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Article

New records of *Copidognathus* (Acari: Halacaridae) from Antalya, Turkey

Furkan Durucan

Işıklar Caddesi No 16, 17 TR-07100 Antalya, Turkey; E-mail: f_durucan@hotmail.com

ABSTRACT
The first investigations of the *Copidognathus* (Trouessart, 1888) halacarid mite fauna of Antalya are reported here. Thirteen species have been found from various macroalgae and sandy sediments. They belonged to the following species: *Copidognathus brachystomus* Viets, 1940, *C. dentatus* Viets, 1940, *C. gibbus* (Trouessart, 1889), *C. lamelloides* Bartsch, 2000, *C. longirostris* (Trouessart, 1896), *C. loricifer* André, 1946, *C. magnipalpus* (Police, 1909), *C. majusculatus* (Trouessart, 1894), *C. oculatus* (Hodge, 1863), *C. quadricostatus* (Trouessart, 1894), *C. remipes* (Trouessart, 1894), *C. septentrionalis* (Halbert, 1915) and *C. tabellio* (Trouessart, 1894). Of these, *C. dentatus*, *C. gibbus*, *C. lamelloides*, *C. longirostris*, *C. loricifer*, *C. majusculatus*, *C. oculatus*, *C. quadricostatus*, *C. remipes* and *C. septentrionalis* are new to the Turkish halacarid fauna. Each species is illustrated and briefly described with notes and lastly showed on a Turkish map.

KEY WORDS: Levantine Sea; meiofauna; Prostigmata; taxonomy; water mites.

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INTRODUCTION

Almost 1200 valid halacarid mites in 64 genera have been described across the world (Bartsch 2009) of which 37 are recorded from the shores of Turkey (Durucan 2018, 2019). The genus *Copidognathus* is the largest and most abundant genus of Halacaridae; with more than 300 described species. It contains 25% of all halacarid species described (Bartsch 2006; Chatterjee and Pešić 2014). They live in all aquatic habitats (marine, brackish and fresh water) and include species that range in size from 180 to 700 µm in body length (Bartsch 2006). In a recent checklist of marine halacarid mites of Turkey, only 7 species of the genus *Copidognathus* were represented (Durucan 2018). But all genus members have been recorded from Sinop province, Black Sea of Turkey by Bartsch (2001, 2004a, 2013). To date, there is no record of this genus from Antalya. In the present contribution, the first results of a study on the *Copidognathus* marine mites from Antalya, Turkey presented here with their original drawings and some notes. The aim of this paper are (1) first results of *Copidognathus* mites records from Turkish Mediterranean Sea; (2) contribute to marine halacarid mite fauna of Turkey; (3) extending the known distribution of the species; (4) knowledge of the halacarid diversity in these areas may contribute to future establishment of conservation programs.

MATERIALS AND METHODS

Halacarids were collected from four different sampling sites (Fig. 1) at depths ranging from 1–9 m

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along the western coast of Antalya, Levantine Sea, Eastern Mediterranean Sea by the author during September-October 2015 and August-November 2016. Samples of various macroalgae (*Corallina officinalis* L., *Cystoseira barbata* C. Agardh, *Jania rubens* (L.), *Laurencia obtusa* (Huds.) and *Padina pavonica* (Huds.)), and fine sand deposits were collected by hand intertidally while snorkeling. Immediately after collection, mites were extracted by washing the substrates. The meiofauna retained in the set of sieves (63 µm, 500 µm, 1 mm) was sorted under binocular microscope (Nikon SMZ 10). Mite specimens were cleared in lactic acid and mounted in Hoyer's medium. All measurements were taken on slide-mounted material and drawings were prepared with a camera lucida (Nikon Eclipse E400). The specimens were kept in the author's personal collection in Antalya. Terminology and abbreviations follow Bartsch (2006). All measurements are given in micrometers (µm).

List of abbreviations

ac	anal cone	GO	genital opening
AD	anterior dorsal plate	gs	genital sclerite
AE	anterior epimeral plate	la	lamella
ca	canaliculi	OC	ocular plate (s)
ce	cerotegument	ov	ovopositor
che	chelicera	P-1 to P-4	first to fourth segments of palp
cm	camerostomal membrane	pa	porose areolae
co	costae	PD	posterior dorsal plate
cor	corneae	PE	posterior epimeral plate (s)
ds-1 to ds-6	dorsal setae, from anterior to posterior	pgs	perigenital seta
ep	epimeral pore	rp	rosetta pores
epr	epimeral ridge	sgs	subgenital seta
GA	genitoanal plate	sp	spermatopositor
glp-1 to glp-5	gland pore/s, from anterior to posterior	T	tectum

Figure 1. Map showing the sampling sites of the coast of Antalya, Turkey. Numbered points indicate stations that yielded *Copidognathus* halacarid mites. 1. Kundu, 36° 51' 1.2996" N; 30° 50' 51.6624" E 2. Yakamoz Beach, 36° 50' 44" N; 30° 47' 57" E; 3. Bilem Beach, 36° 51' 17" N; 30° 44' 38" E; 4. Finike, 36° 16' 44" N; 30° 8' 25" E.

RESULTS

Table 1 shows a list of *Copidognathus* species recorded in this study. I identified 13 *Copidognathus* species from 148 specimens collected from Gulf of Antalya. The diagnosis of the species that will be presented as follows.

SYSTEMATICS

Family Halacaridae Murray 1887
Genus *Copidognathus* Trouessart, 1888

Copidognathus brachystomus Viets, 1940 (Figs. 2 A–G)

Material examined

Finike, 2 m, *Corallina officinalis* 10 ♀♀, 2 ♂♂; 2 m, *Laurencia obtusa*, 5 ♀♀.

Morphology and notes

Females 290–320 long, 200–205 wide, that of males 300–310 long, 200–205 wide. In females, AD 75 long, 100 wide; with three porose areolae with rosette pores. Anterior areola on anterior dorsal plate with frontal projection. OC 87 long, 38 wide; with two corneae. OC longer than AD. PD 212 long, 150 wide; with two pairs of costae. Rosetta pores of costae surrounded by 5–7 canaliculi. Setae ds-1 in anterior edge of paired porose areola on AD. ds-2 on OC. ds-3 to ds-5 on PD. ds-6 on anal cone. Length of AE 87 long, 150 wide. Female GA 150 long, 125 wide, with 3 pairs of pgs. Genital sclerite with a pair of small sgs. Ovipositor extending beyond GO (Figs. 2 A–C). Gnathosoma 88, 73 wide; 1.3 times longer than wide. Dorsal part of gnathosomal base foveated whereas ventrally with small rosette pores. Rostrum triangular, shorter than gnathosomal base, almost reaching level of seta on P-2. Tectum with median small process (Figs. 2 D–E). Leg I 225 long. The chaetotaxy of leg I as follows (from trochanter to tarsus); 1, 2, 6, 4, 4, 6 (Fig. 2 F). Length:height ratio of telofemur I is between 1.7–1.9 (Fig. 2 G). According to Bartsch (2001), *C. brachystomus* is easily distinguished by having a pair of porose areolae on AD oblong, process of tectum short or almost truncate, hardly extending to base of P-1.

Distribution

Baltic, Black and Mediterranean Sea (Bartsch 2009).

Copidognathus dentatus Viets, 1940 (Figs. 3 A–G)

Material examined

Kundu, 3 m, fine sand, 2 ♀♀, 1 ♂.

Morphology and notes

Females 390 long, 275 wide, that of a male 387 long, 262 wide. In females, AD 100 long, 110 wide; the AD with 2 crest like porose areolae. OC with 2 corneae 112 long, 63 wide. PD 265 long, 187 wide; Pair of costae on PD 2 rosetta pores wide. Setae ds-1 in anterior edge of paired porose areola on AD, ds-2 within striated integument. ds-3, ds-4 and ds-5 on PD. AE with three pairs of ventral setae. PE with 1 dorsal and 3 ventral setae. AE 125 long, 225 wide. Epimeral pores 8–9 wide. GA 185 long, 162 wide, with 3 pairs of pgs (Figs. 3 A, B). Male GA with 30 pgs around GO (Fig. 3 C). Gnathosoma 125 long, 75 wide; 1.6 times longer than wide. Rostrum triangular, shorter than gnathosomal base, almost reaching level of P-3. Gnathosomal base with 2 pairs of setae and rostrum with 1 pair of maxillary setae (Fig. 3 D). Leg I 325 long. The chaetotaxy of leg I as follows (from trochanter to tarsus); 1, 2, 4, 4, 7, 6 (Figs. 3 E–G).

Distribution

Northeastern Atlantic and Mediterranean Sea (Bartsch 2009).

