Studie on the morphology of larval stages of water mites (Hydracarina)
2. Some species of the superfamily Hydryphantoidea

[With 1 table and 131 text-figures]

Abstract. The paper contains descriptions of larvae of 19 species of water mites of the superfamily Hydryphantoidea. Larvae of 11 species are described for the first time. General morphological characters and morphometric characteristics of larvae of this group are presented.

Larvae of water mites of the superfamily Hydryphantoidea are still very poorly known. Though there exist descriptions of larvae of several species, they are generally not very exact and the larvae require a re-description. Original descriptions of larvae of a few species were presented by Lundblad (1927). The paper of Vajnstein (1980) containing short but well illustrated diagnoses of ten species, including one North American, is of particular importance for the knowledge of the hydryphantoid larvae of Central Europe. The description of larva of Protzia eximia Protz was presented by Biesiadka and Cichocka (1984).

This paper contains descriptions of hitherto unknown larvae of 11 water mite species of the superfamily Hydryphantoidea, and re-descriptions of larvae of 8 species. Almost all the materials come from laboratory cultures. Only the larva of Panisoides setipes (Viets) originates from its natural habitat.

Euthyas truncata (Neuman) (Figs 1–7)

Previous descriptions are contained in papers of Lundblad (1927), Viets (1936) and Vajnstein (1980).

Mean length of idiosoma 330 μm, breadth 300 μm. Idiosoma outline nearly circular. This is in agreement with Vajnstein's (1980) description, though accor-
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According to *Lundblad* (1927) there is a distinct widening in the anterior part of idiosoma. Dorsal plate irregular in shape, large, occupying more than $\frac{1}{3}$ idiosoma length. On the plate 4 pairs of setae. All, except 2 distinctly thinner pairs, ciliated. The character does not agree with the description by *Lundblad* (1927) or that by *Vajnštejn* (1980) which differ also in this respect. Frontal organ pigmented, situated in the posterior part of dorsal plate. Eyes large, situated laterally to the dorsal plate, anterior distinctly larger than posterior.

Epimeral field occupying c. $\frac{2}{3}$ idiosoma length. Shape and arrangement of epimeres agree with the descriptions of *Lundblad* (1927) and *Vajnštejn* (1980). Anal plate rhomboid in outline, with anus situated in its anterior part, similar to that presented by *Lundblad* (1927). Setae on the ventral surface of idiosoma, situated outside the epimeres and anal plate, ciliated, comparatively thick and set on oval platelets.

Infracapitulum c. 170 μm long, chelicerae 150 μm long. Basal segment of chelicerae slender. Palp comparatively large. Mean length: P.I - 8 μm, P.II - 30 μm, P.III - 30 μm, P.IV - 77 μm, P.V - 26 μm. P.IV terminating with a well developed, tripartite, claw-like process. In the ventral pit of P.IV, P.V is set, with 4 thick, ciliated setae, and 3 thinner, bare.

Legs, as compared to idiosoma, relatively long, chaetotaxy with specific characters. Legs of I pair slightly longer than the remaining (Table).

**Material:** 2 ♀♀ collected on April 30th 1981 in an astatic reservoir near the lake Skanda (vicinity of Olsztyn), eggs laid on May 4th and 13th, numerous larvae hatched on May 28th and June 2nd. Incubation period 20-24 days.

*Thyasides dentatus* (*Thor*) (Figs 8-14)

Very imprecise descriptions of larvae were presented in papers of *Lundblad* (1913, 1927) on which characteristics of *Viets* (1936) and *Sparing* (1959) were based. According to *Lundblad* (1927) larvae of this species are parasites of *Aedes lutescens* (*Culicidae*).

Larvae smaller than those of *Euthyas truncata*. Mean length of idiosoma 240 μm, breadth 200 μm. Dorsal plate rectangular in outline, with no microsculpture and with 4 pairs of setae. Besides, on the dorsal body surface 6 pairs of long setae, set on platelets, and 1 near the eyes of II pair, set directly on the body. All idiosomal setae bare. Eyes distinctly smaller than in the larva of *Euthyas truncata*.

Epimeral field very large, occupying c. $\frac{3}{4}$ idiosoma length. Epimeres large, triangular in outline. Setae set similarly to those of other *Thyadinae*. Larval organ in shape of a small, oval opening adjoining epimeres of I pair and situated distinctly closer to the body margin than in the larva of *Euthyas truncata*. Anal plate rectangular, with elongate anus and 2 pairs of fine setae. Other setae of the ventral surface of idiosoma set on platelets.

Infracapitulum narrow, triangular, equals half idiosoma length (106 μm). Chelicerae narrow, c. 96 μm long. Palp long, massive. Length: P.I - 9 μm, P.II - 27
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µm, P.III — 25 µm, P.IV — 58 µm, P.V — 35 µm. Basal segment rectangular, further 2 segments with long, bare setae. P.IV comparatively short, terminating with a claw-like process, with 3 setae of which 2 ventral have plumose processes.

