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NEOPODOCINUM BARTKEI sp. n.
(MESOSTIGMATA : MACROCHELIDAE) FROM VIÊT-NAM

BY

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The following description is based on material collected by Mgr. A. Bartke during his half-yearly sojourn in Nord Viêt-Nam on the geophysical station in Cha-Pa, SW from Lao-Kay, about 1500 m a.s.l., what causes a comparatively more temperate climate for this tropical country (ca. 22° northern latitude). All the specimens were found on the ventral surface on Copris sp. beetles, without any pronounced tendency to a definite place. This is in accordance with our knowledge of the genus Neopodocinum Oudemans 1902, the species belonging here are tropical or subtropical and are living in association with coprophageous beetles of the family Scarabaeidae (Krantz, 1962). The observed presence of both the adults and nymphs on the beetles permits to suppose, that phoresis is of common occurrence in all stages (true paraphages ?). This is not in accordance with the statement of Vitzthum (1925) for Neopodocinum coprophilum Vitzthum 1926, in which species generally the females only are associated with beetles.

Neopodocinum bartkei sp. n.

Male. Idiosoma : length 1790-2470 μ (the average from 11 specimens 2012 μ), width 1405-2015 μ (the average from 11 specimens 1574 μ). Dorsal shield : length 1690-2320 μ (the average from 10 specimens 1914 μ), width 1405-1850 μ (the average from 10 specimens 1545 μ).

Dorsum (Fig. 1). Broad oval with a shield covering almost the whole body, dark-brown, strongly sclerotized. The shield is smooth, without any ornamentation of the kind of lateral ridges or scallops, with a finely punctate surface and irregular alveolar areas ; with twenty-nine pairs of dorsal setae and a single unpaired seta. The setae are of double shape : the lateral ones are long, stiff, darkish brown.
and plumose in their distal half. The setae in the middle area, d₃-d₈ and m₃-m₅ are very short, smooth and hyaline. Between the pair of dorsal setae d₆ in all examined specimens there is an unpaired additional seta. Seta d₁ is short, blunt, plumose distally; seta m₁ resemble the lateral ones, but is much shorter, seta d₂ closely resembles setae I and mg. The extra-marginal setae on the lateral interscutal membrane are like the marginal setae.

**Fig. 1.** *Neopodocinum barthei* sp. n. Dorsum of male.

*Venter* (Fig. 2). Tritosternum well developed, with a rectangular base, its length parallel to the body axis, and with a pair of long, pilose, weakly sclerotised, hyaline lacinae. Pre-endopodal or jugular plates are lacking. The large stern-genital shield extends as far back as the middle of coxae IV, its posterior edge is straight, the shield without any ornamentation except for a finely punctuation and occasionally some lighter, irregular alveolar areas. The plumose setae, pores and the genital opening are typical for this genus. The peritremes are undulated, but without the loop in the region of the stigma, which is characteristic for *Macrocheles*. The simple anal shield is of oval shape with three smooth anal setae. There are approx. 40 pairs of ventral setae which are plumose except for the posterior pair of pre-anal setae, which are smooth.
The gnathosoma (Fig. 3 C) is typical for this genus. The tectum (Fig. 3 B) is unipartite with a long and narrow median process, laterally spiculated. The epipharynx (Fig. 3 A) is distally somewhat similar to the median process of the tectum, but shorter, broader and with many needle-like lateral processes. Hypopharynx (labrum), hypopharyngeal processes (paralabrum, malae internae), corniculi, styli salivares and the deutosternum with five transverse rows of denticles are typical for the genus. The anterior rostral seta is smooth, while all the others gnathosomal setae are plumose distally. The arrangement of the pedipalpal setae is the same as that of the female: trochanter with one smooth and one plumose seta, femur (Fig. 7 A) with three plumose and two smooth setae, genu with two plumose and four smooth setae, tibia with fourteen smooth setae, tarsus with thirteen smooth setae, one mastitarsala and a three-tined modified palpal claw. The chelicerae (Fig. 3 D) are typical, strong and massive, the fixed digit with three teeth and a molar, the movable digit with two teeth and a molar and a spermaphophoral process of shape typical for this genus; the pilus dentilis, dorsal seta and pore, the lyriform pore and the double pulvillus (Fig. 7 B) are typical.
Legs. Tarsus I, like this of the female (Fig. 6 E), terminates in a number of sensory setae, which is normal for the whole family, but in addition it a short pretarsus with a well has developed pulvillus without claws; a characteristic exceptional in this family. Legs II-IV with normal ambulacral apparatus, tarsi apically with four stumpy spines, which are elongated nearly to the pretarsal length on tarsus IV (Fig. 4 B). Femur II (Fig. 4 A) with a well developed spur the internal edge of which has two teeth; a processus axillaris is lacking, in its place there is a short, stout spine. Genu and tibia II with short, blunt protrusions. Femur IV (Fig. 4 C) has likewise a double, roundet process; a short, rounded protrusion is present also on the tarsus IV at 1/3 of its height (Fig. 4 B). Legs II and III are similar to these of the female.

