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A New Species of the Genus *Copidognathus* (Halacaridae: Acari) from India

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***Copidognathus bengalensis* n. sp. is described from Visakhapatnam coast, Bay of Bengal, India. The present species is characterized by posterodorsal plate (PD) with four costae made up of porose panels, subdivided posterior cornea of ocular plate (OC), and two pairs of basirostral setae in female. This species is related to *C. pulcher* group, but the nature of porose panels on anterior areolae of anterior dorsal plate (AD) and the setal ornamentation of legs were different between the members of *C. pulcher* group and the present new species.**

Copidognathus Trouessart, 1888 is the largest genus of the family Halacaridae, consisting of about 300 species, almost one third of all halacarid species described (Bartsch, 1999). This genus has been reported from the diverse habitats of marine and brackish waters. A few freshwater forms (Bartsch, 1989, 1996) and parasitic forms (Newell, 1956; Bartsch, 1976) were also known.

Seventeen species of the genus *Copidognathus* have been currently known from India by the serial faunal studies from Andaman and Nicobar Islands (Chatterjee, 1991a, 1992, 1995, 1996, 1997, 1999a, b; Sarma and Chatterjee, 1991; Chatterjee and DeTroch, 2003), from Chilka lagoon (Chatterjee, 1991b; Chatterjee and Sarma,1993), from Visakhapatnam (Chatterjee, 1991c; Chatterjee and Annapurna, 2002; Chatterjee et al., 2004), from Kerala (Chatterjee, 2000), and from Mumbai coast (Chatterjee and Chang, 2004).

In the present report, a new species, *Copidognathus bengalensis,* is described from the coastal battery area and harbor area in Visakhapatnam, Bay of Bengal, where the rocks are massive and the sand is mostly coarse by the great wave action, with the algal beds of *Ulva* band in its upper part and *Gracillaria* and *Caulerpa* in the lower part.

Materials and Methods

Mites were collected among algal sediments during February, 2002 by C. Annapurna at the rocky coastal battery area and harbor area, Visakhapatnam, Bay of Bengal, east coast of India. The algae and sediments were rinsed and sieved through a 63 μm mesh. The collected samples were fixed with 5% formalin, and preserved in 70% alcohol. Mites were cleared in lactic acid and mounted in glycerine jelly. Type specimens are deposited in the Department of Biology, Daegu University, Korea.

Abbreviations used in the text are as follows: AD, anterior dorsal plate; AE, anterior epimeral plate; Ds_{1-6}, dorsal setae 1-6; EP, epimeral process; GA, genitoanal plate; GO, genital opening; MC, membranous cuticle; OC, ocular plate; PAS, parambulacral setae; PD, posterodorsal plate; PGS, perigenital setae; PE, posterior epimeral plate; P1-P4, first to fourth palpal segment; SGS, subgenital setae; Vs, ventral setae.

Description

Copidognathus bengalensis n. sp.
(Figs. 1, 2)

Materials examined. Holotype: female (DB0013), among algae from coastal battery, Visakhapatnam, India, 14 February 2002, C. Annapurna. Paratypes: four females (DB0014-0017) with same collection data as in holotype. All type specimens are deposited in the Department of Biology, Daegu University, Korea. One female specimen from harbor area, Visakhapatnam, India is deposited under the research collection of the first author (T. Chatterjee).

Description of female. Idiosoma (Fig. 1A) 297-364 μm long dorsally. All dorsal plates separate. AD with 3 areolae, 1 anteriorly and 2 posteriorly. Anterior one (Fig. 1E) containing 12-14 porose panels with unequal sizes. Panels in anterior areola more elevated (foveate), while porose panels of dorsal plates not foveate. Each

