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SUBFOSSIL REMAINS OF *Camptocercus lilljeborgii* (ANOMOPODA, CHYDORIDAE)

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Abstract

Subfossil remains of *Camptocercus lilljeborgii* were abundant in the sediments of a core taken from a presently paludified shore of Lake Väike Juusa, southern Estonia. This made it possible to identify and describe the subfossil remains of the taxon, especially headshields and shells. The remains resemble those of *Camptocercus rectirostris* but differ in details that make the identification easy. The headshield is stouter and more arched and has no surface sculpture. It can also be distinguished from headshields of *Camptocercus fennicus* and *Acroperus harpae* by shape. The shell is characterized by parallel blurred lines and teeth on the posterior-ventral angle. The postabdomen is elongate and narrow and has more than 20 teeth on the dorsal margins.

Key words: Subfossil Cladocera, *Camptocercus lilljeborgii* Schoedler, identification, eutrophy.

INTRODUCTION

Camptocercus lilljeborgii Schoedler is a rare chydorid Cladocera, although it appears in most of Europe (Illies 1978). Its subfossil remains, except the postabdomen (*e.g.* Flössner 1972), have not been described previously. Smirnov (1998) redescribed the genus and presented excellent line drawings of intact animals, together with details, *e.g.* the teeth on the posterior-ventral angle of the shell. However, the shape of the headshield is not always evident from pictures of intact animals, shown without the border line between the headshield and the shell.

Remains of the taxon were relatively abundant (Sarmaja-Korjonen, unpublished data) in the sediments of a core taken from a presently paludified shore of Lake Väike Juusa, southern Estonia (T. Koff *et al.* unpublished data). Therefore, headshields and shells could be identified according to Smirnov (1998) and photographed. The surface sculpture of subfossil cladoceran headshields and shells usually differs from that of living animals and therefore, identification benefits from pictures of subfossil remains. For example, the drawing in Røen (1995) shows parallel longitudinal lines but not those in the anterior-ventral corner curving down towards the ventral margin (see below).

DESCRIPTION OF THE SUBFOSSIL REMAINS

Camptocercus lilljeborgii is a large chydorid (*ca.* 1.0 mm). The shape of the shell is elongated (Fig. 1A). The sculpture on the subfossil shell is characterized by horizontal, parallel lines which appear blurred. At the anterior-ventral corner they curve down towards the ventral margin. On the posterior-ventral angle there are usually 1–4 separate denticles (Fig. 1B), with streches of free margin of the valve between them. There are also small spinules among and/or above the denticles (cf. Smirnov 1998). On the anterior part of the ventral margin where setae have been attached, there are small projections which make the margin look like a saw blade.

At first sight the headshield (Fig. 1C, 2A) resembles that of *Acroperus harpae* (Baird) (Fig. 2D) because it is folded and there appears no surface sculpture, as on the headshield of *Camptocercus rectirostris* (Fig. 2CC). Actually, it clearly differs from *Acroperus harpae* headshield by being stouter and more arched. The shape of the headshield also differs from that of *Camptocercus fennicus* Stenroos (Fig. 2B) which is less stout and arched and has convex sides of posterior margin. The three median pores of the headshield of *Camprocercus lilljeborgii* are in the keel but they are hardly visible because of the folded shape. The lateral pores were not visible in the subfossil headshields.

The postabdomen (Fig. 1D) is very elongate and narrower than that of *Camptocercus rectirostris*. Whereas there are 12–18 teeth along the dorsal margin of the postabdomen of the latter, there are 25–30 teeth on the *Camptocercus lilljeborgii* postabdomen (Røen 1995). The teeth increase in size towards the tip.