![Fig. 3. — Neopodocinum bartkei sp. n., male. A — epipharynx; B — tectum; C — gnathosoma ventral; D — chelicera.](image)

**FEMALE.** Idiosoma: length 2000-2550 μ (the average from 8 specimens 2268 μ), width 1640-2000 μ (the average from 8 specimens 1817 μ). Dorsal shield: length 1885-2320 μ (the average from 7 specimens 2048 μ), width 1500-1710 μ (the average from 7 specimens 1628 μ).

**Dorsum.** The shape, color and chaetotaxy closely resembles those of the male. A unpaired, additional dorsal seta between setae d₆ appear in females as well as in males.

**Venter** (Fig. 5 A). Tritosternum and gnathosoma are the same as these of the male. The chelicerae are typical for this genus, similar to these of the male, of course except for the spermatophoral process. The anterior rostral seta is smooth
most frequently, sometimes however, is slightly pectinate apically. Sternal shield without any ornamentation, its height in the middle is equal approx. to two thirds of the height at the sides. Metasternal shields are similar to those of *N. jaspersi* Oudemans 1902, as figured by Krantz (1962), with a pair of plumose setae. The posterior edge of the genital shield is arch-shaped and extends between coxae IV; its width is distinctly larger than its height; it bears a pair of plumose setae. Peritrematal and anal shields are similar to those of the male. All ventral setae are plumose.

*Fig. 4. — Neopodocinum bartkei* sp. n., male. A — leg II; B — tarsus IV; C — femur IV.

*Legs* (Fig. 6). Tarsus I (Fig. 6 E) closely resembles that of the male, having in addition to the apical sensory setae on a short pretarsus a distinct pulvillus without a claw. Legs II-IV (Fig. 6 C, B, A) with typical ambulacra, the latero-distal elements of the pretarsi (Fig. 7 C) are short, broad and distally toothed, the tarsi apically with four short, stout spines; these are longer on tarsus IV. The chaetotaxy of the legs is shown in Fig. 6.
Deutonymph. *Idiosoma*: length 1375-1780 μ (the average from 10 specimens 1552 μ), width 1150-1400 μ (the average from 10 specimens 1269 μ). Dorsal shield: length 1320-1595 μ (the average from 9 specimens 1467 μ), width 1140-1300 μ (the average from 9 specimens 1239 μ).

*Dorsum.* Dorsal shield smooth, without any ornamentation, the arrangement of the dorsal setae is the same as that in the male and female, the shield is somewhat smaller and brighter in color. A unpair additional seta between d₆ is present also here.