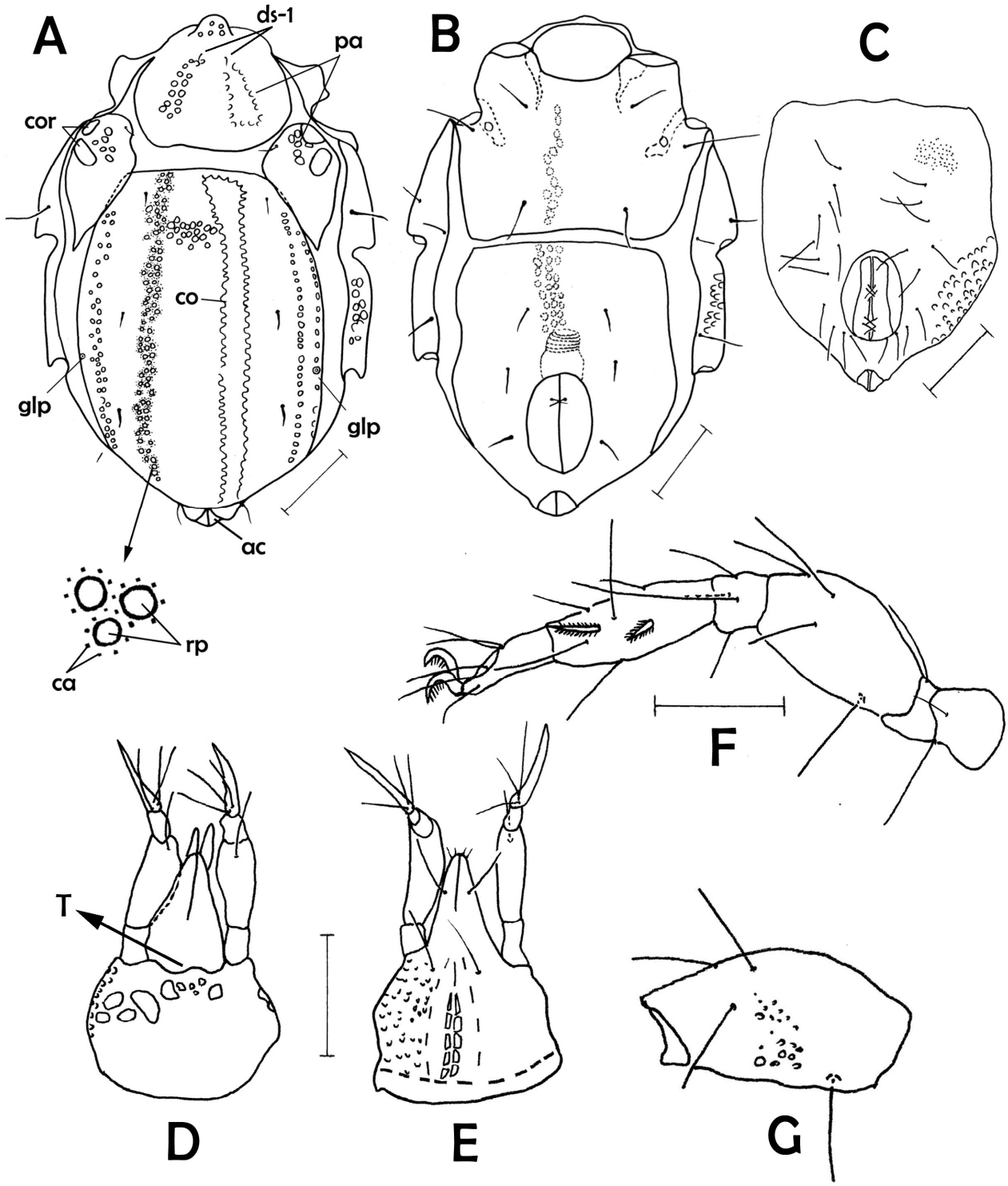

Figure 2. *Copidognathus brachystomus* Viets, 1940 – **A.** Dorsal view of idiosoma (female); **B.** Ventral view idiosoma (female); **C.** GA of male; **D.** Dorsal of gnathosoma (female); **E.** Ventral view of gnathosoma (female); **F.** Medial view of leg I (female); **G.** Medial view of telofemura I (female). Scale bars: 50 µm.

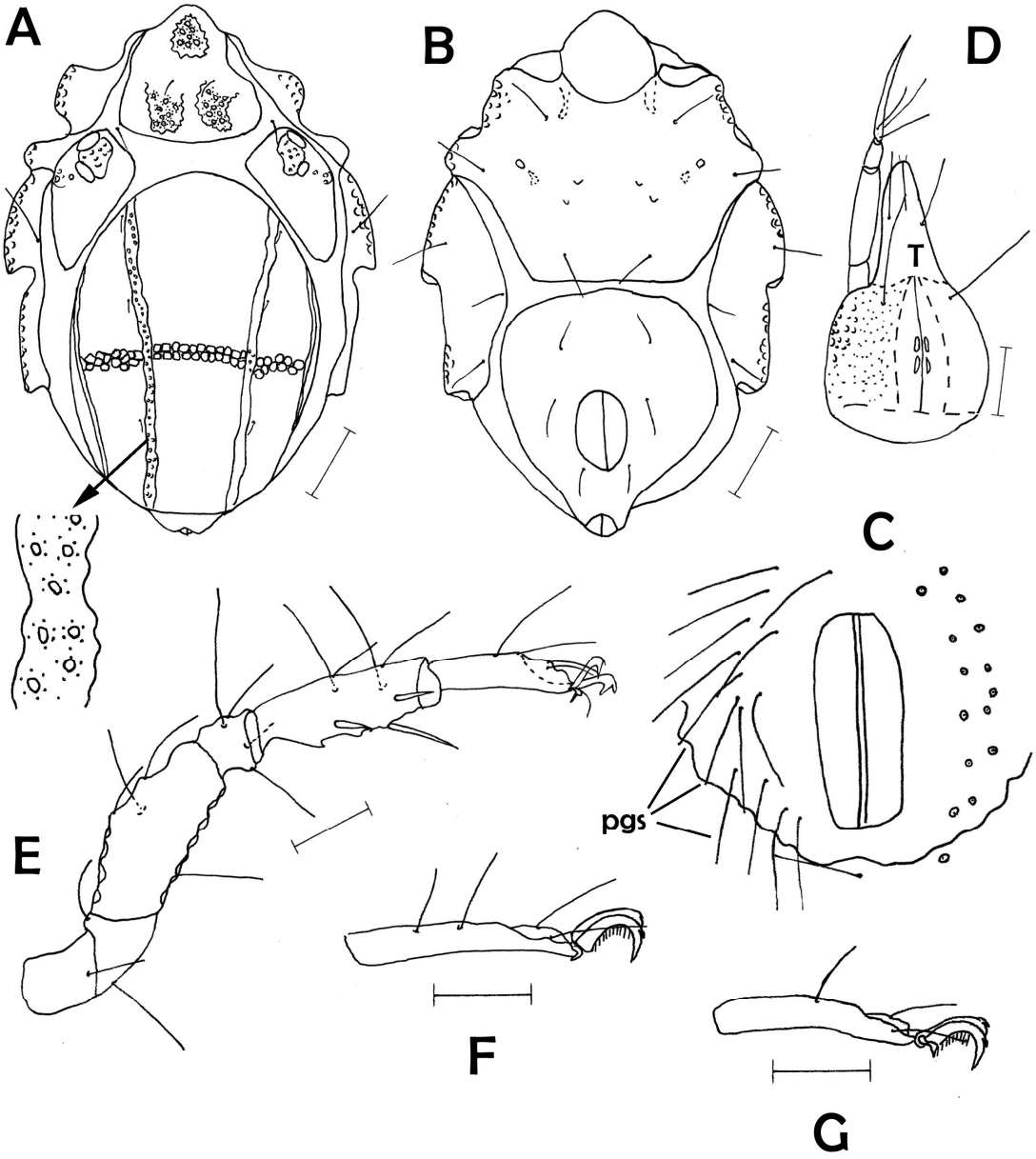

Figure 3. *Copidognathus dentatus* Viets, 1940 – **A.** Dorsal view of idiosoma (female); **B.** Ventral view idiosoma (female); **C.** GO area of male; **D.** Ventral view of gnathosoma (female); **E.** Lateral view of leg I (female); **F.** Lateral view of tarsus III (female); **G.** Lateral view of tarsus IV (female). Scale bars: 50 µm.

Copidognathus gibbus (Trouessart, 1889) (Figs. 4 A–E)

Material examined

Yakamoz Beach, 2 m, fine sand, 6 ♀♀, 4 ♂♂.

Morphology and notes

Females 330–338 long, 165–170 wide, of male 320–325 long, 170–175 wide. Idiosoma anteriorly with pointed protuberance. AD as long as wide (125); has "A" shaped internal sclerite. AD rectangular posteriorly. OC 73 long, 25 wide; PD 187 long, 130 wide. Porose costae on PD 3–5 pores wide. ds-1 on AD, ds-2 on OC and ds-3 to ds-5 on PD. ds-5 quite long (75 long). AE with three pairs of ventral setae. PE with 1 dorsal and 3 ventral setae. AE 120 long, 163 wide. Posterior

margin of AE truncate. Female GA 150 long, 125 wide; with 3 pairs of pgs. Male GA 188 long, 125 wide; with 20 pgs (Figs. 4 A–C). Gnathosoma 85 long, 60 wide; 1.4 times longer than wide and lateral areas punctated. Rostrum triangular, shorter than gnathosomal base, extending level of P-3. Gnathosomal base with 2 pairs of setae (Fig. 4 D). Leg I 212 long. The chaetotaxy of leg I as follows (from basifemur to tarsus); 1, 2, 5, 3, 7, 8. Legs with large lamellae; basifemora-I with small ventral lamellae, telofemora-I with large ventral lamellae, tibiae with posterior articular lamellae (Figs. 4 E–H). This species belongs to the *gibbus* group which has about 42 described species from all over the world. Characteristics of the *gibbus* group are: legs with large lamellae, AD characterized by an "A" shaped internal sclerite (Bartsch 1994; 1997). *Copidognathus gibbus* is most similar to *C. majusculatus*. Distinguishing characters of the two species are discussed in *C. majusculatus* below.

Distribution.

Northeastern Atlantic and Mediterranean Sea (Bartsch 2009).