Legs long, compared to idiosoma longer than in *Euthyas truncata*. Legs of I pair only slightly longer than those of III pair (Table).

**Material:** 4 ♀♀ collected on April 11th 1981 in an astatic reservoir near the lake Skanda (vicinity of Olsztyn), eggs laid on April 13th and 14th, numerous larvae hatched on May 5th. Incubation period 23–24 days.

*Thyas barbigera* Viets (Figs 15–21)

Previous descriptions of larvae (Lundblad 1927, Viets 1936, Sparing 1959) are strongly incompatible with our morphological observations. They may pertain to very young and not fully formed larvae.

Idiosoma circular in outline, its length c. 230 µm, breadth 200 µm. On the dorsal surface of idiosoma, in the anterior body part a frontal plate. Below its middle frontal organ visible, surrounded by 4 openings found only in the genus *Thyas Koch*. On dorsal plate 4 pairs of setae: 2 pairs shorter, of length equal to that of the plate, thin and ciliated, and 2 pairs thicker, very long (almost equal in length to idiosoma) and bare. All the remaining setae of the dorsal surface of idiosoma ciliated and set on platelets. According to Lundblad (1927), Viets (1936) and Sparing (1959) the frontal plate is divided in two parts, anterior and posterior with the frontal organ situated between them.

Epimeral field large, occupying more than half of the ventral surface of idiosoma. Epimeres of I and II pair triangular in outline, epimeres of III pair more rectangular. Larval organ situated in the middle, between epimeres of I and II pair. Like the larvae of the genera *Euthyas Piers* and *Thyasides Lundbl.* larvae of the genus *Thyas Koch* are characterized by the presence of setae on all the epimeres. Anal plate rectangular, with anus in its upper part and 2 pairs of short setae. Setae on the ventral surface of idiosoma, except those on epimeres, similar to those on the dorsal surface.

Infracapitulum small, 83 µm in length, triangular in outline. Chelicerae somewhat smaller, 76 µm long. Palps shorter than in the preceding genera *Euthyas Piers* and *Thyasides Lundbl.*  

Length: P.I — 65 µm, P.II — 32 µm, P.III — 25 µm, P.IV — 51 µm, P.V — 37 µm. P.IV terminating with a bent claw. P.V provided with a dagger-like process, 2 fan-like setae and 3 thin, bare setae. Setae on the first three palp segments also bare.

Legs rather long, with numerous ciliated setae. Length ratio of idiosoma and legs similar to that in the genus *Thyasides Lundbl.* (Table).

**Material:** 1 ♀ collected on April 30th 1981 in a seasonal reservoir in Poznań, eggs laid on May 12th, numerous larvae hatched on May 28th; 2 ♀♀ collected on May 27th 1983 in an astatic reservoir near Olszynek, eggs laid on June 1st and 2nd, numerous larvae hatched on June 13th and 15th; 1 ♀ collected in an astatic reservoir near the lake Skanda (vicinity of Olsztyn) on April 15th 1983, eggs laid

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on May 11th, larvae hatched on May 24th; 1 ♀ collected in a peat-bog Redykajny (vicinity of Olsztyn) on April 22nd 1982, eggs laid on May 9th, larvae hatched on May 25th. Incubation period in various cultures from 12 to 16 days.

**Thyas dirempta** KoEnike (Figs 22–28)

An incomplete description of larva was presented by Vajnstejn (1980).

Idiosoma length 236 μm, breadth 180 μm. Dorsal plate shorter than in *Th. barbigera*, occupying c. $\frac{1}{3}$ idiosoma length; frontal organ situated in the middle of
dorsal plate. Eyes situated like in *Thyasides dentatus*. Bases of dorsal setae outside the dorsal plate of even size. Part of the ventral surface of idiosoma occupied by epimeres larger than in the preceding species, epimeres much narrower. Anus in shape of a long slit. Arrangement of setae in relation to the anal plate different from that in *Th. barbiger*.


Legs longer and more slender than in *Th. barbiger* (Table).

Material: 1 ♀ collected on March 11th 1983 in an astatic reservoir near Olsztynek, eggs laid on March 25th, 6 larvae hatched on April 6th. Incubation period 12 days.

Thyas pachystoma KoéniKe (Figs 29–35)

Larva hitherto unknown.

Larva large, body length c. 300 μm, breadth 250 μm. In the anterior part of dorsal surface of idiosoma, like in the entire subfamily Thyadinae, rectangular dorsal plate, different from that in Th. barbigera in the presence of deeper incisions at the level of second pair setae. Platelets on which setae of idiosoma are set very large, those of the pair of median setae behind frontal plate being the largest.

Epimeral field very large. Epimeres similar to those of larvae of Th. barbigera. Larval organ similarly situated but more widened. Anal plate trapezoid, distinctly broader than in all the preceding species.

