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STUDIES ON THE FAUNA OF CURAÇAO AND OTHER CARIBBEAN ISLANDS: No. 200

# NEW SPECIES OF THE GENUS COPIDOGNATHUS (HALACARIDAE) FROM THE CARIBBEAN REGION

by

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The halacarid fauna of the eastern North Atlantic Ocean and its adjacent waters, the Mediterranean, the North Sea, and the Baltic, has been studied and described in more than 100 papers; but only a few papers deal with the halacarid fauna on the east coast of the United States and the Caribbean area. Twenty-three halacarids are recorded from the Caribbean and the Gulf region, compared to 75 from the Mediterranean Sea.

In samples collected in shallow waters in the Gulf of Honduras and off Nicaragua and Panamá, halacarids were present in low numbers. Several of the species found are new to science. In this paper, *Copidognathus manubriatus* Viets, 1936 is redescribed, and descriptions of *Copidognathus lepidoides* n.sp., *C. nemenus* n.sp. and *C. modestus* n.sp. are given.

I am grateful to Dr. G. HENDLER (Smithsonian Institution, Washington) who made halacarid material from the Caribbean area available to me. I also thank Dr. M. MACQUITTY (London) for improvements of my English text.

## MATERIAL AND METHODS

During the programs CARIBE I and BELIZE of the R/V ALPHA HELIX (Smithsonian Institution), benthos samples were taken along the east coast of Central America. The halacarid fauna is dominated by the genus *Copidognathus*.

Abbreviations used in the following descriptions are: AD = anterodorsal plate; AE = anterior epimeral plate; ds = dorsal setae on idiosoma; E = epimeral plate(s); GA = genitoanal plate; GO = genital opening; OC = ocular plate(s); P = palp, P–1 = first palpal segment; pas = parambulacral setae; PD = posterodorsal plate; pgs = perigenital setae.

All halacarids described in this paper are deposited in the United States National Museum, Washington.

## **Copidognathus manubriatus** Viets, 1936

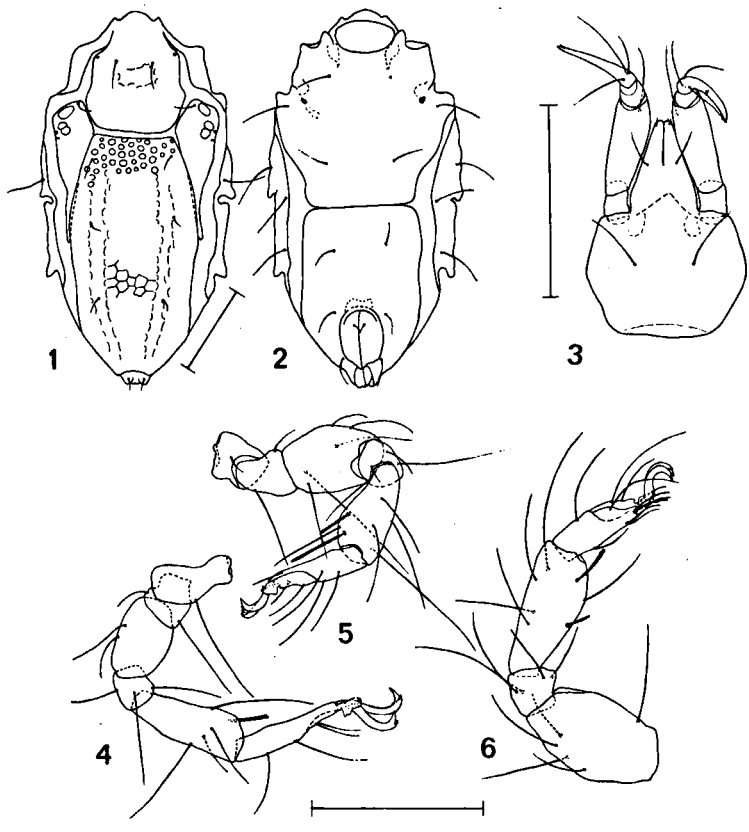
(Figs. 1–6)

Material: 1 female. Gulf of Honduras, 16°48.2′N, 88°04.6′W, 3–9 m, 4 April 1980 (Belize-80, Sta. No. 38).

