# New Species of *Copidognathus* (Acari: Halacaridae) from Hawaiian Islands

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## ABSTRACT

Five species of *Copidognathus* are described. The species were collected on beaches of the islands Hawai'i and Kaua'i (Hawaiian Archipelago). *C. ventriscutatus* n. sp. is an arenicolous form, while the others (*C. hawaiiensis* n. sp., *C. dentipes* n. sp., *C. unispinosus* n. sp., and *C. areolatus* n. sp.) are thought to inhabit crevicular habitats such as rhizoids, algae, and coarse sediment.

## INTRODUCTION

*Copidognathus* is the largest genus of the superfamily Halacaroidea; with 240 described species *Copidognathus* comprises almost ¼ of all halacarid species known. Up to present time a single species of *Copidognathus* was known from Hawaiian waters, that is *C. matthewsi* Newell, a species living among the gills of the decapod crustacean *Parribacus antarcticus* (Lund) (Newell 1956). Five species, collected from intertidal sediment and from algae washed up on shore, are described in this paper.

## MATERIAL AND METHODS

The halacarid mites were collected by Dr. H. Kunz and his wife during a research stay on the Hawaiian Archipelago in autumn 1979. The halacarids had been fixed and stored in formalin; they were cleared in lactic acid and mounted in glycerin jelly.

All holotypes are deposited in the Bernice P. Bishop Museum, Honolulu, Hawai'i (BPBM).

The following abbreviations are used in the descriptions: AD, anterodorsal plate; AE, anterior epimeral plate; ds, dorsal setae; ds-1, 1st pair of dorsal setae; GA, genitoanal plate; GO, genital opening; OC, ocular plate(s); P, palp; P-1, 1st palpal segment; pas, parambulacral setae; PD, perigenital setae; sgs, subgenital setae. Leg segments: I-1, trochanter of leg I; II-2, basifemur of leg II; III-3, telofemur of leg III; IV-4, genu of leg IV; I-5, tibia of leg I; I-6, tarsus of leg I.

## SYSTEMATICS

***Copidognathus dentipes*** Bartsch, **new species** Fig. 1A–I, 2A–D

♀. Idiosoma length 303 μm. Dorsal plates separated by coarsely striated integument. Plates with cuticular panels and narrow raised areolae with rosette pores (Fig. 1C). Rosette pores with fine canaliculi surrounding a small alveolus that opens with an ostium to the surface. AD with small frontal projection and with rosette pores on 3 raised areolae (1 small ovate anterior and 2 crescent posterior). OC with 2 corneae; 6–8 and 1–3 rosette pores medial and lateral to corneae respectively. PD long, ovate, truncate posteriorly; with 2 medial costae, 1–2 pores wide, and 2 lateral costae, 0–1 pores wide. Gland pores small. First pair of gland pores on lateral margin of AD at level of insertion of leg I, 2nd pair of pores on OC lateral to corneae; pore canaliculus

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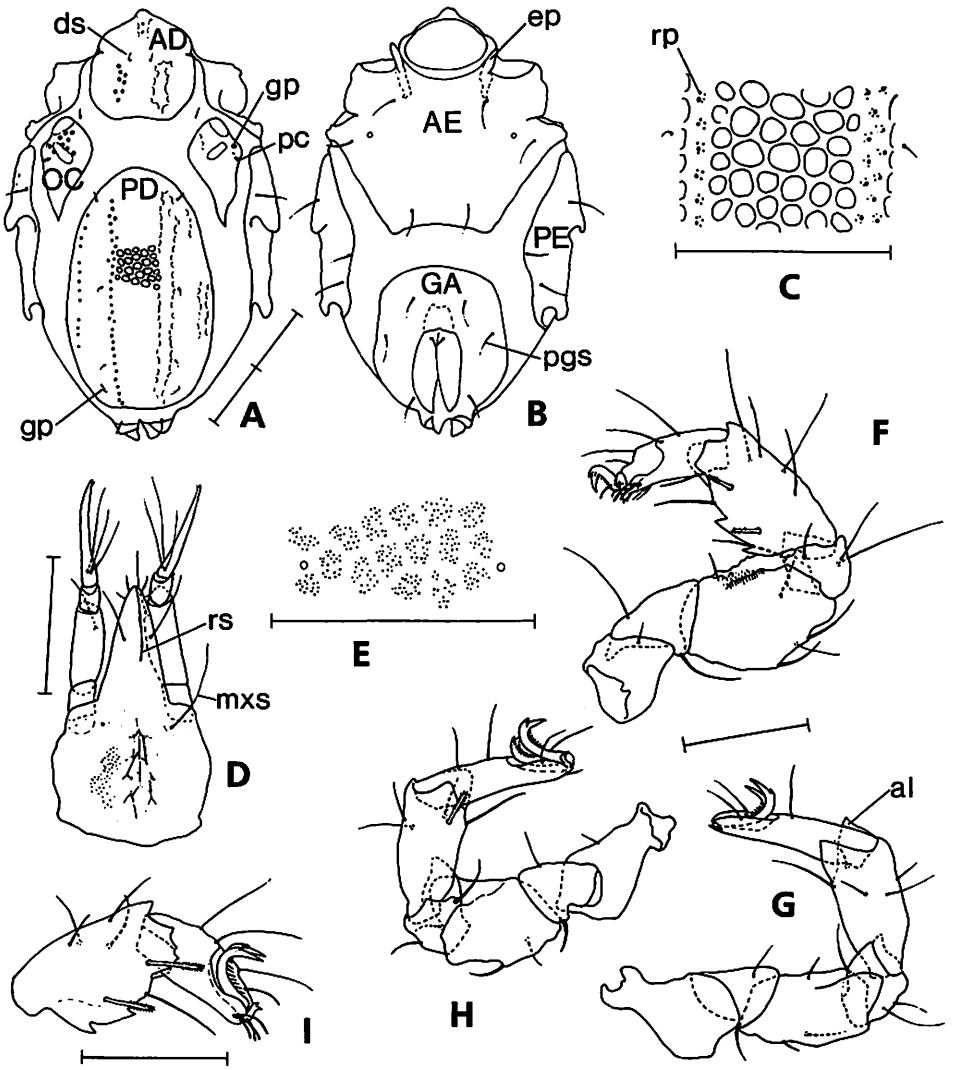


