

Halacaridae (Acari) from Thailand: One New and Two Known Species of the Genus *Copidognathus* Trouessart

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Three halacarid species belonging to the genus *Copidognathus* are recorded from the shallow subtidal sands at Ko Taenae Islet (sand dune) off Ko Pha-Ngan Island, Thailand: *Copidognathus thailandicus* n. sp., *C. euryalus* Bartsch, 1997 and *C. orarius* Otto, 2001. *Copidognathus thailandicus* n. sp. comes close with *C. cribrosoma* (Police, 1909) and *C. cribellus* Bartsch, 1993 due to dorsal plates completely covered with rosette pores. Dissimilarities among them are discussed. *Copidognathus euryalus* and *C. orarius* are recorded here for the first time from Thailand and away from its type locality. The present paper is also the first contribution on the taxonomy of Halacaridae (Acari) from Thailand.

Halacaridae of Thailand are totally unknown to science, although some works have been done from different adjacent areas such as Andaman and Nicobar Islands, India (Chatterjee, 1991, 1992, 1995a, b, 1996a, b, 1999a, b; Sarma and Chatterjee 1991, 1993a, b); Malaysia (Bartsch, 1997a); the Philippines (Bartsch, 1983, 1984a, b, 1985, 1986, 1991a); Hong Kong and southern China (Bartsch, 1990a, b, 1991b, c, 1992a-d, 1997b). To fill these lacunae the authors have collected some halacarids from Thailand coast. In the present paper, one new species and two new records from the shallow subtidal zone of Thailand are reported. This paper is the first contribution to the taxonomic knowledge of halacarid mites from Thailand coast.

Materials and Methods

Material examined in the present study were collected from Ko Taenae Islet (9° 42' N, 99° 59' E) of Ko Pha-Ngan I, Thailand on February 2, 1998 by the second author (C. Y. Chang) among shallow subtidal sands. Mites were stored in 70% ethanol. Halacarids were cleared in lactic acid and mounted in glycerin jelly for the taxonomic purposes. Drawings were prepared using a camera lucida.

Specimens are deposited in the Department of Biology, Daegu University, Korea.

Abbreviations used in the text: AD - anterior dorsal plate; ds₁-ds₅ - dorsal setae 1 to 5; GO - genital opening; OC - ocular plate; PAS - parambulacral setae; PD -

posterodorsal plate; PE - posterior epimeral plate; PGS - perigenital setae; P1-P4 - first to fourth palpal segment; SGS - subgenital setae.

Taxonomic Accounts

Family Halacaridae
Subfamily Copidognathinae

Copidognathus thailandicus n. sp.
(Figs. 1-2)

Type specimens: One male holotype (DB50004), 1 female paratype (DB50005), washings from shallow subtidal sands and some drifting algae of Ko Taenae Islet (sand dune), Ko Pha-Ngan I., Thailand, February 2, 1998, C. Y. Chang and H. S. Rho. Holotype male and one female paratype are deposited in the Department of Biology, Daegu University, Korea.

Description: Male. Idiosoma 283 µm long. All dorsal plates separate. AD and PD completely covered with areolae (Fig. 1A). Areolae made up to rosette pores. ds₁ on anterior half of AD; ds₂ above anterior margin of OC on membranous area; ds₃ on anterior side of PD, near anterior margin; ds₄, ds₅ on PD, and very faint. All ventral plates separate, and porose. AE (Fig. 1B) with 3 pairs of setae. PE with 3 ventral and 1 dorsal seta. GO (Fig. 1D) 26 µm long. Spermatopositor large, extended anteriorly with length of GO. Paragenital areolae present. About 60 PGS present around GO. Four pairs of SGS present. Anterior PGS almost at the level of anterior margin of spermatopositor. Distance between anterior margin of GO to that of GA