Female. Length of idiosoma 207 µm. In the female the following measurements were obtained (in µm):

| | length | width |
|---|---|---|
| idiosoma | 207 | 111 |
| AD | 67 | 57 |
| OC | 77 | 22 |
| PD | 132 | 72 |
| AE | 87 | 100 |
| GA | 92 | 67 |
| GO | 33 | 22 |

The anterior margin of the idiosoma is tricuspid (Fig. 1). A median, ovate portion of the AD is slightly raised. Outside this area, the plate is covered with large pores; within the raised area, the pores are indistinct and subdivided by minute panels. The OC are elongated and taper posteriorly. Two corneas are present; the distal one is divided. On the medial portion of the OC, the surface is ornamented with large pores; on the lateral portions, it is ornamented with subdivided pores. The PD is




Figs. 1–6. *Copidognathus manubriatus* VIETS, female.
1 Idiosoma, dorsal view; 2 idiosoma, ventral view; 3 gnathosoma, ventral view; 4 leg III, lateral view; 5 leg II, medial view; 6 leg I, medial view. (Each scale division = 50 µm).

elongated and has a truncate anterior margin. The 2 slightly raised costae do not extend to the anterior margin of the PD. Anterior and lateral portions of the PD are sculptured with large pores; posterior to level of trochanters III, the pores are subdivided, so that in the distal portion of the PD numerous minor pores are present. Within the raised costae, the upper integumental layers are almost smooth. All dorsal setae are slender; ds-1 are found on the AD at the anterior margin of the ovate area; ds-2 are on the anterior corner of the OC; ds-3, ds-4 and ds-5 are on the PD (Fig. 1). The gland pores are minute.

The surface of the ventral plates is pierced by numerous fine canaliculi. When focussed on deeper integumental layers, a rough panelling is discernable. The large AE extends posteriad well beyond the third pair of the ventral setae (Fig. 2). The epimeral processes on EI and EII are distinct and large. The Claparède organs open with a small slit at the surface of the AE; in deeper layers there is a small, round alveolus. Distance from the anterior margin of the GO to that of the GA equals almost twice the length of the GO. The first pair of the pgs insert in the anterior portion of the GA, the second at level of the anterior margin of the GO, and the third at its posterior margin. A pair of small subgenital setae are found on the genital sclerites, at 0.28 relative to the length of the GO. The ovipositor is short, its extends only slightly beyond the GO.

The gnathosomatic base is ventrally porous; dorsally there are wide pores present. The tectum is triangular (Fig. 3). The short rostrum does not extend beyond the insertion of the seta on P-2. One pair of the long maxillary setae are found on the base of the gnathosoma (Fig. 3), and 1 pair on the rostrum. The rostral sulcus does not reach this pair of maxillary setae.

All telofemora are short; the integument is slightly porous. At the distal ends of the tibiae stand small, narrow lateral and medial lamellae. Tibiae I and II have 2 pectinate and 1 smooth, slender setae; tibia III has 1 pectinate and 1 smooth, slender seta. The lateral and medial membranes of claw fossa on tarsus I are large (Fig. 6); on each membrane insert 1 of the 3 long dorsal setae. On tarsus II, the lateral membrane of the claw fossa is high, the medial one is low (Fig. 5). The membranes of claw fossae on tarsi III and IV are low. Two of the 4 dorsal setae on tarsus III (Fig. 4), and 2 of the 3 on tarsus IV, insert on the membranes of the claw fossae. A claw comb with delicate teeth is present on all claws, but the teeth on claws I are hardly discernable. Between the claws a small bidentate median claw is found.

Male and juveniles. Not seen.

Remarks. The description of *Copidognathus manubriatus* in VIETS (1936:418) is based on a single, damaged female (type in the Zoologisches Institut und Zoologisches Museum, Hamburg). The small female, found in the Gulf of Honduras, and described above, is taken to be

conspecific with *C. manubriatus*, because of: the length of idiosoma; the costae on the dorsal plates; the sculpturing of the dorsal plates; the shape and chaetotaxy of the legs.

*Copidognathus manubriatus* belongs to the *oculatus* group (cf. BARTSCH 1977a).