Fig. 1. *Copidognathus dentipes* Bartsch, n. sp., ♀: **A,** idiosoma, dorsal view; **B,** idiosoma, ventral view; **C,** portion of PD at level of setae ds-4; **D,** gnathosoma, ventral view; **E,** portion of AE at level of posterior setae; **F,** leg I, medial view; **G,** leg IV, medial view; **H,** leg III, medial view; **I,** tibia and tarsus II, medial view. (Abbreviations: AD, anterodorsal plate; AE, anterior epimeral plate; al, articular lamella; ds, dorsal setae; ep, epimeral process; GA, genitoanal plate; gp, gland pore; mxs, maxillary setae; OC, ocular plate; pc, pore canaliculus; PD, posterodorsal plate; PE, posterior epimeral plate; pgs, perigenital setae; rp, rosette pore; rs, rostral sulcus.) Scale divisions represent 50 $\mu$m.

present just posterior to gland pore (Fig. 1A). A slightly raised gland pore present at end of PD. All dorsal setae minute; ds-1 inserted on AD, anterior to crescent costae; ds-2 within striated integument; ds-3 to ds-5 on PD, lateral to medial costae.

*Ventral plates* all separated by wide areas of striated integument. Ventral plates pierced by fine

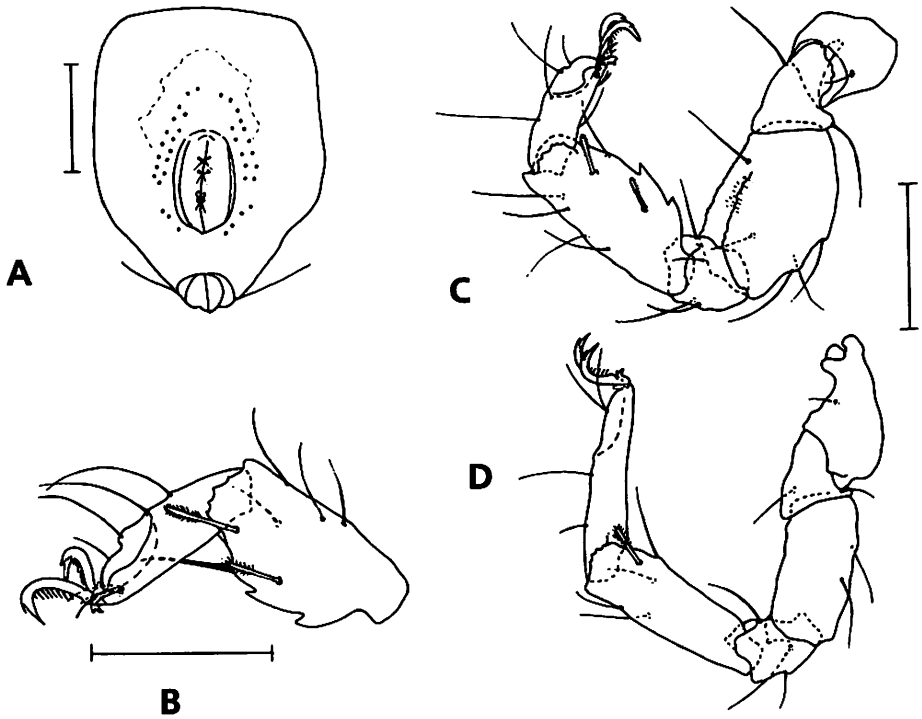


Fig. 2. *Copidognathus dentipes* Bartsch, n. sp., ♂: **A,** genitoanal plate; **B,** tibia and tarsus II, medial view; **C,** leg I, medial view; **D,** leg III, medial view. Scale divisions represent 50 μm.

pores arranged within panels (Fig. 1E). Claparède organ opens with an often H-like slit at the plate surface. Epimeral process I very long. Epimera I wide, with marginal lamella partly concealing base of trochanter II. Ventral setae long, inserted as illustrated (Fig. 1B). Distance from anterior margin of GA to that of GO less than length of GO. Ovipositor surpassing GO, not reaching to anterior pair of pgs.

*Gnathosoma* slender. Gnathosoma base ventrally pierced by fine pores, dorsally paneled. Tectum truncate. Rostrum almost as long as gnathosoma base, rostrum extending to end of P-3. First pair of maxillary setae inserted on gnathosoma base, 2nd pair on rostrum (Fig. 1D). Rostral sulcus extending beyond 2nd pair of maxillary setae. Palp chaetotaxy as characteristic for *Copidognathus*: P-2 with 1 dorsal seta, P-4 with 3 long basal and 1 minute distal setae.

