

First record of *Copidognathides* from the Black Sea (Copidognathinae, Halacaridae, Acari)

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(With 13 figures)

Abstract

The genus *Copidognathides* is recorded from northern France and southern Chile; recently a representative was taken in the Black Sea, between shallow water corallines. The Black Sea species *Copidognathides ampliatus* sp. n. is described. In contrast to other species of that genus, the palps are three-segmented.

Introduction

The subfamily Copidognathinae Bartsch, 1983 includes the five genera *Acarothrix* Bartsch, 1990, *Copidognathides* Bartsch, 1976, *Copidognathus* Trouessart, 1888, *Phacacarus* Bartsch, 1992, and *Werthella* Lohmann, 1907. *Copidognathus* is the most successful genus within the Halacaridae; approximately 300 species, or almost 1/3 of all halacarid species described, belong to this cosmopolitan genus. In contrast, only two *Copidognathides* species have been described, one from the northeastern Atlantic (Bartsch 1976a, b, 1984), the other from the southeastern Pacific (Newell 1984).

Material and Methods

In the Sevastopol area (Crimea, Ukraine) the rocks of the semiexposed and exposed shores often are densely covered with thickets of coralline algae (*Corallina* sp., Rhodophyta) which are growing along and beneath the water line. The meio-fauna on and between the corallines was extracted by washing with fresh water using a 100-µm sieve. The halacarid mites were cleared in lactic acid and mounted in glycerine jelly.

The holo- and paratype are deposited in the Zoologisches Institut und Zoologisches Museum, Hamburg (ZMH: Reg. No. A 112/99 and A 113/99, respectively).

Abbreviations used in the descriptions: *AD*, anterior dorsal plate; *AE*, anterior epimeral plate; *ds-1* to *ds-5*, first to fifth dorsal seta(e) on idiosoma; *GA*, genitoanal plate; *GO*, genital opening; *OC*, ocular plate(s); *P-1* to *P-4*, first to fourth palpal segment; *pas*, parambulacral setae; *PD*, posterior dorsal plate; *PE*, posterior epimeral plate; *pgs*, perigenital setae; *sgs*, subgenital setae. Legs numbered I to IV.

Systematics

Copidognathinae Bartsch, 1983

Copidognathides Bartsch, 1976

DIAGNOSIS. Dorsal plates *AD*, *OC*, *PD*, and ventral plates *AE*, *PE*, *GA* with porose panels or foveae. Dorsum with 4-5 pairs of setae; adanal setae on anal plate. *AE* with 3 pairs of ventral setae and pair of epimeral pores. *PE* with 1 dorsal seta and 3 ventral setae. Female *GA* with 3 pairs of pgs and 1 pair of sgs. Males with 4 pairs of sgs. Rostrum short. Basal pair of maxillary setae on gnathosomal base, distal pair on rostrum. Palps 4- or 3-segmented and lateral to rostrum. *P-2* with 1 distal seta. No seta on short *P-3* (or area corresponding to *P-3*). *P-4* (or area corresponding to *P-4*) with 0-1 basal seta; apically with setula and 2 spurs. Genua much shorter than adjoining segments. Ventral setae on tibiae I to IV numbering 3, 3, 2, 2, namely 2, 2, 1, 1 bipectinate and 1, 1, 1, 1 smooth and slender setae. Tarsi I to IV with 4, 4, 4, 3 dorsal setae (solenidion included) and 1, 0, 0, 0 ventral setae (*pas* excluded). Each tarsus with pair of *pas*. Claws large, with accessory process. Median claw present but small.

With a larval and a single nymphal stage, a protonymph, during development.

TYPE SPECIES. *Copidognathides minutirostris* Bartsch, 1976.