## **Copidognathus modestus** n. sp.

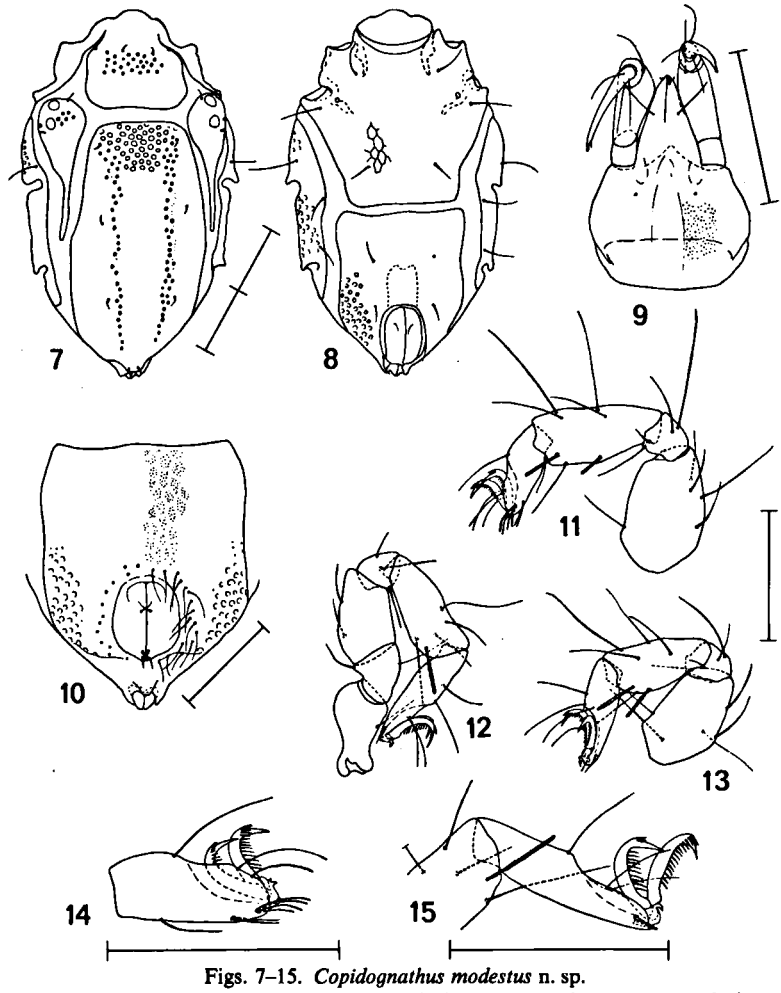
(Figs. 7–15)

Material. 1 female (holotype), 2 males. Off Panamá, 9°12.8′N, 82°02.7′W (type locality), 4 m, 8 July 1977 (Caribe I, Sta. Nos. ND-31, ND-31-500); Gulf of Honduras, 16°04.5′N, 87°59.2′W, 0 m, 14 July 1977 (Caribe I, Sta. No. MS-47-K).

Female. On the holotype female the following measurements were obtained (in μm):

| | length | width |
|---|---|---|
| idiosoma | 263 | 155 |
| AD | 70 | 77 |
| OC | 100 | 35 |
| PD | 180 | 101 |
| AE | 115 | 135 |
| GA | 117 | 95 |
| GO | 44 | 29 |

The dorsal plates are covered with large, shallow pores and rosette pores, i.e. minute canaliculi arranged around an ostium. A large, quadrangular area with rosette pores is present in the middle of the AD (Fig. 7). The OC are elongated, with a posterior tail-like extension. In the anterior portion there are: 2 corneas, medial to the corneas is a round area with rosette pores, and lateral and posterior to the corneas a gland pore and a pore canaliculus. The long PD extends anteriad far beyond the insertion of leg III. The 2 elongated costae on the PD are hardly




Figs. 7–15. *Copidognathus modestus* n. sp.
7 Idiosoma, dorsal view, ♀; 8 idiosoma, ventral view, ♀; 9 gnathosoma, ventral view, ♂; 10 genitoanal plate, ♂; 11 leg I, medial view, ♀; 12 leg III, medial view, ♀; 13 leg II, medial view, ♀; 14 tarsus I, lateral view, ♀; 15 tip of leg IV, medial view, ♀. (Each scale division = 50 μm).

raised; they are 1–3 rosette pores wide. All dorsal setae are minute; ds-1 insert on the AD, anterior to the rosette pore area; ds-2 on the anterior margin of the OC; ds-3, ds-4 and ds-5 on the PD, lateral to the rosette pores (Fig. 7).

