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FIRST RECORD OF THE GROUNDWATER CRUSTACEANS BATHYNELLACEA IN THE NETHERLANDS

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ABSTRACT

The bathynellid groundwater crustacean, *Antrobathynella stammeri* (Jakobi, 1954), is recorded from The Netherlands for the first time. Remarks are made about taxonomy and ecology of this species.

INTRODUCTION

The crustacean suborder Bathynellacea (Syn-carida) consists of small (0.5-3.5 mm) fresh-water animals almost exclusively bound to ground waters (with exception of 2 species from the deep lake Baikal). The distribution of these crustaceans is world-wide. In northern Europe they are represented by the family Bathynellacea, whereas in southern Europe the family Parabathynellidae occurs as well. Several species of the genera *Bathynella* Vejdovski, 1882, *Antrobathynella* Serban, 1966 and *Pseudantrobathynella* Schminke, 1988 were previously recorded from West-Germany in the drainage basin of the river Rhine. Moreover a single species, *Antrobathynella stammeri* (Jakobi, 1954), is known from England and Ireland (Schminke, 1986, 1988). Recently, during a survey of phreatic ground waters in the eastern part of The Netherlands bathynellid crustaceans, represented by *A. stammeri* (fig. 1), were found for the first time in this country. During the same project several species of the harpac-

ticoid copepod *Parastenocaris* were recorded often together with *Antrobathynella*. For information about the sampling method followed see Schminke & Notenboom (1990).

Localities of *Antrobathynella stammeri* in the Netherlands:

sta. 811. Well (bore-hole) just southeast of the church at Kilder, community of Bergh (Montferland), province of Gelderland, coordinates (Amersfoort-grid): 213.15, 439.01, altitude 8.5 m N.A.P., groundwater level 1.60 m below surface (29 March 1989). Co-occurring fauna: Rotatoria (Bdelloidea), Nematoda (a.o. *Onchulus nolli*), *Parastenocaris germanica*, *P. nolli*, *P. tumida*, and *A. stammeri*: 1 ♂ (1.12 mm) and 1 ♀ (1.25 mm).

sta. 819. Well (bore-hole) in the town centre of Cuyck, along the railway at the Bontestraat, province of Noord-Brabant, coordinates: 188.52, 415.57, altitude 11 m N.A.P., groundwater level 3.10 m below surface (14 June 1989). Co-occurring fauna: Rotatoria (Bdelloidea), Copepoda nauplii, Nematoda

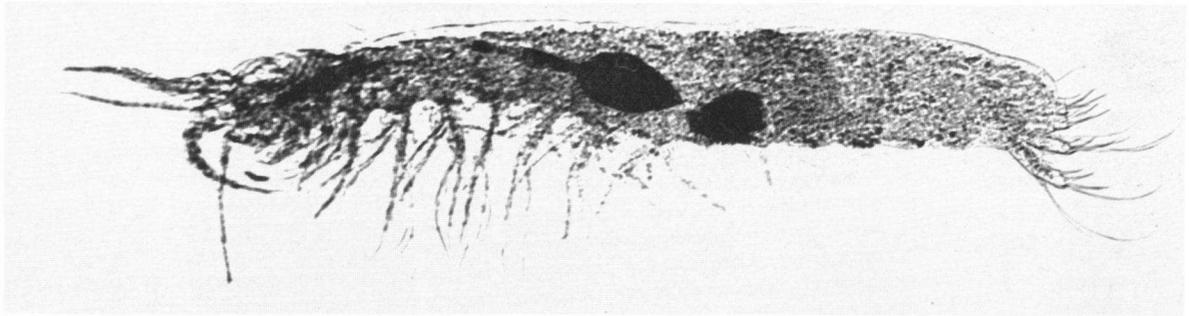


Fig. 1. *Antrobathynella stammeri*, female (1.67 mm) from St. Agatha (sta. 820). Photograph by Mr. L. A. van der Laan.

(a.o. *Onchulus nollii*), Coleoptera, Myriapoda, *A. stammeri*: 2 ♀♀ (1.17 and 0.65 mm).

sta. 820. Well (bore-hole) near small chapel just southeast of St. Agatha, south of Cuyck, province of Noord-Brabant, coordinates: 191.04, 413.95, altitude 11 m N.A.P., groundwater level 2.25 m below surface (14 June 1989). Co-occurring fauna: Rotatoria (Bdelloidea), Tardigrada, Enchytraeidae, Nematoda, Acari, *Diacyclops languidoidea* group, *Parastenocaris germanica*, and *A. stammeri*: 1 ♂ (1.67 mm).