Infracapitulum large (140 μm long). Chelicerae somewhat smaller than gnathosoma, 120 μm long. Palps very long, the longest in the subfamily Thyadinae, like in Euthyas truncata. Length: P.I — 10 μm, P.II — 50 μm, P.III — 28 μm, P.IV — 70 μm, P.V — 47 μm. P.IV provided with a long, bipartite claw, P.V dagger-like, like in other Thyadinae.

Legs very long (Table), robust, richly setose. All setae ciliated. Ambulacral claws exceptionally long and wavy.

Material: 1 ♀ collected on April 22nd in a peat-bog Redykajny near Olsztyn, eggs laid on May 17th, larvae hatched on May 26th; 1 ♀ collected on April 3rd in a peat-bog near the lake Tyrsko (Olsztyn), eggs laid on May 11th, larvae hatched on May 25th; 3 ♀♀ collected on May 21st 1982 in a peat-bog near Jonkowo (vicinity of Olsztyn), eggs laid on May 26th and 27th, larvae hatched on June 11th; 1 ♀ collected on April 2nd 1983 in a peat-bog near the lake Sgnitek (vicinity of Olsztyn), eggs laid on May 12th, larvae hatched on June 23rd. Incubation period from 14 to 40 days, depending on a season of the year.

Thyas rivalis KoéniKe (Figs 36–42)

A very superficial description of larva was presented by Vîets (1923).

Larvae not much smaller than those of Th. barbigera. Idiosoma length c. 220 μm, breadth 200 μm. Dorsal plate deeply incised on sides, almost divided in two parts. Frontal organ situated in the posterior part of the plate. Bases of setae of mid body part, situated outside the plate, exceptionally large. Idiosoma setae rather thick and very long. Ventral surface of idiosoma similar to that in Th. pachystoma. Anal plate broadly oval.

Infracapitulum 100 μm long. Chelicerae and palps similar to those of Th. pachystoma but distinctly shorter and thinner. Length of chelicerae 85 μm. Length of palps: P.I — 6.7 μm, P.II — 33 μm, P.III — 24 μm, P.IV — 53 μm, P.V — 32 μm.

Legs short, setae similar to those in all the genus Thyas Koch (Table).
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Material: 1 ♀ collected on April 23rd 1981 in a spring in the valley of Bogdanka (Poznań), eggs laid on April 25th, larvae hatched on May 15th; 2 ♀♀ collected in the source of the river Łyna (vicinity of Nidzica) on May 5th 1983, eggs laid on May 10th and 17th, larvae hatched on May 25th and June 11th. Incubation period 15–25 days.

Thyas bruzelli Lundblad (Figs 43–49)

An incomplete description of larva was presented by Vajstein (1980).

Larvae rather large. Idiosoma length in two measured specimens 275 and 290 μm, breadth 250 and 220 μm. Dorsal plate distinctly broader in its posterior part in which frontal organ and 2 pairs of elongate openings are situated. Setae arranged like in other species. Platelets on which median setae are set very large.

Epimeral field very large. Epimeres large, all triangular in outline. Larval organ in shape of small, round openings situated in the middle, between epimeres of I and II pair. Anal plate rectangular, small, setae on the ventral surface short, set on small platelets.


Legs long, robust, with thick, ciliated setae (Table).

Material: 1 ♀ collected in an astatic reservoir in Poznań, Wola on April 23rd 1981, eggs laid on April 27th, 2 larvae hatched on May 13th. Incubation period 17 days.

Panisoides setipes (Viets) (Figs 50–55)

Larva hitherto unknown.

Idiosoma length 235 μm, breadth 220 μm. Larva resembling the genus Thyas Koch in its structure. Dorsal plate formed similarly to that of larvae of Thyas dirempta. Frontal organ rather large, visible in the posterior part of the plate. The position of the first pair of thick, ciliated setae of the dorsal surface is a distinctive character as compared with the previous genera. In P. setipes they are situated outside the frontal plate, on separate platelets. The remaining 3 pairs of setae associated with frontal plate set similarly to those of the genus Thyas Koch. Eyes large, larger than in the genera Thyas Koch and Thyasides Lundbl., but smaller than in the genus Euthyas PiERS.

Epimeral field very large, triangular, setae like in the entire subfamily Thyadinae. Larval organ large, oval, situated close to external margins, between epimeres of I and II pair. Anal plate rectangular. Anus large. Ventral setae, like in the preceding genera, set on platelets.

Infracapitulum narrow and long (104 μm). Chelicerae and palps similar to
those in larvae of the genus *Thyas Koch*. Palp length: P.I - 3.8 µm, P.II - 36 µm, P.III - 29 µm, P.IV - 49 µm, P.V - 23 µm.

Legs long (Table), richly setose. Ambulacral claws wavy.

Material: 1 larva collected on June 25th 1983 in the source of the river Łyna (vicinity of Nidzica). It was identified basing on the presence of adults and deutonymphs at the same locality.