Rosette pores are present marginally on the AE, PE and GA, while the ventral areas are finely porous. At low magnification, a cuticular network is discernable. The large AE extends posteriad beyond level of leg III. The epimeral processes on EI and EII are large (Fig. 8). The truncate anterior end of the GA is wider than the truncate adjoining portion of the AE. The GO is placed close to the posterior end of the GA. Three pairs of perigenital setae are present; the second pair insert at the level of the anterior margin of the GO. The ovipositor surpasses the GO and extends almost to the proximal pair of the perigenital setae (Fig. 8). A pair of small subgenital setae stand at 0.33, relative to the length of the GO.

Ventrally, the base of the gnathosoma is porous, dorsally, some scattered pores are present. The tectum is small and slightly pointed. The rostrum extends almost to level of the seta on P-2. The first pair of the long maxillary setae insert on the base of the gnathosoma, the second pair on the rostrum. At the tip of the rostrum there are 2 pairs of minute setae (Fig. 9). The rostral sulcus extends posteriad to the second pair of the long maxillary setae.

The chaetotaxy of the legs I, II and III is illustrated in Figs. 11–13. On the telofemora, the integument is slightly porous. Telofemora I and II are short and high. Ventral lamellae are lacking; but posteriorly small lateral and medial membranes are found. Two blunt, pectinate and 1 slender, smooth setae insert on both tibia I and II; 1 pectinate and 1 smooth seta on tibiae III and IV. The membranes of the claw fossa on tarsus I are large; those on the other tarsi are small. A seta-like solenidion is present on the lateral membrane of claw fossa of both tarsus I and II. Four dorsal setae insert on tarsus III, but only 3 on tarsus IV. Doublet pas stand at the tip of tarsus I (Fig. 14), single pas at the tip of tarsus II, a spur-like lateral and a seta-like medial pas at tarsus III and 2 spur-like pas at the tip of tarsus IV (Fig. 15). All large claws have combs with strong teeth. Between the large claws a small median claw is found.

Male. Length of idiosoma 253 and 257 µm. The males are similar to the female except for the genital region. The GA is large, its anterior margin is slightly wider than that of the adjoining AE. Close to the GO insert 25–29 perigenital setae. Only 3 pairs of subgenital setae are present; the proximal and distal ones are seta-like, the median one is spur-like. Posterior to the GO there is a small cuticular knob which extends to the base of the anal valves (Fig. 10).

Juveniles. Not seen.

Remarks. *Copidognathus modestus* belongs to the *oculatus* group (see BARTSCH 1977a), because of: a median, quadrangular area on the AD; long OC; 2 costae with rosette pores on the PD; well developed epimeral processes; in females, ovipositor surpassing the foramen of the GO; in males, pgs arranged in a corona close to the genital foramen, with a small knob posterior to the GO, and only 3 pairs of subgenital setae present; pectinate setae present on all tibiae.

*Copidognathus modestus* is most similar to *C. oculatus* in respect of length of idiosoma and short telofemora I and II; but the narrower costae on the PD, only 1–3 rosette pores wide, clearly separate *C. modestus* from *C. oculatus*.

