Caenis beskidensis Sowa new to Belgium, with remarks on the Ephemeroptera of the river Meuse

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Abstract: Ephemeroptera were collected extensively in the middle course of the river Meuse in Belgium and northern France. Among 14 species found, *Caenis beskidensis* Sowa is recorded for the first time in Belgium. *Raptobaetopus tenellus* (Albarda), a scarce species all over Europe, appears to be present in small numbers, at least in the upper part of the river section investigated.

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Introduction

Investigations on the benthic macroinvertebrates of the river Meuse in Belgium have been carried out by scientists of UNECED (Unité d'Écologie des Eaux Douces) of the university of Namur, Belgium, between 1977 and 1983. Most of the Ephemeroptera collected in the course of this study, were offered to the author for identification. Details on the sampling methods used, as well as information on the river section investigated, are given by Meurisse-Genin et al. (1987). The sampling sites are ranging from Ham-sur-Meuse in northern France to Ampsin in Belgium (fig. 1).

Fig. 1. Sampling localities of the river Meuse in Belgium and northern France, mentioned in the text.

The collection contained approximately 2200 specimens (mainly larvae) belonging to the 14 species listed below. Half the number of individuals belonged to a single species, *Heptagenia sulphurea* (Müller). Less abundant, but still present in rather large numbers were two species of *Caenis*, viz. *C. macrura* Stephens and *C. luctuosa* (Burmeister) with a total number of 560 specimens, and *Baetis fuscatus* (Linnaeus) with 269 specimens. Together these four species covered nearly 85% of the material.

Eleven out of the 14 recorded species are not very scarce in Belgium. Still it seems opportune to give a full account on localities and dates of all species in the material studied as only little is known about the Ephemeroptera of the river Meuse at present. Moreover the data may contribute to the analysis of water quality of the Meuse, which may be of importance both for Belgium and The Netherlands.

Among the 14 species listed below *Heptagenia fuscogrisea* (Retzius) has not been recorded for Belgium yet. Its presence in Bel-

gium, however, is most likely, as one specimen was collected in the French part of the Meuse, only a few kilometers before the Belgian border. The presence of the species *Caenis beskidensis* Sowa and *Raptobaetopus tenellus* (Albarda) in the material is especially worth mentioning. Both will be briefly discussed further on in the text.

In spite of the rather large amount of specimens that have been collected, the total number of 14 species is not very high. Pollution and stream regulation often cause decreases in numbers of insect species in rivers, but according to Meurisse-Genin et al. (1987) the aquatic communities in the Meuse, upstream of Namur, are apparently not much disturbed yet. An important reason for the relative low number of species of Ephemeroptera may be the fact that most of the sampling was carried out in September. This month is not very favorable for mayfly collecting as a number of species is present then, only as eggs or earliest larval instars, which are difficult to collect.

List of species

(Numbers mentioned below indicate numbers of larvae, unless stated otherwise)

BAETIDAE

Baetis rhodani (Pictet, 1843)

Ham, 4.iii.1982: 1; Waulsort, 26.ix.1980: 6; Anseremme, 16.ix.1980: 3; Dinant, 17.ix.1980: 14; Houx, 17.ix.1980: 2; Rivière, 27.ix.1980: 2, 24.ix.1983: 2.

Baetis vernus Curtis, 1834

Waulsort, 26.ix.1980: 3; Dinant, 22.ix.1977: 1; 17.ix.1980: 1; Ampsin, 6.vi.1983: 5.

Baetis fuscatus (Linnaeus, 1761)

Waulsort, 19.ix.1977: 48, 22.ix.1977: 1; 26.ix.1980: 52; Dinant, 22.ix.1977: 3; 17.ix.1980: 8; Houx, 17.ix.1980: 22; Yvoir, 22.ix.1977: 50; Rivière, 27.ix.1980: 85.

Cloeon dipterum (Linnaeus, 1761)

Rivière, 22.ix.1977: 12 ♀; Bas-Oha, 3.i.1983: 1, 9.vi.1983: 1; Ampsin, 9.vi.1983: 3.

Raptobaetopus tenellus (Albarda, 1878)

Waulsort, 26.ix.1980: 4; Dinant, 22.ix.1977: 8; Houx, 22.ix.1977: 2; Yvoir, 22.ix.1977: 5; Rivière, 27.ix.1980: 2; La Plante, 22.ix.1977: 3.

HEPTAGENIIDAE

Heptagenia fuscogrisea (Retzius, 1783)

Chooz, 4.iii.1982: 1.