*Hydryphantes ruber* (Geer) (Figs 56–63)

Very superficial descriptions of larvae were presented by Koënike (1908) and Viets (1936). A more complete characteristic is contained in the paper of Vajnstein (1980).
Larva purple coloured. Smaller than larvae of the genus *Thyas* KOCH. Mean length of idiosoma 210 μm, breadth 180 μm. Idiosoma oval, on its dorsal surface a heart-shaped plate of a rather variable shape. Anterior part of the plate with a characteristic microsculpture consisting of longitudinal wrinkles. On dorsal plate 2 pairs of setae: 1 pair of comparatively long and 1 pair of short, median. In the posterior part of dorsal plate, in the median line, poorly visible frontal organ. In the anterior part of the plate 2 pairs of setae set on 2 oval platelets. Eyes small situated laterally to the plate, anterior pair larger than the posterior. On the dorsal surface, besides, 6 pairs of ciliated setae with bases.

Epimeral field occupying half of the ventral surface of idiosoma. Epimeres of II pair the smallest, with no setae. Epimeres of III pair the largest, somewhat removed from those of II pair, with 1 seta set differently than in species of the preceding genera. Setae on epimeres of I pair set as in larvae of the preceding

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genera. Anal plate rhomboid, according to the description of Vajnstein (1980) triangular, with a differently situated anus.


Legs short (Table), with thick segments. Legs of I pair the longest, their length exceeding that of idiosoma. Basifemur and telofemur very short. Tibia and tarsus richly setose. Setae thick, ciliated. Empodial claw delicate, sickle-like bent. Ambulacral claws short, feebly bent.

**Material:** 2 ♀ collected in an astatic reservoir in Poznań, Wola: 1 collected on June 11th 1980, eggs laid on June 12th, larvae hatched on July 6th; 1 collected on April 23rd 1981, eggs laid on April 29th, larvae hatched on May 28th; 3 ♀ collected in an astatic reservoir near the lake Skanda (vicinity of Olsztyn): 2 collected on April 26th 1984, eggs laid on May 5th and 11th, larvae hatched on May 25th and 28th; 1 collected on May 15th 1984, eggs laid on May 18th, larvae hatched on May 25th. Incubation period 7–30 days.

*Hydryphantes hellichi* Thon (Figs 64–70)

Larva hitherto unknown.

Larvae smaller than those of *H. ruber*. Idiosoma length 145 μm, breadth 125 μm. Dorsal surface similar to that of larvae of the preceding species. Dorsal plate larger than in *H. ruber*, pear-shaped, more uniform than in the preceding species; almost its entire surface covered with microsculpture. Platelets on which 2 pairs of setae are set larger and rounder.

Epimeral field smaller than in *H. ruber*. Larval organ strongly widened. Anal plate oval in outline.


Legs (Table) of a structure similar to that found in the entire genus *Hydryphantes* Koch. Legs of I pair equal in length to idiosoma, other legs only slightly shorter.

**Material:** 1 ♀ collected in floods of the lake Domowe in Szczyno on May 6th 1982, eggs laid on May 9th, larvae hatched on May 26th; 1 ♀ collected in a peat-bog near the lake Sgnitek (vicinity of Olsztyn) on May 26th 1982, eggs laid on June 2nd, larvae hatched on June 23rd. Incubation period 17–20 days.
Figs 64–70. *Hydryphantes hellichi* Thon: 64 — dorsal surface, 65 — ventral surface, 66 — chelicera, 67 — palp, 68 — leg I, 69 — leg II, 70 — leg III.

*Hydryphantes nonundulatus* Viets (Figs 71–77)

Larva hitherto unknown.

Body length 150 μm, breadth 135 μm. Body oval. On the dorsal surface a large dorsal plate, heart-shaped, situated between two pairs of eyes. The plate provided with a poorly distinct microsculpture in shape of lines disappearing in its posterior part. Setae on dorsal plate situated similarly as in other species of the genus *Hydryphantes* Koch. Frontal organ close to the posterior margin of the plate, poorly visible. In front of the dorsal plate, in anterior body part, 2 pairs of dorsal setae set on separate platelets of different shape. Setae of I pair shorter, broader and ciliated, set on an elliptical platelet with a long, medially directed process. The process touches directly another plate, roundish, on which II pair setae are set. Setae of II pair thin, long, bare and reaching far outside the dorsal plate. Besides, on the dorsal surface 5 pairs of rather thick and ciliated setae of even length.
Epimeral field occupying a considerable part of the ventral surface of idiosoma. Epimeres of I and III pair rather large, irregularly ovate in outline, epimeres of II pair much smaller, their outline triangular. Larval organ large, ovate. Anal plate very small, ovate, with round anus posteriorly. On the sides of the plate 1 pair of short, bare setae. In other species of the genus *Hydryphantes* Koch the setae are set on anal plate.

Infracapitulum 95 μm long, rather broad, its anterior margin rounded. Chelicerae c. 90 μm long. Basal segment massive. Claw of the basal segment spatulate. Chela crescentic, set under the claw of the basal segment. Palps short: P.I – 7 μm, P.II – 23 μm, P.III – 16 μm, P.IV – 26 μm, P.V – 12 μm. The strongly shortened P.V is distinct in its interesting structure. Bipartite claw of P.IV strongly curved, one part sharply, another bluntly terminated and somewhat shorter. Last segment strongly elongate, on its termination 2 processes. It is also characterized by being very sparsely setose.

