

THE MORPHOLOGY OF LARVA OF THE WATER MITE *PANISUS MAJOR*  
TUZOVSKIJ (ACARIFORMES, HYDRYPHANTIDAE)

МОРФОЛОГИЯ ЛИЧИНКИ ВОДЯНОГО КЛЕЩА *PANISUS MAJOR* TUZOVSKIJ  
(ACARIFORMES, HYDRYPHANTIDAE)

P. V. Tuzovsky  
П. В. Тузовский

Institute for Biology of Inland Waters, Russian Academy of Sciences, Borok, Yaroslavl Prov., 152742  
Russia

Институт биологии внутренних вод РАН, пос. Борок, Ярославская область, 152742 Россия

Key words: Hydryphantidae, Thyadinae, *Panisus major*, water mite, larva

Ключевые слова: Гидрыфантиды, Тиадины, *Панисус мажор*, водяной клещ, личинка

ABSTRACT

The first illustrated description of water mite larva *Panisus major* is given.

РЕЗЮМЕ

Первое иллюстрированное описание личинки водяного клеща *Panisus major*.

INTRODUCTION

The genus *Panisus* Koenike, 1896 includes about thirty species known from adult instars [Viets, 1987], with only two species (*P. michaeli* Koenike, 1896 and *P. clypeolatus* Maglio, 1909) that are known from larvae. In Russia, this genus known from three species: *P. michaeli* from the European part of Russia [Viets, 1925; Sokolow, 1940], *P. sharapkensis* [Tuzovsky, 1976] and *P. major* [Tuzovsky, 1994] from Western Siberia. The purpose of this paper to give a description of *P. major*.

MATERIAL AND METHODS

Larvae of *P. major* were collected with adult mites in the spring near village Sharap, Prokopyevsk Distr., Kemerovo Province, 20.08.1973, coll. P.V. Tuzovsky.

In the description, notations of idiosomal setae follow Tuzovsky [1987]. The following abbreviations are also used: s — solenidion, s1 — proximal solenidion on tibia of legs I and II, s2 — distal solenidion on tibia of legs I and II; e — eupathidium, ac — acanthoid seta; P1–5 — pedipalp segments (trochanter, femur, genu, tibia, and tarsus); I Leg. 1–6 — first leg, segment 1–6 (trochanter, basifemur, telofemur, genu, tibia and tarsus); tarsus of leg I: de1 — distance between the anterior end of the segment and eupathidium, ds1 — distance between

the anterior end of the segment and solenidion; tarsus of leg II: de2 — distance between the anterior end of the segment and eupathidium, ds2 — distance between the anterior end of the segment and solenidion; n — the number of measured specimens.

Subfamily Thyadinae (Viets, 1926)

*Panisus major* Tuzovskij, 1994

Figs 1–3.

**Larva. Description.** Dorsal plate distinctly narrowed laterally, with straight or weakly concave anterior and posterior edges, with 2 pairs of simple setae and 2 pairs of trichobothria (Fig. 1, a). Setae Fp and Vi thick and rather short, trichobothria (Fp, Oi) longer and thinner than the simple setae. Medial eye convex, located between setae Vi. Lateral eyes separated by wide distance; anterior eyes usually larger than posterior ones. Setae Oe, Hi, He, Sci, Sce, Li, Le, Si, Se and Ci subequal, their bases situated on rather large, rounded sclerites.

Coxae I and II triangular, coxae III trapezoid (Fig. 1, b). Posterolateral setae on coxae I and II longer than medial setae on coxae I and III. Urstigma of medium size and located on anterior edge of coxa II laterally. Bases of setae Pi and Pe situated on soft integument.

Anal plate small, its shape variable (Figs. 2, a–d). Anal opening situated in center of the plate. Anal setae (Ai) reduced, their alveoli situated in anterior part of the plate.

Capitulum with wide base and long rostrum (Fig. 2, e); dorsal setae twice as long as ventral ones. The mouth surrounded by small papillae.