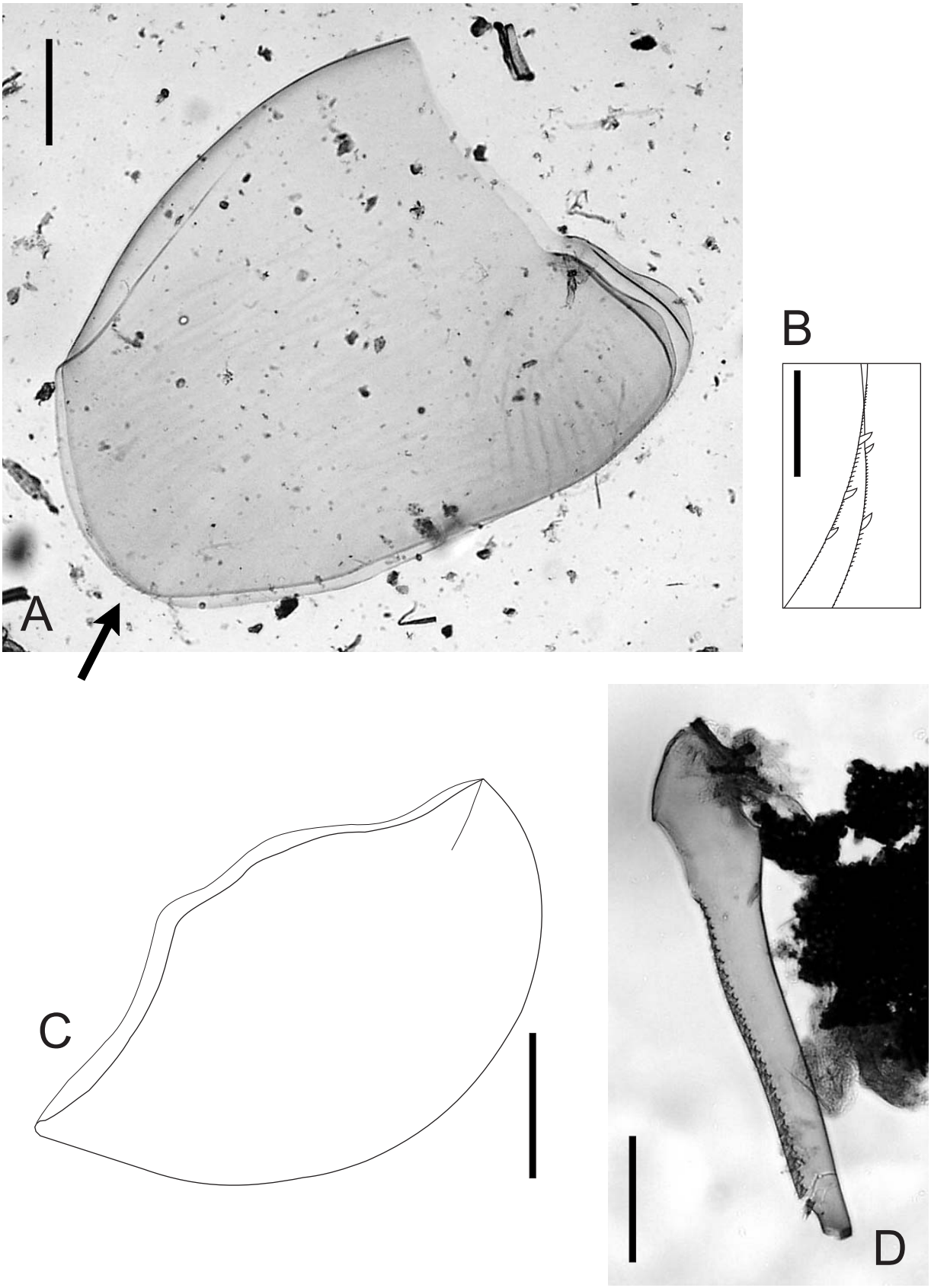

Fig. 1. Subfossil remains of *Camptocercus lilljeborgii* Schoedler. **A** – Shell (Lake Väike Juusa, core JM 99 cm, Sarmaja-Korjonen unpubl.). The arrow points to the location of the denticles on the posterior-ventral angle; **B** – Denticles and spinules on the posterior-ventral angle of the shell (Lake Väike Juusa, core JM 250 cm, Sarmaja-Korjonen unpubl.); **C** – Headshield (Lake Väike Juusa, core JM 245 cm, Sarmaja-Korjonen unpubl.); **D** – Postabdomen (Lake Vähä-Pitkusta 50 cm, Hakala *et al*. 2004). Scale bar in A, C, D = 100 µm, in B = 15 µm.