## **Copidognathus lepidoides** n. sp.

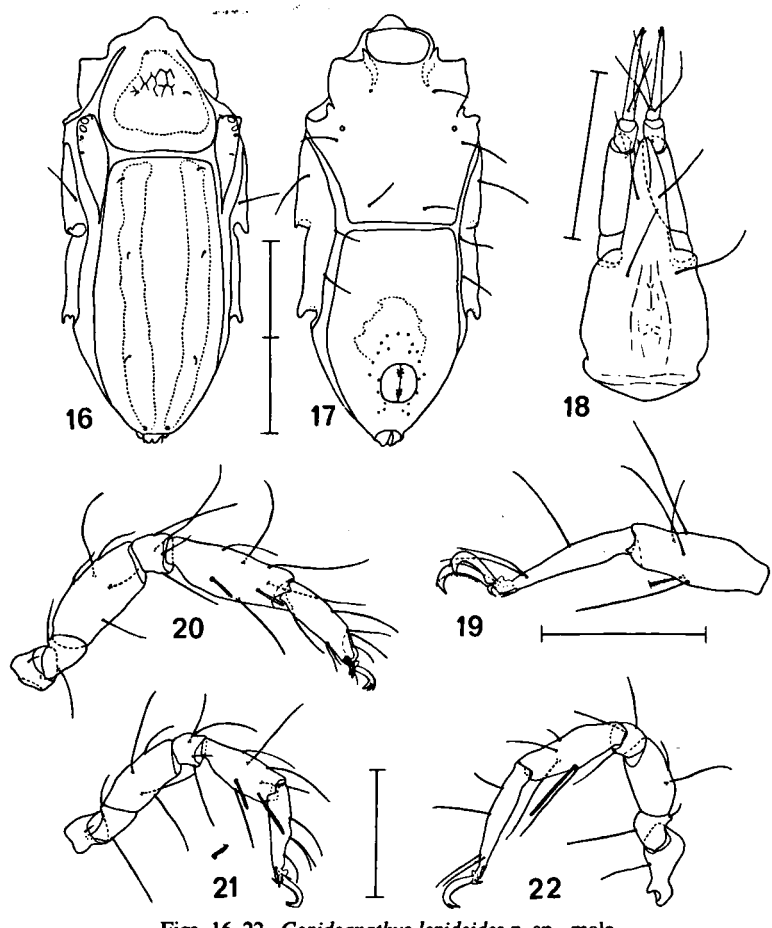
(Figs. 16–22)

Material (holotype). 1 male. Gulf of Honduras, 16°48.2'N, 88°04.6'W, 3–9 m, 4 April 1980 (Belize-80, Sta. No. 38).

Female. Not seen.

Male. In the holotype, the following measurements were obtained (in μm):

| | length | width |
|---|---|---|
| idiosoma | 222 | 100 |
| AD | 72 | 60 |
| OC | 55 | 19 |
| PD | 146 | 72 |
| AE | 85 | 92 |
| GA | 110 | 70 |
| GO | 20 | 20 |




Figs. 16–22. *Copidognathus lepidoides* n. sp., male.
16 Idiosoma, dorsal view; 17 idiosoma, ventral view; 18 gnathosoma, ventral view; 19 tibia and tarsus IV, lateral view; 20 leg I, medial view; 21 leg II, medial view; 22 leg III, medial view. (Each scale division = 50 µm).

A small rounded process is present on the frontal margin of the AD (Fig. 16). Within a median, triangular, slightly raised area on the AD, the integument is panelled and minutely porous; outside this area, only shallow pores are found. The 2 gland pores stand close together, at the anterior margin of the porous area. The OC are elongated, with a tail-like posterior portion. Two minute corneas, beneath a little brown eye pig-

ment, are present in the anterior portion of the OC; a gland pore inserts lateral to the corneas, and a pore canaliculus distal to the cornea. The PD is long, its anterior margin is truncate. Within the 2 slightly raised longitudinal costae, the cuticular ornamentation is coarser (deeper pores) than outside the costae. A pair of gland pores is present close to the terminal margin of the PD. All dorsal setae are small; the ds-1 are widely separated from each other and are found on the AD posterior to the gland pores; ds-2 stand on the anterior corner of the OC; ds-3, ds-4 and ds-5 on the PD, within the slightly raised costae (Fig. 16).

Between the large ventral plates there are only small striae of membranous integument present. The surface of the plates is uniformly porous. Epimeral processes on EI and EII are present in form of small lamellae (Fig. 17). The pores of the Claparède organs are small. Three pairs of long ventral setae insert on the AE, 3 ventral and 1 dorsal on the PE. The GO is small. The distance from the GO to the anterior margin of the GA equals 3 times the length of the GO. The spermapositor extends far beyond the genital foramen, almost halfway between the GO and the anterior margin of the GA. The GO is surrounded by 23 perigenital setae. Four pairs of subgenital setae stand on the genital sclerites, the anterior ones are seta-like, the posterior ones spur-like.

The gnathosoma is slender (Fig. 18). At the base, the integument is uniformly porous. The rostrum extends to the end of the P-2. One pair of the long maxillary setae sit on the base of the gnathosoma, one pair on the rostrum, and 2 pairs of minute setae at the tip of the rostrum. The rostral sulcus extends almost to the second pair of the long maxillary setae. P-4 is almost as long as P-2. A long dorsal seta inserts on P-2, 3 long setae at base of P-4 and a minute one at its tip.