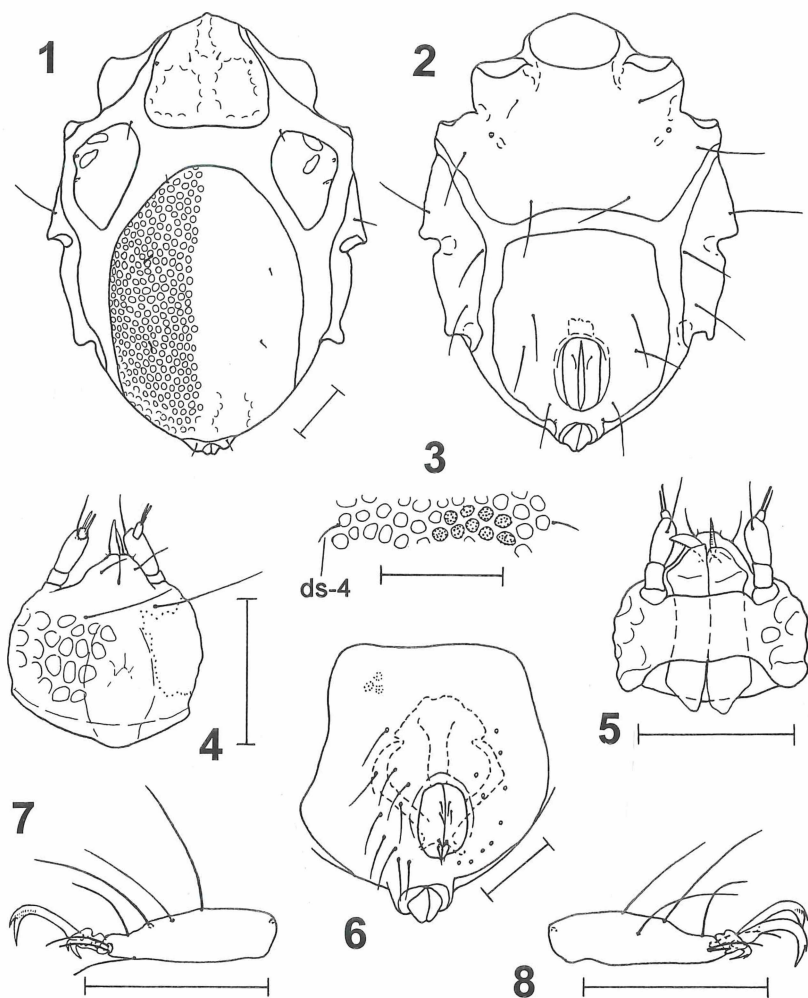
Copidognathides ampliatus sp. n.

HOLOTYPE. Female (ZMH), Black Sea, Crimea, area of Sevastopol, southern coast, corallines at 0.4 m depth. 17 May 1995; coll. I. Bartsch.

PARATYPE. Male (ZMH); collection data as above.

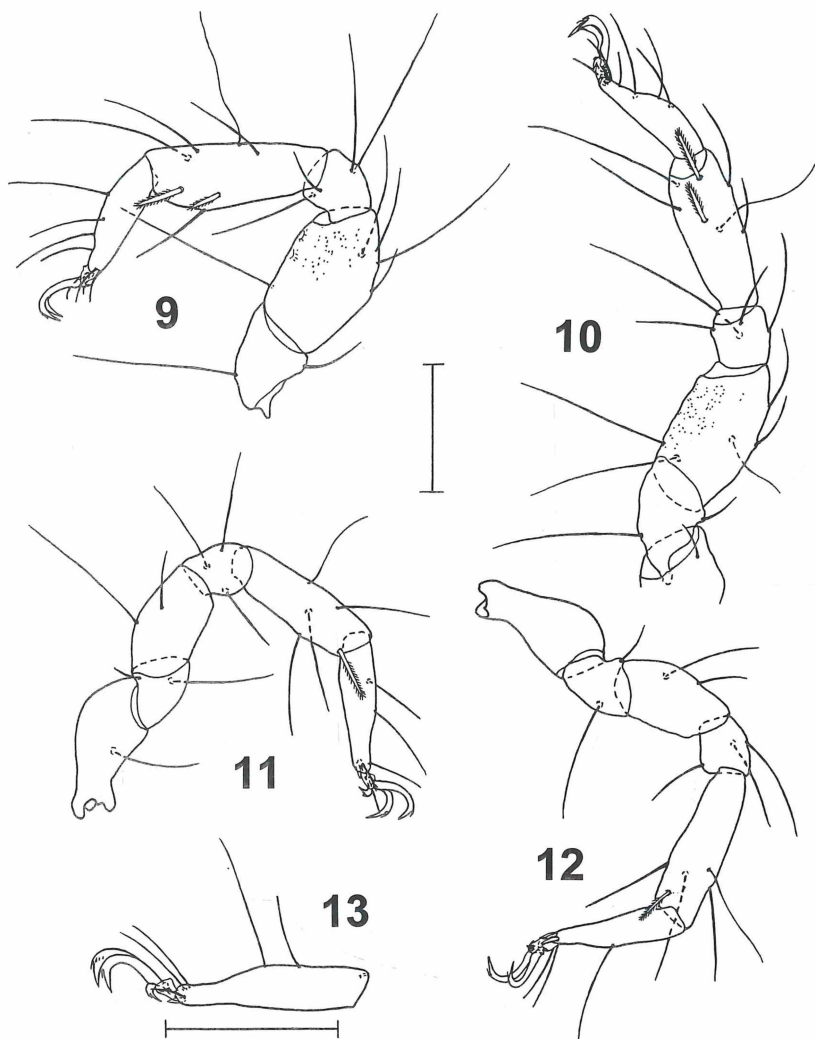
DESCRIPTION. *Female.* Idiosoma 380 µm long, 285 µm wide. Dorsal plates foveate; each fovea with numerous delicate pores (Fig. 3). *AD* 105 µm long, 112 µm wide; with crest-like porose anterior areola and pair of dome-like and delicately raised posterior areolae. First pair of gland pores near lateral margin at the level of insertion of leg I. *OC* 87 µm long, 60 µm wide. Two corneae present, posterior one hardly delimited. Pore canaliculus 20 µm posterior to gland pore; both in lateral margin of *OC*. *PD* 232 µm long, 174 µm wide; without distinctly raised costae. A pair of gland pores in posterior margin of the plate. Dorsal setae small, *ds-1* on *AD* between anterior and pair of posterior areolae; *ds-2* within or just outside margin of *OC*; *ds-3* to *ds-5* on *PD*, *ds-3* within margin of *PD* (in the holotype right *ds-3* lacking, Fig. 1), *ds-4* and *ds-5* level with insertion of legs III and IV, respectively. Adanal setae on anal plate.