The material has been deposited in the crustacean collection of the Zoological Museum Amsterdam (ZMA).

TAXONOMIC NOTES

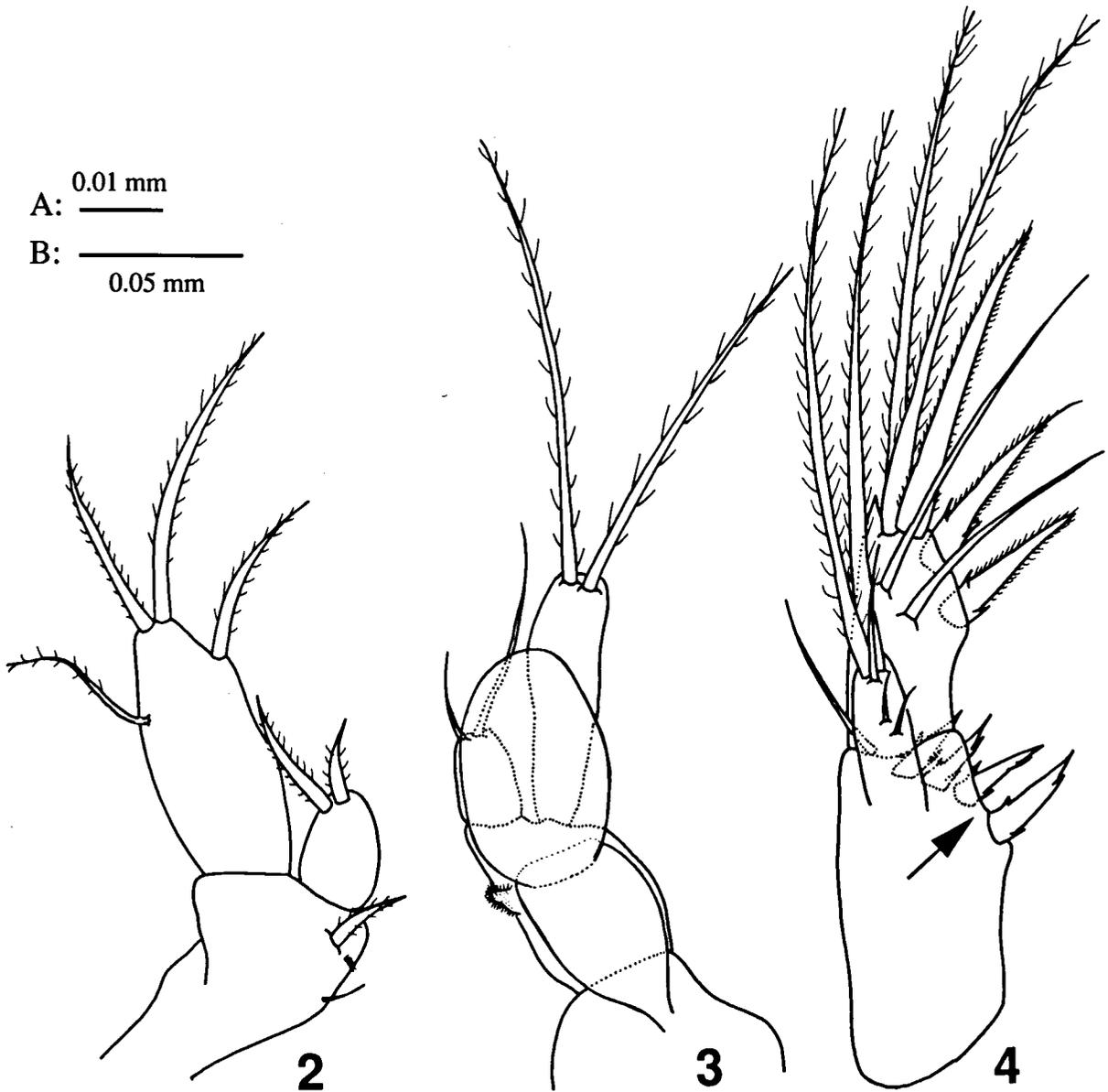
The Dutch specimens of *Antrobathynella stammeri* are morphologically very similar to the previously described German material. Illustrations of a complete set of female appendages can be found in Husmann (1964). Females and males of *Antrobathynella* can easily be separated by the structure of the 8th pereopod (compare figs. 2 and 3). The monotypic genus *Antrobathynella* differs from the two other western European genera, *Bathynella* and *Pseudantrobathynella*, in the combination of the following features (Schminke, 1988; Husmann, 1968; Serban, 1966a, b). (1) The mandible has 5 teeth, the largest distal one with a small accessory tooth (*Bathynella* deviates through 7 teeth, including the accessory one). (2) The