*Legs* shorter than idiosoma. Telofemora and tibiae paneled. Telofemora short. Telofemora I and II ventrally porose. I-3 and II-3 with narrow ventrolateral and ventromedial lamellae, III-3 and IV-3 with large distilateral and smaller distimedial lamellae. Genua and tibiae also with distal lamellae, often the lateral lamella larger than the medial. Tibiae I and II with 2 strong cuticular ventral spinelets, and with 2 bipectinate ventromedial and 1 smooth ventral bristle. Tibia III with 1 bipectinate ventromedial and 1 smooth ventral bristle; tibia IV with both bristles smooth. Number and insertion of setae shown in Figs. 1f-h. Lateral membranes of claw fossa on all tarsi huge, medial membranes on tarsus I and II smaller, on tarsus III and IV almost as large as lateral membrane. Tarsi I and II each with 3 dorsal setae, 1 inserted on lateral membrane of claw fossa anterior to the seta-like solenidion. Tarsus III with 4 dorsal setae, tarsus IV with 3 setae.

*Claws* on leg I shorter than claws on the following legs; claws on leg I with strong accessory process and small teeth from claw comb. Claw comb on the following legs with strong teeth.

♂. Idiosoma length 297–300 μm. In dorsal aspect similar to female, but areolae with rosette pores slightly larger; medial costae 2-3 pores wide, lateral costae longer than in female, 1-2 pores wide. GO surrounded by 37 pgs, arranged in a rather dense corona around the GO (Fig. 2A). Four pairs of sgs, with the 2 anterior and the posterior pair seta-like, the 3rd spur-like. Distance from GO to anterior pgs ½ length of GO. Distal lamellae on telofemora, genua, and tibiae smaller than those in ♀ (Figs. 2B–D).

**Type data.** Holotype ♀ (BPBM 14321), KAUA'I: Wainiha Bay, 0 m, coarse sand and red algae washed up on beach, 30.X.1979. 1 ♂, O'AHU: Pupukea Beach, 0 m, low energy beach with coarse sand and clay, 0–10 cm sediment depth, 26.X.1979. 1 ♂, O'AHU: Waimea Bay, 0 m, exposed beach, from 10 cm sediment depth, 26.XI.1979. Holotype in BPBM, other specimens in author's collection.

**Remarks.** Characteristics are: AD with crescent areolae; PD with 4 narrow costae; ventral plates porose; tibia I and II each with ventral cuticular spinelets; I-3 and II-3 with porose areolae. ♂ differs from ♀ in having smaller distal lamella on telofemora, genua, and tibiae. *Copidognathus dentipes* is closely related to *C. punctatissimus* (Gimbel 1919) and *C. dentatus* Viets (1940), known from the western and eastern Atlantic Ocean respectively (Gimbel 1919; Viets 1940; Green & MacQuitty 1987). *C. dentipes* is separated from the others by the smaller idiosoma length, larger lamellae on legs, and wider corona of pgs in ♂. The 3 species form a natural group.

***Copidognathus hawaiiensis*** Bartsch, **new species** Figs. 3A–J

♀. Idiosoma length 298 μm. Similar to male except for the genital region. Length of GA 60 μm. Three pairs of pgs present. Ovipositor small, hardly surpassing GO (Fig. 3F). Subgenital setae minute.

♂. Idiosoma length 300-317 μm. Dorsal plates with ample and prominent porose areolae; plates paneled outside these areolae (Figs. 3A,C). AD with anterior projection; posterior margin truncately rounded. OC long, squarish anteriorly, tail-like posteriorly; with 1 garland-shaped porose areola. Anterior cornea prominent, posterior cornea indistinct. PD large, with 4 longitudinal porose costae, all contiguous anteriorly. First pair of gland pores opening on small projections at lateral margin of AD, at level of insertion of leg I; 2nd pair on lateral margin of OC; 3rd and 4th pairs at posterior end of PD, with 3rd pore within marginal porose costae and 4th pore within medial costae (Fig. 3A). Dorsal setae minute; 1st pair of setae on AD medial to paired porose areolae; ds-2 on medial margin of OC; ds-3 on anterior margin of PD; ds-4 and ds-5 within paneled areas of PD.

*Integument* of ventral plates pierced by fine pores arranged within panels (Fig. 3D); pores on epimera I to IV slightly deeper than on ventral portion of AE and PE. Pore of Claparède organ circular. AE with 3 pairs of setae. PE with 1 dorsal and 3 ventral setae. GA with 28 pgs arranged loosely around GO (Fig. 3B). Distance from anterior pgs to GO more than latter's length. Subgenital setae minute; 2 proximal pairs seta-like, 3rd pair spur-like, 4th pair seta-like.

*Gnathosoma* short with globular gnathosoma base and short, cone-like rostrum. Gnathosoma base ventrally porose, dorsally paneled, tectum truncate (Fig. 3G). Palpi short. First pair of maxillary setae inserted close to base of rostrum, 2nd pair in distal ⅓ of rostrum. Rostral sulcus extending posteriad for more than ½ rostrum's length.

