the River Rhône (France) found it to be rather different from other Leptoceridae in respect to habitat utilization, as it shows low spatial-temporal habitat variability. However, in another study of the macroinvertebrate communities in aquatic banks of the upper Rhône River, Cogerino et al. (1995) found *S. punctatus* together with several other Trichoptera species to be associated with cobbles. In the present study, the larvae were found on a substrate of gravel and stones. Thus, *S. punctatus* seems to be closely associated with riffles in rivers, typically inhabiting the potamon zone.

The other representative of the genus *Setodes* in NW-Europe (and Sweden), *S. argentipunctellus*, seems to be rather widespread in southern and south-central Sweden (Degermann et al. 1994; Medin, unpubl.). However, although it has been recorded from about 80 different streams (Degerman et al. 1994; Medin, unpubl.), it is according to Medin et al. (unpubl.) a relatively rare species, as it only occurred in 4.6% studied stream sites. It inhabits both small and large streams (width 1-40 m), humic as well as clearwater streams, streams with or without submerged macrophytes, but not in acid (pH<5.5) or organic polluted streams (Medin, unpubl.). However, it is also found in the littoral zone of lakes, occurring with at least the same frequency as in streams (Medin, unpubl.; Degerman et al. 1994). Also in the U.K., *S. argentipunctellus* is found on lake shores (Wallace 1991). It only occur on hard bottom substrates (gravel, stones and boulders). The preference for hard bottom is confirmed for British sites (Wallace 1991).

In River Ätran *S. argentipunctellus* did not

occur together with *S. punctatus*, but has been found in several of its tributaries (Medin, unpubl.).

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Sammanfattning

Larver av nattsländan *Setodes punctatus* har påträffats i Ätran i centrala Falkenberg. Arten har aldrig tidigare rapporterats från nordvästra Europa. Fyndet är överraskande eftersom den närmast kända lokalen ligger minst 500 km bort, på andra sidan Östersjön. Det nya fyndet gör att antalet kända nattsländearter i denna region är uppe i 246. Larverna påträffades i ett snabbt strömmande parti där botten huvudsakligen består av sten och grus samt en del näckmossa. Vattnet är här måttligt näringsrikt, med en hög alkalinitet, och halterna av tungmetaller är relativt låga.