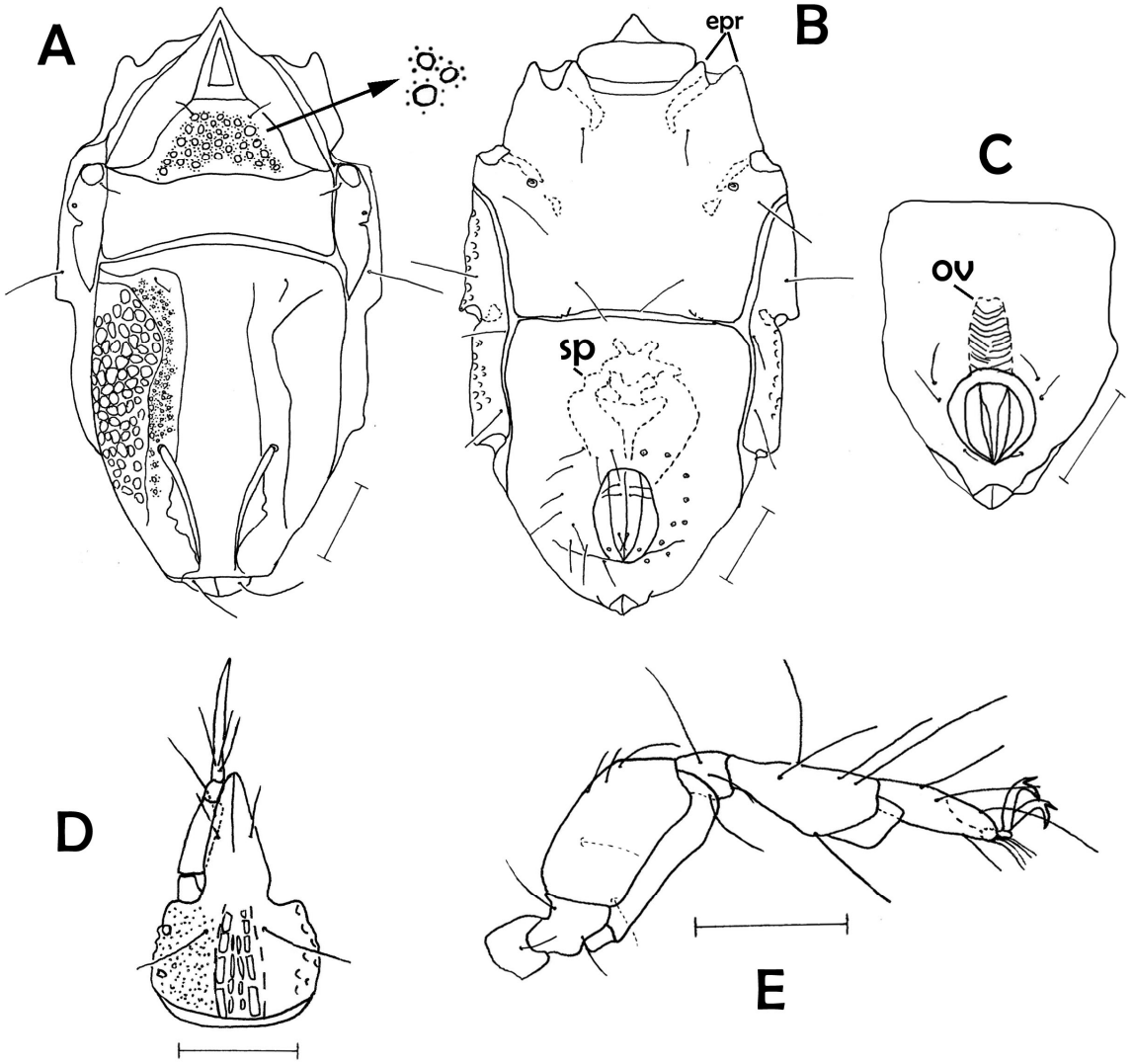

Figure 4. *Copidognathus gibbus* (Trouessart, 1889) – **A.** Dorsal view of idiosoma (male); **B.** Ventral view of idiosoma (female); **C.** GA area of female; **D.** Ventral view of gnathosoma (male); **E.** Lateral view of leg I (female). Scale bars: 50 µm.

Copidognathus lamelloides Bartsch, 2000 (Figs. 5 A–E)

Material examined

Yakamoz Beach, 2 m, fine sand, 2 ♂♂.

Morphology and notes

Males 260 long, 175 wide. AD with 3 round raised areolae with rosette pores. OC 75 long, 50 µm wide with 2 corneae. PD 175 long, 120 wide; Pair of ds-1 in anteromedial angles of pair of porose areolae, ds-2 within striated integument. ds-3 to ds-5 on PD. AE with three pairs of ventral setae. PE with 1 dorsal and 3 ventral setae. AE 90 long, 162 wide. Epimeral pores 4–5 wide. GA 160 long, 115 wide; with 22 pgs. Genital sclerite with 4 pairs of small sgs (Figs. 5 A, B, D). Gnathosoma 75 long and 50 wide; 1.5 times longer than wide. Rostrum extending just beyond the level of P-2 (Fig. 5 C). Legs slender. Leg I 215 long. The chaetotaxy of leg I as follows (from trochanter to tarsus); 1, 2, 5, 3, 7, 9 (Fig. 5 E). According to Bartsch (2001), *C. lamelloides* resembles to *C. brevipes*. Distinguishing characters are: position of glp-1 (in margins of porose areolae vs near lateral margin of AD), ds-2 (within striated integument vs on OC), length:height ratio of telofemur I (1.7–2.1 vs 1.5–1.6) and shape of ventromedial seta on tibia IV (bipectinate vs smooth).

Distribution

Northeastern Atlantic, Black and Mediterranean Sea (Bartsch 2009).

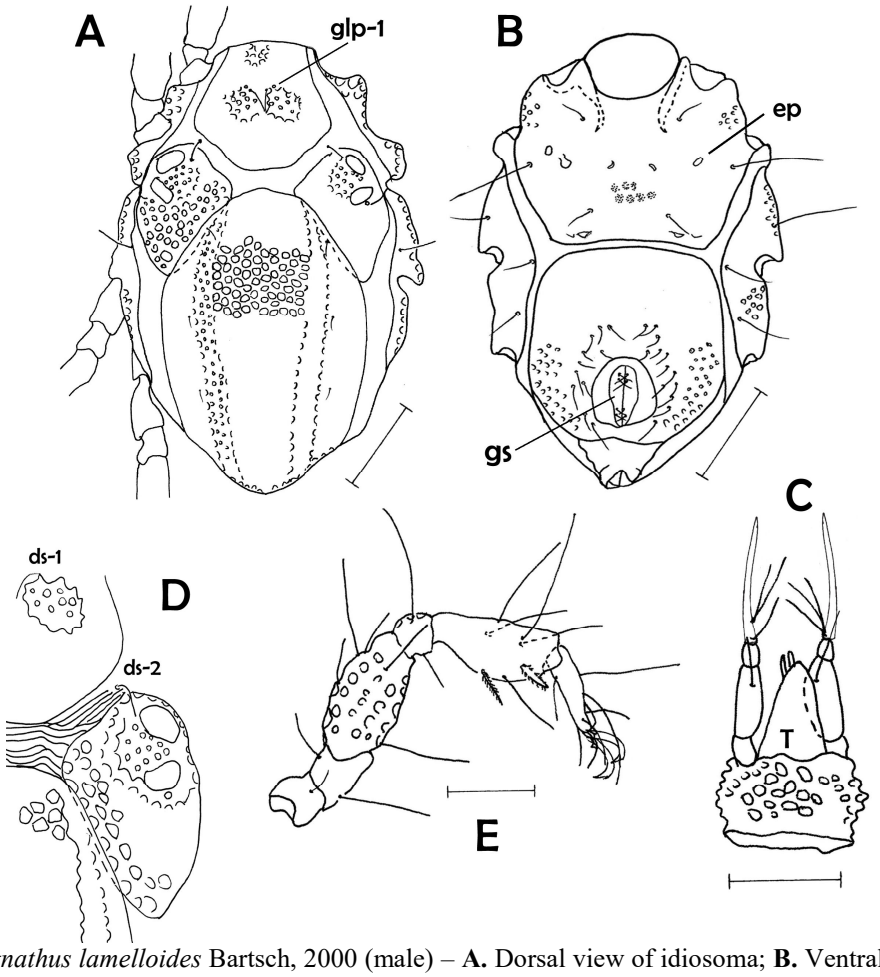

Figure 5. *Copidognathus lamelloides* Bartsch, 2000 (male) – **A.** Dorsal view of idiosoma; **B.** Ventral view of idiosoma; **C.** Dorsal view of gnathosoma; **D.** Detail of OC and showing of ds-1 and ds-2 on AD; **E.** Lateral view of leg I. Scale bars: 50 µm.

Copidognathus longirostris (Trouessart, 1896) (Figs. 6 A–G)

Material examined

Kundu, 3 m, fine sand, 4 ♀♀, 10 ♂♂.

Morphology and notes

Females 330–340 long, 210–215 wide, that of males 325–330 long, 212–220 wide. AD with 3 round raised areolae, anterior areola with rosette pores. OC 87 long, 35 wide with 2 corneae. PD 225 long, 125 wide. Setae ds-1 on AD, ds-2 within striated integument. ds-3 to ds-5 on PD. AE with three pairs of ventral setae. PE with 1 dorsal and 3 ventral setae. Male AE 112 long, 160 wide. Epimeral pores 8 wide. Male GA 175 long, 110 wide; with 18 pgs. Genital sclerite with 3 pairs of small sgs (Figs. 6 A-C). Gnathosoma slender; 125 long and 65 wide; 1.9 times longer than wide. Rostrum extending just beyond the level of P-3 (Fig. 6 D). Legs slender. Leg I 260 long. The chaetotaxy of leg I as follows (from trochanter to tarsus); 1, 2, 4, 3, 6, 7 (Figs. 6 E–G). My specimens agrees with the description of made by Morselli and Mari (1985).

Distribution

Southeastern Pasific and Mediterranean Sea (Bartsch 2009).

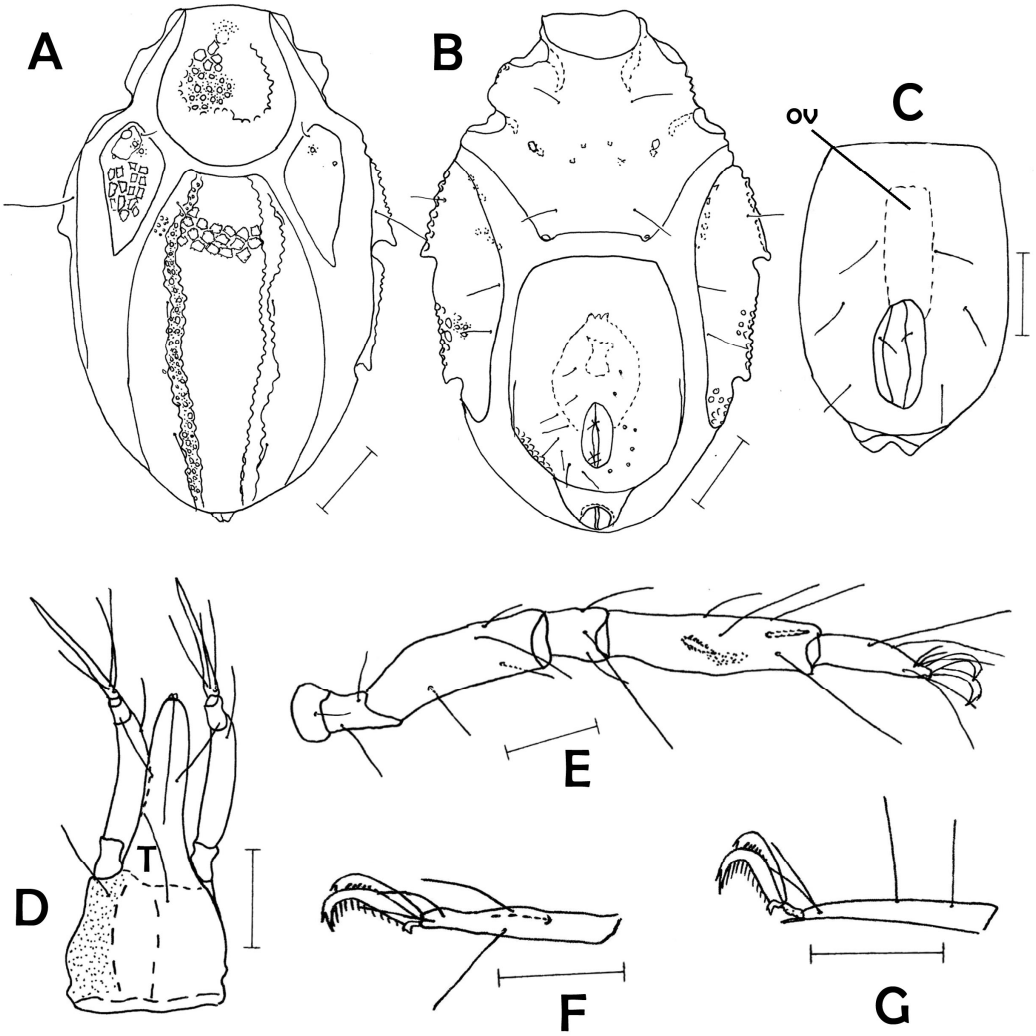

Figure 6. *Copidognathus longirostris* (Trouessart, 1896) – **A.** Dorsal view of idiosoma (male); **B.** Ventral view of idiosoma (male); **C.** GA (female); **D.** Ventral view of gnathosoma (male); **E.** Lateral view of leg I (male); **F.** medial view of tarsus II (female); **G.** Lateral view of tarsus III (female). Scale bars: 50 µm.

