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Contribution to the morphology of the third-instar larvae of *Laccophilus poecilus* KLUG (Coleoptera: Dytiscidae)

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ABSTRACT**.** Morphology of a larva of *Laccophilus poecilus* KLUG. is described, with particular attention paid to the features distinguishing it from *L.minutus* (L.) and *L.hyalinus* (DEG.).

Key words: entomology, morphology, larvae, Coleoptera, *Dytiscidae*, *Laccophilus poecilus*.

INTRODUCTION

The presence of three species of aquatic beetles of the genus *Laccophilus* LEACH has been recorded in Poland: *L. hyalinus* (DEG.), *L. minutus* (L.) and *L. poecilus* KLUG [=*L. variegates* (GERM. et KAULF.)]. The major features of larvae of the beetles of the genus *Laccophilus* LEACH have been presented by DE MARZO (1976) and GALEWSKI (1978). Detailed morphologic and morphometric analysis of larvae of *L. hyalinus* (DEG.) and *L. minutus* (L.) has been conducted by SHAVERDO (1999).

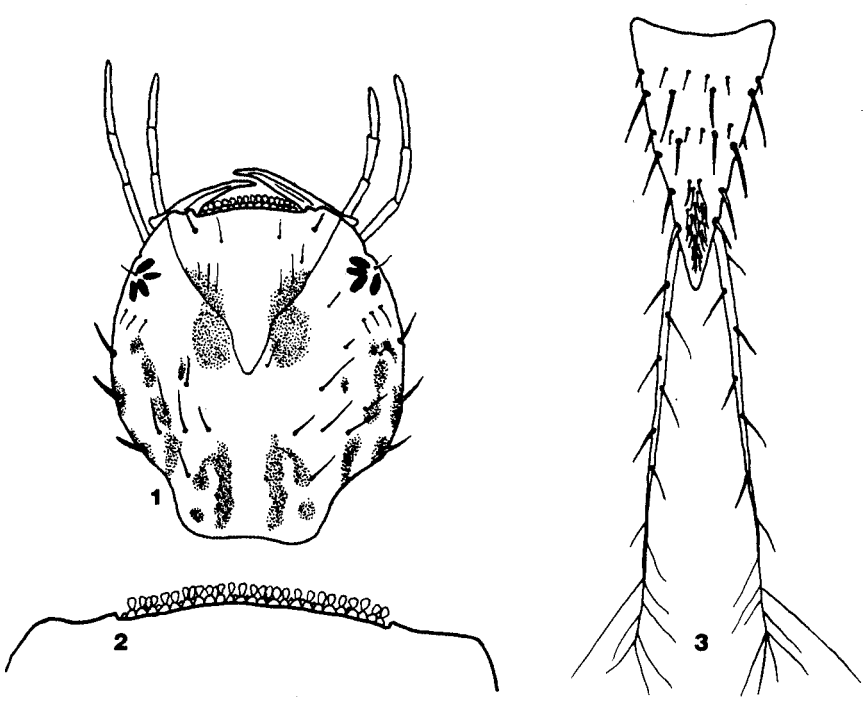
Considering the vast knowledge of the morphology of larvae of those two species, the larva of *L. poecilus* KLUG is described insufficiently and needs to be re-described. Collecting of a large amount of larvae of this rare and scarce species made it possible to fulfil the task which is the aim of this study.

MATERIAL AND METHODS

Over 100 larvae of *Laccophilus poecilus* KLUG were collected from the peat bog of Zehlau (Kaliningrad Region, Russia), where the species was one of the most numerous aquatic beetles in sphagnous bog mats surrounding the water reservoirs situated on peat-bog (BIESIADKA and MOROZ 1996). The collected material was preserved in 75% alcohol and then marked. The marked larvae of *L. poecilus* KLUG were used for making microscopic preparations in Faure's fluid. Based on a microscopic observation of the preparations, drawings were made of particular parts of the body; this was followed by characterising and a comparative analysis of the larvae of *L. poecilus* KLUG.