Leg I is distinctly larger than the other legs. The integument is porous on the lateral flank of telofemur and tibia. All tibiae have distally pointed lateral and medial lamellae. One smooth and 2 pectinate setae are present on the ventral flank of both tibia I and II, 1 smooth and 1 pectinate seta on tibiae III and IV. Four dorsal setae insert on tarsus III, 3 on tarsus IV. The chaetotaxy of the legs I, II and III is illustrated in Figs. 20–22. The chaetotaxy of leg IV is similar to that of leg III except for: presence of 1 ventral and 2 dorsal setae on telofemur IV and 3 dorsal setae on tarsus IV. The lateral membrane of the claw fossa on tarsus I is large, the medial one is slightly smaller. The membranes of claw fossae on the posterior

tarsi are absent. The 2 claws on tarsus I only have an accessory process, while the claws on the following tarsi have long claw combs with numerous minute teeth. Between the large claws is a small median claw with a very delicate upper tooth.

Juveniles. Not seen.

Remarks. *Copidognathus lepidoides* belongs to the *hartmanni* group (see BARTSCH 1977b, 1980). This natural group includes: *C. hartmanni* BARTSCH, 1972, *C. lepidus* BARTSCH, 1977b, *C. pauciporus* BARTSCH, 1977b, and *C. pygmaeus* BARTSCH, 1980. *C. hartmanni* and *C. pauciporus* (length of idiosoma 276 µm and 219–254 µm, respectively) are larger than *C. lepidoides*; the porous areas on the dorsal plates are more distinctly separate from the surrounding panelling than in *C. lepidoides*. *C. lepidus* (length of idiosoma 199–204 µm) is smaller than *C. lepidoides*, the dorsal plates are almost smooth. *C. pygmaeus* (length of idiosoma 217 µm) is of similar size, but in *C. pygmaeus*, the first pair of the gland pores are closer to the anterior margin of the AD and the frontal projection of the AD is smaller than in *C. lepidoides*.

## **Copidognathus nemenus** n. sp.

(Figs. 23–30)

Material. 1 male (holotype). Off Nicaragua, 14°34.2'N, 82°58.0'W, 0 m, 11 July 1977 (Caribe I, Sta. No. MS-39-500).

Female. Not seen.

Male. In the holotype the following measurements were obtained (in µm): [see table on p. 12]

All plates are almost evenly porous. A coarse panelling is obvious, due to slightly wider bars between groups of canalicular pores. The outline of the dorsal plates is illustrated in Fig. 23. Gland pores with large ostiae occur on small cones on the AD, at level of insertion of leg I, in the anterior portion of the OC and the PD (Fig. 23). Ds-1 insert in the middle

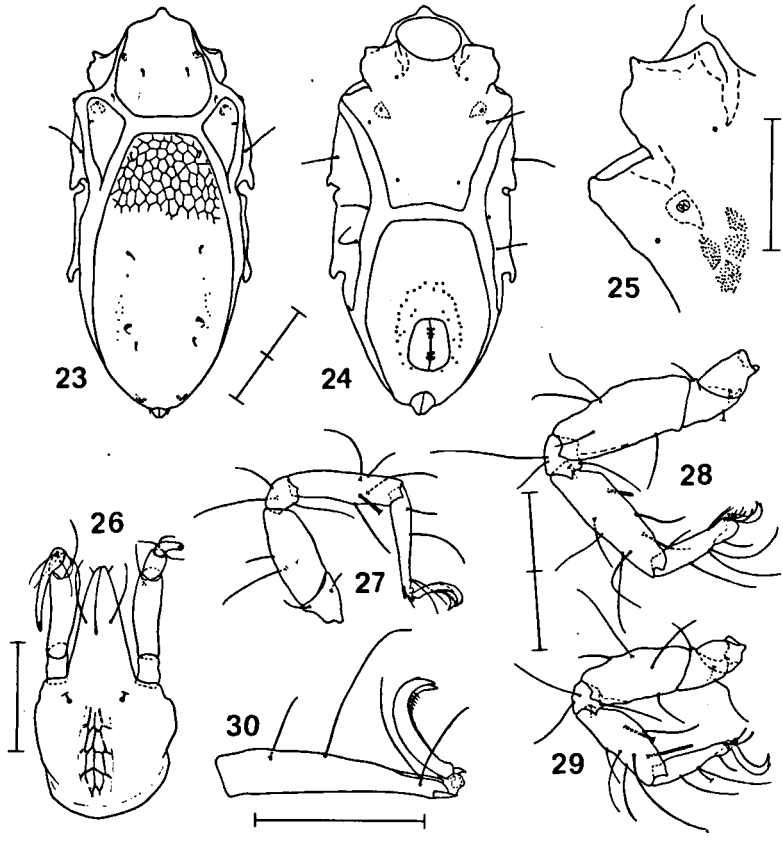
| | length | width |
|---|---|---|
| idiosoma | 378 | 170 |
| AD | 105 | 94 |
| OC | 88 | 35 |
| PD | 259 | 130 |
| AE | 135 | 160 |
| GA | 179 | 115 |
| GO | 48 | 38 |

