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A new species of *Exosphaeroma* Stebbing (Crustacea: Isopoda: Sphaeromatidae) from the Pacific coast of Mexico

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Abstract.—*Exosphaeroma bruscai* is described from the Pacific coast of Mexico. *Exosphaeroma bruscai* is most closely related to *E. diminuta* Menzies & Frankenberg, 1966 from the western Atlantic, from which it differs in having much longer antenna, an acute rostrum, a triangular first pleopod endopod, a transverse suture on exopod of pleopods 3–5, and a considerably longer and more slender appendix masculina. Specimens examined here define the geographic distribution of *E. bruscai* from the central Gulf of California to Los Arcos, in the southern part of Banderas Bay, Jalisco. Previously published records of an unidentified *Exosphaeroma* from the eastern tropical Pacific indicate that *E. bruscai* occurs from sandy beaches of the upper Gulf of California to Colombia.

Sphaeromatidae is the most specious family of marine isopods. According to a recent survey it contains 633 species (Kensley & Schotte 2000) and they are often very abundant in intertidal and shallow water habitats. Their taxonomy is one of the most confused among isopods, in great part due to marked sexual dimorphism in some genera (Schultz 1969, Brusca 1980, Kensley & Schotte 1989) and to the difficulty in establishing generic relationships within the family (see Bruce 1995). The family has been formally divided into five subfamilies by Iverson (1982), who based his study on previous works by Hurley & Jansen (1977) and Bowman (1981). More recently, genera of Sphaeromatidae have been reviewed by Harrison & Ellis (1991) who presented an identification key to genera.

The genus *Exosphaeroma* is known from the Pacific coast of Mexico, but no identified species has been recorded. The first published record of *Exosphaeroma* for the area is by Dexter (1972) who recorded *E. diminuta* Menzies & Frankenberg, 1966, a west Atlantic sphaeromatid, from sandy beaches of the west coast of Panama. Dexter (1974, 1979) later reported the same species for similar habitats in Costa Rica and Colombia. This identification, however, was considered doubtful by Brusca & Iverson (1985:26–28) who thought that Pacific records of Dexter (1974, 1979) belong to an undescribed species, probably extending from the upper Gulf of California, Mexico, to Parque Nacional Santa Rosa, Costa Rica. Brusca & Iverson (1985:26–28) provided some diagnostic characters of this undescribed *Exosphaeroma,* illustrated parts of an adult male, but did not give it a new name.

Since Brusca and Iverson's 1985 note on this genus, another report of an *Exosphaeroma* sp. was published by Ríos & Ramos (1990) from specimens collected in Malaga Bay, Colombia. These authors refer to the data presented by Brusca & Iverson (1985). No further reports on *Exosphaeroma* from the Pacific coast of America have been published. Recent collecting along the Pacific coast of Mexico, including sampling on sandy beaches, led to the discovery of an undescribed species similar to those of Brusca & Iverson (1985) in several localities. The purpose of the present paper is to formalize the description of this apparently

abundant species, the first of the genus *Exosphaeroma* reported for the Pacific coast of America.

Abbreviations used in this paper are: St., sampling station; TL, total length; NS, unsexed specimen; coll., collector; EMU, Unidad Académica Mazatlán UNAM Invertebrates Reference Collection.

Sphaeromatidae H. Milne-Edwards, 1840
Exosphaeroma Stebbing, 1900
Exosphaeroma bruscai, new species
Figs. 1–5

Exosphaeroma diminutum.—Dexter, 1972: 425; 1974:54; 1979:547 (Pacific records only).

Exosphaeroma sp.—Brusca & Iverson, 1985:26–28, fig. 10b–d.—Ríos & Ramos, 1990:86–87, fig. 2.

Type material.—Holotype, 1 male (TL 4.6 mm), Los Arcos (20°32.5′N, 105°18.4′W), Jalisco, Mexico, 12 Apr 1996 (EMU-4745). Paratypes, 3 females (TL 1.9–2.8 mm), Los Arcos (20°32.5′N, 105°18.4′W), Jalisco, Mexico, 12 Apr 1996 (EMU-5357).