Copidognathus loricifer André, 1946 (Figs. 7 A–E)

Material examined

Yakamoz Beach, 2 m, fine sand, 4 ♀♀, 1 ♂.

Morphology and notes

Females 300–337 long, 212 wide, that of a male 310 long, 210 wide. AD with porose areolae and the plate 93 long, 85 wide, anteriorly with 20–22 rosette pores "Y" shaped areolae and two oblong posterior areolae each with about 13–16 rosette pores. OC 63 long, 35 wide with 2 corneae. PD 200 long, 110 wide. Setae ds-1 on AD, ds-2 within striated integument. ds-3 to ds-5 on PD. Female AE 100 long, 148 wide. AE with three pairs of long ventral setae. PE with 1 dorsal and 3 ventral long setae. Epimeral pores 7-8 wide. Female GA 110 long, 75 wide; with 33 pgs (Figs. 7 A–C). Gnathosoma 110 long and 70 wide; 1.5 times longer than wide. Rostrum extending just beyond the level of P-2 (Fig. 7 D). Leg I 240 long. The chaetotaxy of leg I as follows (from trochanter to tarsus); 1, 2, 5, 4, 7, 6 (Fig. 7 E). *Copidognathus loricifer* and *C. magnipalpus* belongs to the *pulcher* group. The group has about 15 named species from all over the world (Bartsch 1984; Chatterjee & De Troch 2000). *Copidognathus loricifer* is similar to *C. magnipalpus*. Distinguishing characters of the two species are discussed in *C. magnipalpus* below.

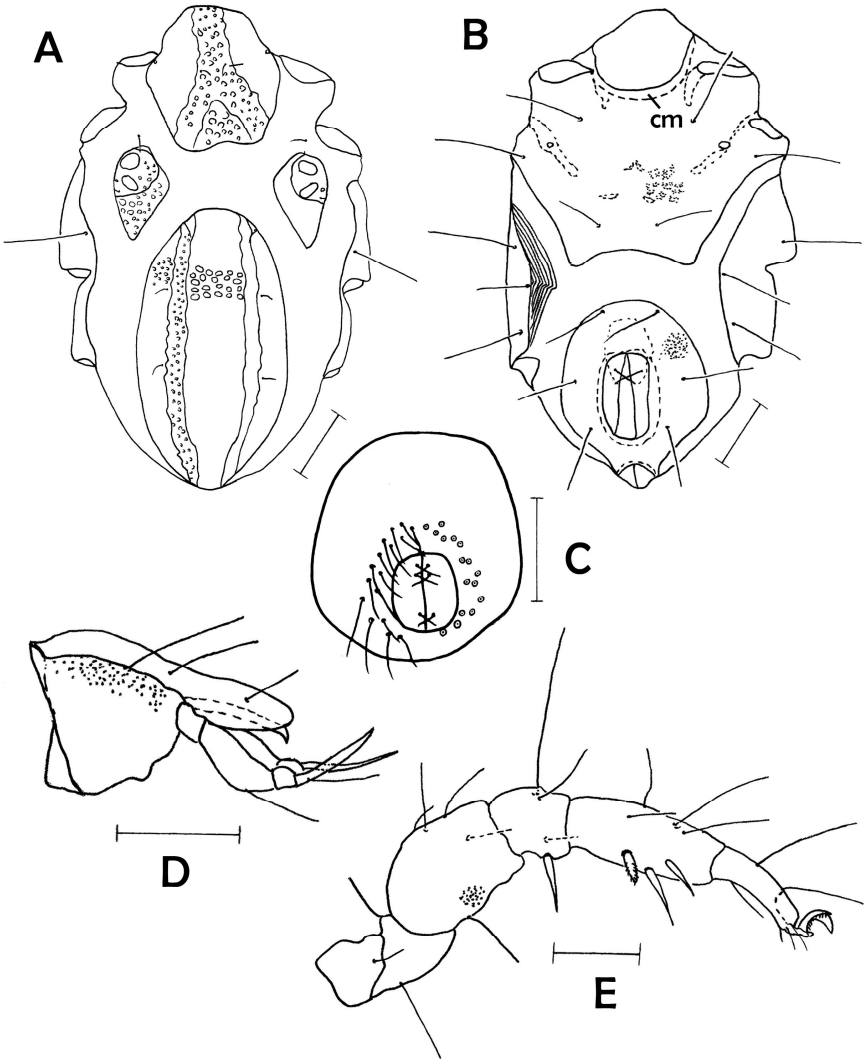

Figure 7. *Copidognathus loricifer* André, 1946 – **A.** Dorsal view of idiosoma (female); **B.** Ventral view of idiosoma (female); **C.** GA (male); **D.** Lateral view of gnathosoma (female); **E.** Lateral view of leg I (female). Scale bars: 50 µm.

Distribution

Northeastern Atlantic and Mediterranean Sea (Bartsch 2009).

Copidognathus magnipalpus (Police, 1909) (Figs. 8 A–E)

Material examined

Yakamoz Beach, 1 m, *Jania rubens*, 30 ♀♀, 16 ♂♂; Bilem Beach, 6 m, *Cystoseira barbata*, 10 ♀♀; Finike, 2 m, *Corallina officinalis*, 2 ♀♀, 5 ♂♂.

Morphology and notes

Females 340–350 long, 210–220 wide, that of male 325–335 long, 200–210 wide. Porose areolae of all dorsal plates with canaliculi arranged within polygons. AD 87 long, 75 wide and with an anterior and two posterior porose areola. OC 70 long, 30 wide with 2 corneae. Posterior cornea of the plate subdivided. PD 200 long, 125 wide. Setae ds-1 on AD, ds-2 within striated integument between AD and OC. ds-3 to ds-5 on PD. Female AE 112 long, 175 wide. Epimeral pores 8–10 wide. Female GA 135 long, 100 wide; with three pairs of pgs and one pair of sgs. Male GA 150 long, 125 wide; with 22 pgs and three pairs sgs (Figs. 8 A–C). Gnathosoma 100 long and 75 wide; 1.3 times longer than wide. Rostrum extending just beyond the level of P-2 (Fig. 8 D). Leg I 230 long. The chaetotaxy of leg I as follows (from basifemur to tarsus); 2, 5, 4, 7, 5 (Fig. 8 E). *Copidognathus magnipalpus* is close to *C. loricifer*. Both species have "Y" shaped areolae on AD. They can be easily distinguished from each other type of areolae on AD (ovate porose polygon areolae in *C. magnipalpus*, in *C. loricifer* with rosetta pores) (Bartsch 1979; 2001).

Distribution

Eastern Atlantic, Kenya, Black and Mediterranean Sea (Bartsch 2009).

Copidognathus majusculatus (Trouessart, 1894) (Figs. 9 A–E)

Material examined

Bilem Beach, 9 m, fine sand, 3 ♀♀, 1 ♂.

Morphology and notes

Females 375–380 long, 205–210 wide, that of a male 375 long, 200 wide. AD 137 long, 150 wide. OC 85 long, 20 wide with 2 corneae. PD 225 µm long, 150 wide. AE with three pairs of ventral setae. PE with 1 dorsal and 3 ventral setae. Female AE 150 long, 175 wide. Female GA 137 long, 113 wide; with 22 pgs. Gnathosoma 125 long and 63 wide; 1.9 times longer than wide. Rostrum extending just beyond the level of P-2 (Fig. 9 D). Leg I 265 long. The chaetotaxy of leg I as follows (from trochanter to tarsus); 1, 2, 5, 3, 7, 8 (Fig. 9 E). As mentioned above, *C. gibbus* resembles *C. majusculatus*. According to Bartsch (2004b) the main character that distinguish it from its conger is the size of rosetta pores and number of ostia. In *C. gibbus*; AD with rosetta pores; each pore large and with ostium surrounded by up to 20 canaliculi. Rosetta pores and ostia small with surrounded by 2–4 canaliculi in *C. majusculatus*.

Distribution.

Mediterranean Sea (Bartsch 2009).