*Legs:* Leg I stronger than posterior legs. Integument of all telofemora finely paneled. Telofemur I with prominent cuticular spines, usually 2 long ventrolateral, 1 small obtuse distilateral, and 1 pointed distimedial cuticular spine. Genu I and tibia I with pointed articular lamellae (Fig. 3J), both laterally and medially. Ventral spine on tibia I slender, smooth, with a cuticular, spinelike projection on its lateral flank (Fig. 3H). Tibia I with 2 ventral bristles, the basal one blunt, slightly pectinate, the distal one slender; both bristles with minute, pointed

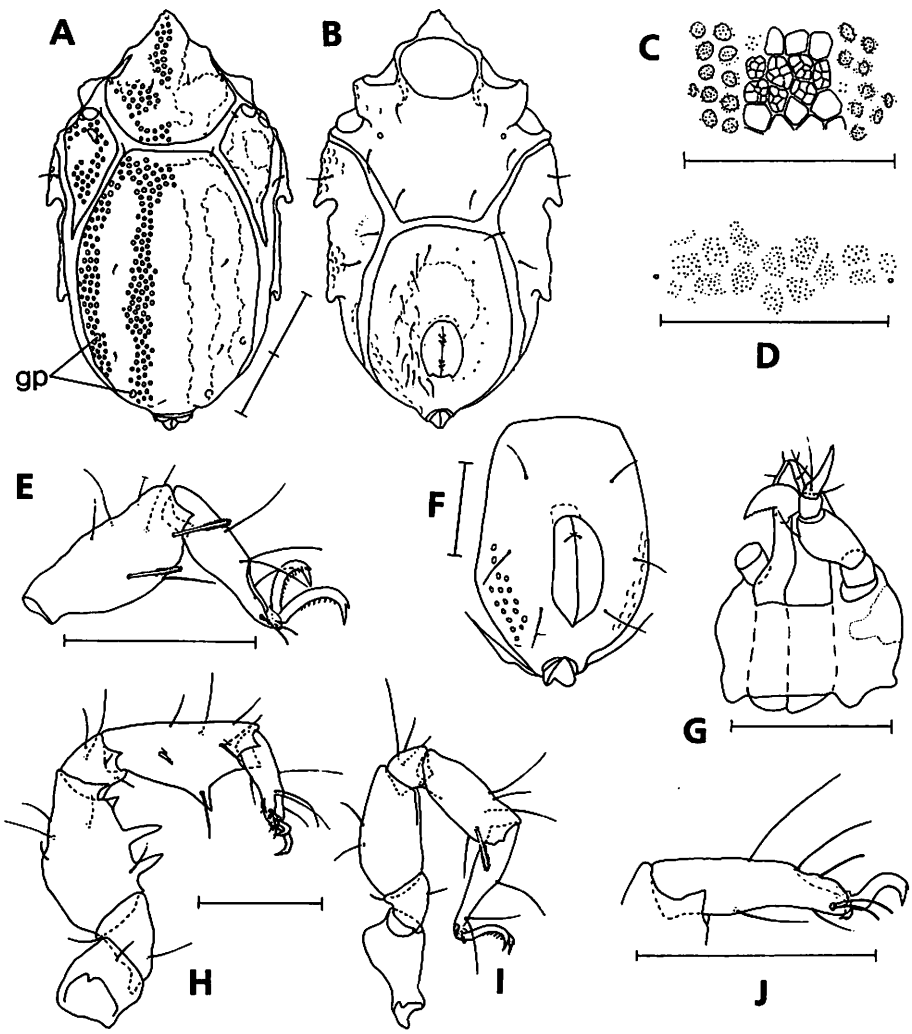


Fig. 3. *Copidognathus hawaiiensis* Bartsch, n. sp.: **A,** idiosoma, dorsal view, ♂; **B,** idiosoma, ventral view, ♂; **C,** portion of median PD anterior to setae ds-4, ♂; **D,** portion of AE at level of posterior setae, ♂; **E,** tibia and tarsus II, medial view, ♂; **F,** genitoanal plate, ♀; **G,** gnathosoma, dorsal view, ♂ (stippled areas include porose areola); **H,** leg I, medial view, ♀; **I,** leg IV, medial view, ♀; **J,**tarsus I, lateral view, ♀ (medial setae omitted). (Abbreviation: gp, gland pore.) Scale divisions represent 50 μm.

cuticular projections at their base. Tibiae II to IV with pointed articular lamellae both laterally and medially. Tibia II with 2 ventromedial, bipectinate bristles and 1 slender ventral bristle (Fig. 3E), tibiae III and IV each with 1 bipectinate ventromedial and 1 smooth ventral bristle. Genu IV with 4 setae (Fig. 3I). Lateral membrane of claw fossa on tarsus I large, medial membrane small. Posterior legs with both lateral and medial membranes of claw fossa inconspicuous. Tarsi I and II each with 3 dorsal setae, all inserted outside region of claw fossa. Tarsi III and IV each with 3 dorsal setae, the 2 distal ones inserted close to end of tarsus, within area of claw

fossa. Tarsus I with 1 seta-like solenidion and 1 canalicular famulus, tarsus II with 1 long, seta-like solenidion, dorsolateral in position.

*Claws* on tarsus I slightly smaller than those on following legs, with an accessory process but no claw comb. Claws on tarsi II to IV with claw comb with few strong teeth. Median claw minute.

**Type data.** Holotype ♂ (BPBM 14322), KAUA'I: Anini Beach, 1 m, sheltered beach area, 1.XI.1979. Allotype ♀ (BPBM 14322a), same data as holotype. Paratype ♂, same data as holotype. 1 ♀, KAUA'I: Anini Community Beach, coarse sand, 3.XI.1979. Holotype ♂ and allotype ♀ in BPBM, paratypes in author's collection.

**Remarks.** Characteristics of *C. hawaiiensis* are: telofemur I with large ventrolateral spine-like projections; porose areolae on dorsal plates wide; ventral bristle on tibia I with cuticular projection at its base.

*C. hawaiiensis* is similar to *C. ornatus* Bartsch, a species found in the Mozambique Channel (Bartsch, 1981). *C. hawaiiensis* is separated from the latter by the above-mentioned characters. Another closely related species has been found in intertidal and subtidal sediments along Philippine shores (unpublished data).