REDESCRIPTION OF THE THIRD INSTAR LARVA OF *LACCOPHILUS POECILUS* KLUG

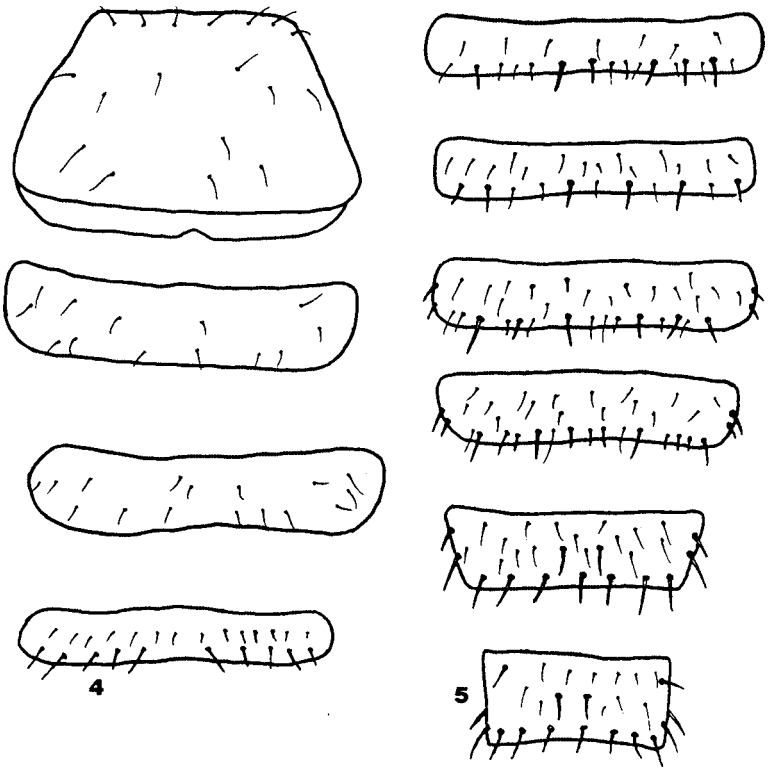
Head (figs. 1- 2). The head is large, its silhouette oval, in its posterior part it narrows down, like in other species of the genus *Laccophilus* LEACH. The head is elongated to the same extent as *L. minutus* (L.). Temporal angles are not distinct,



1-3. *Laccophilus poecilus* KLUG: 1 – head, dorsal side, 2 – anterior edge of the head, 3 – last abdominal segment (siphon), from below

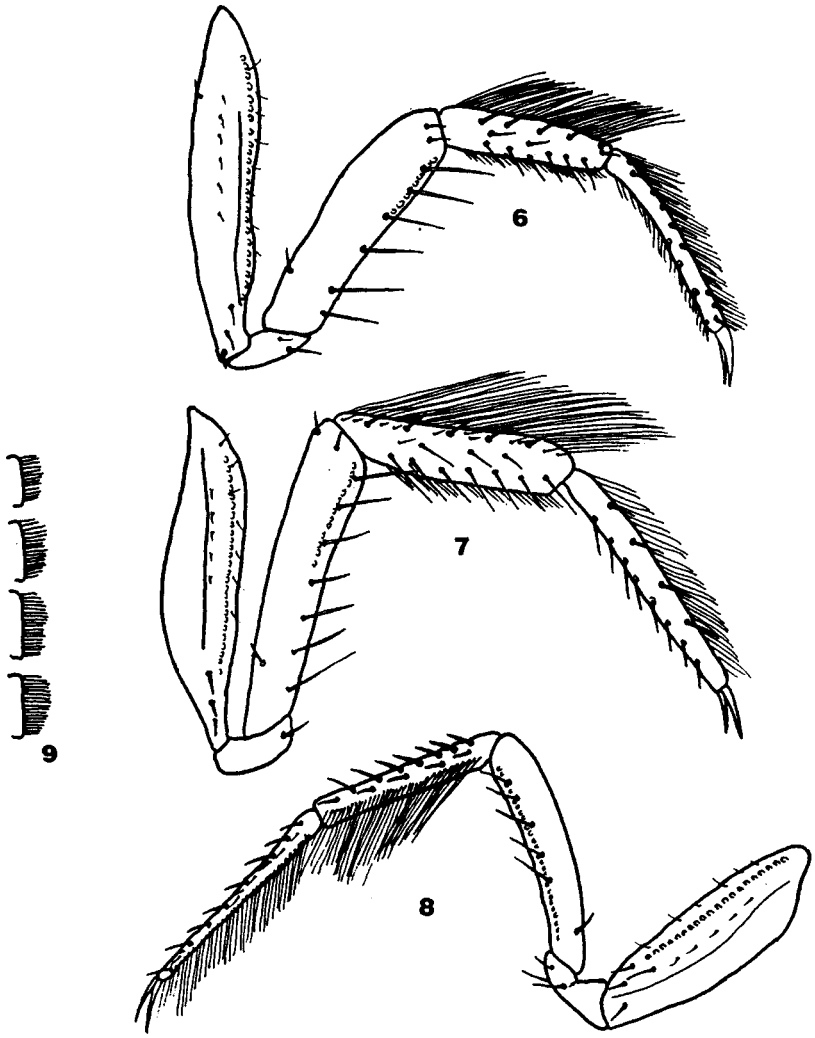
like in *L. minutus* (L.). The lateral edge of the epicranium has three barb-like vertex bristles. The anterior edge of clypeus is slightly bent into an arch, with two rows of scale-like bristles, situated on hardened nodules; the upper row, slightly protruding, contains 17-18 such bristles, whereas the lower one has 15-16. Two rows of scale-like bristles are also found in larvae of *L. hyalinus* (DEG.), whereas in *L. minutus* (L.) there is only one row (SHAVERDO 1999). Lateral nodules of the clypeus are less distinct in *L. poecilus* KLUG than in the other two species. The number of bristles and hairs on the dorsal side of the head is much smaller than in the other two species; however, the hairs are longer and thinner, gathered in the area of clypeus-epicranial raphe, ocellae and lateral parts of the head. Intensive pigmentation of the head, making up the changeable pattern of distinct, dark patches, is characteristic of *L. poecilus* KLUG. In the other species the pigmentation is less intensive and blurred.