*Venter* (Fig. 5 B). Gnathosoma, tectum, chelicerae and tritosternum like these of the female. The anterior rostral seta is smooth. Sternal shield is rather short reaching out slightly beyond coxae III, more or less strongly narrowed or pointed posteriorly. Sternal setae are plumose. Metasternal setae are smooth, and are placed together with a pair of circular pores in the soft cuticle, outside the sternal shield. Peritrematal and anal shields closely resembles these of the female; in the anal shield there is posteriorly a pair of pores, which are not visible in males or females. All ventral setae are plumose.
Legs. Like in the male and female tarsus I (Fig. 8 A) terminates in a number of sensory setae but there is also a distinct pretarsus and ambulacrum with small claws. The number of tarsal setae differs slightly from this in the female; thus e.g. on tarsus I, apart from the apical sensory setae, there are 14 setae (13 in the ♀), on tarsus III (Fig. 8 B) 15 setae (16 in the ♀), tarsi II and IV have identical numbers of setae as these of the female. Legs II-IV with large, well developed ambulacra.

Protonymph. Idiosoma: length 1098-1330 μ (the average from 8 specimens 1201 μ), width 930-1090 μ (the average from 8 specimens 1009 μ). Notocephale: height 725-807 μ (the average from 9 specimens 766 μ), width 930-1045 μ (the average from 9 specimens 998 μ). Notogaster: height 317-425 μ (the average from 9 specimens 368 μ), width 725-815 μ (the average from 9 specimens 775 μ). The proportions of heights of notocephale and notogaster are 68 % and 32 %, respectively, or approximately 2 : 1.

Dorsum (Fig. 10 A). The general shape and arrangement of setae, except the appearance of two dorsal shields, resemble these of deutonymph, but some setae
are lacking. In all, there are 14 pairs of setae on the notocephale and 8 pairs on the notogaster, which makes together on the two shields twenty two pairs of setae, while there are twenty nine pairs on the adults and deutonymph. Setae d₆ are completely lacking. Both dorsal shields are smooth, without any ornamentation or sculpture, with irregular alveolar areas. The extra-marginal setae are like these in the above mentioned forms.

**Fig. 7.** — *Neopodocinum bartkei* sp. n., female.  
A — pedipalpus dorsal (femur, genu, tibia, tarsus); B — chelicera ventral; C — ambulacrum IV.

*Venter* (Fig. 10 B). Tritosternum of the same shape as that of the deutonymph and the adults. The sternal shield resembles that of the deutonymph, but the metasternal setae are lacking. Genital setae are short and smooth, the first pair of the ventral setae are also smooth, the other ventral setae, about twenty six pairs in all, are plumose. Anal shield similar to that of the deutonymph and the adults.
Gnathosoma. Tectum, epi- and hypopharynx, deutosternum, corniculi and chelicerae do not differ from these of the above described forms. The anterior and the posterior external rostral setae, as well as the capitular seta, are smooth (now and then the latter may be slightly pectinate); the posterior internal seta only is apically distinctly plumose. Pedipalp, as is usual for protonymphs, has a smaller number of setae: trochanter with one plumose seta, femur with one plumose and three smooth setae, genu with one plumose and four smooth, tibia with twelve smooth setae, while the tarsus has probably an equal number of setae as the adults, i.e. thirteen + mastitarsala + three-tined modified palpal claw.

**Fig. 8. — Neopodocinum barthei** sp. n., deutonymph. A — tarsus I; B — tarsus III.

Legs (Fig. 9). Tarsus I (Fig. 9 D) terminates with sensory setae and an ambulacrum with small claws on the pretarsus, similarly as in the deutonymphs. The arrangement of setae on the legs is similar to that in the adults, but some setae are missing; for example tarsus I (Fig. 9 D), apart from the sensory setae, has 12 ordinary setae (13 in the ♀), tarsus II (Fig. 9 C) — 15 setae (16 in the ♀), tarsus III (Fig. 9 B) — 15 setae (16 in the ♀), and tarsus IV (Fig. 9 A) — 15 setae (16 in the ♀).

