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CONTRIBUTION TO THE MORPHOLOGY
AND BIOLOGY OF LARVAL PANISELLUS THIENEMANNI (VIETS, 1920)
(ACARI : PARASITENGONAE : HYDRACHNIDIA)

BY Werner R. BOEHLE *

ABSTRACT : The larva of the water mite Panisel/us thienemanni (Viets, 1920)
(Hydryphantoidea, Thyasidae) is described for the first time. It parasitizes adults and
nymphs of the collembolans Pogonognathellus flavescens (Tullberg, 1871) and
Tomocerus minor (Lubbock, 1862) (Entomobryomorpha; Tomoceridae). Feeding lasts
approximately three weeks. This is apparently the first time that a species of
water-mite parasitizing collembolans has been identified.

INTRODUCTION

Numerous water-mite larvae are known to parasitize insects living in or near water (SMITH &
OLIVER, 1986, SMITH, 1988). Keys to larvae were prepared by PRASAD & COOK (1972) and VAINSTEJN
(1980). The hosts and larvae of many water-mite species are still unknown. To the present day,
parasitism of water-mite larvae on collembolans has been reported only once, the larvae having been
assigned to the genus Thyas (SMITH & OLIVER, 1986). The development of Panisel/us has remained
obscure. Panisel/us thienemanni, which is reported from Belgium, Germany, England, Sweden and
Czech Republic, belongs to the family Thyasidae (Superfamily Hydryphantoidea) and is regarded as
an arctic-montane species. Adults and deutonymphs have been found in the seepage-water of forest
and moorland springs (helokrenobiont) and in the groundwater of riverine gravels (hyporheic), both in

* Department of Animal Ecology Institute of General and Systematic Zoology, Justus-Liebig-University of Gießen, Stephanstr. 24,
D 35390 Gießen, Germany.

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**Fig. 1**: *Paniselis thienemanni*, larva.

montane areas and at locations near the coast. (Cooreman, 1954; Gledhill, 1960; 1973; Laska, 1966; Lundblad, 1927; Ronneberger, 1975; Schwoerbel, 1959; 1961; Viets, 1920; 1925).

LOCALITY

Mites were collected in the lower montane zone (“Oberwald”) of the Vogelsberg, a shield-like basalt complex in the south of the Hessian Mountains (middle of western Germany), from Sphagnum turfs at the borders of mountain creeks (altitude: 610-710 m above sea level; dates: 9 April 1989; 16 June 1990; 14 May 1994).

Large numbers of parasitized hosts — the collembolans Pogonognathellus flavescens and Tomocerus minor — were collected in the field. The parasitized springtails were kept in the laboratory at 12°C and LD 16:8 within plastic vials, filled to one third with a mixture of plaster of Paris and charcoal (5:1), until the engorged larvae dropped off. When they later hatched into deutonymphs, they were fixed in ethanol, cleared (Marc André I), mounted on slides (Marc André II) and identified. The descriptions are based on unfed larvae. All measurements (n = 8) are given in micrometers. Larvae and deutonymphs are preserved in the author’s collection.

MORPHOLOGY

Idiosoma. Length 180-190, width 125-140.

Dorsum (Fig. 1 A). Setae finely serrated, borne on large platelets (medial platelets largest and provided with a pore), C-, D-, E-, F- and H-regions with two pairs each, PS-region with 1 + 1 setae. Four pairs of cupules, ia, im, ip and ih, between medial and lateral row of setae. Dorsal plate lightly sclerotized, almost square, length 46-47, width 49-50, bearing four pairs of propodosomal setae (Al-Al 42, Pl-Pl 43, Am-Am 35, Pm-Pm 16) and a median eye. 2 + 2 free lateral eyes; the anterior largest.

Venter (Fig. 1 B). Anal plate, length 13, width 13, with four relatively long serrate setae, each at a corner (Fig. 1 D). 1 + 1 preanal setae. Epimera (I 26-29, II 30-33, III 35-41) separate, with 2, 1, 1 setae. Urostigma circular.

Gnathosoma. Capitulum length 85, width at base 56-61, scale-like patterned in the middle, with posterior and anterior pair of long hypostomal setae; velum (Fig. 1 F) deeply serrated. Chelicerae with basal segments separate, length 63, cheliceral claw with two tiny teeth. Pedipalp (Fig. 1 E): length of trochanter 6-8, femur 19-21, genu 19-21, tibia 29-31 (34-36), tarsus 9-10. Segments with 0, 1, 2, 3, 8 setae, femoral seta short, stout and branched, claw of palptibia bidentate, palptarsus with short solenidion and very robust, brush-like apical seta, one of the normal setae exceptionally long.

Legs (Fig. 1 G-I). Approximately as long as idiosoma. Normal setae long ciliated. Pretarsus with heavy empodial claw and two thin lateral claws. Lengths of segments and numbers of setae are given in Tables 1 and 2.

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<tr>
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<tr>
<td>Tarsus</td>
<td>62-67</td>
<td>54-56</td>
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TABLE 1: Lengths of leg segments (n = 8).

PHENOLOGY AND BIOLOGY

Parasitized hosts were found from the beginning of April to middle of June. The larvae attached dorsomedially on the reduced prothorax of the host. The back of the host’s head served as a base that supported the swelling idiosoma of the larva (Fig. 2 B). Normally a host was parasitized by one mite, but numbers up to four — a lethal maximum — could be observed. In the course of feeding the length of idiosoma increases from less than 0.2 mm to 0.7 mm at most. After approximately three weeks the larvae leave their hosts and seek shelter within minute cavities. At 12°C the metamorphosis to the nymph (nymphochrysalis stage) takes about 20 days.
FIG. 2: Paniselis thienemanni larvae on Pogonognathellus flavescens.


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<td>4</td>
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<tr>
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<td>Tarsus</td>
<td>20+1 Sol+1 Fam+1 Eu</td>
<td>20+1 Sol+1 Fam+1 Eu</td>
<td>20</td>
</tr>
</tbody>
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Table 2: Number of setae on leg segments (n = 8). Abbreviations: Sol solenidion/solenidia, Fam famulus, Eu eupathidium.
REFERENCES