Basal segment of chelicera very large, its dorsal edge convex (Fig. 2, f). Cheliceral stylet is

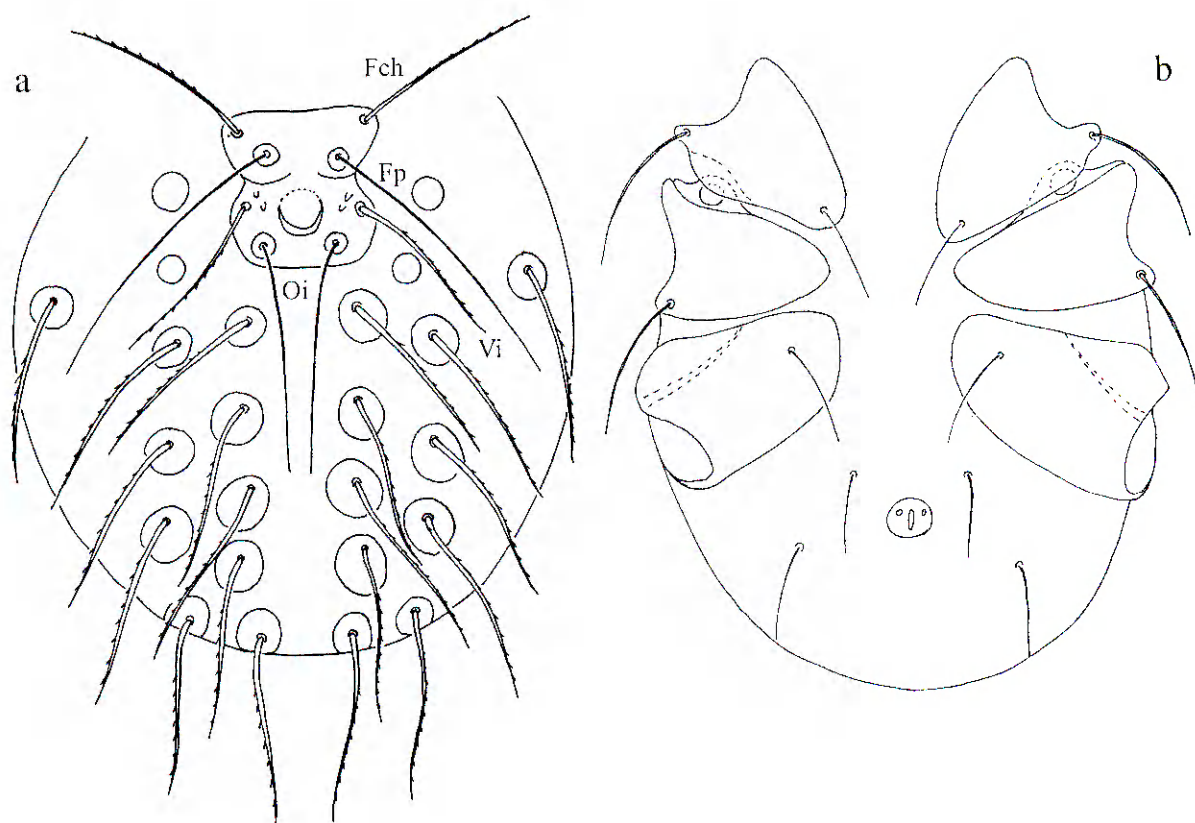


Fig. 1. *Panisus major*, larva: a — dorsal view, b — ventral view.