A protonymph (*Copidognathus* sp. A) described in Bartsch (1979) is supposed to be conspecific with *C. hawaiiensis*.

***Copidognathus unispinosus*** Bartsch, **new species** Figs. 4A–G

♂. Idiosoma length 263 μm. Dorsal plates with distinct areolae with rosette pores; outside these areolae, integument finely paneled. AD with a frontal spine and 2 small lateral projections (Fig. 4B). OC wide, with 1 large distinct cornea anteriorly, and 1 indistinct ovate cornea posterior to 1st. Two areolae with rosette pores on either side of corneae. PD wide, with 4 narrow longitudinal costae, 1–2 pores wide. Gland pores large. First pair of gland pores on AD, anterolateral to paired porose areolae; 2nd pair on OC, with a delicate wall arising above the plate (Fig. 4D); 3rd and 4th pairs of gland pores in posterior PD, both open within porose costae, with delicate ostia raised above surrounding integument. Dorsal setae minute. First pair of setae on AD anterior to paired porose areolae; ds-2 at anterior margin of OC; ds-3 to ds-5 on PD, ds-4 at level of insertion of leg IV, ds-5 slightly posterior to ds-4 but anterior to gland pores.

*Integument* of ventral plates with wide areolae with almost evenly scattered pores and with rosette pores on narrow areolae marginally and ventrally on PE, and garland-like on both sides of GO (Fig. 4C). Ventral setae on AE and PE long and slender. Thirty-three pgs, arranged loosely around GO; anterior pgs almost halfway between anterior margin of GO and that of GA.

*Gnathosoma* short, with porose areolae on both sides of the pharyngeal area (Fig. 4A). Tectum truncate. First pair of maxillary setae inserted close to base of rostrum, 2nd pair at beginning of distal ⅓ of rostrum.

*Legs:* Leg I larger than following legs. Telofemur I with a huge spine-like ventrolateral lamella (Fig. 4G). Genu I with 1 blunt ventromedial spine, 1 strong ventral bristle, 1 slender and 1 stout dorsal setae. Tibia I with 1 long slender ventral spine, 1 short blunt ventromedial spine, and 1 ventromedial bristle. Telofemora II to IV without ventral lamellae. Genua II, III, and IV with 4, 3, and 4 setae respectively, none spiniform. Tibia II with 1 smooth ventral and 2 bipectinate ventromedial bristles (Fig. 4F), tibia III with 1 slender ventral and 1 blunt bipectinate ventromedial bristle, tibia IV with both bristles (ventromedial and ventrolateral) seta-like (Fig. 4E). Tarsus I with large lateral membrane of claw fossa. Medial membrane and membranes on posterior legs narrow. Tarsi I and II each with 3 dorsal setae, inserted outside area of claw

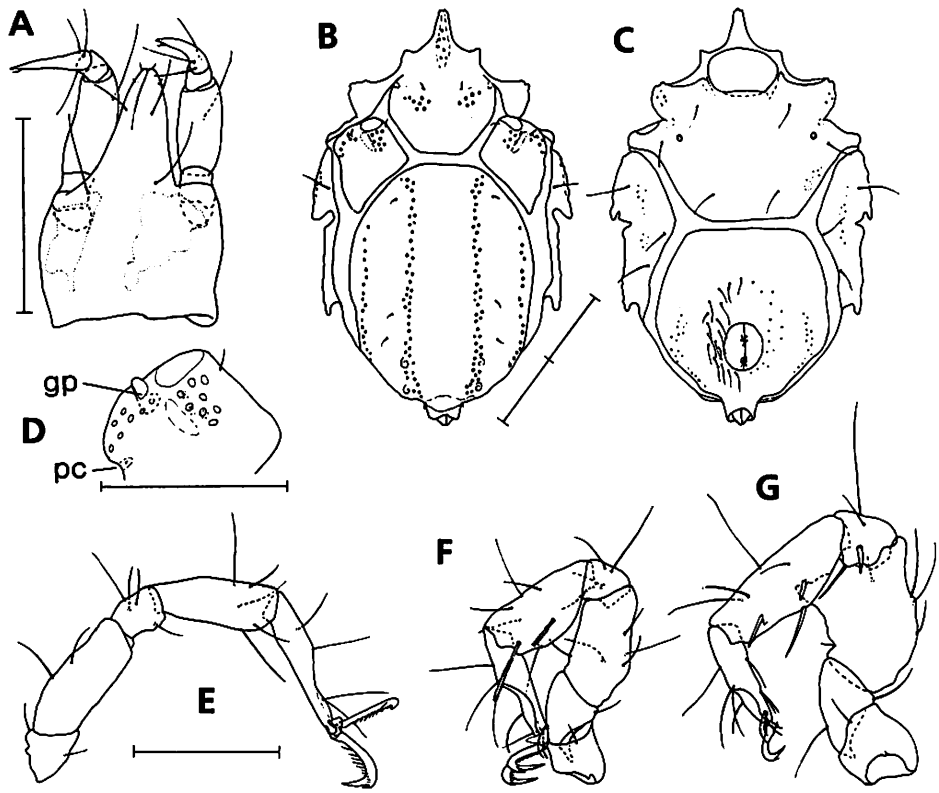


Fig. 4. *Copidognathus unispinosus* Bartsch, n. sp., ♂: **A,** gnathosoma, ventral view (stippled areas include porose areolae); **B,** idiosoma, dorsal view; **C,** idiosoma, ventral view; **D,** anterior ocular plate; **E,** leg IV, medial view; **F,** leg II, medial view; **G,** leg I, medial view. (Abbreviations: gp, gland pore; pc, pore canaliculus.) Scale divisions represent 50 μm.

fossa, and 1 solenidion dorsolateral in position. Tarsi III and IV each with 4 dorsal setae, the paired distal ones arising within area of claw fossa.