of the AD, ds-2 in the membranous area between AD and OC, ds-3, ds-4 and ds-5 on the PD.

The sculpturing of the ventral plates is weaker than that on the dorsal plates, the pores have no deep canaliculi, the panelling, characteristic for the dorsal plates is very faint. The epimeral processes on EI and EII are inconspicuous. The Claparède organs are remarkably large; the small pore at the surface opens into a large (16 μm) alveolus (Fig. 25).

The integument of the gnathosoma is ventrally and dorsally finely porous. The rostrum is slender and triangular, it does not quite reach to the end of P-2. The tectum is truncate. The first pair of the long maxillary setae insert on the gnathosomatic base, the second pair almost in the middle of the rostrum. The rostral sulcus extends beyond the second pair of the maxillary setae (Fig. 26). The chaetotaxy of the palps corresponds to that characteristic for the genus *Copidognathus*.

The telofemora and tibiae are long (Figs. 27–29), the integument is uniformly porous. Terminally, medial and lateral lamellae are present on all telofemora, genua and tibiae; those on the tibiae are pointed. One pectinate and 2 slender, smooth setae insert on the ventral side of tibia I, 2 pectinate and 1 slender, smooth on tibia II, and 1 pectinate and 1 smooth both on tibiae III and IV. Four setae are present on tarsus III and tarsus IV. The lateral membrane of the claw fossa is large on tarsus I, the medial one is inconspicuous; only small, narrow membranes are found on the following legs. Doublet eupathid pas stand on the tip of tarsus I, single eupathid on the tip of tarsus II, a medial seta-like and a lateral




Figs. 23–30. *Copidognathus nemenus* n. sp., male.
23 Idiosoma, dorsal view; 24 idiosoma, ventral view; 25 right anterior epimeral plate, ventral view; 26 gnathosoma, ventral view; 27 leg III, medial view; 28 leg I, lateral view; 29 leg II, lateral view; 30 tarsus IV, medial view. (Each scale division = 50 μm).

spur-like eupathid on the tip of tarsus III and 2 spur-like eupathids on tarsus IV. The 2 large claws on leg I each have an accessory process, but no claw comb. On the following legs, the claw combs are large, and have a few strong and numerous fine teeth. A small median claw occurs between the large claws; it is bidentate on tarsus I, and unidentate on the following tarsi.

Juveniles. Not seen.

Remarks. *Copidognathus nemenus* is very similar to *C. magniporus* BARTSCH, 1973, known from the eastern North Atlantic Ocean. The Caribbean specimen is larger than the east Atlantic ones, 378 µm vs 301–316 µm; the anterior end of the PD is slightly wider, the alveolus of the Claparède organ is much larger; the GO is surrounded by 37 pgs, instead of 30 as in *magniporus*. But, from the Caribbean area only 1 specimen was available and from the eastern North Atlantic Ocean 2 adult specimens; hence, the variability of the above described characters is unknown. More material from both sides of the Atlantic Ocean may prove these 2 forms to be conspecific.

SUMMARY: In benthos samples taken along the east coast of Central America, the halacarid fauna was dominated by the genus *Copidognathus*. In the present paper *Copidognathus manubriatus* Viets is redescribed, and descriptions of the species *Copidognathus lepidoides* n. sp., *C. modestus* n. sp. and *C. nemenus* n. sp. are presented.

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