Legs (Table) as compared with larvae of other species of the genus rather long, of a structure similar to that found in other larvae.

Material: 1 ♀ collected on June 11th 1980 in an astatic reservoir in Poznań, Wola, eggs laid on June 11th, larvae hatched on July 10th. Incubation period c. 30 days.
Hydryphantes bayeri Pisarovic (Figs 78-84)

Larva hitherto unknown.

Idiosoma length 143 \( \mu \)m, breadth 123 \( \mu \)m. Dorsal plate large, broadly heart-shaped in outline, its anterior part microsculptured with striae. Two pairs of setae, situated in front of the dorsal plate, set on a pair of oval platelets. All setae of the dorsal surface shorter than in the preceding species.

Epimeres large, first 2 pairs triangular. Epimeres of III pair nearly rectangular in outline, with broadly rounded median margin. Setae on epimeres short. Anal plate large, with large anus and a pair of short setae. Setae on the ventral surface also with small bases; they are the shortest and the thinnest of setae of larvae of the genus Hydryphantes Koch.

Infracapitulum small (76 \( \mu \)m long), chelicerae 71 \( \mu \)m long, rather broad, of breadth even on their entire length, chela short, antychela tubercle-like, fairly high. Palps rather characteristic, short and broad. All setae ciliated, setae on P.III the longest. P.IV terminating with a small, sharp claw. P.V short, with numerous

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Legs short, especially basifemur and telofemur (Table).

**Material:** 1 ♀ collected on April 9th 1984 in an astatic reservoir near the lake Skanda (vicinity of Olsztyn), eggs laid on April 16th, larvae hatched on May 1st. Incubation period 15 days.

*Hydryphantes crassipalpis* KOENIKE (Figs 85–91)

Larvae were described by VAINSTEIN (1980) but his description and figures show marked differences when compared to our material.

Idiosoma round, 152 μm long, 106 μm broad. Dorsal plate triangular in outline, with irregularly incised posterior margin. VAINSTEIN (1980) drew a straight margin. Microsculpture poorly visible. In front of dorsal plate 2 pairs of setae on separate platelets of different shape. According to VAINSTEIN (1980) the setae on idiosoma are shorter and thicker than in the studied material.

Epimeral field occupying half of the ventral surface of idiosoma. Larval organ strongly broadened, situated on body sides, between epimeres of I and II pair. Epimeres of III pair fairly large, their outline nearly rectangular, with a broadly rounded posterior margin. Anal plate oval, with large, elongate anus and 1 pair of setae. Setae on the ventral surface of idiosoma distinctly thinner than in the figures of VAINSTEIN (1980).


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Infracapitulum narrow, 71 μm long. Chelicerae small (56 μm long), comparatively narrow, basal segment almost rectangular, chela delicate. Palps short and broad, P.I and P.II broadest. Claw on P.IV long, straight, bipartite. P.V short, nearly cylindrical, prolonged as a thick, ciliated seta next to which a few similar but somewhat thinner setae are set. Length: P.I — 5 μm, P.II — 16 μm, P.III — 15 μm, P.IV — 26 μm, P.V — 10 μm.

Legs (Table) relatively short. Legs of I pair shorter than idiosoma and only slightly longer than the other legs.

Material: 1 ♀ collected on May 5th 1981 in the valley of Bogdanka in Poznań, Wola, eggs laid on May 19th, larvae hatched on June 4th; 4 ♂♂ collected in an astatic reservoir near the lake Skanda (vicinity of Olsztyn): 1 on April 28th 1982, eggs laid on May 5th, larvae hatched on May 25th; 1 on May 14th 1982, eggs laid on May 20th, larvae hatched on June 4th; 2 on May 17th 1983, eggs laid on May 20th, larvae hatched on June 1–3rd. Incubation period 12–20 days.

*Hydryphantes abnormis* KOENIKE (Figs 92–98)

Larva of this species was superficially described by KOENIKE (1908), and some morphological characters were given by VIETS (1936).

Idiosoma oval, c. 120 μm long and 105 μm broad. Dorsal plate with a distinct microsculpture on its entire surface. Shape of the plate and arrangement of setae
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similar to those in *H. crassipalpis*. Paired platelets situated in front of dorsal plate also like in the preceding species. Setae on idiosoma rather long.

Epimeral field large. All epimeres triangular in outline, those of I pair the largest, of II pair the smallest. Larval organ of a shape and position similar to those found in the preceding species. Anal plate broad oval, with large anus and a pair of setae.

Infracapitulum 65 µm long. Chelicerae very small (55 µm long), antychela in shape of a triangular tubercle, chela strongly bent. Palps thick and short, P.V elongate, richly setose, P.IV with a straight, bipartite claw. Length: P.I — 5 µm, P.II — 20 µm, P.III — 13 µm, P.IV — 22 µm, P.V — 9 µm.

