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First stage larvae of the Central European species of *Hydaticus* LEACH (Coleoptera, Dytiscidae) with a key to all larval stages

[With 25 text-figures]

Abstract. Descriptions of the first larval instars of three Central European species of *Hydaticus* LEACH, *H. transversalis* (PONTOP.), *H. seminiger* (DEG.) and *H. stagnalis* (FABR.), are given, together with bionomical data and identification key to all larval stages. The larvae differ chiefly in their head shape, the form of clypeus and cephalic appendages, as well as in the length of cerci.

In my earlier papers (GALEWSKI 1975a, b, 1983) I discussed diagnostic characters and presented descriptions of the second and the third stage larvae of the genus in question. Now I am dealing at last with the most elusive and difficult to find the first stage. Generic diagnosis of larvae of the European species of *Hydaticus* LEACH has been provided previously (GALEWSKI 1983) and also particulars concerning life cycles of the species and rearing methods have been extensively discussed in my earlier paper.

BERTRAND'S (1928) skimpy description (only general colouring and measurements data) of *H. seminiger* unfortunately has not any diagnostic value, in view of lacking data of the other species.

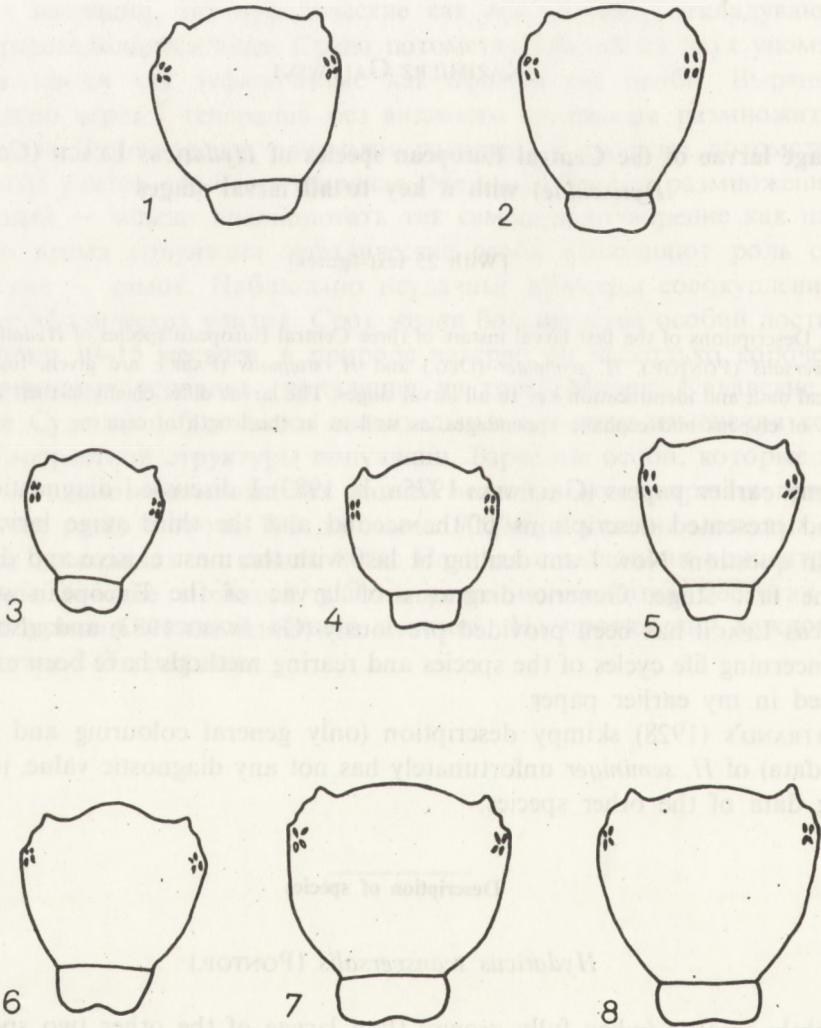
Description of species

Hydaticus transversalis (PONTOP.)

Slightly smaller (when fully grown) than larvae of the other two species, but their most notable characteristics appear to be a clearly smaller head and the form of clypeus. Length of fully grown larvae not exceeding 13 mm.

Head length (excluding neck) 1.15 mm. Head fairly short, more rounded than in the other species, with sides gently and regularly arcuate. Clypeus more elongate than in either *H. seminiger* or *H. stagnalis*, clypeus edge noticeably, strongly curved – almost angular – distinctly protruding anteriorad.