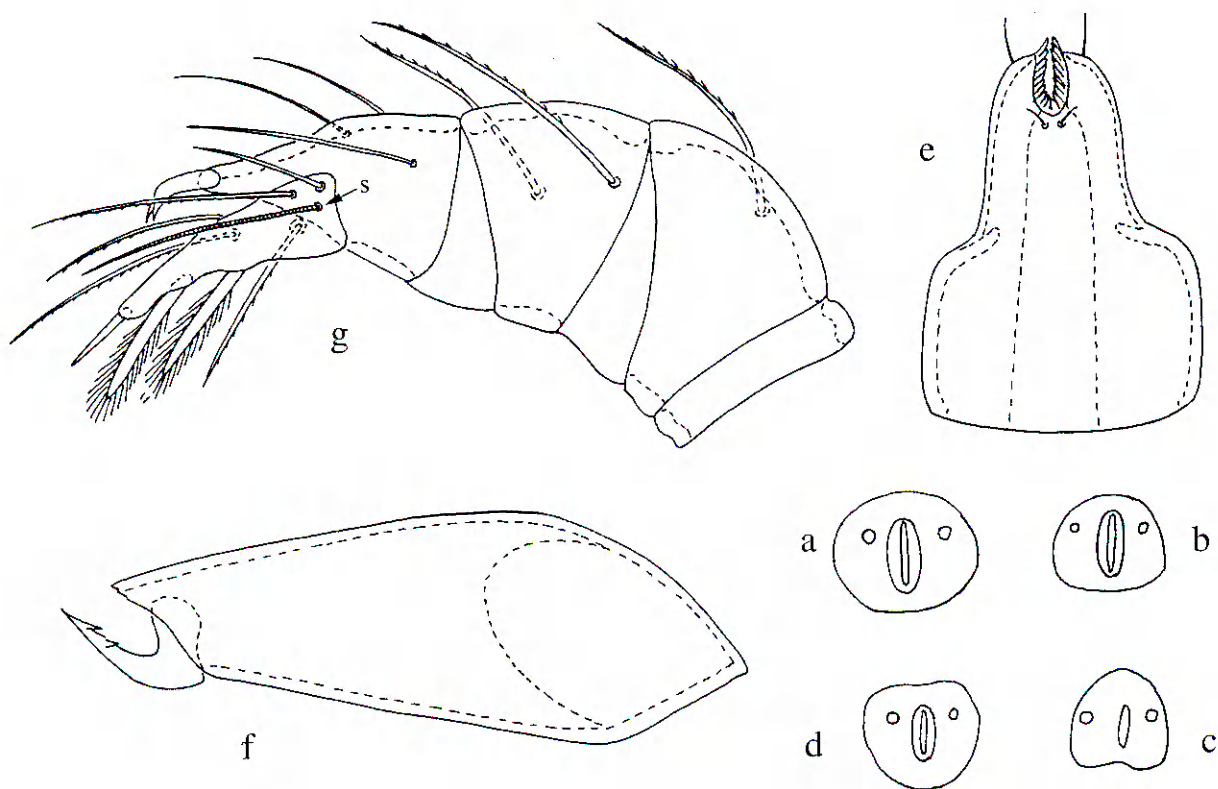


Fig. 2. *Panisus major*, larva: a-d — anal plate, e — capitulum, ventral view; f — chelicera, g — pedipalp.