Legs short (Table), richly setose, like in the preceding species.

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*Hydryphantes planus* Thon (Figs 99–105)

The larva described by Vajnstein (1980) as *H. planus* differs distinctly from our materials and may represent a different species.

Idiosoma length 155 µm, breadth 123 µm. Dorsal plate broadly pear-shaped. Frontal organ at the bottom of the plate. Microsculpture only on the sides of dorsal plate, barely visible. Setae in the anterior body part, in front of dorsal plate, set on one, undivided, large, triangular platelet. Setae on the dorsal body surface rather long and thick, with bases large but smaller than in the subfamily *Thyadinae*.

Epimeral field occupying 1/3 idiosoma. Epimeres of I and III pair large. Larval organ broad oval. Anal plate trapezoid, with large anus and a pair of rather long, bare setae.


Legs short (Table), all pairs shorter than idiosoma.

**Material**: 1 ♀ collected on April 30th 1981 in an astatic reservoir in Poznań, Wola, eggs laid on May 7th, larvae hatched on May 24th; 2 ♀♀ collected on May 10th 1984 in an astatic reservoir near the lake Skanda (vicinity of Olsztyn), eggs laid on May 18th, larvae hatched on May 29th. Incubation period 11–18 days.

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Larva hitherto unknown.

Idiosoma length 150 \( \mu \text{m} \), breadth 120 \( \mu \text{m} \). Dorsal plate large, pear-shaped, with distinct longitudinal microsculpture. Anterior platelets of varied size, adjoining each other.

Epimere shape similar to that found in larvae of *Hydryphantes planus*, anal plate more oval, with shorter setae.

Infracapitulum 68 \( \mu \text{m} \) long, rather broad, chelicerae short, their external surface with a linear microsculpture, like in most species of the genus. Palps similar to those of *H. planus*, claw bipartite, almost straight. P.V short, terminating with a thick seta surrounded by 4 thinner setae. At the base of the segment a thick seta with a claw-like incised margin, not found in the preceding species of *Hydryphantes Koch*. Palp length: P.I - 5 \( \mu \text{m} \), P.II - 17 \( \mu \text{m} \), P.III - 14 \( \mu \text{m} \), P.IV - 25 \( \mu \text{m} \), P.V - 12 \( \mu \text{m} \).

Legs similar to those of *H. planus*, tibia and tarsus somewhat shorter (Table).
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**Material:** 2 ♀♀ collected in an astatic reservoir near the lake Skanda (vicinity of Olsztyn): 1 on April 22nd 1983, eggs laid on May 17th, larvae hatched on May 23rd; 1 on May 17th 1983, eggs laid on June 2nd, larvae hatched on June 15th. Incubation period 8–12 days.

![Figures 106-112](http://rcin.org.pl)


*Hydryphantes frici* Thon (Figs 113–119)

Larva hitherto unknown.

Idiosoma length 160 μm, breadth 125 μm. Dorsal plate pear-shaped, distinctly longer than in larvae of the preceding species of the genus. Microsculpture rather poorly visible. Hind margin of the plate straight. Setae situated in front of eyes, behind frontal plate, set on separate but broadly united platelets. All setae on idiosoma longer than in the preceding species of the genus.

Epimeres small, epimeral field occupying c. half of the ventral surface of idiosoma. Epimeres of all pairs triangular in outline, larval organ situated on body margin, nearly oval. Anal plate elliptical, with large anus and a pair of setae. Other setae of the ventral surface of idiosoma rather thin, ciliated.

Infracapitulum 80 μm long, chelicerae 74 μm long, thick, chela short, antychela large. Palps small. P.II shorter than in larvae of other species of the genus *Hydryphantes* Koch. P.IV with a long, straight, bipartite claw, longer than in other

Legs short, like in larvae of the preceding species (Table).

Material: 1 ♀ collected on April 24th 1983 in an astatic reservoir near the lake Skanda (vicinity of Olsztyn), eggs laid on May 17th, larvae hatched on May 31st. Incubation period 14 days.


Hydryphantes thoni (Piersig) (Figs 120–126)

Larva hitherto unknown.

Idiosoma length 160 μm, breadth 130 μm. Idiosoma elongate. Dorsal plate pear-like in outline, posteriorly broadly rounded, anteriorly tapered, with a delicate microsculpture. Setae of II pair much thinner and shorter, like in other species. Platelets in front of frontal plate divided by a suture. Setae of I pair very thick, those of II pair thin and long. Further setae on the dorsal surface very thick, the thickest in the genus Hydryphantes Koch.

Epimere shape similar to that in H. frici, but larval organ more elongate and shifted towards the mid body axis. No anal plate, only large anus and a pair of setae visible.
Infracapitulum 70 µm long, chelicerae 65 µm long, chela very short. Palps short, P.IV terminating with a bipartite claw, P.V with 4 bare setae of which 1 is very thick. Palp length: P.I — 5 µm, P.II — 14 µm, P.III — 15 µm, P.IV — 24 µm, P.V — 10 µm.