Appendages of head shorter than in other species. Mandible lower edge regularly and feebly arcuate. Labial processes inconspicuous and labial palps about a third to a half shorter than in the remaining species – barely protruding beyond a clypeus edge.



Figs 1–8. Heads of larvae (dorsal side, no appendages): 1, 2 – first stage, 3–5 – second stage, 6–8 – third stage; 1, 4, 7 – *Hydracarus stagnalis*, 3, 6 – *H. transversalis*, 2, 5, 8 – *H. seminiger*.

Pronotum sides strongly converging anteriorad. Other characters not particularly differing from those of the other species.

Bionomics. Larvae of *H. transversalis* were met in July in a large, permanent fish pond (former palest park pond) at Białowieża, in marginal zone among aquatic and paludal vegetation, as well as in some meadow ditches overgrown with bog and water plants in Warsaw (Wawrzyszew, Chomiczówka).

Hydaticus seminiger (DEG.)

Length up to 15 mm. Dorsal side yellowish-testaceous; head, legs, median segments of antennae and palps and abdominal segments darkened.

Head length (excluding neck) 1.35 mm. Head elongate with sides barely curved in basal half; head without neck about as long as broad at ocular angles; neck about twice as long as broad. Clypeus edge moderately arcuate.

Mandibles conspicuously arcuate and with well curved apex, visibly tapering about the middle. Labial palp segments long, the apical protruding beyond the clypeus edge. Labial processes also well developed.

Pronotum relatively long with sides feebly converging.

Penultimate abdominal segment with sides parallel.

Terminal abdominal segment long and slender, with a conspicuous apical process.

Cerci short, at most half as long as terminal abdominal segment.

Bionomics. Larvae of various stages were found from May to August, mostly in small, temporary water-bodies, including very shallow, highly ephemeral rain-water pools and puddles. Collected in the vicinity of Warsaw, at Białowieża and on the Mazury lake district.

Hydaticus stagnalis (FABR.)

Length up to 13.5 mm. Body wider, "plumpier" than in preceding species, sclerotized parts almost unicolorous. Dorsal side paler than in the forgoing species, yellowish-testaceous with barely darkened meso- and metanotum and apex of terminal abdominal segment; clypeal tubercles distinct, pigmented.

Head wider than in the preceding species with sides less regularly arcuate – with a noticeable basal bulge – and provided with longer, more conspicuous setae. Clypeus edge strongly and regularly arcuate. Neck slightly wider than in *H. seminiger*. Mandibles less tapered apically, labial processes less conspicuous and labial palps almost totally concealed ventrally – the apical segment not protruding beyond clypeal edge.

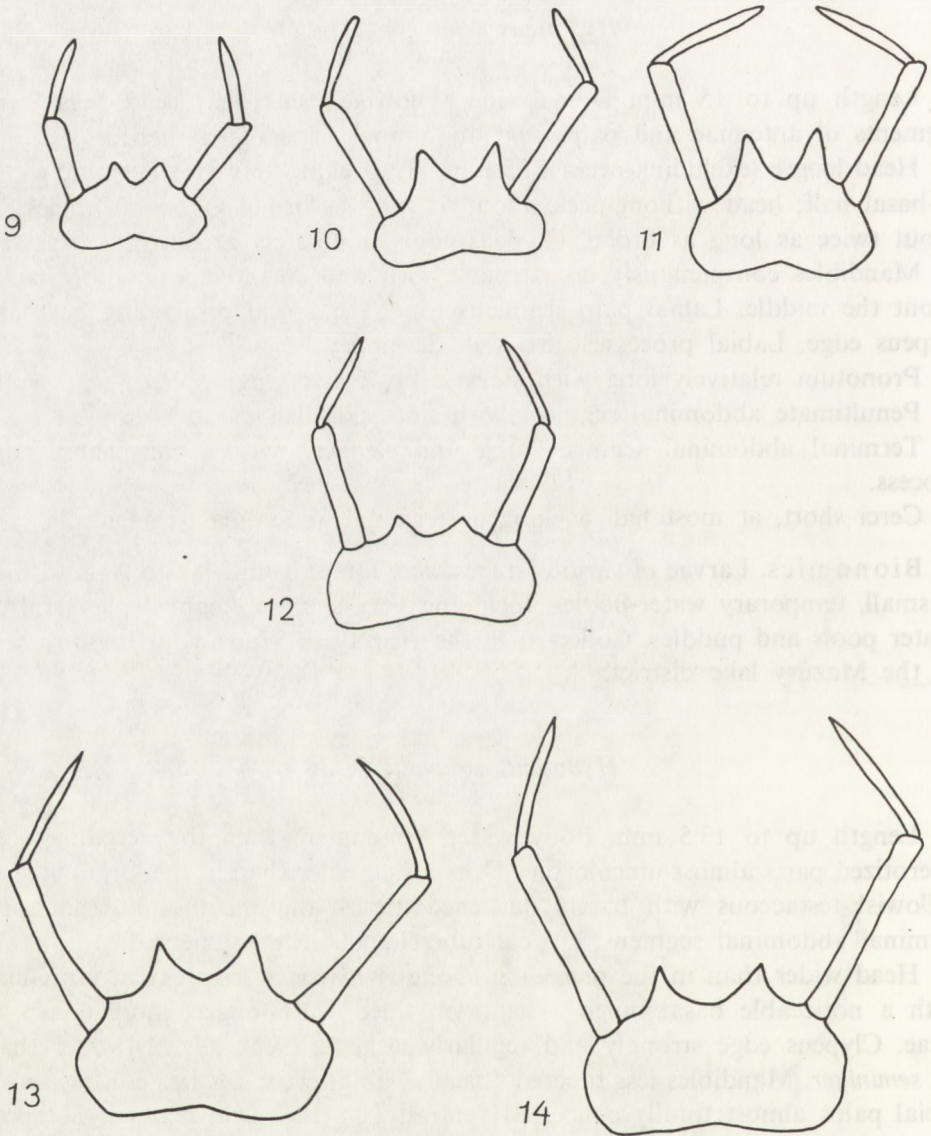
Pronotum shorter and wider than in *H. seminiger*.