Heptagenia sulphurea (Müller, 1776)

Ham, 5.xi.1981: 2; Chooz, 4.iii.1982: 3; Heer-Agimont, 4.iii.1982: 1; Waulsort, 22.ix.1977: 4, 26.ix.1980: 150; Anseremme, 16.ix.1980: 77, 1 ♂ subimago, 13.ix.1983: 1; Dinant, 22.ix.1977: 46, 17.ix.1980: 53, 14.ix.1983: 5; Houx, 22.ix.1977: 275, 17.ix.1980: 208; Yvoir, 22.ix.1977: 32, 1 ♀ subimago; Rivière, 22.ix.1977: 2, 27.ix.1980: 189, 24.ix.1983: 6; Lustin, 14.ix.1983: 25; Dave, 22.ix.1977: 26; La Plante, 22.ix.1977: 6; Bas-Oha, 9.vi.1983: 1; Ampsin, 9.vi.1983: 1.

Ecdyonurus venosus (Fabricius, 1775)

Rivière, 27.ix.1980: 1; La Plante, 22.ix.1977: 1.

EPHEMERELLIDAE

Ephemerella ignita (Poda, 1761)

Waulsort, 22.vii.1977: 6, 26.ix.1980: 2; Dinant, 17.ix.1980: 2; Rivière, 27.ix.1980: 1; Bas-Oha, 9.vi.1983: 16; Ampsin, 9.vi.1983: 68.

Torleya major (Klapalék, 1905)
(= *T. belgica* Lestage, 1916)

Waulsort, 26.ix.1980: 2; Dinant, 17.ix.1980: 3; Houx, 17.ix.1980: 5; Rivière, 27.ix.1980: 1.

EPHEMERIDAE

Ephemera danica Müller, 1764

Ham, 5.ix.1981: 2; Chooz, 4.iii.1982: 18; Hastière, 12.ix.1983: 4; Waulsort, 19.ix.1977: 23, 26.ix.1980: 20; Anseremme, 16.ix.1980: 5, 13.ix.1983: 1; Dinant, 17.ix.1980: 1, 14.ix.1983: 1; Houx, 17.ix.1980: 1; Rivière, 27.ix.1980: 1.

CAENIDAE

Caenis macrura Stephens, 1834

Hastière, 5.xi.1981: 10; Dinant, 17.ix.1980; 1; Bas-Oha, 3.i.1983: 5, 9.vi.1983: 175; Ampsin, 9.vi.1983: 63.

Caenis luctuosa (Burmeister, 1839)
(= *C. moesta* Bengtsson, 1917)

Ham, 5.xi.1981: 20; Chooz, 4.iii.1982: 1; Hastière, 5.xi.1981: 2; Dinant, 17.ix.1980: 1; Bas-Oha, 8.xi.1982: 2, 9.vi.1983: 25; Ampsin, 3.i.1983: 3, 9.vi.1983: 1.

Caenis macrura group

A number of larvae of *Caenis* could not be identified with certainty, either because of the small size (about 1 mm) or the fact that the specimens were too heavily damaged (especially fore legs missing). Because of the deep incision of the last sternite all specimens belong to the *C. macrura*-group, sensu Malzacher (1984). Two species of this group, viz. *C. macrura* and *C. luctuosa* are known to occur in the Meuse.

Ham, 5.xi.1981: 65, 4.iii.1982: 1; Hastière, 5.xi.1981: 15; Waulsort, 22.vii.1977: 2, 22.ix.1977: 3, 26.ix.1980: 11; Dinant, 22.ix.1977: 2, 17.ix.1980: 5; Houx, 22.ix.1977: 13; Rivière, 22.ix.1977: 6, 27.ix.1980: 1; La Plante, 22.ix.1977: 1; Bas-Oha, 3.i.1983: 12, 9.vi.1983: 100; Ampsin, 3.i.1983: 3, 9.vi.1983: 11.

Caenis beskidensis Sowa, 1973.

Anseremme, 16.ix.1980, 3 ♂; Dinant, 17.ix.1980: 1.

Note on some species

Raptobaetopus tenellus (Albarda).

This is generally regarded as a rare species. Although records are known from The Netherlands, Belgium, Finland, Poland, Rumania, Lithuania and Russia (Müller-Liebenau, 1978a, 1978b), Czechoslovakia (Soldán, 1978), France (Fontaine & Perrin, 1981) and Spain (González del Tánago, 1984), only very few specimens were obtained in most cases. The river Loire in France seems to be an exception as *R. tenellus* proved to be locally abundant there (Lecureuil et al., 1984).