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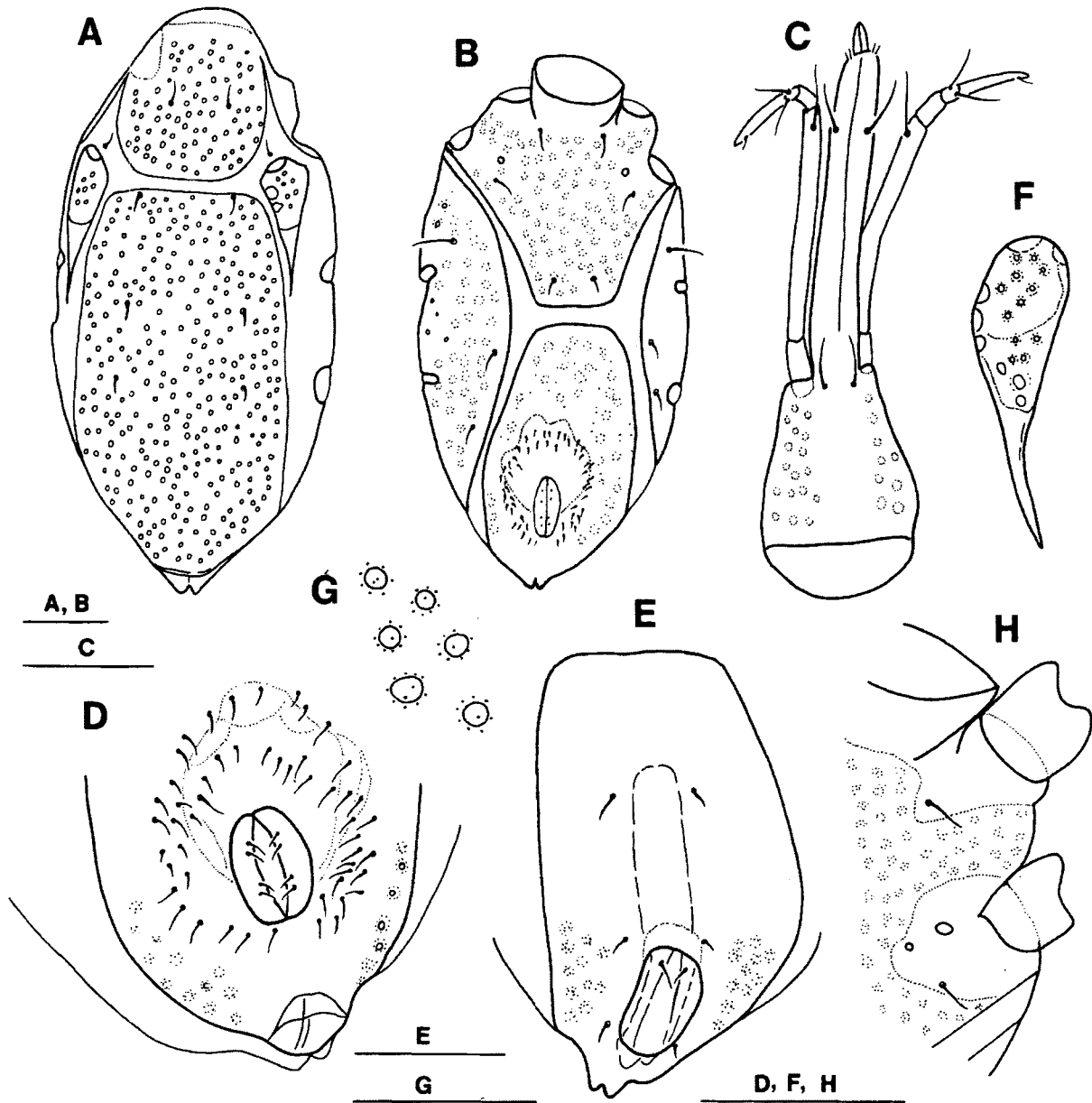


Fig. 1. *Copidognathus thailandicus* n. sp. A, Idiosoma, dorsal (male). B, Idiosoma, ventral (male). C, Gnathosoma. D, Part of magnified view of GA (male). E, GA (female). F, OC. G, Magnified view of rosette pores of PD. H, Magnified view of coxa I and II region. Scale bars = 25 μ m (G) and 50 μ m (A-F, H).

more than twice the length of GO. Distance between posterior end of GO to that of GA subequal with length of GO.