Penultimate abdominal segment widened anteriorad.

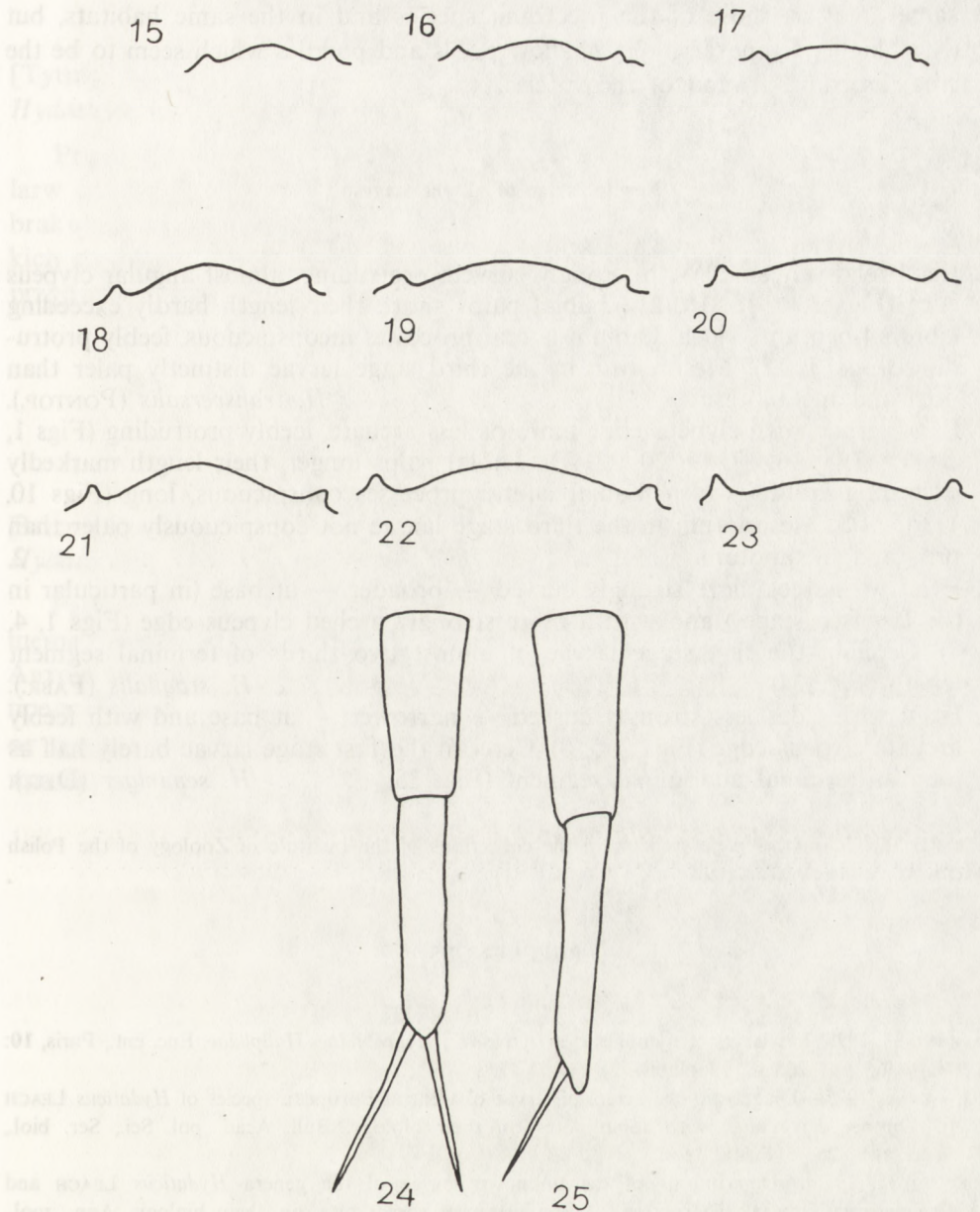
Terminal abdominal segment slightly more robust and with less conspicuous apical process than in the preceding species.