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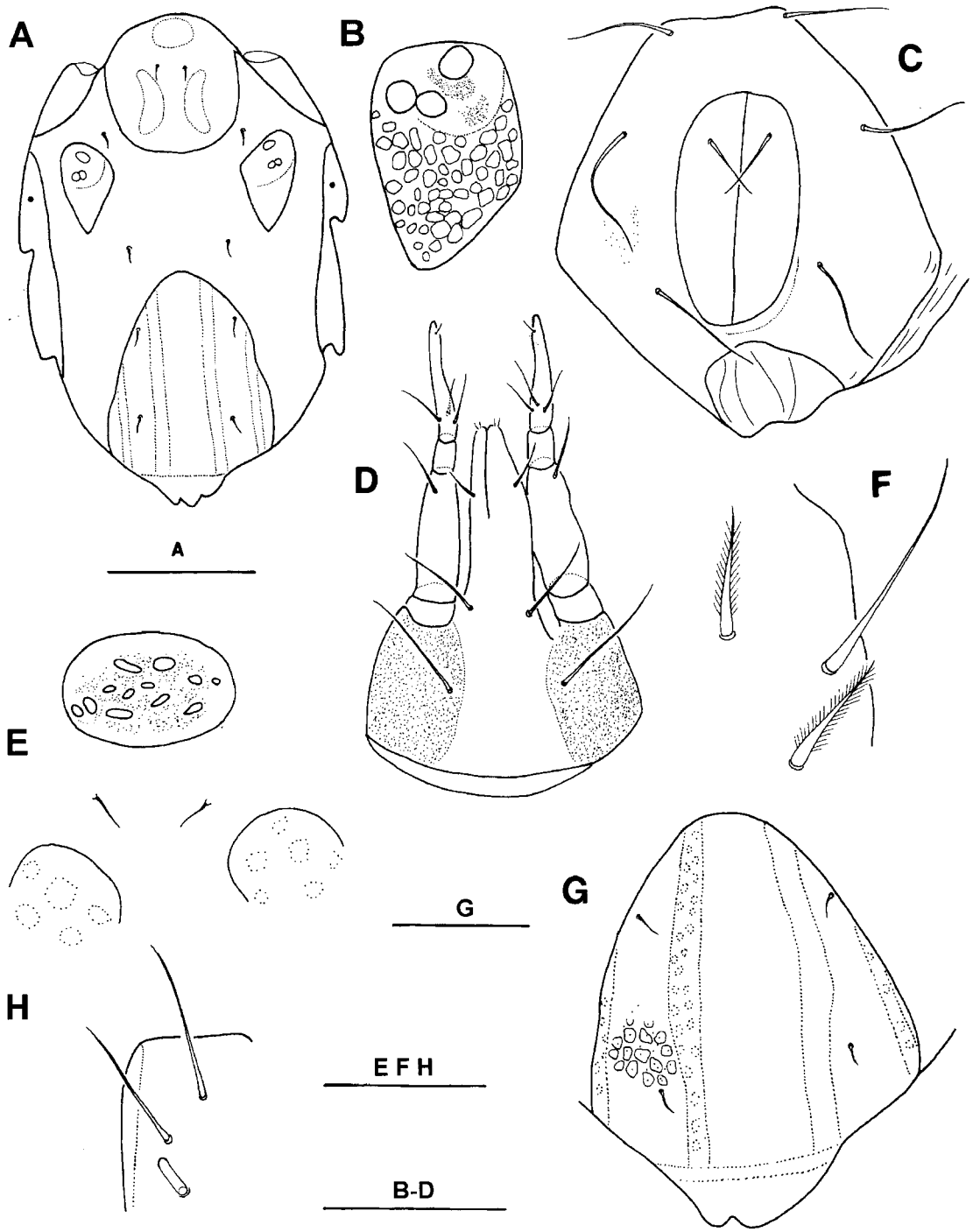

Fig. 1. *Copidognathus bengalensis* n. sp., female. A, Idiosoma, dorsal. B, OC. C, GA. D, Gnathosoma. E, Areola and Ds_1 of AD. F, Ventral setae of tibia II. G, PD. H, Ventral setae of tibia I. Scale bars=25 µm (E, F, H), 50 µm (B-D, G), and 100 µm (A).

posterior areola on AD containing about 16 porose panels. Posterior end of AD roundish. Ds_1 anterior to posterior areolae of AD. Rest of AD covered with panels. OC (Fig. 1B) with 2 corneae, posterior one subdivided. Brownish pigment present between 2 corneae; porose areola present on the corneal zone; rest portion of OC covered with panels reticularly. Canaliculi present on reticulated panel. Posterior portion of OC not tail-like (not