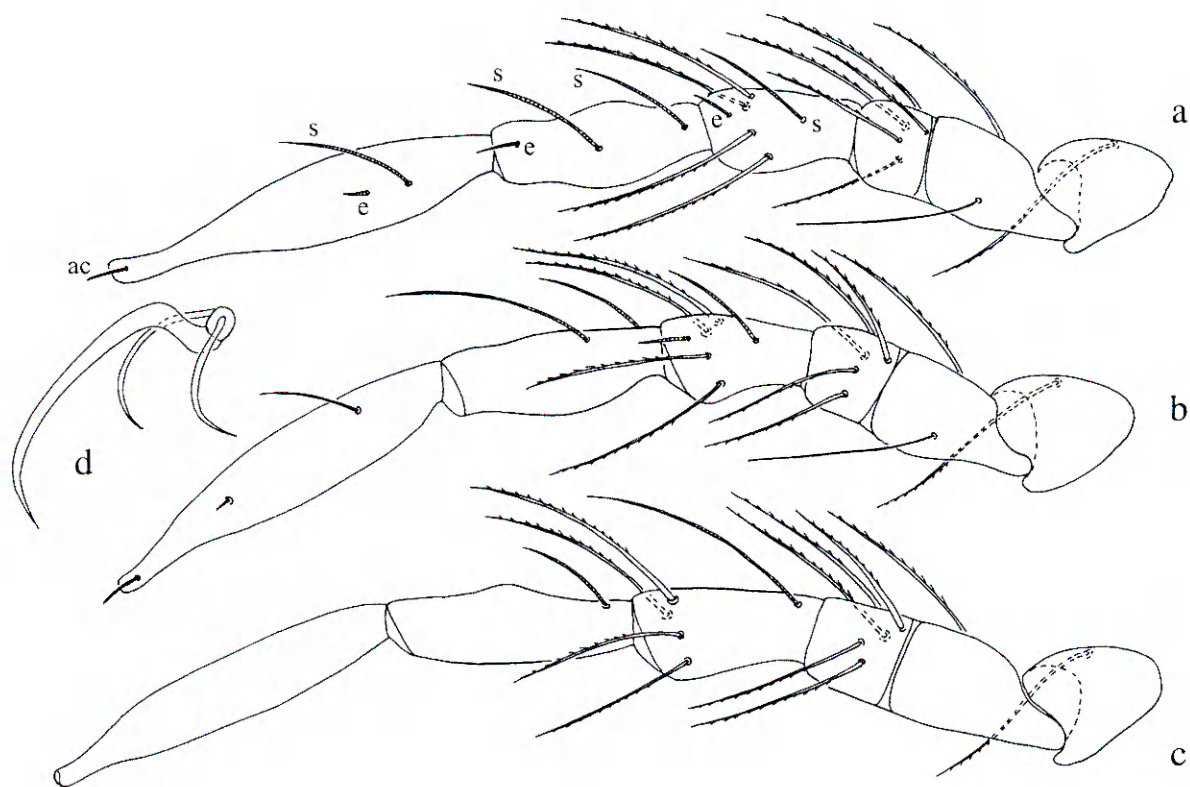


Fig. 3. *Panisus major*, larva: a — leg I, b — leg II, c — leg III, d — claws. Simple setae on tibia and tarsus of all legs are not shown.

small, crescent, with two small denticles (tips of denticles oriented to cheliceral base).

First 3 segments of pedipalp thick, tibia and tarsus cone-like (Fig. 2, g). Trochanter of pedipalp without setae. Femur of pedipalp with one dorsal seta. Two lateral setae of equal length (internal and external) are present on genu of the pedipalp. Tibia of the pedipalp with 3 unequal setae and thick, bent, and bifurcated dorsodistal spine. Pedipalpal tarsus with two ventral thick plumose setae, short distal spine, 5 thin setae, and long solenidion (situated in anterior half of segment).

Legs 6-segmented. Number of leg setae: I Leg. 1–6: 1, 2, 5, 6 (s, e), 13 (2s, e), 23 (s, e, ac); II Leg. 1–6: 1, 2, 5, 6 (s, e), 12 (s), 23 (s, e, ac); III Leg. 1–6: 1, 1, 5, 5 (s), 11 (s), 20. Basifemur of legs I–II with thick dorsal and thin ventral setae (Figs. 3, a–b). Genu of leg I–II with short solenidion, genu of leg III with long solenidion (Fig. 3, c). Tibia of leg I with solenidia (s1, s2) approximately equal in length, tibia of leg II with short proximal (s1) and long distal solenidion (s2). Solenidion and eupathidium on tarsus I proximal to middle of the segment; on tarsus of leg II they are widely separated, solenidion situated in proximal, and eupathidium in distal half of the segment. Tarsus of leg I and II with rather short acanthoid seta.

Claws of all legs with large crescent empodium and thin short ambulacrae (Fig. 3, d).

