

Neophyllobius succineus n. sp. from Baltic amber (Acari: Raphignathoidea: Camerobiidae)

HANS R. BOLLAND & WOJCIECH L. MAGOWSKI

BOLLAND, H. R. & W. L. MAGOWSKI, 1990. *NEOPHYLLOBIUS SUCCINEUS* N. SP. FROM BALTIC AMBER (ACARI: RAPHIGNATHOIDEA: CAMEROBIIDAE) – *ENT. BER., AMST.* 50 (2): 17-21.

Abstract: *Neophyllobius succineus* n. sp. is described, based on a single adult female specimen preserved in a piece of Baltic amber from the Upper Eocene. Remarks on biology and systematic position within the genus *Neophyllobius* Berlese are made.

H. R. Bolland, Department of Pure and Applied Ecology, University of Amsterdam, Kruislaan 302, 1098 SM Amsterdam, The Netherlands.

W. L. Magowski, Department of Animal Taxonomy and Ecology, A. Mickiewicz University, Szamarzewskiego 91 A, 60-569, Poznan, Poland.

Introduction

Among arthropods preserved in fossil resins as organic inclusions, a considerable number of mites is found with a wide variety of forms originating from a broad range of trees and shrubs and from the litter layer of the ancient forest. Despite their frequency of occurrence, relatively little is known about fossil mites and their habitats.

During a preliminary survey of Acari in Baltic amber in the collection of the Earths Museum (Warsaw, Poland) the second author found a specimen undoubtedly belonging to the genus *Neophyllobius* Berlese, 1886, of the family Camerobiidae – “stilt-legged mites”.

So far mainly oribatid mites have been examined as fossil (e.g. Sellnick, 1931; Krivolutsky & Druk, 1986) or subfossil material. Much less frequently gamasid, acaridid or actinedid mites have been reported. This paper presents the first data on a fossil specimen of Camerobiidae.

Remarks: The type specimen is located near one of the margins of the piece of amber: next to the camerobiid female the piece contains a very small specimen of an undetermined (probably actinedid) larva, and a stellate hair of vegetable origin.

The specimen is dated on the basis of the deposition in which it occurred, i.e. in the area of Gdansk Gulf, which dates back to the Upper Eocene.

Methods

The piece of amber had been gently polished before deposition in the collection. The condition of the specimen was suitable for investigation, without any correcting treatment.

The specimen was studied with a microscope, equipped with an additional source of light permitting simultaneous observation in translucent and reflecting light. The setation on certain legs was incomplete. Both left and right legs are therefore figured to show the setation as exact as possible. Studying the figures of the dorsal and ventral side one should keep in mind that the right side of the dorsal figure corresponds to the left side of the ventral figure as the inclusion cannot be studied as a normally cleared mite specimen.

Nomenclature used for dorsal chaetotaxy follows Bolland (1986).

Neophyllobius succineus nov. spec.

(figs. 1-10)

Type material: Holotype ♀, in Baltic amber. The type-piece of amber was found in the Górki Wschodnie near Gdansk, (Poland) in 1978; it was polished and delivered after purchase to the Earths Museum in Warsaw by Mr T. Giecwicz. The piece of amber, 8 × 9 × 1.1 mm in size, is kept in the collection of organic inclusions in Baltic amber in the Earths Museum of the Polish Academy of Sciences (Warsaw) and catalogued under No. 16749. Despite the long time of preservation, the specimen has not

been completely cleared. Characters needed for genus identification are still present (see key in Bolland, 1986).