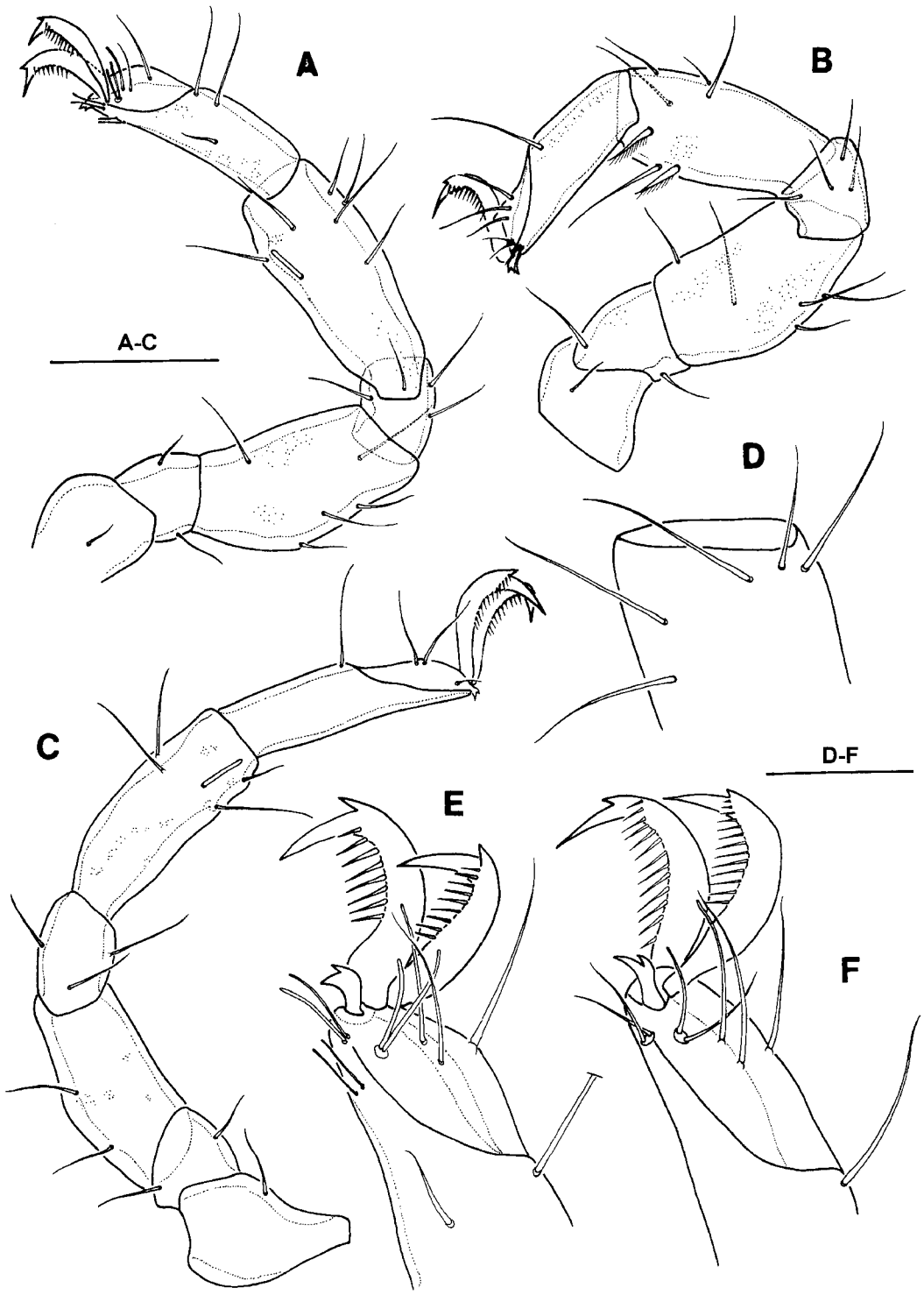

Fig. 2. *Copidognathus bengalensis* n. sp., female. A, Leg I. B, Leg II. C, Leg III. D, Setae on tibia IV. E, Anterior portion of leg I. F, Anterior portion of leg II. Scale bars=25 μm (D-F) and 50 μm (A-C).

strongly projected posteriorly). Ds_2 on MC above the level of anterior end of OC. Ds_3 on MC. Ds_4 and Ds_5 on PD lateral to middle costae. Except dorsal setae of PE all other dorsal setae small. PD (Fig. 1G) with 4 costae. Middle costae 2 porose panel wide. The area between 2 middle costae 6 reticulate panel wide.

Ventral plates porose. Many canaliculi present in each panelled area. EP not developed. All ventral setae long. AE with 3 pairs of setae. Vs_3 away from the posterior margin of AE. PE with 3 ventral and 1 dorsal setae. GO (Fig. 1C) large, the distance between anterior end of GO to that of GA about 1/3 of the length of GO. Ovipositor small. Three pairs of PGS present. Anterior pair of PGS near the anterior margin of GA. One pair of SGS present.