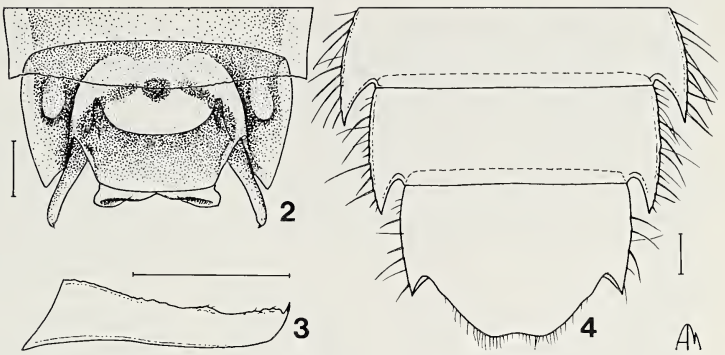
Five specimens from Belgium were known so far from four localities in the surroundings of Liège. Adults were recorded from Féchereux, La Roche aux Faucons (River Ourthe near Esneux) and from Biens-Communaux, la Vecquée (near Seraing) by Lestage (1918, 1920). A single larva was found at Colonster (Riv. Ourthe south of Liège – specimen mentioned by Lestage (1918) as *Baetis ? niger*, vide Müller-Liebenau, 1978a), whereas two larvae were collected more recently in the river Amblève near Comblain-au-Pont (Müller-Liebenau, 1978a). The present study revealed that *R. tenellus* apparently is not very scarce in the river Meuse upstream of Namur.

Lecureuil et al. (1984) have summarized the known ecological characteristics of *R. tenellus*. Larvae live in rivers of 40 to 450 m width at altitudes below 200 m. They were most frequently found on gravel or sandy bottoms or, to a lesser extend, on large stones. Full-grown larvae were present from May to the end of September, but small larvae were only obtained in June and July by Lecureuil et al. (1984). Several small specimens (about 1-1.5 mm), however, were present in the material of the river Meuse, collected at the end of September.

Caenis beskidensis Sowa
(figs. 2-4)

C. beskidensis is new to the fauna of Belgium. Earlier records are known from southern Poland (Sowa, 1973), Czechoslovakia (Soldán, 1980), West Germany (Malzacher, 1981, 1986) East Germany (Braasch & Jacob, 1984), Austria (Malzacher, 1986), France and Spain (Thomas et al., 1986; Malzacher, 1986). According to Malzacher (1981) the species may prove to be widely distributed in mountainous areas of Europe.

C. beskidensis is closely related to *C. pseudorivulorum* Keffermüller, 1960; both species cannot always be separated easily (P. Malzacher, in litt.). Males mainly differ in the shape of the genital forceps (Malzacher, 1984). In *C. beskidensis* these forceps are relatively wide with a group of short, but clearly visible, apical spines, whereas the forceps of *C. pseudorivulorum* are more narrow, slightly tapering towards



Figs. 2-4. *Caenis beskidensis* Sowa. 2-3, ♂ genitalia (Anseremme, 16.ix.1980); 2, ventral view; 3, detail of right forceps. 4, full-grown ♂ larva, sternites 7-9 (Dinant, 17.ix.1980). Scale lines represent 0.1 mm.

the apex, with the apical spines hardly developed. The males from Anseremme clearly resemble *C. beskidensis* in this respect (figs. 2 and 3).

Larvae can be separated by the shape of the last sternite and by the size and shape of the lateral abdominal spines (Sowa, 1973; Malzacher, 1984). In the specimen from the Meuse the abdominal spines are rather large with lateral margins straight to slightly convex (fig. 4). This character fits better to *C. beskidensis* than to *C. pseudorivulorum*. Recently Malzacher (1986) argued, on the base of material from The Netherlands, that hybridization could take place between *C. beskidensis* and *C. pseudorivulorum* in western Europe. More detailed information on the *C. pseudorivulorum*-complex in The Netherlands and Belgium, however, will be required to confirm this statement.

Records from Poland and other countries mentioned above, indicate that larvae of *C. beskidensis* inhabit streams of small to medium size at 300 to 600 m altitude. The river Meuse, however, is a rather large river, with the localities Anseremme and Dinant situated at about 100 m. As only a single larva of *C. beskidensis* was found among approximately 560 larvae of other species of *Caenis*, it may seem possible that *C. beskidensis* inhabits the Meuse only occasionally. Perhaps the main population lives in the smaller tributaries at higher altitude.

In addition to the material discussed here, two extra species should be mentioned, that were discovered in or along the middle course of the river Meuse in Belgium rather recently.

A single larva of *Ephemera lineata* Eaton, 1870 (fam. Ephemeridae) was found near Namêche (between Bas-Oha and La Plante) on 24.iii.1982 (leg. H. Smit). According to Mr. P. Stroot (UNECED, pers. comm.) one larva of this species was present in the UNECED-material as well, captured in Jambes (near La Plante) in the spring of 1980 (leg. R. Kaiser), but unfortunately the specimen got lost soon after sampling.

The second species is *Ephoron virgo* (Olivier, 1791) (fam. Polymitarcidae), of which several males and females were found in cobwebs along the Meuse near Anseremme on 28.viii.1983 (leg. A. G. Klink).

Both *E. lineata* and *E. virgo* have been recorded for Belgium already by Lestage (1928), but as both species are confined to medium-sized or large rivers, they undoubtedly will be present in a small number of localities only.

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