Gnathosoma 160 μ m long. Rostrum (Fig. 1C) longer than gnathosoma base. Rostrum tip extends beyond anterior end of P3. Palp consists of 4 segments. P2 longest among 4 segments, and longer than total length of P3 and P4 together. Ventrolateral sides of gnathosoma containing areolae.

Leg I (Fig. 2A) longer than other legs. Telfemora,

patella and tibia of all legs with articulating lamella on anterior side. Telfemora, patella and tibia of all legs with porose areolae; canaliculi present in small groups.

Chaetotaxy of legs as follows: trochanter 1-1-1-0, basifemur 2-2-2-2, telfemur 5-4-2-3, patella 3-3-3-3, tibia 7-7-5-5. Tibia I and II with 3 ventral setae of which 2 pectinate, 1 smooth. Pectinate setae of tibia I smaller than pectinate setae of tibia II. Tibia III and IV with 1 pectinate ventral seta and 1 smooth ventral seta. Tarsus I with 4 dorsal setae, 3 ventral setae (1

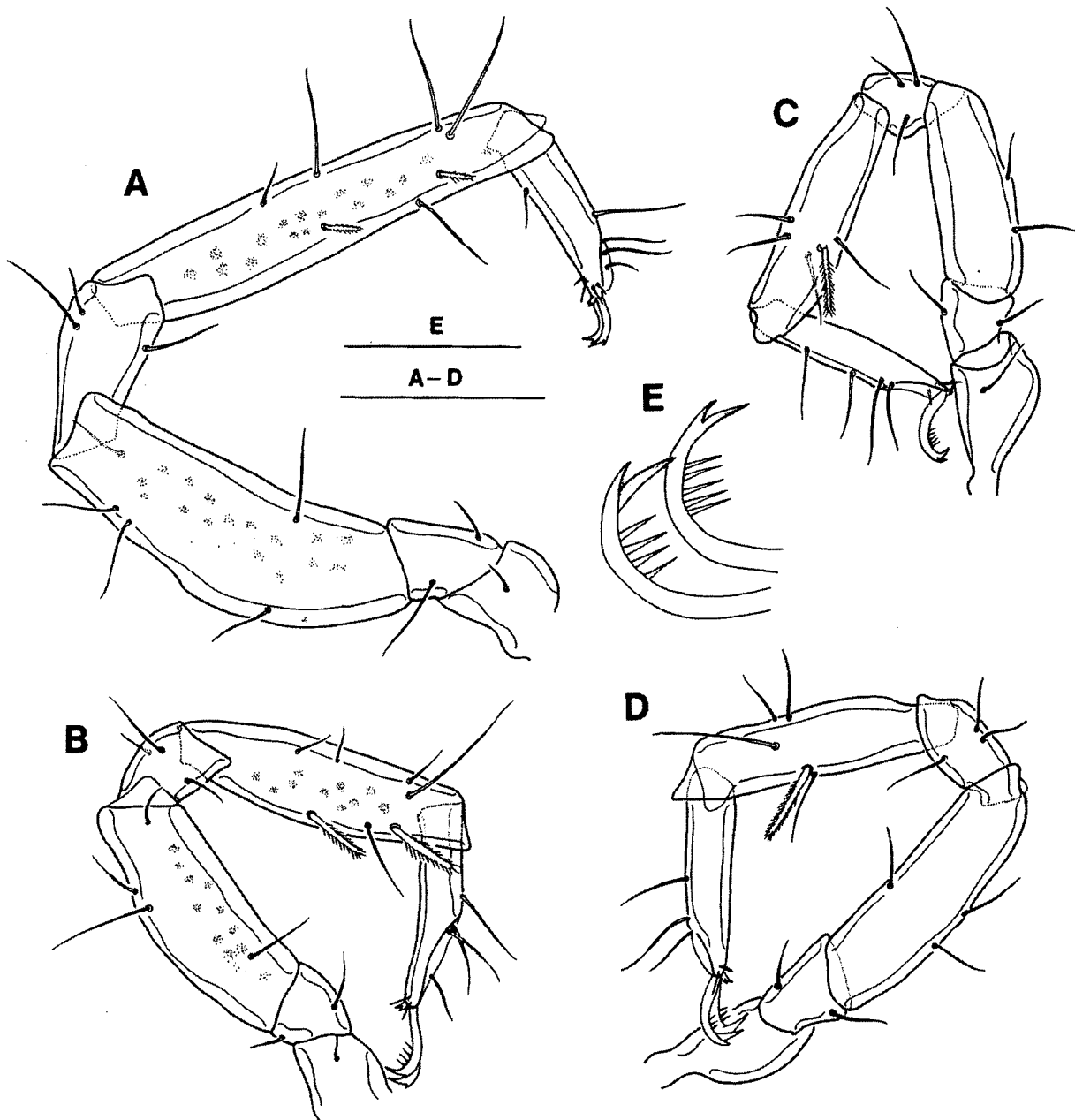


Fig. 2. *Copidognathus thailandicus* n. sp. A, Leg I. B, Leg II. C, Leg III. D, Leg IV. E, Lateral claw of leg III. Scale bars = 25 μ m (E) and 50 μ m (A-D).

filiform seta basally and 2 eupathidia distally), 4 PAS, 1 solenidion and 1 profamulus. Tarsus III with 4 dorsal setae, distance between two basal setae a little longer than width of tarsus. Tarsus IV with 3 dorsal setae. Telfemur III devoid of any ventral seta; telfemur IV with a ventral seta.

All legs with 2 lateral claws, ventrally with 3-5 prominent teeth, and 1 small dorsal tooth. All legs with bidentate median claw.

Female. Idiosoma 290 μ m long. Female resembles male except for genitoanal region. GO (Fig. 1E) 38 μ m

long. The distance between anterior end of GO and that of GA more than twice the length of GO. Paragenital areolae more developed than in male. Ovipositor long, extending anteriorly beyond GO by more than length of GO. Three pairs of PGS and 1 pair of SGS present.

Remarks: Two species, *Copidognathus cribellus* Bartsch and *C. cribrosoma* (Police), earlier described from Australia (Bartsch, 1993) and from Mediterranean region (Police, 1909; Morselli and Mari, 1981), come