*Claws* on tarsus I smaller than those on posterior legs, claws I with an accessory tooth but no distinct claw comb. Claws on posterior legs with long claw comb with strong teeth.

♀. Not seen.

**Type data.** Holotype ♂ (BPBM 14323), KAUA'I: Wainiha Bay, on red algae washed ashore, 30.X.1979.

**Remarks.** Characteristic is the combination of: AD with frontal spine; narrow areolae with rosette pores on AD, PD, PE, and GA; PD with 4 longitudinal costae; gland pores on PD arising close together, both posterior to ds-5; telofemur I with huge spine-like ventrolateral lamella; genu I with 1 blunt ventromedial spine.

*C. unispinosus* belongs to the *bairdi* group (see Bartsch 1984). Most of the known species within the *bairdi* group have telofemora with no or only slender ventral lamella, though small projections are present in *C. gibberipes* Viets (1936), *C. grandiculus* Bartsch (1977), and *C. spinula* (Trouessart 1899). Unique in *C. uniscutatus* is the huge spine-like lamella on telofemur I.

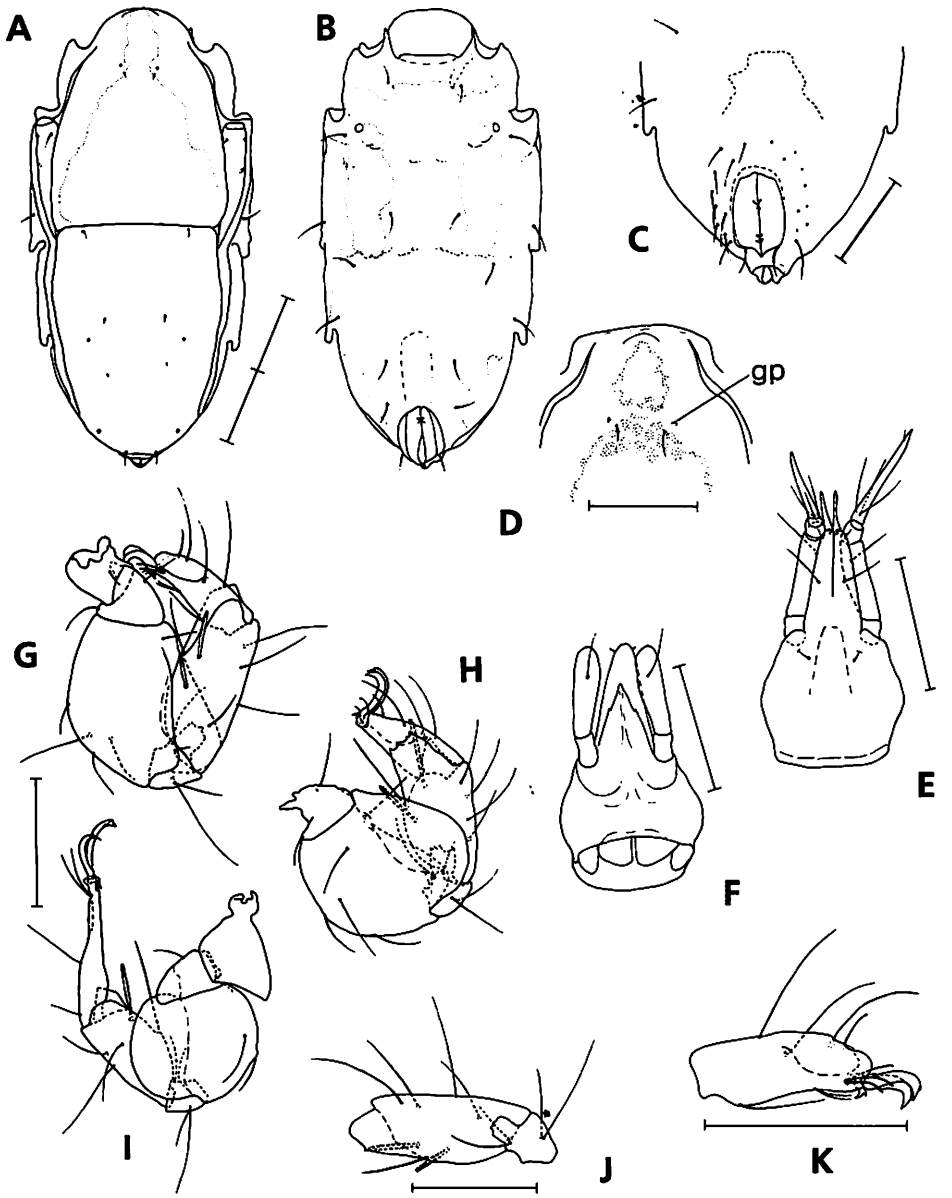


Fig. 5. *Copidognathus ventriscutatus* Bartsch, n. sp.: **A,** idiosoma, dorsal view, ♀; **B,** idiosoma, ventral view, ♀; **C,** posterior idiosoma, ventral view, ♂; **D,,** anterior anterodorsal plate, ♀; **E,** gnathosoma, ventral view, ♀; **F,** gnathosoma, dorsal view, ♂; **G,** leg I, medial view, ♀; **H,** leg II, medial view, ♀; **I,** leg IV, lateral view, ♀; **J,** tibia I, lateral view, ♀; **K,** tarsus I, lateral view, ♀. (Abbreviation: gp, gland pore.) Scale divisions represent 50 $\mu$m.