Additional material.—El Tesoro (24° 18.0′N, 110°19.0′W), La Paz, Southern Baja California, Mexico, 17 Jul 1996, 2 ovigerous females (TL 1.6–2.6 mm) and 1 unsexed, unmeasured specimen (EMU-4743). Piedras Pintas (27°56.5′N, 111° 05.5′W), Sonora, Mexico, 24 Mar 1997, 1 female (TL 4.7 mm) (EMU-4742). Piedras Pintas (27°56.5′N, 111°05.5′W), Sonora, Mexico, 24 Mar 1997, 2 females (TL 2.9–3.4 mm) and 1 ovigerous female (TL 2.4 mm) (EMU-4744). Bacochibampo Bay (27°54.3′N, 110°57.6′W), Guaymas, Sonora, Mexico, 26 Mar 1997, 1 ovigerous female (TL 2.4 mm) collected by diving (EMU-5376).

Description of male.—Body ovate (Fig. 1A, C), about twice as long as wide; dorsal surface smooth. Head wide, rostrum short, acute. Length of holotype 4.6 mm. Pereonite 3 longest, pereonites 1–2 and 4–5 subequal in length; pereonite 7 more than half as long as pereonite 6. Coxae smooth (Fig. 2), not ventrally directed, without suture, not narrowed. Pleon with 3 incompletely fused pleonites. Pleotelson smooth, wider than long, regularly curving towards posterior margin in lateral view (Fig. 1B, D); wider anteriorly, posteriorly rounded in dorsal view. Epistome scarcely visible in dorsal view; elongate in ventral view (Fig. 1E), about twice as long as wide in its middle part, apex truncate, posterior arms shorter than anterior portion. Antennular peduncle with 3 articles; flagellum with 8–9 articles. Antennal peduncle with 4 articles; flagellum with 11–12 articles, twice as long as antennular flagellum (Fig. 1E). Mandibular palp of 3 articles; 2 distal articles with 9 and 14 spines. Left mandible with incisor 4-dentate and lacinia mobilis (3-dentate); setal row of 4 serrate setae; molar process serrate. Right mandible similar in shape, with a 4-dentate incisor; setal row of 4 serrate setae; molar process with dentate margin and a seemingly rugose surface (Fig. 3A, B). Apex of the lateral lobe of maxillula (Fig. 3C) with 6 serrate setae, and 3 slender non-plumose, non-serrate setae; mesial lobe with 4 plumose setae, and a short non-plumose seta. Maxilla (Fig. 3D) lateral lobe with 6 serrate setae, middle with 7, and mesial lobe with 7 plumose setae and a much longer, slender, mesial plumose setae. Maxilliped palp (Fig. 3E) with 4 articles; 11-10-11-8 setae on articles 1–4, respectively; endite with 1 retinaculum, 9 plumose setae, 4 stout non-plumose setae and about 7 setules.

All pereopods with setules, simple spines, composed spines (stout spines with basal part tipped with a slender seta), and diminutive scales on margins. Pereopod 1 (Fig. 4A) merus slightly shorter than half ischium length; ischium with 4 setae at superior distal angle; merus with 3 setae at superior distal angle; carpus triangular, short, slightly longer than half merus length; propodus shorter than ischium; dactylus about half propodus length, with 1 subterminal seta on the lower margin; composed spines, scales and serrate scales pre-