Description

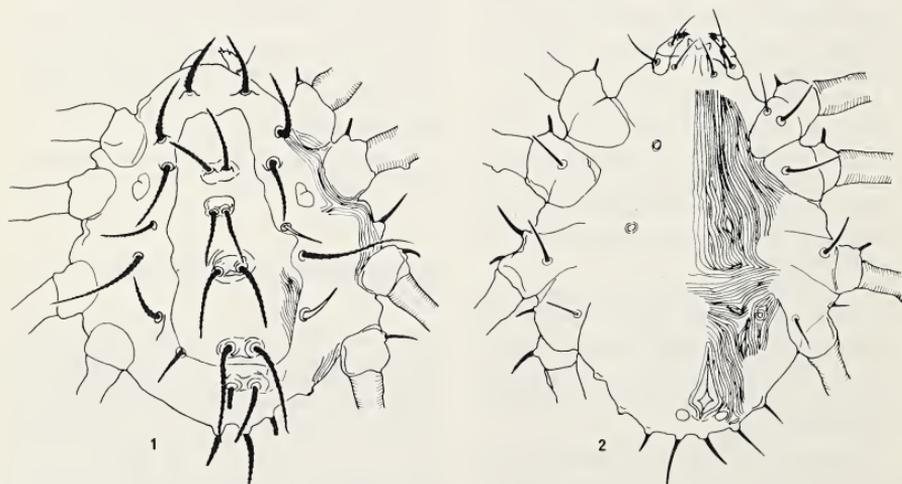
Female: body length 250 μm , width (measured between second and third pair of legs) 218 μm . *Gnathosoma*: placed on the ventral side. On the palpfemur one seta is visible, subequal in length to the rest of the appendage, palpgenu with one seta slightly weaker than that on the femur. The border between tibiae and tarsi is not clear and only three setae are visible in this area. Chelicerae entirely retracted. Peritremes remain invisible.

Idiosoma, dorsal side (fig. 1): broadly oval in outline, strongly flattened dorsoventrally.

Doubled eyes are present on each side, behind l_3 setae, on the transverse line between insertion of the second pair of legs. Supracoxal setae, usually reported for cameroibiids over coxae I, indistinguishable.

Six pairs of dorsocentral setae (mc_1 - mc_6) present along the longitudinal body axis, inserted on distinct tubercles. Each pair located on the small area of stiffer integument (probably sclerites) risen over the dorsum surface, which may be an artefact caused by dehydration. Setae mc_1 located in the transverse line

with l_3 reaching basis of l_2 ; right seta $mc_1 = 43 \mu\text{m}$ long, the left one poorly visible. Tubercles of setae mc_2 located slightly anterior of l_4 , left seta $mc_2 = 47 \mu\text{m}$ long, i.e. as long as the distance between its base and base of mc_3 , the right one poorly visible. Setae $mc_3 = 47 \mu\text{m}$ long, i.e. as long as the distance between its base and base of mc_3 , the right one poorly visible. Setae $mc_3 = 47 \mu\text{m}$ long, not passing the bases of mc_4 and shorter than mc_4 . Setae mc_3 located posterior of l_5 , on the same level with trochanters III. Setae mc_4 located on the level of trochanters IV, at least 75 μm long, i.e. remarkably longer than the distances between its bases and those of mc_3 or basis of mc_6 . Both setae mc_5 badly preserved, broken or indiscernible, right one about 30 (?) μm long. Their bases inserted closer between mc_4 and mc_5 bases than the distance between any other pair of mediocentral setae. Setae mc_6 located on the strict posterior extremity of the body (in recent species rather on the dorsal side); right about 46 μm long, left apparently broken. Lateral setae l_1 , l_2 and l_3 , subequal in length: 53 μm , 50 μm , and 47 μm respectively. Distances between basis of l setae on each side are: l_1 - $l_2 = 29 \mu\text{m}$, l_2 - $l_3 = 12 \mu\text{m}$, l_3 - $l_4 = 47 \mu\text{m}$. l_2 located on the transverse line of trochanters I, and l_3 on that of trochanters II. Setae l_4 located close behind



Figs. 1-2. *Neophyllobius succineus* n. sp., ♀, holotype. 1, dorsal side; 2, ventral side.

mc_2 level, left seta $l_4 = 42 \mu\text{m}$ long, i.e. longer than its distance to l_5 but shorter than the distance to l_3 or mc_2 .

L_5 setae ($68 \mu\text{m}$ long) the longest setae of l series, located slightly anterior of mc_3 level, on the transverse line of anterior extremities of trochanters III. Setae l_6 located at the level between trochanters III and IV, left seta $37 \mu\text{m}$ long, nearly reaching the base of l_5 . Left l_7 poorly visible and unmeasurable just below the level with the mc_4 setae. The pair of l_8 setae remains unnoted; l_9 right seta broken, positioned subterminally on the level between bases of mc_5 and mc_6 , but more laterally.

On different parts of dorsal side an indistinct striation can be observed.