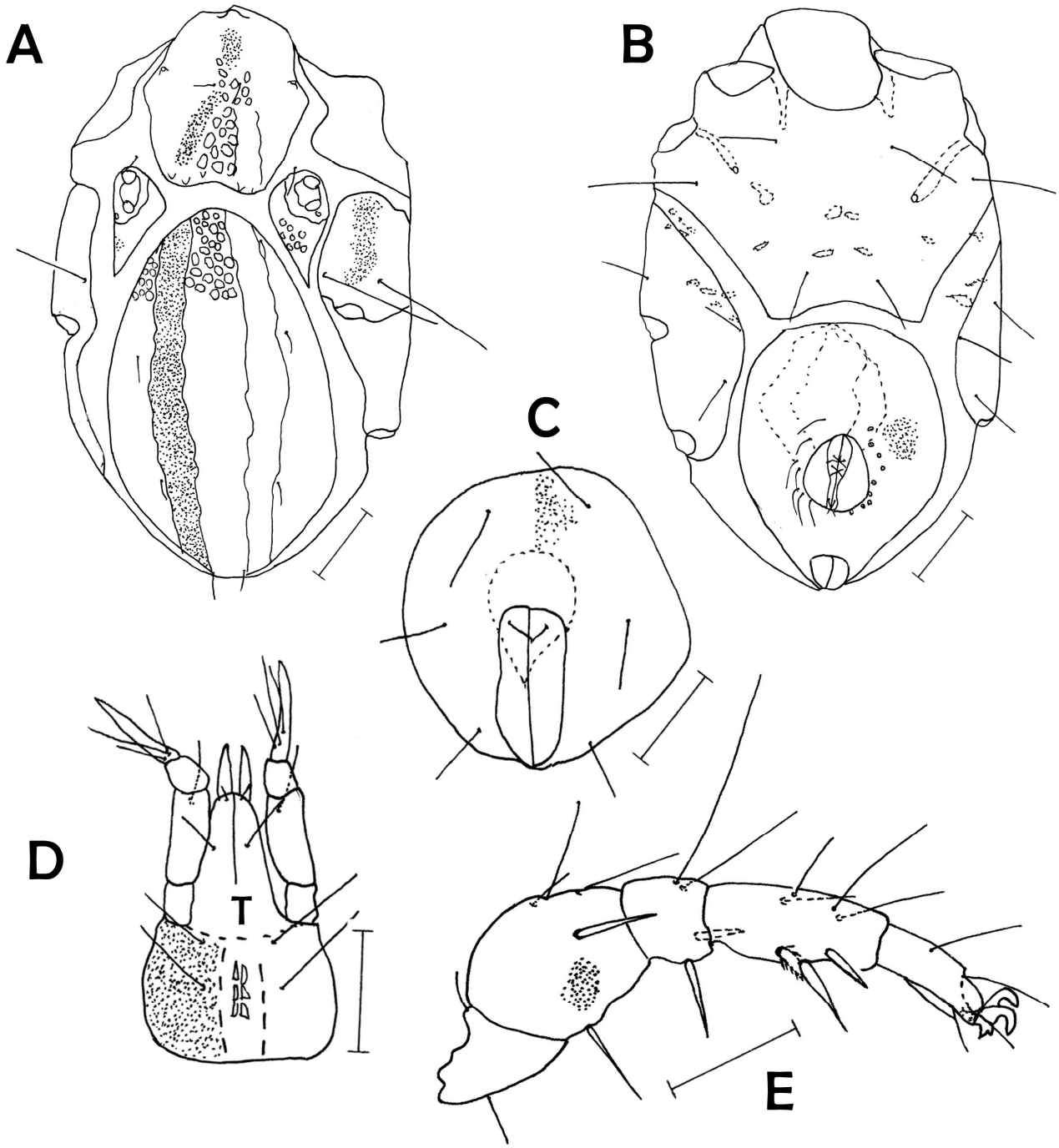

Figure 8. *Copidognathus magnipalpus* (Police, 1909) – **A.** Dorsal view of idiosoma (male); **B.** Ventral view of idiosoma (male); **C.** GA (female); **D.** Ventral view of gnathosoma (male); **E.** Lateral view of leg I (male). Scale bars: 50 µm.

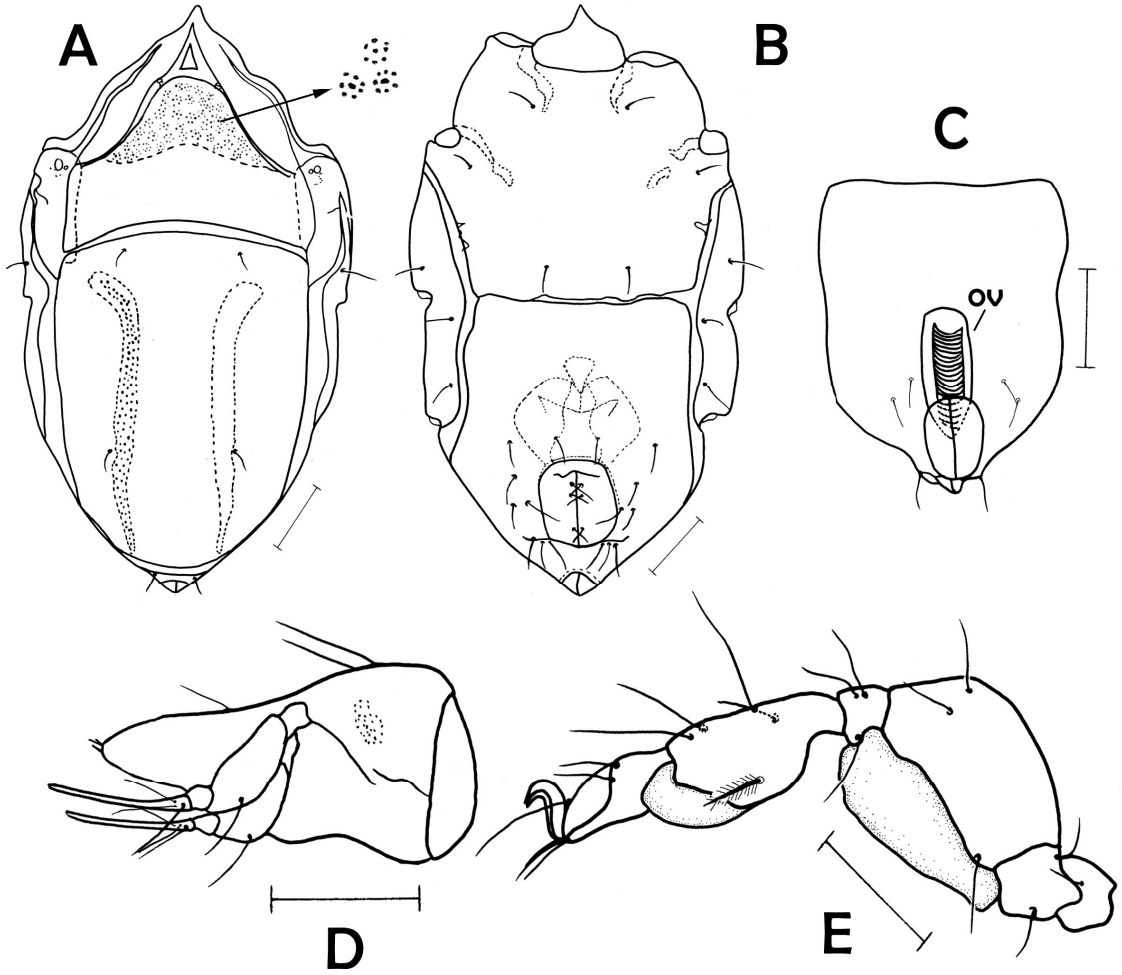

Figure 9. *Copidognathus majusculatus* (Trouessart, 1894) – **A.** Dorsal view of idiosoma (male); **B.** Ventral view of idiosoma (male); **C.** GA (female); **D.** Medial view of gnathosoma (male); **E.** Medial view of leg I (male). Scale bars: 50 µm.

Copidognathus oculatus (Hodge, 1863) (Figs. 10 A–I)

Material examined

Yakamoz Beach, 1 m, *Jania rubens*, 5 ♀♀, 1 ♂.

Morphology and notes

Dorsal plates with rosette pores. Females 212–237 long, and 130 wide, of a male 212 long, 115 wide. AD 70 long, 63 wide. OC tail like posteriorly, extending beyond ds-4. The plate 75 long, 25 wide, longer than AD. PD 140 long, 87 wide and with single pair of costae. AE with three pairs of ventral setae. PE with 1 dorsal and 3 ventral setae. Female GA 100 long, 75 wide; with 3 pairs of pgs. Genital sclerite with pair of small sgs. Male GA 112 long, 75 wide; with 10 pairs of pgs. (Figs. 10 A-D). Gnathosoma 63 long, 40 wide, 1.5 times longer than wide. Rostrum extends seta on P-2. Tectum triangular and almost reaching end of P-1. Gnathosomal base with 2 pairs of maxillary setae (Figs. 10 E, F). Legs short. Leg I 165 long. The chaetotaxy of leg I as follows (from trocanter to tarsus); 1, 2, 4, 5, 7, 8. Telofemur I reticulated. Claw pectines with large tines (Figs. 10 G–I).

Distribution

Northeastern Atlantic, North Sea, Baltic and Mediterranean Sea (Bartsch 2009).

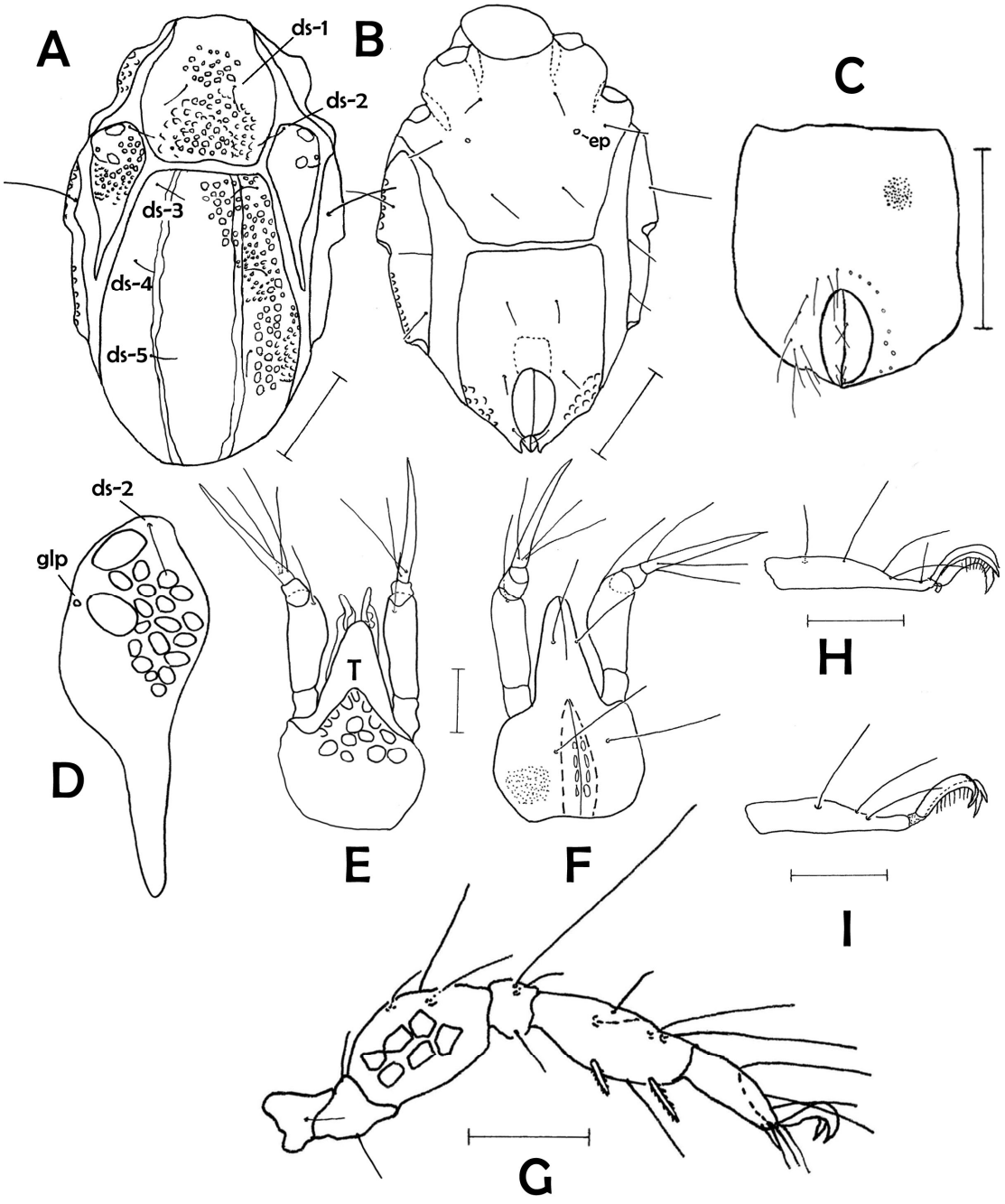

Figure 10. *Copidognathus oculatus* (Hodge, 1863) – **A.** Dorsal view of idiosoma (female); **B.** Ventral view of idiosoma (female); **C.** Ventral view of idiosoma (male); **D.** Ocular plate; **E.** Dorsal view of gnathosoma (female); **F.** Ventral view of gnathosoma (female); **G.** Lateral view of leg I (female); **H.** Lateral view of tarsus III (female); **I.** Tarsus II (female). Scale bars: 50 µm.