Thorax and abdomen (figs. 3-5). The larva is broad like in *L. hyalinus* (DEG.), the broadest in the prothorax. The segments of the thorax of *L. poecilus* KLUG have significantly fewer hairs and bristles compared to *L. hyalinus* (DEG.)



4-5. *Laccophilus poecilus* KLUG, body: 4 – thorax and first abdominal segment, other abdominal segments

and *L. minutus* (L.). The prothorax of *L. poecilus* KLUG is trapezoidal in cross section. SHAVERDO (1999) shows the prothorax of *L. hyalinus* (DEG.) and *L. minutes* (L.) as rectangular with rounded sides, but in the drawing by GALEWSKI (1978) the prothorax in these species is also trapezoidal. On the dorsal side of thorax segments of *L. poecilus* KLUG, there are only scarce, thin hairs. In *L. hyalinus* (DEG.) and *L. minutus* (L.) on the prothorax there are numerous thin hairs and short bristles, and on the remaining segments there are also long and



6-9. *Laccophilus poecilus* KLUG, legs: 6 – I pair, 7 – II pair, 8 – III pair, 9 – some placoidal sensillae enlarged

thick bristles. On segments of the abdomen in *L. poecilus* KLUG there are, like in other species of genus *Laccophilus* LEACH, various types of bristles, which in this case are regularly arranged. Thick and long barbs (usually two pairs) are situated in a row along the posterior edge of segments I – VII of the abdomen, whereas in segments VI – VII there are few and they are situated centre-wise. Between the barbs there is a pair of shorter and thinner bristles, which are embedded in the middle part, at the back edge of tergites. On the whole back area of abdomen segments, immediately before the row of barbs, there are scarce, thin and long hairs. In *L. hyalinus* (DEG.) and *L. minutus* (L.) there is no regular arrangement of hairs or bristles. Siphon (terminal segment of the abdomen) in *L. poecilus* KLUG is significantly different than in *L. hyalinus* (DEG.) and *L. minutus* (L.), strongly elongated and blunt at the tip. In its middle part there is a band of thick and long bristles. The bristles situated on the siphon surface in the other two species only tend to gather together, without forming a clear band. The cerci are long, only slightly longer than the last two segments of the abdomen, with two types of bristles, the number of which is 21 – 23 pairs. Long and thick bristles are situated on 4/5 of the total length of cerci. On the remaining, terminal part of abdominal appendages there are long, thin hairs.

Legs (figs. 6-9). The legs are long and slender, like in the two other species of the genus *Laccophilus* LEACH. The number of hairs and bristles on the legs of *L. poecilus* KLUG is not different from *L. hyalinus* (DEG.) and *L. minutus* (L.) (figs 6-8). The coxa of all legs have small barbs along the central line. At the lower edge 1-3 there are slightly longer bristles. The trochanter of legs of the I, II and III pair with 1-3 short and thick bristles, situated immediately at the anterior edge. The femora with a row of about 5 bristles, which are thick and long, situated along the ventral edge, like in *L. hyalinus* (DEG.) and *L. minutus* (L.). The tibia in all the pairs of legs with dorsal and ventral rows of thick and long bristles (about 7) and very long and thin swimming hairs. All the feet with dorsal and ventral rows of 8 long, thick bristles and long, thin swimming hairs.

On the coxa and femora of all the pairs of legs there is a row of bristles with a peculiar structure. On petal-like skin appendixes, a row of short and stiff hairs (directed backwards) is embedded. On the coxa, the rows of bristles are situated on the lower surface, whereas on the femora they are on the posterior edge. On the femur of pair I of legs, the row is shortened and is situated in the distal part of the segment. Similar bristles are found in other species of the genus *Laccophilus* LEACH. The role of those bristles is not yet clear. Supposedly these structures are helpful when larvae crawl on a hard surface, although NILSSON (1987) describes them as placoidal sensilla. The view seems poorly justified, because such bristles are not found in all the larvae of *Dytiscidae* and rather can be linked to larvae which demonstrate a particular manner of movement. However, this assumption needs to be corroborated in further studies.

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