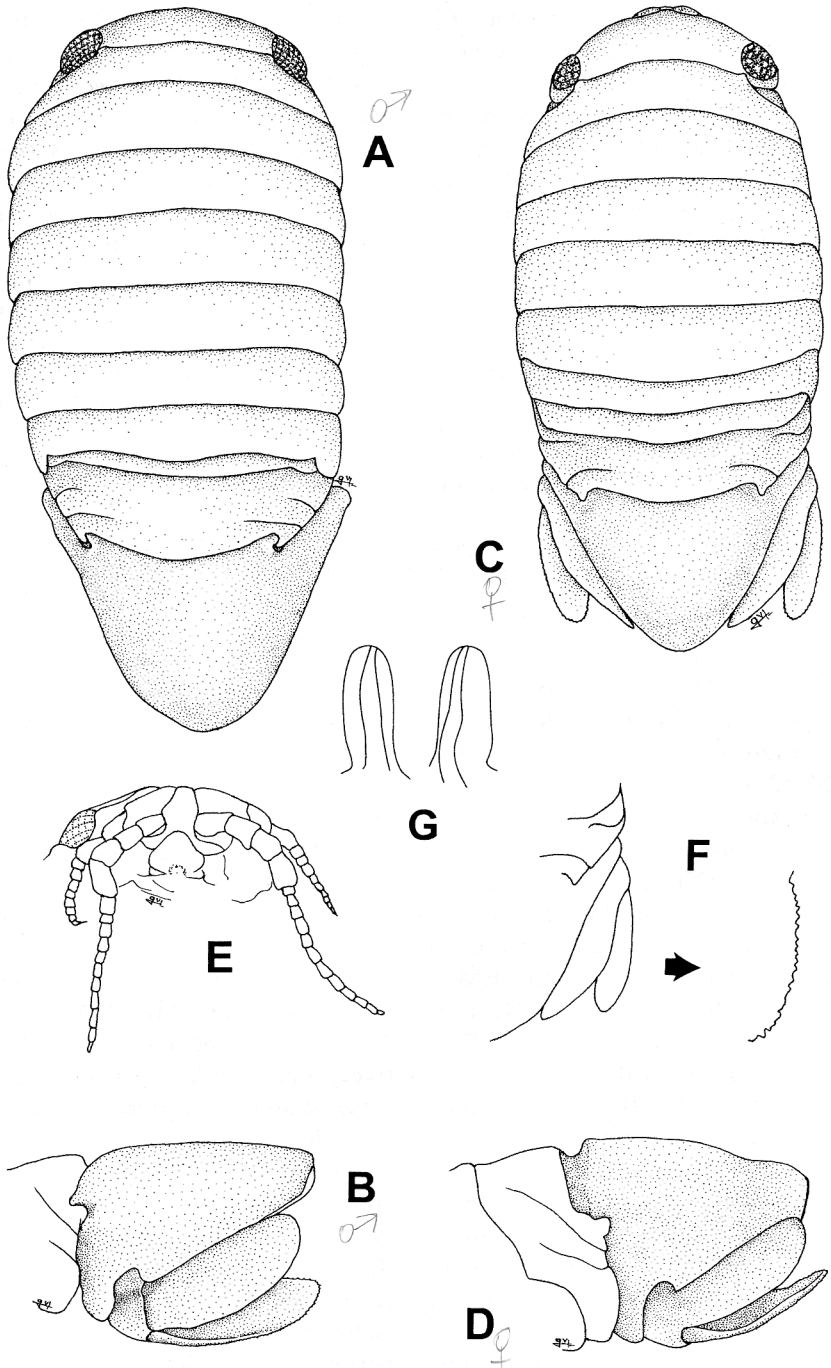

Fig. 1. *Exosphaeroma bruscai,* new species. A, Holotype, male, dorsal view (EMU-4745); B, pleotelson, male, lateral view; C, Paratype, female, dorsal view (EMU-5357); D, pleotelson, female, lateral view; E, cephalon, male, ventral view; F, uropods, dorsal view, detail; G, penes, male.