**Measurements** ( $\mu\text{m}$ ,  $n = 5$ ). Length of the dorsal plate 64–71, its width 57–64; diameter of the urstigma 16; diameter of the medial eye 16–19; length of anal plate 12–16, width 15–19; length of the capitulum 105–120, length of rostrum 54–70; length of basal segment of chelicera 85–105, length of the cheliceral stylet 22–26; length of the pedipalpal segments (P 1–5): 9–13, 40–43, 25–29, 41–45, 28–42; length of legs segments: I Leg. 1–6: 32–39, 48–60, 28–32, 48–55, 73–84, 130–145; II Leg. 1–6: 32–42, 48–60, 24–29, 48–60, 70–77, 128–138; III Leg. 1–6: 38–42, 50–60, 25–32, 44–58, 80–93, 144–150; ds1 28–35, de1 48–60; ds2 25–32, de2 80–90.

## DISCUSSION

The larva of *P. clypeolatus* was briefly described by Motaş [1928]. It has a small medial eye (diameter  $10 \mu$ ) and proximal seta (solenidion) on genu III nearly equal to the combined length genu + tibia III [Motaş, 1928]. In the larva of *P. major*, the medial eye is larger (diameter 16–19  $\mu$ ) and proximal solenidion of genu III is distinctly shorter than the combined length genu + tibia III. The larva of *P. michaeli* was described by Lundblad [1927]

and Martin [2003]. It is characterized by the following: all idiosomal seta are smooth and not pinnate; the dorsal plate is transverse, its width slightly exceeding its length; the pedipalpal tibia has a long dorsodistal projection; genu III has a short solenidion [Martin, 2003]. The larva of *P. major* has slightly pinnate idiosomal simple setae; the length of the dorsal plate distinctly exceeds its width; the pedipalpal tibia has a short dorsodistal projection, genu III with a long solenidion.

#### REFERENCES

- Lundblad O. 1927. Die Hydracarina Schwedens. I. Beitrag zur Systematik, Embryologie, Ökologie und Verbreitungsgeschichte der Schwedischen Arten. *Zool. Bidr.*, 11: 185–540.
- Martin P. 2003. Larval morphology of spring-living water mites (Hydrachnidia, Acari) from the Alps. *Ann. Limnol. — Int. J. Limn.*, 39 (4): 363–393.
- Motaş C. 1928. Contribution à la connaissance des Hydracariens français, particulièrement du Sud-Est de la France. *Travaux du Laboratoire d'Hydrobiologie et de Pisciculture de l'Université de Grenoble*, 20: 1–373.
- Sokolov I.I. 1940. [Hydracarina — the aquatic mites. Part I. Hydrachnellae. Fauna of the USSR (nouv. sér., no 20), Paukoobraznye 5 (2)]. Publisher: Nauka, Moscow-Leningrad. 24 s.+511. [in Russian]
- Tuzovsky P.V. 1976. [Water mites of Kemerovo Province]. In: *Biologiya i Sistematika Presnovodnykh Bespozvonochnykh*. Yaroslavl, p. 70–87. [in Russian]
- Tuzovsky P.V. 1987. [Morphology and Postembryonic Development in Water Mites]. Nauka Publ., Moscow. 172 s. [in Russian]
- Tuzovsky P.V. 1994. [Description of a new water mite species of the genus *Paniscus* (Acariformes, Thyasidae)]. *Zool. Zhurnal*, 73 (11): 138–142. [in Russian]
- Viets K. 1925. Einige Hydracarina aus Quellen bei Moskau, gesammelt von Herrn Dr. N. Decksbach. *Russ. Hydrobiol. Zhurnal*, 4: 3–6.
- Viets K.O. 1987. Die Milben des Süßwassers (Hydrachnellae und Halacaridae [part], Acari. 2: Katalog. *Sonderbände des Naturwissenschaftlichen Vereins in Hamburg*, 8: 1–1012.