Legs rather short (Table), length of I pair roughly equal to that of idiosoma.

Material: 1 ♀ collected on April 30th 1982 in a peat-bog near the lake Tyrsko in Olsztyn, eggs laid on May 18th, larvae hatched on May 31st; 2 ♂♂ collected in a peat-bog near the lake Sgnitek near Gutkowo (vicinity of Olsztyn): 1 on April 21st 1982, eggs laid on April 22nd, larvae hatched on April 29th; 1 on April 22nd 1983, eggs laid on May 17th, larvae hatched on May 25th. Incubation period 8–12 days.


Hydrodroma despiciens (Müller) (Fig. 127)

The larvae were described by numerous authors (Weissenberg-Lund 1918, Lundblad 1927, Viets 1936, Sparing 1959, Prasad and Cook 1972, Vainstein 1980, Wiles 1985).

The descriptions, especially those more recent, are fairly exact, so there is no need for a re-description. Attention should be drawn here only to the presence of a
large though poorly distinct frontal plate on the dorsal body surface. Most authors overlooked the plate, but it was noticed by Lundblad (1927), though described as smaller and differently shaped. Also dorsocentral setae of I pair are characteristically set directly on the body, laterally to rather large platelets. Other characters of larvae of *H. despiciens* are in agreement with the descriptions. Legs rather long (Table), longer than idiosoma.

![Fig. 127. Dorsal surface of the *Hydrodromia despiciens* (MOLL.).](http://rcin.org.pl)

| Table. Lenght (in µm) of the leg segments of the investigated water mite species |
|-----------------------------------|-----------|----------|---------|--------|--------|--------|--------|
| **Species**                       | **Leg**   | **Trochanter** | **Basifemur** | **Telofemur** | **Genu** | **Tibia** | **Tarsus** |
| **Euthyas truncata**               | I         | 30        | 51      | 35     | 64     | 81     | 179     |
|                                   | II        | 29        | 39      | 27     | 35     | 76     | 148     |
|                                   | III       | 29        | 37      | 28     | 37     | 73     | 159     |
| **Thyasides dentatus**            | I         | 23        | 38      | 25     | 48     | 75     | 130     |
|                                   | II        | 24        | 40      | 23     | 39     | 73     | 127     |
|                                   | III       | 25        | 42      | 25     | 43     | 70     | 131     |
| **Thyas barbigera**               | I         | 19        | 38      | 22     | 43     | 69     | 113     |
|                                   | II        | 18        | 35      | 20     | 36     | 65     | 111     |
|                                   | III       | 25        | 38      | 18     | 33     | 69     | 115     |
| **Thyas dirempta**                | I         | 25        | 47      | 26     | 54     | 100    | 124     |
|                                   | II        | 22        | 43      | 25     | 39     | 79     | 116     |
|                                   | III       | 23        | 43      | 25     | 46     | 81     | 127     |
| **Thyas pachystoma**              | I         | 28        | 48      | 31     | 48     | 83     | 146     |
|                                   | II        | 26        | 42      | 25     | 44     | 74     | 141     |
|                                   | III       | 29        | 45      | 27     | 43     | 86     | 150     |
| **Thyas rivalis**                 | I         | 21        | 37      | 25     | 43     | 65     | 100     |
|                                   | II        | 19        | 32      | 19     | 32     | 58     | 96      |
|                                   | III       | 23        | 36      | 22     | 32     | 66     | 101     |
Table.  (contd)

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http://rcin.org.pl
Material: 1 ♀ collected in the lake Krzywe on June 2nd 1982, eggs laid on June 8th, larvae hatched on June 26th; 15 ♀♀ collected on July 13th 1982 in a reservoir at WOSTiW in Olsztyn, eggs laid from July 17th to 21st, larvae hatched from July 26th to August 1st. Incubation period 8–12 days.

Diversification of idiosoma structure in larvae of *Hydryphantoidea*

The idiosoma in larvae of the studied group is of a distinctly more uniform structure than that in adult stages. On the dorsal surface of the larval idiosoma (Fig. 128) of all the species there are large, distinct eyes. The dorsal plate is only exceptionally absent (*Protzia* Piers). In species of the genus *Hydryphantes* Koch it is triangular in outline, or pear-shaped. In the remaining species the dorsal plate has a tetragonal outline and sometimes shows a tendency to divide in two parts: anterior and posterior. In the genus *Hydryphantes* Koch the dorsal plate is thus divided. On the dorsal surface of idiosoma there are, besides, 10–12 pairs of setae, in many species set on round platelets.