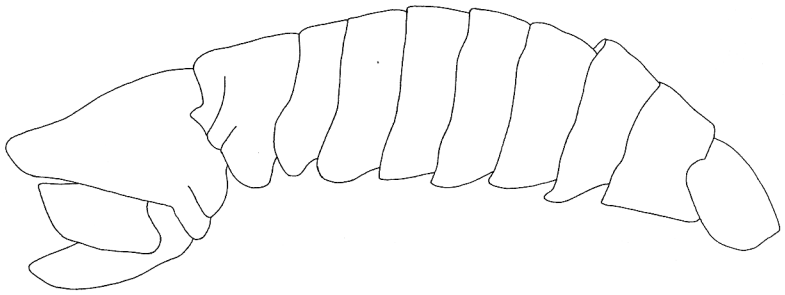

Fig. 2. *Exosphaeroma bruscai,* new species, male holotype (EMU-4745). Schematic drawing of body in lateral view; appendages not ilustrated.

sent on articles as illustrated. Pereopods 2–3 similar, 3rd slightly longer than 2nd. Pereopod 3 (Fig. 4B) merus slightly longer than half ischium length; ischium with 5 spines near superior distal angle and 1 shorter proximal spine; merus with 6 spines at superior distal angle; carpus subcylindrical, similar in length to merus; propodus shorter than ischium; dactylus about half length of propodus, with 1 subterminal spine on the lower margin; composed spines, spines, scales and serrate scales present on articles as illustrated. Pereopod 7 (Fig. 4C) longer and more slender than pereopods 1–3; merus with 4 spines at superior distal angle; carpus distal margin with 2 inferior and a row of 5 superior serrated spines; propodus with 1 bifid spine and 1 subterminal serrate seta at superior angle; composed spines, spines and scales present on joints as illustrated. Pereopods 5–6 similar in shape and spination to pereopod 7; these pereopods slightly increasing in size from 5th to 7th.

Penes not fused, about twice as long as basal width (Fig. 1G).

Pleopods 1–3 (Fig. 5A–C) endopod and exopod with long, plumose marginal setae on pleopods as follows (endopod and exopod): pleopod 1, 16 and 26; pleopod 2, 18 and 27; pleopod 3, 13 and 30; protopod with 3 coupling spines. Distal margin of pleopod 1 exopod slightly curved; endopod triangular. Appendix masculina of pleopod 2 elongate, slender, distally minutely serrate and curving, tip rounded, overreaching endopod of pleopod 2 by about half length of the latter. Pleopod 3 as illustrated. Exopod of pleopods 3–5 with complete transverse suture. Pleopod 4 (Fig. 5D) endopod with distinct thickened ridges, 3 short plumose marginal setae on ventral margin of exopod and 1 on endopod; a row of short non-plumose setae on the inner margin of exopod. Pleopod 5 (Fig. 5E) endopod with distinct thickened ridges, a row of short, non-plumose setae on inner margin of exopod and 6 similar setae near ventral margin of endopod; exopod with a deep cleft along inner margin, and 5 small lobes with scales close to inner distal and ventral margins.

Uropod exopods of similar length, endopod slightly longer and acute, exopod with rounded tip.

Female.—Body ovate, about twice as long as wide. Pleotelson slightly more inflated than in male, with a weak depression near posterior margin. All characters, including all pereopods, very similar to male.

Etymology.—This species is named for Richard C. Brusca, from the BIOSPHERE-2 Center, Tucson, Arizona, in recognition of his contibution to knowledge of the Isopoda, and for his support of our work.

Habitat.—In the eastern Pacific, previous records of *Exosphaeroma* are usually from sandy beaches. On Panamanian beaches, the species was collected in substrate composed of quartz sand, fine sand and calcareous shell fragments (Dexter 1972). Ríos & Ramos (1990) recorded specimens from sandy beaches of Colombia. *Exosphaeroma*