Cerci markedly longer than in *H. seminiger* of at least two thirds of terminal segment length.

Bionomics. Larvae of various stages were found from May to September in



Figs 9–14. Labia (mentum) with palps: 9–11 – second stage, 12–14 – third stage; 9, 12 – *Hydracarina transversalis*, 10, 13 – *H. stagnalis*, 11, 14 – *H. seminiger*.



Figs 15-25. Outline of clypeus margin (15-23) and last abdominal segments with cerci (24, 25): 15-17, 24, 25 - first stage, 18-20 - second stage, 21-23 - third stage; 15, 18, 21 - *Hydaticus transversalis*, 16, 19, 22, 24 - *H. stagnalis*, 17, 20, 23, 25 - *H. semingeri*.

the same areas as those of the preceding species and in the same habitats, but mostly in highly temporary, very shallow pools and puddles which seem to be the principal breeding ground of the species.

Key to larvae of all the stages

1. Head relatively small with strongly curved, protruding, almost angular clypeus edge (Figs 3, 6, 15, 18, 21). Labial palps short, their length hardly exceeding labium (mentum) width. Labium lateral processes inconspicuous, feebly protruding (Figs 9, 12). Mesonotum in the third stage larvae distinctly paler than pro- and metanotum *H. transversalis* (PONTOP.).
- Head larger, with clypeus edge more or less arcuate, feebly protruding (Figs 1, 2, 4, 5, 7, 8, 16, 17, 19, 20, 22, 23). Labial palps longer, their length markedly exceeding labium width. Labial lateral processes conspicuous, long (Figs 10, 11, 13, 14). Mesonotum in the third stage larvae not conspicuously paler than pro- and metanotum 2.
2. Head with sides more strongly curved — broader — at base (in particular in the last two stages) and with a more strongly arched clypeus edge (Figs 1, 4, 7). Cerci in the first stage larvae of almost two thirds of terminal segment length (Fig. 24) *H. stagnalis* (FABR.).
- Head with sides less strongly curved — narrower — at base and with feebly arcuate clypeus edge (Figs 2, 5, 8). Cerci in the first stage larvae barely half as long as terminal abdominal segment (Fig. 25) *H. seminiger* (DEG.).

The material used in this paper is kept in the collections of the Institute of Zoology of the Polish Academy of Sciences, Warsaw.

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STRESZCZENIE

[Tytuł: Larwy pierwszego stadium środkowoeuropejskich gatunków z rodzaju *Hydaticus* LEACH (*Coleoptera*, *Dytiscidae*)]

Praca jest uzupełnieniem wcześniejszych opracowań (GALEWSKI 1975a, b, 1983) larw środkowoeuropejskich gatunków z rodzaju *Hydaticus* LEACH. Autor podaje brakujące opisy larw pierwszego stadium oraz klucz do oznaczania larw wszystkich stadiów. Larwy różnią się między sobą głównie kształtem głowy, nadustka i przydatków głowowych oraz długością przysadek odwłoka (cerci).

РЕЗЮМЕ

[Заглавие: Личинки первой стадии центрально-европейских видов из рода *Hydaticus* LEACH (*Coleoptera*, *Dytiscidae*)]

Работа дополняет прежние публикации (GALEWSKI 1975 a, b, 1983) посвящены личинкам центрально-европейских видов из рода *Hydaticus* LEACH. Автор описывает до сих пор неизвестные личинки первой стадии, а тоже представляет определитель личинок всех стадий. Личинки отличаются друг от друга по форме головы, клыпеуса, а тоже придатками головы и длиной придатков брюшка (церци).