***Copidognathus ventriscutatus*** Bartsch, **new species** Figs. 5A–K

♀. Idiosoma length 282–292 μm. Surface of dorsal plates rather smooth, though pierced by fine, evenly scattered pores; pores on AD slightly deeper than on PD, but lacking on anterolateral margin of AD and on a small transverse bar (Figs. 5A, D). OC slender, with some scattered pores within oblong area in middle of plate and 1 distinct cornea at anterior margin. Posterior end of OC narrow, hidden beneath PD.

*Gland pores* small. First pair of gland pores standing close together on AD, at level of transverse cuticular bar; 2nd gland pore and pore canaliculus on lateral margin of OC; 3rd pair of gland pores on PD at level of leg III, and 4th pair at posterior margin of PD.

*Ventral plates* all fused to a ventral shield. Integument pierced by uniformly scattered pores; these slightly deeper within a central area of AE and on marginal areas of AE, PE, and GA (Fig. 5B). Epimeral process I long and pointed. Pore for Claparède organ distinct. GO placed near end of idiosoma; thus, genital sclerites partly concealing anal cusps. Ovipositor projecting beyond GO for slightly more than length of GO and surpassing anterior pair of 3 pairs of pgs.

*Gnathosoma* slender. Gnathosoma base finely punctate ventrally and marginally. Rostrum slightly shorter than gnathosoma base. Tectum spine-like (Fig. 5F). Rostrum projecting beyond P-2 (Fig. 5E).

*Legs:* All telofemora with huge ventral lamellae and all tibiae with large distal lamellae (Figs. 5G–I). Trochantera III and IV dorsally cuspidate, basifemora III and IV with ventral lamellae. Tarsi I and II each with huge lateral membrane of claw fossa; membranes on tarsi III and IV narrow. Tarsus I with 3 dorsal and 3 ventral setae, and with 1 solenidion and 1 utricular famulus on lateral membrane of claw fossa (Fig. 5K).

*Claws* on tarsi III and IV slender, longer than those on tarsi I and II. Median claw on all tarsi small, bidentate.

♂. Idiosoma length 282–301 μm. In dorsal aspect similar to female. Ventral plates fused. GO surrounded by 11 pairs of pgs. Spermapositor large (Fig. 5C).

**Type data.** Holotype ♀ (BPBM 14324), HAWAI'I, Anaeho'omalu Bay, 0 m, medium coarse sand, 14.XI.1979. 3 ♀, 2 ♂ paratypes, same data as holotype. Holotype and 1 paratype in BPBM, rest in author's collection.

**Remarks.** *Copidognathus ventriscutatus* belongs to the *gibbus* group (see Newell 1984: key group 4000; Bartsch 1985). It is easily distinguished from the other species in this group by the fused ventral plates AE, PE, and GA.

***Copidognathus areolatus*** Bartsch, **new species** Figs. 6A–H

♂.Idiosoma length 233 μm. Dorsal plates AD, OC, and PD contiguous. AD with a raised crest that forms a frontal spine and diverges posteriad and with a small internal transverse bar at level of ds-1 (Fig. 6H). Raised crest beset with ostia (from reduced rosette pores). PD with 2 slightly raised costae with large ostia surrounded by minute canaliculi. Costae in anterior PD 2 pores wide, in middle and posterior PD 1 pore wide (Fig. 6A). Integument finely reticulate medial to costae, coarsely paneled lateral to costae. Gland pores inconspicuous. First pair of gland pores on AD; 2nd gland pore and 1 minute pore canaliculus at lateral margin of OC. Dorsal setae slender, with ds-1 inserted on AD at level of transverse internal bar; ds-2 on small protruding anterior edges of OC; ds-3, ds-4, and ds-5 on PD, ds-3 close to anterior margin, ds-4 and ds-5 within costae, anterior and posterior to insertion of leg IV respectively.

*Ventral plates* ventrally punctate, marginally with rosette pores with wide ostia and numerous fine canaliculi. AE and GA fused laterally (Fig. 6B). Pore for Claparède organ narrow due to 2 projecting cuticular teeth. Distance from anterior GA to plate of GO slightly more than 2x the latter's length. Spermapositor large. Ventral setae long and slender, inserted as shown in