Ventral plates ornamented with porose groups, with 6-16 canaliculi in each. *AE* 122 µm long, 257 µm wide; posterior margin slightly excavated. Epimeral processes small, lamellar. Ventral setae 45-70 µm long, much longer than dorsal setae. Epimeral pores indented. *PE* 177 µm long; each plate with 1 dorsal, 1 lateral and 2 ventral setae; lateral setae longer than the other setae. *GA* 194 µm long, 158 µm



Figs 1-8. *Copidognathides ampliatus* sp. n.: 1 - idiosoma, dorsal, female; 2 - idiosoma, ventral, female; 3 - PD between ds-4, female; 4 - gnathosoma, ventral, female; 5 - gnathosoma, dorsal, male; 6 - genitoanal plate, male; 7 - tarsus I, medial (lateral pas and claw omitted), male; 8 - tarsus II, medial, male (ds-4, fourth dorsal seta). Scale line = 50 µm.

wide. Three pairs of pgs arranged as illustrated (Fig. 2). Ovipositor extending beyond GO but not reaching level of anterior pair of pgs. GO 65 µm long; distance to anterior margin almost 1.5 times length of GO.



Figs 9-13. *Copidognathides ampliatus* sp. n., male. **9** - basifemur - tarsus I, medial; **10** - leg II, ventromedial; **11** - leg III, medial; **12** - leg IV, medial; **13** - tarsus III, medial. Scale line = 50 μ m.

Gnathosoma short, 65 μ m long, 68 μ m wide. Gnathosomal base laterally with porose foveae (Fig. 4). Rostrum very short, 17 μ m long, conical, ending abruptly. Basal pair of maxillary setae long, inserted on gnathosomal base; second pair of setae 1/3 of length of basal pair and situated on rostrum. Tip of rostrum with minute

pair of rostral setae. Rostral sulcus short. Palps slender and short, 24 μm long. *P*-1 cylindrical, 7 μm long. *P*-2 17 μm long; its dorsal seta slightly plumose. Following segment cylindrical, 5 μm long, ending with setula and 2- μm long spurs.

Legs as in male short, approximately 0.65 of idiosomal length. Ventral flank of telofemora I and II foveate and porose (Figs 9, 10). Tarsi lack membranes of claw fossa. Telofemora I, III, and IV shorter than tibiae of these legs; telofemur II about as long as tibia II. Tarsi I and II shorter than tibiae I and II; tarsi III and IV about as long as preceding segment (Figs 11, 12). Number of setae, from trochanter to tarsus (solenidia included; *pas* excluded): leg I, 1, 2, 5, 4, 7, 5; leg II, 1, 2, 5, 4, 7, 4; leg III, 1, 2, 2, 3, 5, 4; leg IV, 0, 2, 2, 3, 5, 3. Bluntly ending bipectinate ventromedial setae on tibiae I to IV numbering 2, 2, 1, 1. Tarsus I with single ventral eupathid seta and 4 dorsal setae (Fig. 7), namely 3 fossary setae and 1 setiform solenidion; basal fossary seta large; dorsomedial fossary seta shorter and more slender than dorsolateral one; solenidion 20 μm long; tip of tarsus with pair of doubled eupathid *pas*. Tarsus II with pair of 11/2 *pas* (1 long eupathid and 1 distinctly shorter tapering seta); solenidion setiform, almost 20 μm long (Fig. 8). Lateral *pas* of tarsus III scaliform, medial *pas* setiform, eupathid (Fig. 13). On tarsus IV both *pas* scaliform.