endopodite of female 8th pereopod is provided of 2 terminal setae, and the coxa has a brush-like protuberance (fig. 3) on the medial margin (in *Bathynella* the endopodite bears 4 setae; in *Pseudantrobathynella* the endopodite is lacking and the coxa has a hooked-spine at the place of the protuberance). (3) The basipodite of the male 8th pereopod has a complex structure (for the details see Serban, 1966a). (4) The sympodite of the uropod has a row of only 4 terminal spines (in *Bathynella* and *Pseudantro-*

Table 1. Chemical and physical data of the Dutch *Antrobathynella* localities.

Station number	811	819	820
Chloride (mg/l)	48	46.8	14.7
Sulphate (mg/l)	70.8	77.9	34.9
Phosphate (µg/l)	21	214	526
Hydrogencarbonate (mg/l)	180	63	40
Nitrate (mg/l)	170	36	16
Ammonium (mg/l)	0.11	0.02	0.58
Potassium (mg/l)	5.1	8.5	4.7
Calcium (mg/l)	120.1	54.9	62.3
Magnesium (mg/l)	13.3	7.1	10.7
Sodium (mg/l)	35.1	27.8	25.1
Iron (µg/l)	201	8046	64
DOC ¹⁾ (µg/l)	1.3	1.3	1.2
EC ²⁾ (25°C) (µS/cm)	798	459	206
pH	7.9	6.5	6.4
Oxygen ³⁾ (mg/l)	2.9	0.1	2.6
Temperature ³⁾ (°C)	10.7	11.8	10.4

¹⁾ Dissolved Organic Carbon. ²⁾ Electric Conductivity. ³⁾ Measured at about 3 m below ground water level after pumping 1200 l of water. Most analyses have been performed by the laboratory of anorganic chemistry (LAC) at the National Institute of Public Health and Environmental Protection.



Figs. 2-4. *Antrobathynella stammeri*; 2, male (1.12 mm) pereopod 8 (complex structure of basipodite not figured) (scale A); 3, female (1.67 mm) pereopod 8 (scale A); 4, female (1.25 mm) uropod (scale B).

bathynella there are more than 4 spines), the most proximal one is slightly larger, and the gap between the proximal spine and the other three is slightly wider than the gaps between the three spines themselves (see arrow in fig. 4). In particular the last feature makes a quick and easy recognition of *A. stammeri* possible.

Several authors (Husmann, 1964; Schminke, 1988) mention a sexual dimorphism in the ter-

restrial setae of the mandible palp. However, this could not be ascertained in the only available Dutch male specimen which has these setae simple and similar to those of the female.

ECOLOGICAL NOTES

In the Dutch localities *Antrobathynella* is found together with several species of *Parastenocaris*,

the *Diacyclops languidoides* group, and the nematod *Onchulus nollii*. These elements are in the German literature (e.g., Husmann, 1962a, b, 1964, 1966, 1968) together with several others, viz., *Troglochaetus beranecki*, *Bathynella natans*, *Chappuisius* and *Greateriella* species, frequently mentioned as members of a mesopsammal community (the *Bathynella-Parastenocaris* community) typical for (unpolluted) ground waters of sandy-gravelly aquifers without or with a very slight input of substances from surface streams. It seems that such a community occurs in the ground waters of the eastern part of The Netherlands as well. The reason that it is not found in its most optimal composition might be the less favourable prevailing ecological conditions or an unsuitable sampling method applied. In the latter case other elements of the *Bathynella-Parastenocaris* community might be expected to be present in Dutch ground waters as well.

The Dutch localities of *Antrobathynella* are situated in Pleistocene areas. The Montferland (locality 811) consists of coversands, fluvio-periglacial deposits and ice-pushed ridges. The wells 819 and 820 are located in the river area of the Meuse, the subsoil consists of river deposits of coarse sands and gravels. Chemical and physical data of the Dutch *Antrobathynella* localities are given in Table 1. These data do not point to direct communication between aquifer and river at localities 819 and 820. Remarkable were the large numbers of *Parastenocaris germanica* (>10,000) which were found together with *Antrobathynella* at locality 820.

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