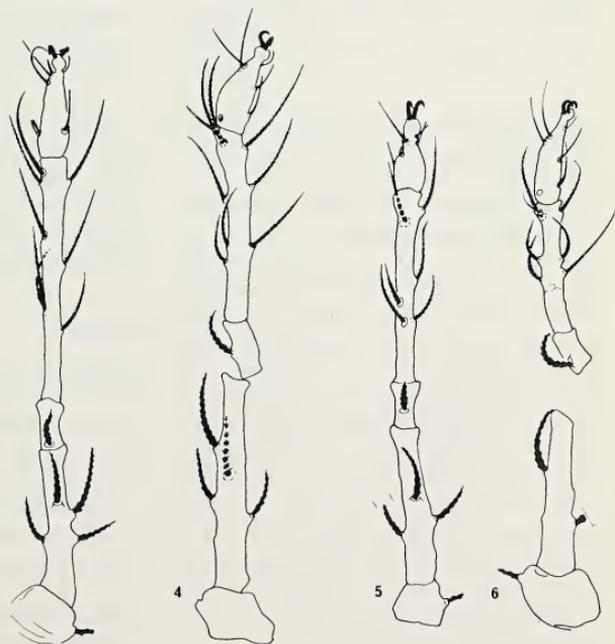
Idiosoma, ventral side (fig. 2): of the four pairs of ventral setae usually noted in the female of a recent *Neophyllobius* only alveoli of one pair is visible on the level of coxae IV. Setae on coxae are probably typical for the *Neophyllobius* pattern. The setae $1b$ and $1c$ on the right coxae I are visible of which $1c$ is stronger and easier to observe than $1b$. Coxae

II with one seta coxae III with two setae. On the coxae IV two setae inserted: one short, more laterally located, and the second, little longer, located more medially. All setae on coxae stiff.

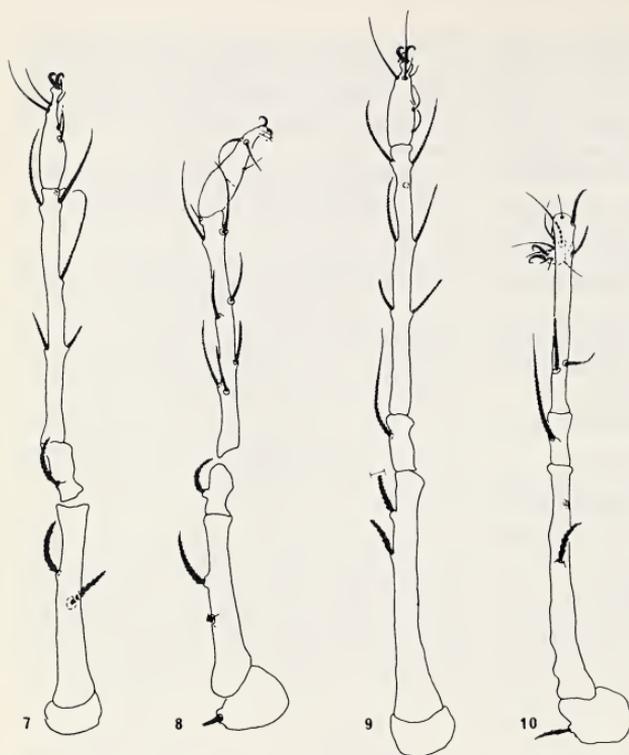
Anogenital region: only features of shape that allow to determine the sex of the specimen are visible.

Legs (figs. 3-10): all longer than the body: leg I-308 μm , leg II-281 μm , leg III-335 μm , leg IV-367 μm . Leg setation: coxae 2 (3) - 1 - 2 - 2; trochanters 1 - 1 - 1 - 1; femora 4 - 3 - 2 - 2; genua 1 - 1 - 1 - 1; tibiae 8 (9) + Φ - 7 (8) + Φ - 7 (8) + Φ - 6 (7) + Φ ; tarsi 2 + 5 (8) + ω - 2 + 4 (8) + ω - 2 + 4 (6) - 2 + 5 (6); (setation for particular leg segments of the most related species, *N. aesculi* Bolland, is given in parentheses).

Tarsi of legs I and II primarily equipped with solenidion ω , positioned proximally, like in all *Neophyllobius* species, (in *N. succineus* holotype, ω solenidion can be seen only on the left leg I, on second pair only the point of location clearly discernible). All tarsi equipped with two



Figs. 3-6. *Neophyllobius succineus* n. sp., ♀, holotype. 3, left leg I; 4, right leg I; 5, left leg II; 6, right leg II.