Copidognathus quadricostatus (Trouessart, 1894) (Figs. 11 A–J)

Material examined

Bilem Beach, 5 m, fine sand, 4 ♀♀, 2 ♂♂.

Morphology and notes

Females 270–275 long, 140–150 wide, that of males 300 long, 170 wide. Major parts of AD,

OC, and PD reticulate and, meshes of reticulum undivided. AD 50 long, 65 wide; anteriorly truncated. OC 75 long, 23 wide; slender with three corneae and longer than AD. PD 210 long, 100 wide; two costae and extending anterial beyond anterior margin of OC. AE with three pairs of ventral setae and "U" shaped porose areola. Female AE 112 long, 137 wide. Epimeral pores 7–9 wide. PE with 1 dorsal and 3 ventral setae. Female GA 125 long, 70 wide; with 6 pgs. Genital sclerite with pair of small sgs. Male GA 138 long, 100 wide; with 22 pgs. Spermatopositor is large, 75 long, 50 wide, extending beyond genital opening by almost 1.5 times (Figs. 11 A, B). Gnathosoma 100 long and 60 wide; 1.6 times longer than wide. Rostrum triangular and extending slightly beyond of P-2. Tectum truncate (Figs. 11 C, D). Legs slender. Leg I 350 long. The chaetotaxy of leg I as follows (from trochanter to tarsus); 1, 2, 5, 4, 7, 6 (Fig. 11 E). Tarsi II, III and IV with 3, 3 and 2 setae respectively (Figs. 11 F–H). *Copidognathus quadricostatus* belong to the *tricorneatus* group which contains 14 species around the world including *C. adriaticus*, *C. andhraensis*, *C. dictyotellus*, *C. dictyotus*, *C. hummelincki*, *C. kagamili*, *C. leptoporus*, *C. longipes*, *C. megaloporus*, *C. mucronatus*, *C. quadricostatus*, *C. tricorneatus*, *C. trouessarti* and *C. xaixaiensis* (Bartsch 1991; Otto 2001; Chatterjee *et al.* 2004). *Copidognathus quadricostatus* is most similar to *C. mucronatus* and *C. trouessarti*. *C. quadricostatus* can be distinguished from *C. mucronatus* on the basis of the reticulation of the PD (meshes of the reticulum subdivided in *C. mucronatus* but undivided in *C. quadricostatus*) and outline of the porose areolae on the AE and GA (porose areolae in *C. mucronatus* smaller than *C. quadricostatus*). *Copidognathus trouessarti* has a much longer, slender rostrum, and the arrangement of the maxillary setae is different (apical pair of maxillary setae inserted in basal quarter of rostrum or level with end of P-1) from the other species (Bartsch 1991; 1997; 2001).

Distribution.

Eastern Northatlantic, Mediterranean and Black Sea (Bartsch 2009).

Copidognathus remipes **(Trouessart, 1894) (Figs. 12 A–E)**

Material examined

Yakamoz Beach, 6 m, fine sand 4 ♀♀, 3 ♂♂.

Morphology and notes

Females 227–260 long, 110 wide, of males 220–250 long, 125. AD 75 long, 63 wide with A shaped areola. Posterior portion of AD rectangular. OC 85 long, 18–20 wide. PD 163 long, 88 wide. Dorsal setae small. AE with three pairs of ventral setae. PE with 1 dorsal and 3 ventral setae. AE 89 long, 113 wide. Posterior margin of AE truncate. Female GA 100 long, 75 wide; with 3 pairs of pgs. Ovipositor extending only slightly beyond GO. Male GA 100 long, 87 wide with 20 pgs (Figs. 12 A-C). Gnathosoma 75 long, 45 wide; 1.6 times longer than wide. Rostrum triangular, extending level of P-3 (Fig. 12 D). Leg I 148 long. The chaetotaxy of leg I as follows (from trochanter to tarsus); 2, 2, 2, 2, 4, 6. Telofemora I with ventrolateral lamella (Fig. 12 E). The material is very similar to *C. gibbus*. The most marked differences between these two species are as follows: *C. remipes* is smaller than *C. gibbus*. The idiosoma colour of *C. remipes* darker than *C. gibbus. C. remipes* has a pair of short, weak and narrow costae on the PD. The morphological characteristics of the specimens from Turkey accord with the previously descriptions of the species (Bartsch 1977a).

Distribution

Eastern Northatlantic and Mediterranean Sea (Bartsch 2009).

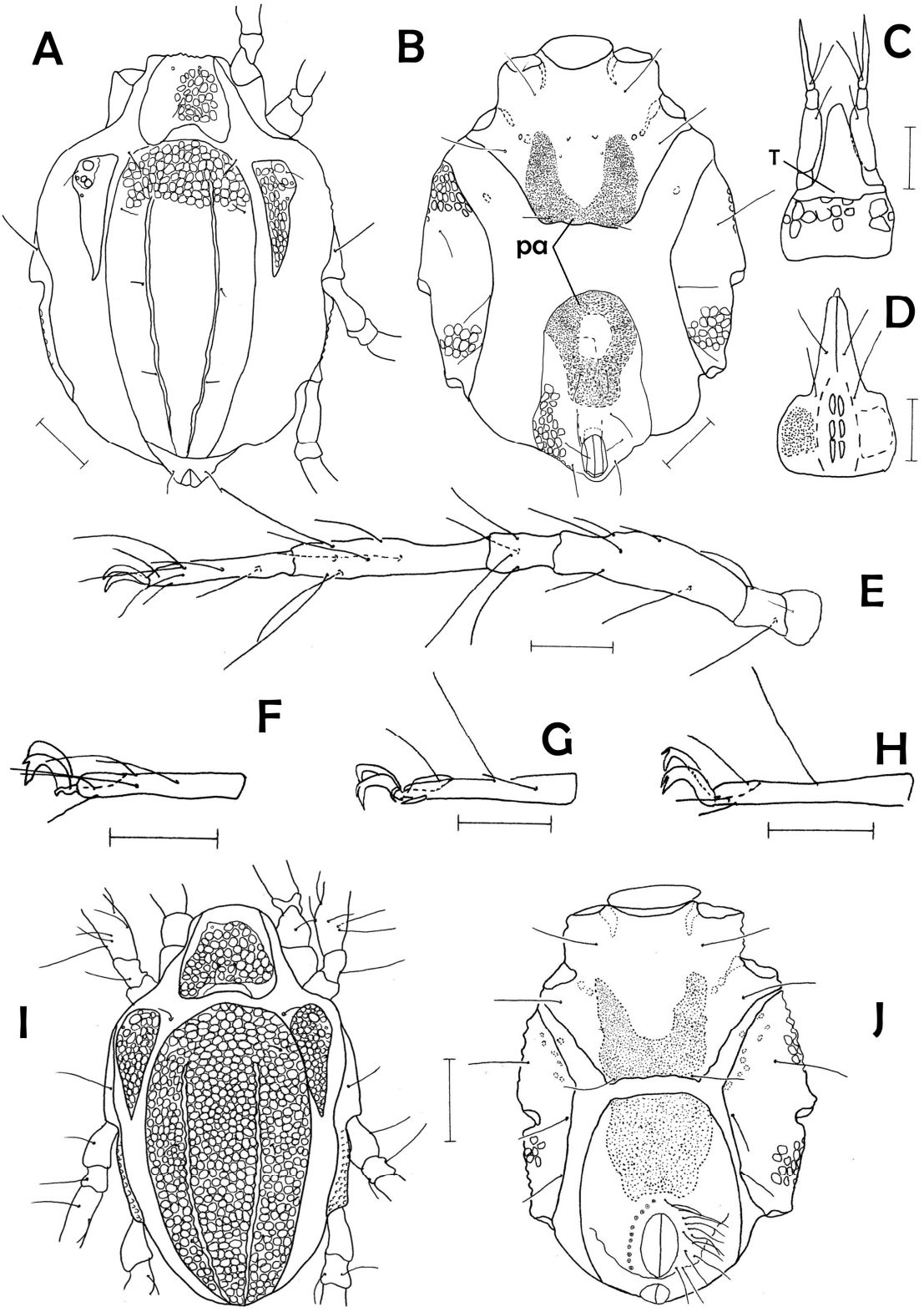

Figure 11. *Copidognathus quadricostatus* (Trouessart, 1894) – **A.** Dorsal view of idiosoma (female); **B.** Ventral view of idiosoma (female); **C.** Dorsal view of gnathosoma (female); **D.** Ventral view of gnathosoma (female); **E.** Lateral view of leg I (female); **F.** Lateral view of tarsus II (female); **G.** Lateral view of tarsus III (female); **H.** Lateral view of tarsus IV (female); **I.** Dorsal view of idiosoma (male); **J.** Ventral view of idiosoma (male). Scale bars: 50 µm.