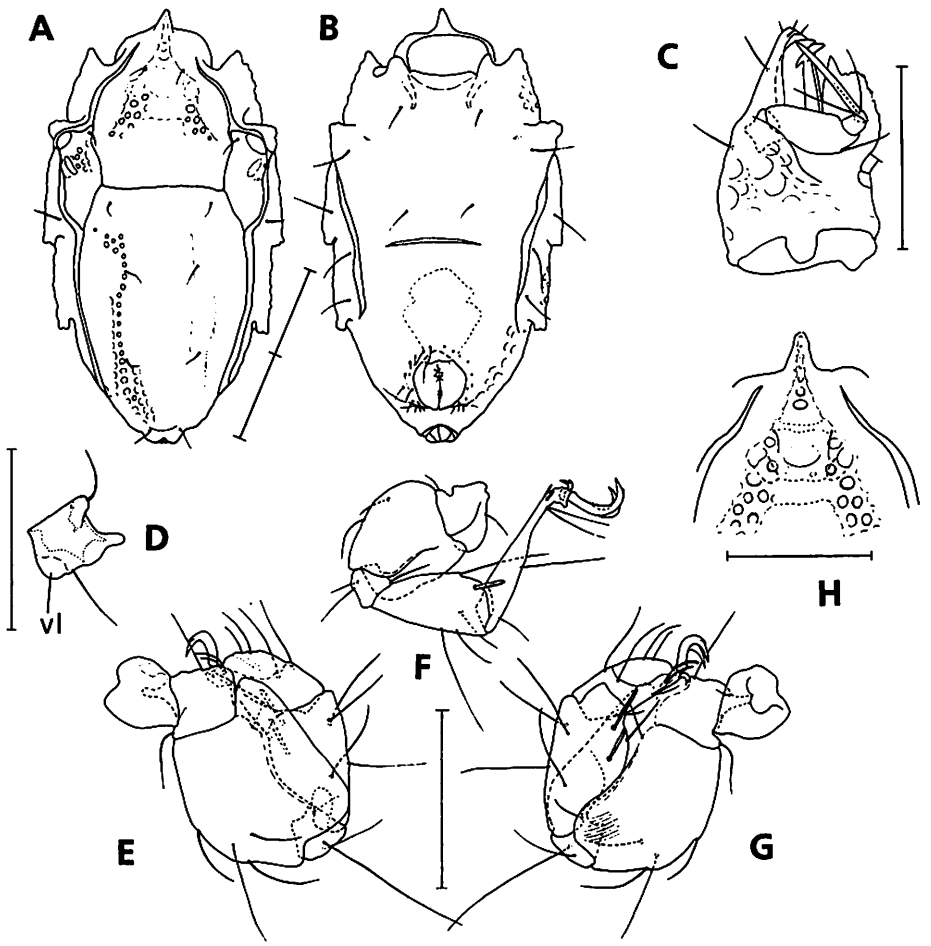


Fig. 6. *Copidognathus areolatus* Bartsch, n. sp., ♂: **A,** idiosoma, dorsal view; **B,** idiosoma, ventral view; **C,** gnathosoma, lateral view; **D,** basifemur I, lateral view; **E,** leg I, lateral view; **F,** leg IV, medial view; **G,** leg I, medial view; **H,** anterior anterodorsal plate. (Abbreviation: vl, ventral lamella.) Scale divisions represent 50 μm.

Fig. 6B. GO surrounded by 22 pgs. Genital sclerites with 4 pairs of sgs, the 2 anterior and the posterior most seta-like, the 3rd pair spur-like.

*Gnathosoma* with a wide base, integument ornamented with wide pores (ostia) and numerous fine canaliculi. Tectum with a huge crest (Figs. 6C). First pair of maxillary setae inserted on base of gnathosoma, 2nd pair on rostrum.

*Legs* with large lamellae (Figs. 6E–G). I-2, III-2, and IV- 2 each with ventral lamella (Fig. 6D); lamella on II-2 smaller. All telofemora with huge ventrolateral but narrow ventromedial lamellae. Medial lamellae on I-3 and II-3 each with areolae with longitudinal striae (Fig. 6G); medial lamellae delicately reticulate. Genua I and II with elongate distilateral lamellae but without medial lamellae, genua III and IV without lamellae. Tibiae I and II each distally with large articular lamellae, tibiae III and IV with lamellae smaller, rectangular. Trochantera III and

IV cuspidate. Lateral membranes of claw fossa large on tarsi I and II; medial membranes on tarsi I and II and both membranes on tarsi III and IV inconspicuous. Tarsus I with 3 ventral and 3 dorsal setae; tarsus II with 3 dorsal setae; both tarsi with 1 of 3 dorsal setae inserted on lateral membrane of claw fossa, just anterior to seta-like solenidion. Tarsi III and IV with 4 dorsal setae. III-5 and IV-5 each with 1 slender smooth bristle ventrally and 2 obtuse bipectinate bristles ventromedially.

*Claws* long and slender; all with accessory process. Claw comb on posterior legs with fine teeth. Median claw bidentate.

♀. Not seen.

**Type data.** Holotype ♂ (BPBM 14325), KAUA'I: Wainiha Bay, intertidal, from red algae washed up on beach, 30.X.1979.

**Remarks.** *C. areolatus* belongs to the *gibbus* group. Within this group, *C. areolatus* is distinguished by the combination of: AD with raised A-like costae, protruding anteriorly; PD with 2 costae with rosette pores, 2–3 pores wide anteriorly and 1 pore wide halfway and posteriorly; median PD reticulate; AE and GA partly fused in males; base of trochantera I and II flanked by protruding medial and lateral epimeral processes; tectum with a huge crest; basifemora with ventral lamellae; articular lamellae on tibiae III and IV small, rectangular; claw comb with delicate teeth.

*Copidognathus areolatus* is similar to *C. incarinatus* Newell, a species found in South Chile, on mussels and algae (Newell 1984). *C. areolatus* differs from the latter by the narrower costae on PD, and by insertion of ds-4 and ds-5 (anterior and posterior to insertion of leg IV in *C. areolatus*; posterior to leg IV in *C. incarinatus*).

## ECOLOGY

The material on hand is a very small collection of marine mites. According to the collecting data and the habitus of the mites, *C. ventriscutatus* is thought to be arenicolous in habit, while the other species (*C. hawaiiensis*, *C. dentipes*, *C. unispinosus*, and *C. areolatus*) certainly will be found in crevicular habitats such as rhizoids, algae, and coarse sediments.

## ACKNOWLEDGMENTS

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