Figs. 7-10. *Neophyllobius succineus* n. sp., ♀, holotype. 7, left leg III; 8, right leg III; 9, left leg IV; 10, right leg IV.

midventral setae (on the tarsus III only one visible); of the apical cluster of 8 (tarsi I-II) or 6 (tarsi III-IV) setae, two always 1.5 time longer than midventral ones simple, well visible; minute ones hardly discernible – on tarsus I-4, on II-2, on III-2 and on IV-3. Minute bifid setae often found on the tops of tarsi cannot be discerned with certainty. Pretarsus consists of the weak apotele and two moderately strong claws; empodium markedly distorted in the form of seta like apophyse; tenent hairs invisible. Setae on tibia I-IV long, tapering, delicately barbed. Small, delicate solenidion Φ present on tibiae of all legs. Setae on genua I-III usually short, thick, strongly barbed, expanding slightly beyond the distal border of its segment, only setae on genua IV longer (nearly twice as long as those of proceeding legs), whip-like, barbed, nearly reaching the first (proximal) row of tibial setae.

Minute solenidia, usually inserted near the base of the genual seta of leg I and II, not visible. Setae of femora thick, barbed and tapering. Setae on trochanters very short, poorly visible due to the pollution of the resin around the body margin.

Diagnosis

The pattern of dorsal setae and the alignment of two midventral setae on all tarsi in the described specimen appears to be that of the largest group of *Neophyllobius* species (Bol-land, in prep.).

The species seems to be related to *N. aesculi*. It differs however from this latter species in the shorter length of genu setae. The setae on genua I, II and III are very short (as long as its segment) and those on genu IV not longer than the first row of the tibial setae. Those on genua

I, II and III of *N. aesculi* pass the first row of tibial setae and the seta on genu IV even passes the tarsus border.

Discussion

The discovery of the *N. succineus* n. sp. in Baltic amber is interesting. The family Camerobiidae is not well known at present. Among the species described, most are known from only few or even single specimens. The family is distributed in all parts of the world in temperate and tropical zones (Bolland, 1986). Camerobiid mites are very delicate and may easily be damaged by touching or manipulation. The finding of the undamaged specimen in Baltic amber is therefore remarkable.

Neophyllobius species are known as predators of crawlers of scale insects and of plant associated mites. They are usually encountered singly or in very small numbers, often hidden in very small shelters. The preys are reported to belong to such genera as *Latania*, *Chrysomphalis* and *Aonidiella* (McGregor, 1950; Hassan, 1976; Meyer, 1962). It is probable that the potential prey of *N. succineus* was a member of the coccid genus *Matsucoccus* which occurs as more than the half of all coccid material in Baltic amber (Koteja, 1984).

Acknowledgements

We wish to express our thanks to Mrs E. Kulicka (Earths Museum, Polish Academy of Sciences, Al. Na Skarpie 20/26, Warsaw, Poland) for giving access to the collection of organic inclusions in amber, and information on the exact origin and dating of the type material.

References

- BOLLAND, H. R., 1983. A description of *Neophyllobius aesculi* n. sp. and its developmental stages (Acari: Camerobiidae). – *Ent. Ber., Amst.* 43: 42–47.
- BOLLAND, H. R., 1986. Review of the systematics of the family Camerobiidae (Acari, Raphignathoidea). I. The genera *Camerobia*, *Decaphyllobius*, *Tillandsobius* and *Tycherobius*. – *Tijdschr. Ent.* 129 (7): 191–215.
- BOLLAND, H. R., (in prep.) Review of the systematics of the family Camerobiidae. The genus *Neophyllobius* (Acari; Raphignathoidea).
- HASSAN, M. F., 1976. *Studies on some prostigmatid predators*: 1–70. (M. Sc. Thesis, Faculty of Agriculture, Cairo University).
- KRIVOLUTSKY, D. A. & A. Y. DRUK, 1986. Fossil oribated mites. – *Ann. Rev. Ent.* 31: 533–545.
- KOTEJA, J., 1984. The Baltic amber *Matsucocidae* (Homoptera, Coccinea). – *Ann. Zool.* 37 (19): 437–496.
- MCGREGOR, E. A., 1950. Mites of the genus *Neophyllobius*. – *Bull. Soc. Calif. Acad. Sc.* 49: 55–70.
- MEYER, M. K. P., 1962. Two new mite predators of red scale (*Aonidiella aurantii*) in South Africa. – *S. Afr. J. agric. Sci.* 5: 411–417.
- SELLNICK, M., 1931. Milben in Bernstein. – *Bernst. Forsch.* 2: 148–180.

Accepted 15.xi.1989.