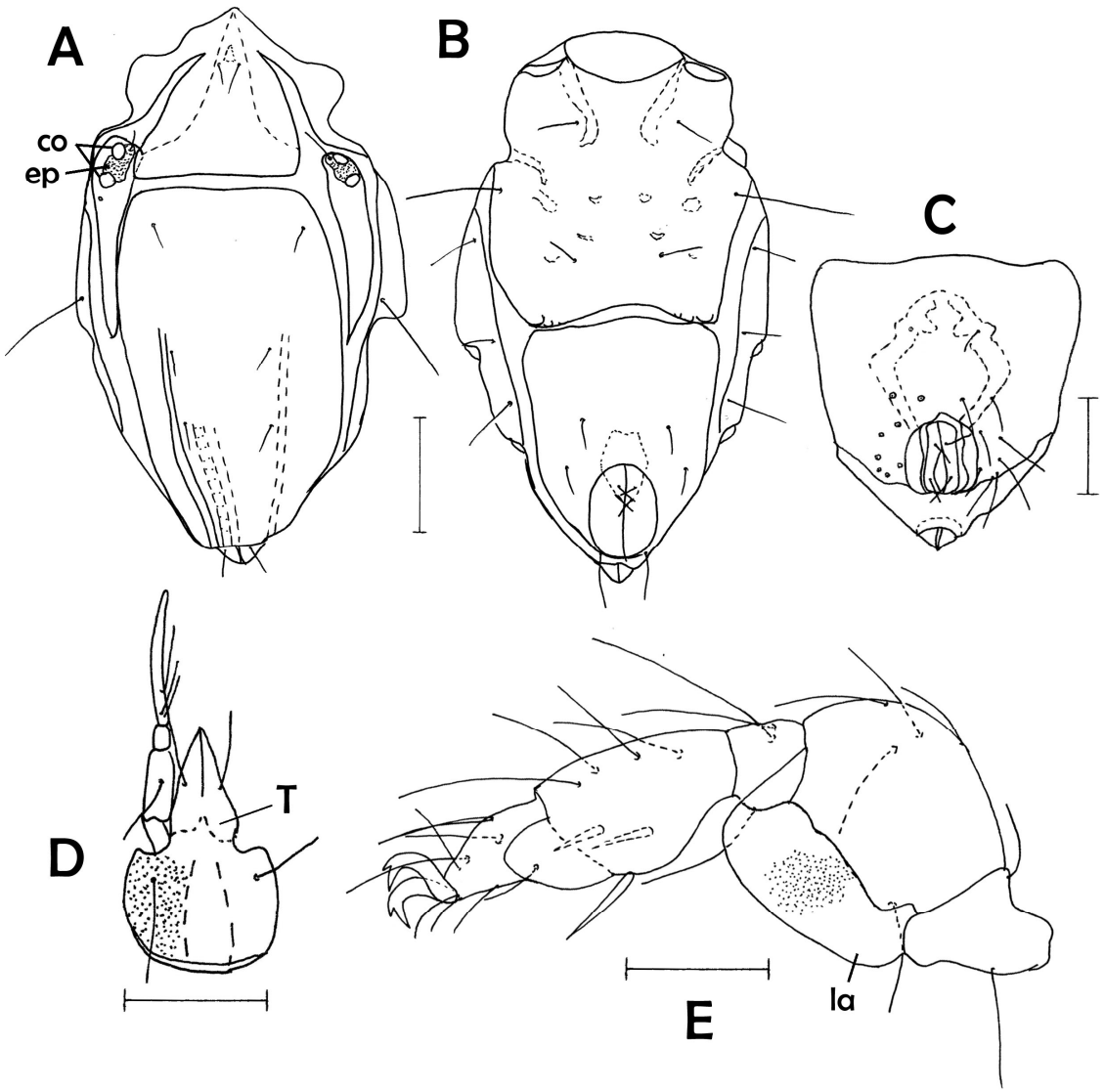

Figure 12. *Copidognathus remipes* (Trouessart, 1894) – **A.** Dorsal view of idiosoma (female); **B.** Ventral view of idiosoma (female); **C.** Ventral view of idiosoma (male); **D.** Ventral view of gnathosoma (female); **E.** Lateral view of leg I (female). Scale bars: 50 µm.

Copidognathus septentrionalis (Halbert, 1915) (Figs. 13 A–G)

Material examined

Yakamoz Beach, 2 m, fine sand, 2 ♀♀.

Morphology and notes

Females 400–460 long, 225 wide, male 325 long, 300 wide. AD as long as wide (125). OC 112 long, 50 wide and extending to level of insertion of leg III. PD with pair of porose costae. The plate PD 300 long, 175 wide. AE with three pairs of ventral setae. PE with 1 dorsal and 3 ventral setae. Female AE 170 long, 224 wide. Female GA 225 long, 150 wide; with 3 pairs of pgs and sgs. Male GA 175 long, 100 wide; with 9–10 pairs of pgs, and 4 pairs of sgs (Figs. 13 A–E). Gnathosoma 125 long, 65 wide; 1.9 times longer than wide. Rostrum triangular and reaching level of seta on P-2. Tectum truncate (Fig. 13 F). Leg I 400 long. The chaetotaxy of leg I as follows (from trochanter to

tarsus); 1, 2, 5, 4, 7, 6 (Fig. 13 G). The morphological characteristics of the specimens from Turkey accord with the previously descriptions by Bartsch (1977b).

Distribution

Eastern Northatlantic (Bartsch 2009).

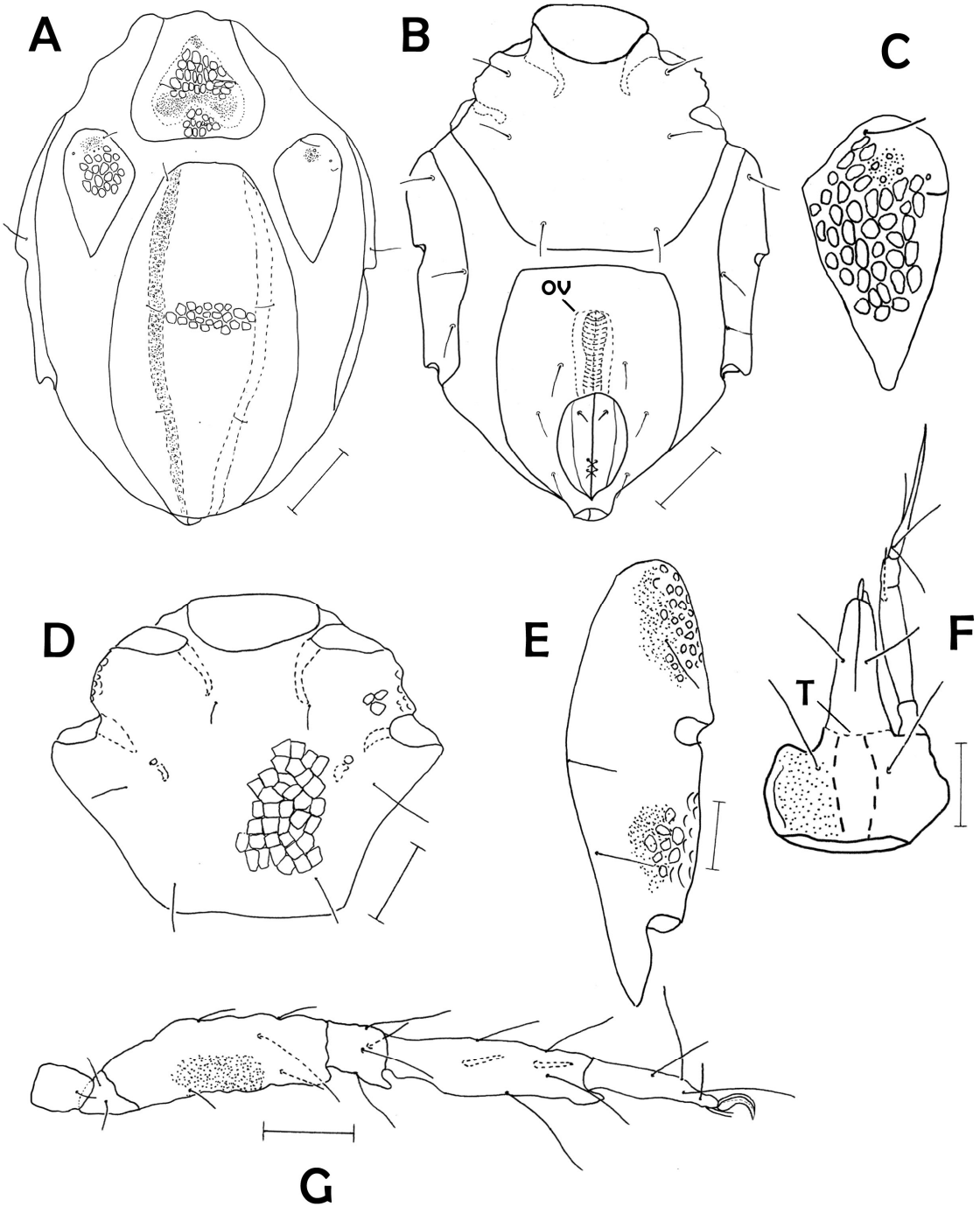

Figure 13. *Copidognathus septentrionalis* (Halbert, 1915) (female) – **A.** Dorsal view of idiosoma; **B.** Ventral view of idiosoma; **C.** Enlarged ocular plate; **D.** Anterior epimeral plate; **E.** Posterolateral epimeral plate; **F.** Ventral view gnathosoma; **G.** Lateral view leg I. Scale bars: 50 µm.

Copidognathus tabellio (Trouessart, 1894) (Figs. 14 A–E)

Material examined

Finike, 2 m, *Laurencia obtusa*, 7 ♀♀, 2 ♂♂.

Morphology and notes

Females 265–325 long, 185–200 wide, of males 280 and 310 long, 190 and 200 wide. Integument of the specimens have brown pigmentation both females and males. Especially, this is clearly can be seen on OC. In females, AD 100 long, 87 wide. AD with 3 distinct rounded porose areolae. OC almost as long as AD (87) with 2 large corneae. PD 213 long, 125 wide. PD with a pair of costae that are two rosetta pores wide. AE with three pairs of ventral setae. PE with 1 dorsal and 3 ventral setae. AE 90 long, 163 wide. Epimeral pores 7–8 wide. GA 137 long, 100 wide; with 3 pairs of pgs. Ovipositor extending only slightly beyond GO. Male GA 125 long, 100 wide; with 22–24 pgs (Figs. 14 A–C). Gnathosoma 100 long, 63 wide; 1.5 times longer than wide. Rostrum triangular and reaching level of P-3. Tectum with short median process not reaching end of P-1 (Fig. 14 D). The chaetotaxy of leg I as follows (from trochanter to tarsus); 1, 2, 5, 3, 6, 5 (Fig. 14 E). According to Bartsch (2001), *C. tabellio* is closely related to *C. lamelloides.* The two species are closest for having the raised areolae bear typical rosette pores, the AD a pair of round porose areolae, the PD a pair of medial costae, the ventral plates delimited marginal areolae but can be distinguished by statement of ds-2 (present on OC in *C. tabellio*, whereas present on integument in *C. lamelloides*), presence of glp-1 (present near anterolateral margins of AD in *C. tabellio* whereas present in margins of porose areola in *C. lamelloides*) and type of tibia IV (smooth in *C. tabellio* whereas bipectinate in *C. lamelloides*).