Ventrolateral portion of gnathosoma porose (Fig. 1D). Palp consisting of 4 segments. P2 with a dorsal seta. P3 without any seta. P4 with 3 basal setae and 1 small seta distally. Two pairs of basirostral setae present; tritorostral setae on anterior half of rostrum; proto- and deutorostral setae minute, at the tip of rostrum.

All legs stout, with 2 lateral claws and 1 bidentate median claw. Lateral claws of leg I (Fig. 2E) smaller than other legs, with about 8-10 pecten ventrally and dorsally with a tooth. On other legs, lateral claws with well developed pecten, about 12-14 tines in each claw ventrally, and with a tooth dorsally.

Chaetotaxy of trochanter to tibia as follows: trochanter 1-1-1-0; basifemur 2-2-2-2; telofemur 5-5-2-3; patella 4-4-3-3; tibia 7-7-5-5.

Telofemur III with 2 dorsal setae and without any ventral seta; telofemur IV with 2 dorsal and 1 ventral seta. Tarsus I with 3 ventral setae (one ventromedially on posterior side, other two ventrodistally), 3 dorsal long setae, 1 solenidion, 2 doublets eupathidia PAS. But, on one side of one specimen, probably as abnormality, tarsus I with 4 dorsal long setae (besides solenidion), instead of 3 in normal case (with 2 proximodorsal setae instead of 1 proximodorsal seta) (Fig. 2A).

Three ventral setae on tibia I (Fig. 1H), of which posterior one small, thick and coarsely pectinate. Three ventral setae on tibia II (Fig. 1F), of which two small, pointed and pectinate, while one long and smooth. Tibiae III with 2 ventral, 1 ventromedial (one faintly pectinate, and two smooth) and 2 dorsal setae (Fig. 2C). Tibia IV with 2 ventral, 1 ventromedial and 2 dorsal setae (all smooth and long) (Fig. 2D).

Remarks. There are many natural groups under the genus *Copidognathus*. One of such groups is *Copidognathus pulcher* group. The characteristics of *C. pulcher* group was given in Bartsch (1984, 1998). List of species and distribution of the group was given in Chatterjee and DeTroch (2000).

Copidognathus bengalensis n. sp. shows many characteristics of *C. pulcher* group, that is, AD with three porose areolae, triangular OC, subdivided posterior cornea, paired Ds_1 close together, ventral plate with porose panels, large lateral and ventral setae, gnathosoma with three pairs of maxillary setae, telofemorae I and II with ventral porose panels, tibia I ventrally with one short, thick and blunt spine like seta and two long, smooth, and slender setae, and three dorsal setae present on tarsi III and IV.

However, the nature of porose panels on anterior areolae of AD is different between the species of *C. pulcher* group and the present species. Tibiae III and IV bear a short bipectinate ventral seta in the *pulcher* group, while in the present species tibia III with a bipectinate seta (not short as in the members of *pulcher* group), tibia IV without any bipectinate seta (all setae smooth and long, as shown in Fig. 2D), and telofemur IV with a ventral seta (which is absent in *C. pulcher* group). Further investigation is needed to clarify the interspecific variabilities of the characters above among the members of *C. pulcher* group.

Among the members of *C. pulcher* group the present species is most similar to *C. milliporus* Bartsch, 1984 due to the presence of four costae on PD. However, *C. bengalensis* n. sp. differs from *C. milliporus* in the following respects. Ds_3 of *C. bengalensis* locate on MC instead of PD. The distance between anterior end of GO to that of GA is about 1/3 of GO's length in *C. bengalensis*, while subequal in *C. milliporus*. Posterior areolae on AD join to form 'Y' shape in *C. milliporus*, but do not join in *C. bengalensis*. Nature of anterior areolar panel varies between the two species. Pectination on a ventral seta of tibia IV is present in *C. milliporus,* but not in *C. bengalensis*.

The present report is the first record of a *Copidognathus* species related to '*C. pulcher*' group from Indian coast. Three species of *Copidognathus* viz. *C. gitae* Chatterjee, *C. waltairensis* Chatterjee and Annapurna and *C. andhraensis* Chatterjee, Annapurna and Chang were earlier described from Visakhapatnam coast, Andhra Pradesh, Bay of Bengal (Chatterjee, 1991c; Chatterjee and Annapurna, 2002; Chatterjee et al., 2004). Rao and Ganapati (1968) and Rao (1972) reported *C. fabricii* (Lohmann) from Visakhapatnam coast, Bay of Bengal. However, Bartsch (2001) commented that the record of *C. fabricii* should be regarded as erroneous. We completely agree with Bartsch and remove *C. fabricii* from the list of halacarid fauna in India.

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