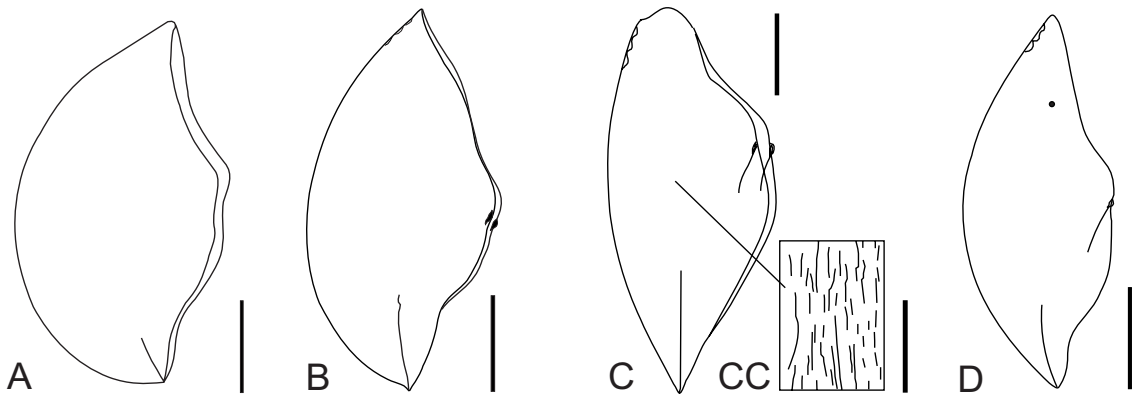

Fig. 2. Headshields of **A** – *Camptocercus lilljeborgii*, **B** – *Camptocercus fennicus*; **C** – *Camptocercus rectirostris*, and **D** – *Acroperus harpae*, which are all folded. Headshield of *Camptocercus rectirostris* can be easily identified on the basis of the fine strach-like markings (**CC**). Headshield of *Camptocercus lilljeborgii* differs from that of *Acroperus harpae* by being stouter and more arched. It also differs from headshield of *Camptocercus fennicus* which is less stout and arched and has convex sides of posterior margin. The three median pores are in the keel. The lateral pores were not visible clearly enough for drawing. **A** – Lake Väike Juusa 245 cm (Sarmaja-Korjonen unpubl.). **B –** Lake Vankavad 205 cm (Sarmaja-Korjonen et al. 2003). **C**, **CC** and **D** were redrawn and modified after Frey (1959). Scale bar in A, B, C, D = 100 μm, in CC = 20 μm.

DISCUSSION

According to Røen (1995), in Denmark the taxon lives in the macrophytic zone of small water bodies rich in calcium carbonates and has never been found in acidic basins. Furthermore, it is associated with enriched lakes in eastern Finland (Cotten 1985) and Mäemets (1961) classified it as a meso-eutrophic form in Estonia. This is in accordance with its abundance in the shore core of eutrophic Lake Väike Juusa (Estonia), accompanied by other indicators of high trophic state, *e.g. Pleuroxus* spp. and *Leydigia acanthocercoides* (Fischer) (Sarmaja-Korjonen, unpublished data). As many chydorids have a wide range of tolerance of water quality and are not very precise environmental indicators, subfossil remains of *Camptocercus lilljeborgii* may offer a valuable addition to the list of chydorids indicating a high trophic state.

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