Claws slender; each with accessory process and short pectines with delicate tines along arc of claw. Median sclerite with claw-like, bidentate process.

Male. Idiosoma 353 μm long. Dorsal aspect as in female. Pair of *ds*-3 slightly removed from anterolateral margin of *PD*. *GA* 174 μm long, 165 μm wide. *GO* 50 μm long; distance to anterior margin of *GA* equalling 1.8 times length of *GO*. *GA* with 10 pairs of *pgs* (Fig. 6).

Gnathosoma 55 μm long, 65 μm wide; outline and ornamentation as in female. Tectum truncate, wide (Fig. 5). Chelicerae 65 μm long; cheliceral claw wide, its dorsal edge serrate.

REMARKS. The first record of this genus, *Copidognathides minutirostris*, is from northern France, from the upper tidal zone of a sandy shore with coarse sediment (Bartsch 1976a). An almost identical species from the French Atlantic coast (Bay of Arcachon) was given a rank of a subspecies (Bartsch 1976b). Another representative, *C. chiloensis* (Newell, 1984), is recorded from Chiloe Island, southeastern Pacific (Newell 1984).

The Black Sea *Copidognathides ampliatus* sp. n. has three-segmented palps and two corneae on each of the ocular plates whereas in the type species *C. minutirostris*, the palps are four-segmented and the OC bears vestiges of a single cornea. In addition, there is a slight difference in the position of the *ds*-2; in *C. ampliatus* sp. n. that seta is in the striated integument or within the margin of the OC, in *C. minutirostris* the *ds*-2 is on the OC.

C. chiloensis differs from the northern Atlantic and Black Sea species in having a basal seta on *P*-4.

Discussion

The majority of halacarid mites have four-segmented palps, with a short cylindrical basal segment (*P-1*), a distinctly longer *P-2*, a short *P-3*, and a generally tapering *P-4*. According to Newell (1984), Green & MacQuitty (1987), and Abé (1998), these segments correspond to trochanter (*P-1*), femur (*P-2*), genu (*P-3*), and tibiotarsus (*P-4*), respectively, whereas the author expects the *P-4* and a tarsus to be homologous segments. *P-1* is a separate segment; the following segments may be fused, the number of palpal segments reduced to three or two. Sometimes, the articulations still are represented by delicate furrows. In the genus *Scaptognathus*, with two-segmented palps, the furrow between the shaft with its two setae and the posterior portion of the palps with the large spines certainly represents the previous articulation between *P-2* and *P-3*, a second delicate furrow divides the portion with a large spine, equivalent to *P-3*, from the medially directed apical *P-4*.

In general, the number of palpal segments is the same within a genus, but exceptions do exist. The palps of *Colobocerasides auster* Bartsch, 1998 are four-segmented, those of *C. koehler* (Trouessart, 1896) three-segmented (Trouessart 1896, Bartsch 1998). A delicate furrow in the posterior part of the second segment obviously represents the articulation between *P-2* and *P-3*. The palps of *Australacarus inexpectatus* Bartsch, 1987 are four-segmented, those of *A. pustulatus* Bartsch, 1993 three-segmented (Bartsch 1987, 1993). In that latter species, the portions corresponding to *P-2* and *P-3* are fused.

Copidognathides is another genus with both four- and three-segmented palps. In *C. chiloensis* *P-3* and *P-4* are not conspicuously small, the combined length (apical spurs excluded) equals almost that of *P-2*, and *P-4* bears a basal seta. In *C. minutirostris* the *P-3* and *P-4* are short but still distinct segments; *P-3* and *P-4* together are slightly shorter than *P-4*. In *C. ampliatus* there is a single small segment attached to the *P-2*. *P-3* is either reduced or, in contrast to *Colobocerasides* and *Australacarus*, the segments *P-3* and *P-4* are fused.

Acknowledgements

Thanks are due to the staff of the Institute of Biology of Southern Seas for help and hospitality during my stay in Sevastopol. Travel funding was provided by the Deutsche Forschungsgemeinschaft which is gratefully acknowledged.

Zusammenfassung

Die Gattung *Copidognathides* war bisher nur aus dem Norden Frankreichs und Süden Chiles bekannt, nun ist sie auch im Schwarzen Meer gefunden worden. Die zwischen Kalkalgen lebende Schwarzmeer-Art *Copidognathides ampliatus* sp. n. wird beschrieben. Im Unterschied zu anderen Arten dieser Gattung bestehen die Palpen aus nur drei Gliedern.

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Band/Volume: [13](#)

Autor(en)/Author(s): Bartsch Ilse

Artikel/Article: [First record of Copidognathides from the Black Sea \(Copidognathinae, Halacaridae, Acari\) 139-145](#)