**Type specimens.** The type series on which this description is based consists of twelve males, fourteen females, eleven deutonymphs and ten protonymphs mounted as microscopical slides in Berlese's medium, partly uncleared, partly cleared in hot lactic acid or KOH.
Fig. 9. — Neopodocinum bartkei sp. n., protonymph.
A — tarsus IV; B — tarsus III; C — tarsus II; D — tarsus I.

Fig. 10. — Neopodocinum bartkei sp. n., protonymph.
A — dorsum; B — venter.
Holotype. A male of the following measurements: idiosoma, length 1847 μ, width 1435 μ, cleared in hot lactic acid. Forty six other specimens of the type series are paratypes. The holotype and some paratypes are deposited in the Zoological Museum of the Jagiellonian University in Kraków, Poland, the rest will be sent to the Zoological Department of the University of Hanoi, Nord-Viètnam and to other of the centers of acarological studies.

Type locality. Cha-Pa, Nord-Viètnam, surroundings of the Geophysical Station, on Copris sp. beetles. Legit A. Bartke, 2-19 March 1961.

Discussion.

Neopodocinum bartkei sp. n. differs distinctly from the descriptions of other species in this genus which are known to me. *N. rhinolophi* Oudemans 1914 and *N. vosi* Oudemans 1903, known only as protonymphs, have few and very short dorsal setae (Oudemans 1904). The female of *N. jaspersi* Oudemans 1902 differs from *N. bartkei* sp. n. by the dorsal chaetotaxy and lateral ridges on the dorsal shield (Oudemans 1904, Krantz 1962). The dorsal setae I and mg of the males of *N. nederveeni* Oudemans 1903 shorten towards the end of the body, setae m1 are much longer than d4, moreover this species has jugular shields and beyond the stigma elongated peritrematal shields. *N. coprophilum* Vitzthum 1926 differs chiefly in the dorsal chaetotaxy and in the shape of the anal shield. As far as it is possible to see from the very short description with no drawing, the new species seems to resemble closest the male of *N. maius* Berlese 1911, but the tarsus II of this species has a distinct spine-like spur terminated apically with two teeth.

As a primary generic character of the Family Macrochelidae is considered the lack of an ambulacral apparatus (pulvillus and claws) on leg I. As is evident from the above description this taxonomic feature cannot be maintained for the genus *Neopodocinum*. Both sexes of *N. bartkei* sp. n. have a distinct pulvillus with no any claw on leg I, but the claws are present in the deuto- and protonymphs. This probably shows that this feature is a recent acquisition from the evolutionary point of view, and not well stabilized, as it appears in the adults only. This is not new in this genus, since already Oudemans (1903, 1905) mentioned an ambulacrum on tarsus I in the male of *N. nederveeni* Oudemans 1903. The genus *Neopodocinum* differs in this respect distinctly from the genus *Macrocheles* Latreille 1829, in which an ambulacrum is lacking even in the earliest larval stages (Bregetova and Koroleva 1960, Pereira and Castro 1945).

Krantz (1962) mentioned that in *N. jaspersi* Oudemans 1902 which is the type species for the genus, known only as female, an extra dorsal seta is present, but he did not attach any importance to this feature. In *N. bartkei* sp. n. this extra, unpair dorsal seta appears regularly both in the adults and the deutonymphs (in the protonymph the d6 setae are lacking). The stability of this character is at any rate higher, than the lack of ambulacrum I.
There is a striking feature in the new species: the considerable uniformity and resemblance of the specific characters in all sexes and developmental stages. The fact that the forms described belong to one and the same species is beyond any doubt. This is worth noticing because — so far I know — in the only species which was described for both sexes and nymphal stages, *N. coprophilum* Vitzthum 1926, there are considerable dissimilarities. Thus e.g. the protonymph, as described by Vitzthum (1926), has an elliptic anal shield, the deutonymph a nearly rounder, the female a broader than higher shield and the male a considerably smaller one. Similarly the ventral chaetotaxy of the female is quite different than this of the deutonymph. These significant differences in the specific characters make it possible that all the forms described as *N. coprophilum* Vitzthum 1926 do not belong in fact to the same species.

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