On the ventral surface of the body of larvae of *Hydryphantoidea* (Fig. 129) epimeral and anal fields can be distinguished. The epimeral field comprises 3 pairs of epimeres with 2–4 pairs of setae. The anal plate is only exceptionally absent (*Hydryphantes thoni*, *Hydrodroma despiciens*). In the remaining species studied its outline is roughly triangular or tetragonal. On the anal plate 2–3 pairs of fine setae are set. Besides, in the anal region there are 4–7 pairs of setae.

![Figs 128, 129. Schemes of idiosoma of the *Hydryphantoidea* larvae: 128 — dorsal surface, 129 — ventral surface (a broken line denotes plates and setae occurring only in particular genera).](http://rcin.org.pl)

Morphometric characteristics

Morphometric studies were based on the method used by BIESIADKA (1975) and BIESIADKA and CICHOCKA (1984), using mean values of measurements of 10–20 larvae of particular species (exceptions: *Panisoides setipes* — 1 larva and *Thyas*...
Morphology of larvae of Hydracarina

bruzeili — 2 larvae). The total length of idiosoma and the length of particular leg segments were measured. The measurements are summarized in diagrams (Figs 130, 131), and the length ratio of idiosoma and legs is presented as an index resulting from dividing idiosoma length by the mean length of leg.

The larvae of Hydryphantoidea can be divided in two groups: large, idiosoma length 250–350 μm, with legs long, longer than the idiosoma, and small, idiosoma length 120–210 μm and legs shorter than the idiosoma. The first group comprises the genera: Euthyas PIERS., Thyas KOCH, Thyasides LUNDBL., Panisoides LUNDBL., Hydrodroma KOCH, and Protzia PIERS., the second — Hydryphantes KOCH. Among species of the genus Hydryphantes KOCH, H. ruber is exceptional in having its body c. 100 μm longer than the other species, and the I pair of legs longer than the idiosoma. Thus H. ruber represents a transition between the I and the II group of larvae. There is apparently no functional (ecological) justification for the diversification of larvae into morphometric types. The hydryphantoid larvae live in the humid border zone between water and land. In streams they occupy hygropetric

![Fig. 130. Comparison of larval idiosoma and leg dimensions in some species of water mites: A — Euthyas truncata (NEUM.), B — Thyasides dentatus (THOR), C — Thyas barbigerus VIETS, D — Thyas diempta KOEN, E — Thyas pachystoma KOEN, F — Thyas rivalis KOEN, G — Thyas bruzelli LUNDBL., H — Panisoides setipes (VIETS), I — Hydrodroma despiciens (MÜLL.) (tr — trochanter, fb — basifemur, ft — telofemur, ge — genu, ti — tibia, ta — tarsus; the numbers denote the length ratio of idiosoma and legs).](http://rcin.org.pl)
habitats, in stagnant waters they live in a coastal zone, on plants or surface film. The larvae of *Hydryphantoidea* are not swimmers, in contrast to other water mite larvae. Legs of I pair in all the hydryphantoid larvae are the longest, legs of II pair the shortest, while those of III pair are somewhat shorter than the I pair or slightly longer than the II pair, depending on a species. Tarsus is the longest segment, in larvae of the I group it is more elongate than in those of the II group. Besides, in larvae of the I group the basifemur is often twice longer than the telofemur, whereas in larvae of the II group it is either equal or only slightly longer than the telofemur.

**REFERENCES**


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STRESZCZENIE

[Tytuł: Badania nad morfologią stadiów larwalnych wodopójek (Hydracarina). 2. Gatunki z nadrodziny Hydryphantoidea]


Budowa larw Hydryphantoidea jest bardziej jednorodna niż deutonimf i imagines. Przedstawiono ogólny schemat budowy idiosomy larw tej grupy. Na podstawie charakterystyki morfometrycznych wyróżniono dwie grupy larw: larwy duże, z odnóżami długimi, dłuższymi od idiosomy (rodzaje: Euthyas PIERS., Thyas KOCH, Prozia PIERSIG, Thyasides LDBL., Panisoïdes LDBL., Hydrodroma KOCH) i larwy małe, z odnóżami krótkimi, krótszymi od idiosomy (rodzaj Hydryphantes KOCH).

РЕЗЮМЕ

[Заглавие: Исследования по морфологии личиночной стадии водяных клещей (Hydracarina). 2. Виды из надсемейства Hydryphantoidea]

В работе содержатся подробные описания и рисунки личинок 19 видов из надсемейства Hydryphantoidea. Личинки 11 видов описаны здесь впервые.
Материал для этой разработки, за исключением Panisoides setipes (Viets), происходит из лабораторных разведений, которые велись в 1980—1984 годах.

Строение личинок Hydryphantoidea является более однородным, чем строение дейтонимф и взрослых особей. Представлено общую схему строения идиосомы личинок этой группы. Исходя из морфометрических характеристик выделено две группы личинок: личинки большие, с длиннее идиосомы, конечностями (роды: Euthyas Piers., Thyas Koch, Protzia Piersig, Thyasides LdbL., Panisoides LdbL., Hydrodroma Koch) и личинки маленькие, с короткими, короче идиосомы, конечностями (род Hydryphantes Koch).