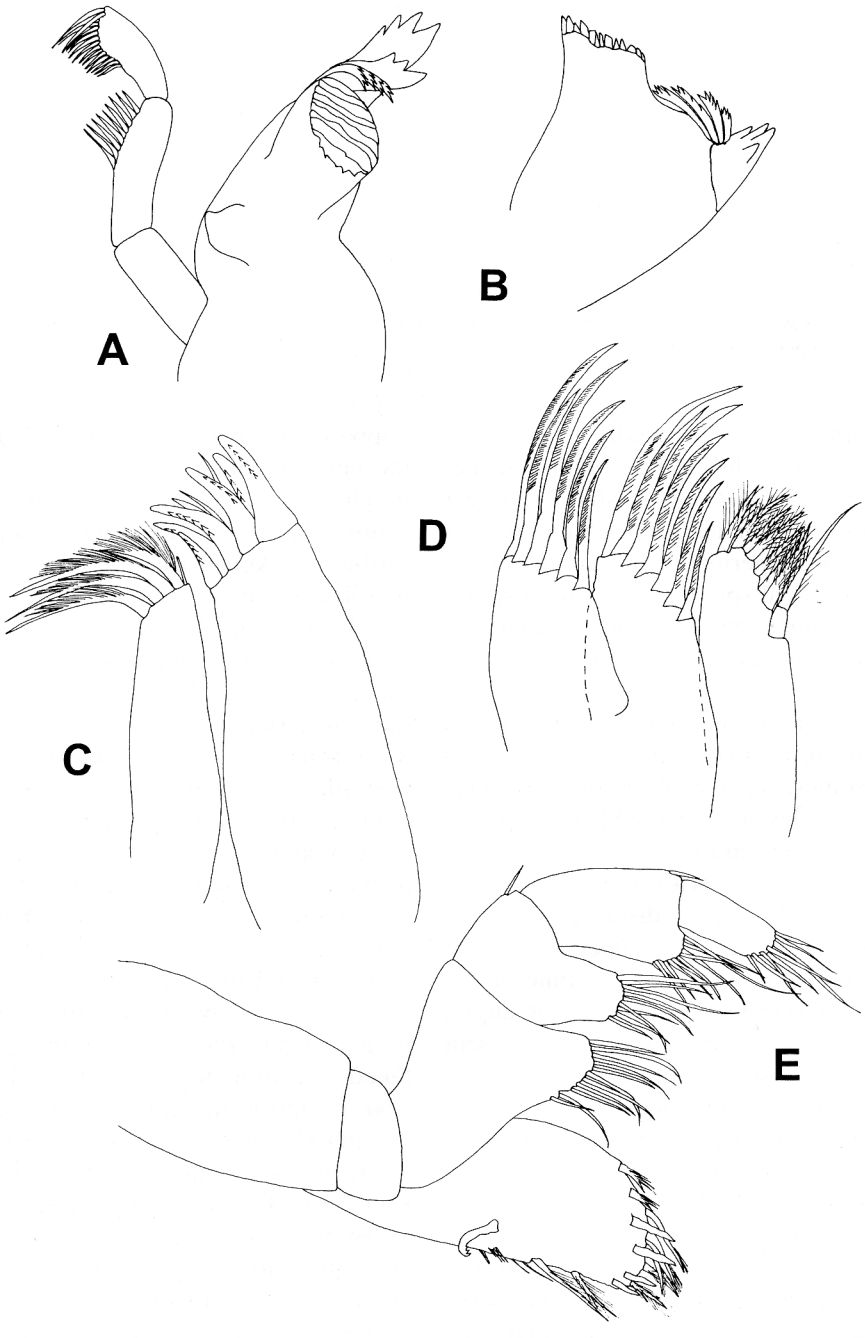

Fig. 3. *Exosphaeroma bruscai,* new species, male holotype (EMU-4745). A, left mandible; B, right mandible; C, right maxilulla; D, right maxilla; E, right maxilliped.