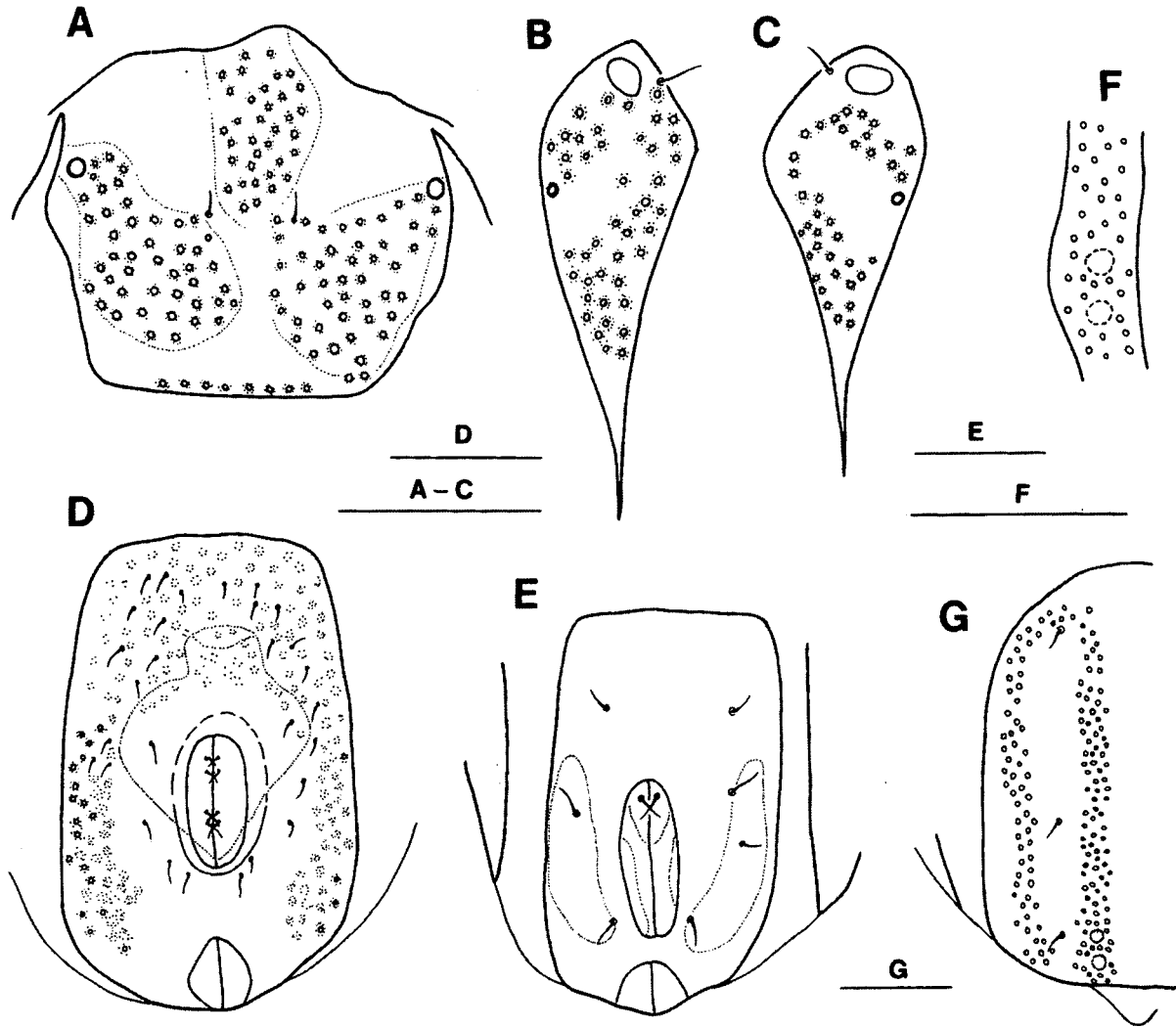


Fig. 3. A-E, *Copidognathus orarius* Otto. A, AD. B-C, OC. D, GA (male). E, GA (female). F-G, *Copidognathus euryalus* Bartsch. F, Magnified view of costae of PD. G, Costae of PD. Scale bars = 50 μ m.

very close with *C. thailandicus* n. sp. in sharing the character combination: wholly covered with rosette pores on AD and PD; long rostrum; patella I and II each with three setae (normally four setae found on patella I and II in the genus *Copidognathus*); spermatopositor extending beyond GO to about equal length of GO; tarsi III and IV with four and three dorsal setae, respectively.

However, the present new species differs from *C. cribellus* due to the following points. In *C. cribellus* ds_2 is present on the anterior end of OC, but in this species it is on membranous cuticle between AD and OC. Telfemur IV with a ventral seta in the present case, but it is absent in *C. cribellus*. In this species articulating lamella is found on anterior side of telfemora, tibia and patella of all legs which is absent in *C. cribellus*. In the present case telfemora, tibia and

patella are porose. Twenty PGS are present around GO in *C. cribellus*, but in this species about 60 PGS are present.

This species is different from *C. cribrosoma* by the following points. In the present case gnathosoma and rostrum are longer than in *C. cribrosoma*. Patella III and IV are furnished with four setae in *C. cribrosoma*, but in the present case three setae. Telfemur IV is equipped with a ventral seta in this species, but devoid of any seta in *C. cribrosoma*. Moreover, ds_2 is implanted on OC in *C. cribrosoma*, but on membranous cuticle in the present case.

Copidognathus euryalus Bartsch, 1997
(Fig. 3F, G)

Copidognathus euryalus Bartsch, 1997c, p. 234, Fig. 2.

Material examined: One male, 1 female, Ko Taenae Islet, Ko Pha-Ngan I., Thailand, February 2, 1998, C. Y. Chang and H. S. Rho.