Distribution

Eastern Northatlantic, Mediterranean and Black Sea (Bartsch 2009).

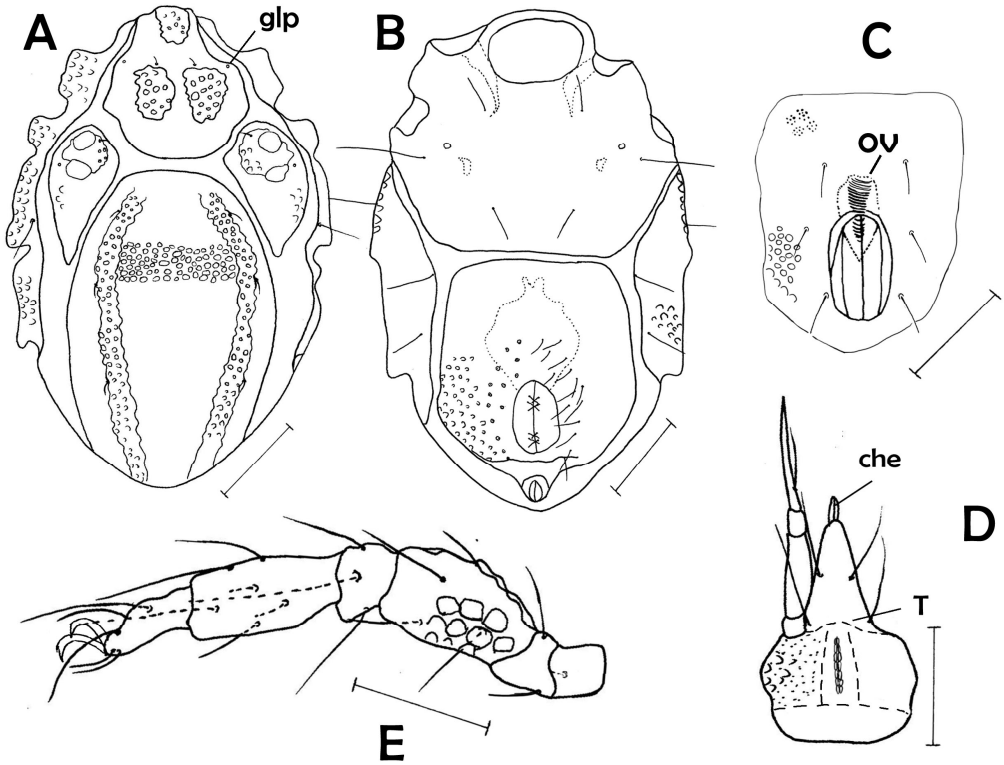

Figure 14. *Copidognathus tabellio* (Trouessart, 1894) – **A.** Dorsal view of idiosoma (male); **B.** Ventral view of idiosoma (male); **C.** GA (female); **D.** Ventral view of gnathosoma (female); **E.** Medial view of leg I (female). Scale bars: 50 µm.

DISCUSSION

In the present study, a total of 13 *Copidognathus* species and 148 specimens have been identified from subtidal areas along the western coast of Antalya, Turkey: *C. brachystomus*, *C. dentatus*, *C. gibbus*, *C. lamelloides*, *C. longirostris*, *C. loricifer*, *C. magnipalpus*, *C. majusculatus*, *C. oculatus*, *C. quadricostatus*, *C. remipes*, *C. septentrionalis* and *C. tabellio* (Figs. 2–14). Among them, 10 species (*C. dentatus*, *C. gibbus*, *C. lamelloides*, *C. longirostris*, *C. loricifer*, *C. majusculatus*, *C. oculatus*, *C. quadricostatus*, *C. remipes*, *C. septentrionalis*) are new to the Turkish halacarid fauna (Table 1).

Table 1. List of recorded *Copidognathus* species in this study. 1: New records for Turkey; 2: New records for Antalya.

No	Species	1	2
1	*Copidognathus brachystomus* Viets, 1940	-	x
2	*Copidognathus dentatus* Viets, 1940	x	x
3	*Copidognathus gibbus* (Trouessart, 1889)	x	x
4	*Copidognathus lamelloides* Bartsch, 2000	x	x
5	*Copidognathus longirostris* (Trouessart, 1896)	x	x
6	*Copidognathus loricifer* André, 1946	x	x
7	*Copidognathus magnipalpus* (Police, 1909)	-	x
8	*Copidognathus majusculatus* (Trouessart, 1894)	x	x
9	*Copidognathus oculatus* (Hodge, 1863)	x	x
10	*Copidognathus quadricostatus* (Trouessart, 1894)	x	x
11	*Copidognathus remipes* (Trouessart, 1894)	x	x
12	*Copidognathus septentrionalis* (Halbert, 1915)	x	x
13	*Copidognathus tabellio* (Trouessart, 1894)	-	x

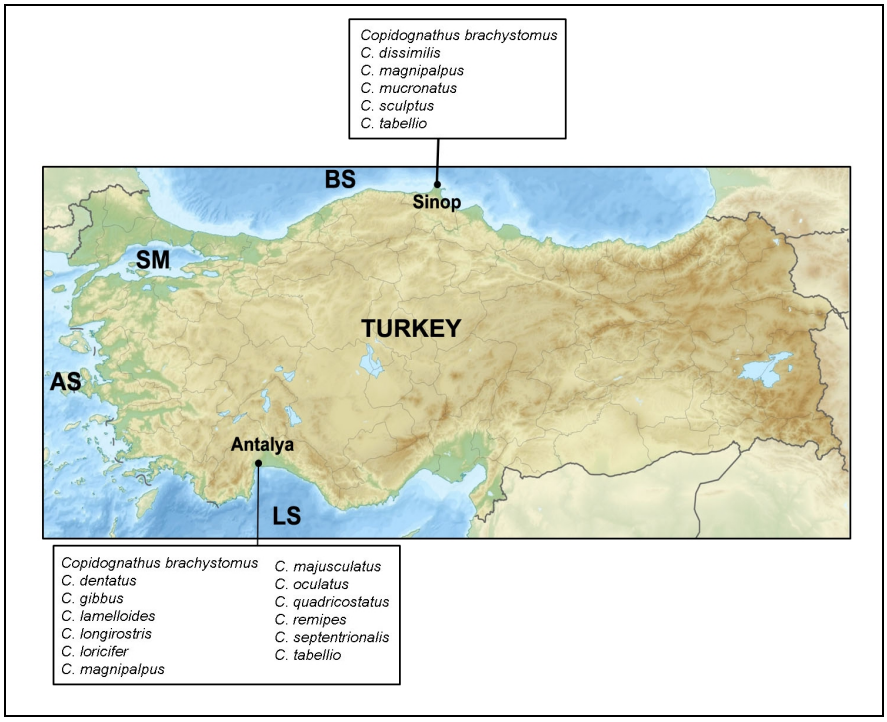

Figure 15. Map showing recorded *Copidognathus* species in Turkey. The points indicated that city names where the genus members recorded till now. BS: Black Sea, SM: Sea of Marmara, AS: Aegean Sea, LS: Levantine Sea.

In the present contribution, the author presents the first results of a study on the *Copidognathus* marine mites from Antalya, Turkey. Prior to this study, only 6 *Copidognathus* species (*C. brachystomus*, *C. dissimilis*, *C. magnipalpus*, *C. mucronatus*, *C. sculptus* and *C. tabellio*) had been recorded from the Turkish marine waters. All of them were reported from Sinop (Black Sea) by Bartsch in 2001, 2004a, 2013 and 2015. Together with previously reported data, a total of 16 *Copidognathus* species have been recorded in Turkey to date. Three *Copidognathus* species (*C. brachystomus, C. magnipalpus* and *C. tabellio*) are recorded from both the Black Sea and Mediterranean Sea of Turkey (Fig. 15). Presently, 37 species under 20 genera are found in Turkey. According to published records number of marine halacarid known species increases from 37 to 46 in Turkey including this study. However, some habitats of halacarid mites such as muddy sediments, colonies of hydrozoans, barnacles, mussels, coralligane habitats, sponge communities, marine phanerogams, deep-sea habitats and sea caves have not been investigated along the Turkish coast.

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گزارش‌های جدید از جنس *Copidognathus* (Acari: Halacaridae) از آنتالیا، ترکیه

فورکان دوروکان

ایشیکلار کادسی شماره ۱۶، ۱۷ تی‌آر-۰۷۱۰۰ آنتالیا، ترکیه؛ رایانامه: f_durucan@hotmail.com

چکیده

نخستین بررسی فون کنه‌های دریازی جنس *Copidognathus* (Trouessart, 1888) آنتالیا گزارش می‌شود. سیزده گونه از روی جلبک‌های بزرگ و رسوبات شنی گوناگون یافت شد. این گونه‌ها عبارت‌اند از: *Copidognathus brachystomus* Viets, 1940، *C. dentatus* Viets, 1940، *C. gibbus* (Trouessart, 1889)، *C. lamelloides* Bartsch, 2000، *C. longirostris* (Trouessart, 1896)، *C. loricifer* André, 1946، *C. magnipalpus* (Police, 1909)، *C. majusculatus* (Trouessart, 1894)، *C. oculatus* (Hodge, 1863)، *C. quadricostatus* (Trouessart, 1894)، *C. remipes* (Trouessart, 1894)، *C. septentrionalis* (Halbert, 1915)، *C. tabellio* (Trouessart, 1894). از بین آنها، گونه‌های *C. dentatus*، *C. gibbus*، *C. lamelloides*، *C. longirostris*، *C. loricifer*، *C. majusculatus*، *C. oculatus*، *C. quadricostatus*، *C. remipes* و *C. septentrionalis* برای فون کنه‌های دریازی ترکیه جدیدند. هر گونه، ترسیم و به صورت مختصر همراه با یادداشت‌هایی توصیف و در آخر روی نقشهٔ کشور ترکیه نشان داده شده‌اند.

واژگان کلیدی: دریای لوانتین؛ جانوران ریز جزر و مدی؛ پیش‌استیگمایان؛ آرایه‌شناسی؛ کنه‌های آبزی.

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