Diagnosis: Idiosomal length of male 288 μm and that of female 305 μm . AD with 3 areolae (1 anterior elongated and 2 middle semilunar/crescent-shaped), besides few rosette pores on posterior side. PD with 4 costae; paracostae join with middle costae anteriorly. Two pairs of gland pores on PD at posterior half (Fig. 3F, G). Both ends of paragenital areolae thick; in middle thin, following the contour of lateral side of GA. Rosette pores on AD and PD each with big prominent ostium but without any canaliculi. Patella IV with 4 setae. Tarsi III and IV with 4 dorsal setae.

Remarks: This species was earlier described from northern Australia (Bartsch, 1997c). The present record is the first from Thailand and away from its type locality.

Copidognathus orarius Otto, 2001
(Fig. 3A-E)

Copidognathus orarius Otto, 2001, p. 725, Figs. 9, 10.

Materials examined: Two males and 2 females, washing from shallow subtidal sands and some drifting algae at Ko Taenae Islet (sand dune) off Ko Pha-Ngan I., Thailand, February 2, 1998, C. Y. Chang and H. S. Rho.

Diagnosis: Idiosomal dorsal length ranged between 260 μm to 274 μm . AD (Fig. 3A) with 1 anterior, 2 middle and 1 posterior marginal areolae. PD with 4 costae. Two middle costae 3-4 pores wide in middle; 2 lateral costae 1-2 pores wide. Lateral costae convergent anteriorly, all costae anteriorly joining with each other. OC posteriorly caudiform; arrangement of rosette pores on OC as indicated in Fig. 3B, C. ds_3 at anterior end of PD. ds_4 just above level of insertion of leg IV between middle and paracostae. A pair of gland pores below level of insertion of leg IV, at lateral side of middle costae. ds_5 present little below gland pores. About 30 PGS present in male (Fig. 3D), 3 pairs of PGS in female (Fig. 3E). Patella IV with 4 setae. Ventrodistal lamella present in all telofemora and tibiae. Tibia I with 3 ventral setae, basal one small, thick, pectinate. Tibia II with 3 ventral setae of which 2 bipectinate. Tarsi III and IV with 3 dorsal setae. Lateral claw thin; all lateral claws with small accessory process dorsally; lateral claw II-IV pecten ventrally, about 6-7 tines in the middle.

Variability: Ventrodistal lamellae were found in all telofemora and tibiae. Sometimes due to orientation of leg segment (during mounting), lamellae were not seen properly. In some specimen, anterior areola of AD contained more rosette pores, and posterior part of anterior areola almost joined with anterior part of middle

areolae of AD (Fig. 3A). In some specimens more rosette pores were found on OC (Fig. 2B, C). Spermatopositor was large, extending anteriorly from GO to little less than length of GO. PGS started before anterior end of spermatopositor (Fig. 2D). In Australian specimens 24-27 PGS were described, but here about 30-35 PGS were found, which may be an intraspecific variation. In female, distance between GO to anterior end of GA was almost equal with the length of GO, and three pairs of PGS were present. But in one female 3 PGS were on one side and 4 PGS on the other side (Fig. 2E). Ovipositor in all specimens examined was small.

Remarks: *Copidognathus orarius* Otto belongs to *C. ornatus* group (characteristics of this group were given in Bartsch, 1992a). So far, nine species have been described under this group viz. *C. ornatus* Bartsch from Mozambique (Bartsch, 1981) and Australia (Otto, 2001); *C. hawaiiensis* Bartsch from Hawaii Islands (Bartsch, 1989); *C. acanthoscelus* Bartsch and *C. umbonatus* Bartsch from Hong Kong (Bartsch, 1982a); *C. adonis* Otto, *C. barrierensis* Otto, *C. emblematus* Otto, *C. orarius* Otto, and *C. prideauxae* Otto from Australia (Otto, 2001). The Thailand specimens are generally coincided with Otto's (2001) original description, except for some minor discrepancies by the intraspecific variability as above mentioned. *Copidognathus orarius* is recorded here for the first time from Thailand and away from its type locality.

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