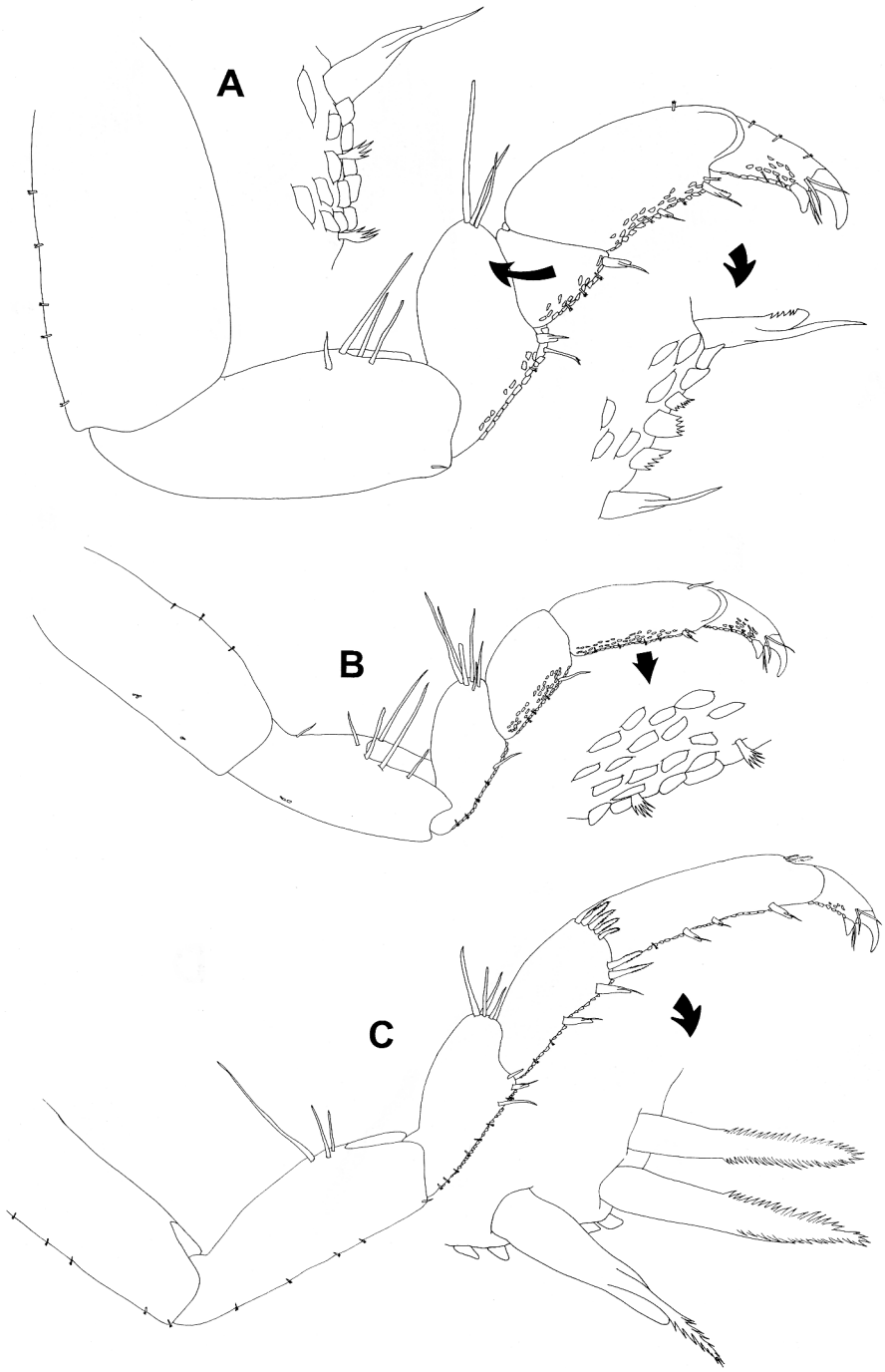

Fig. 4. *Exosphaeroma bruscai,* new species, male holotype (EMU-4745). A, right pereopod 1; B, right pereopod 3; C, right pereopod 7.

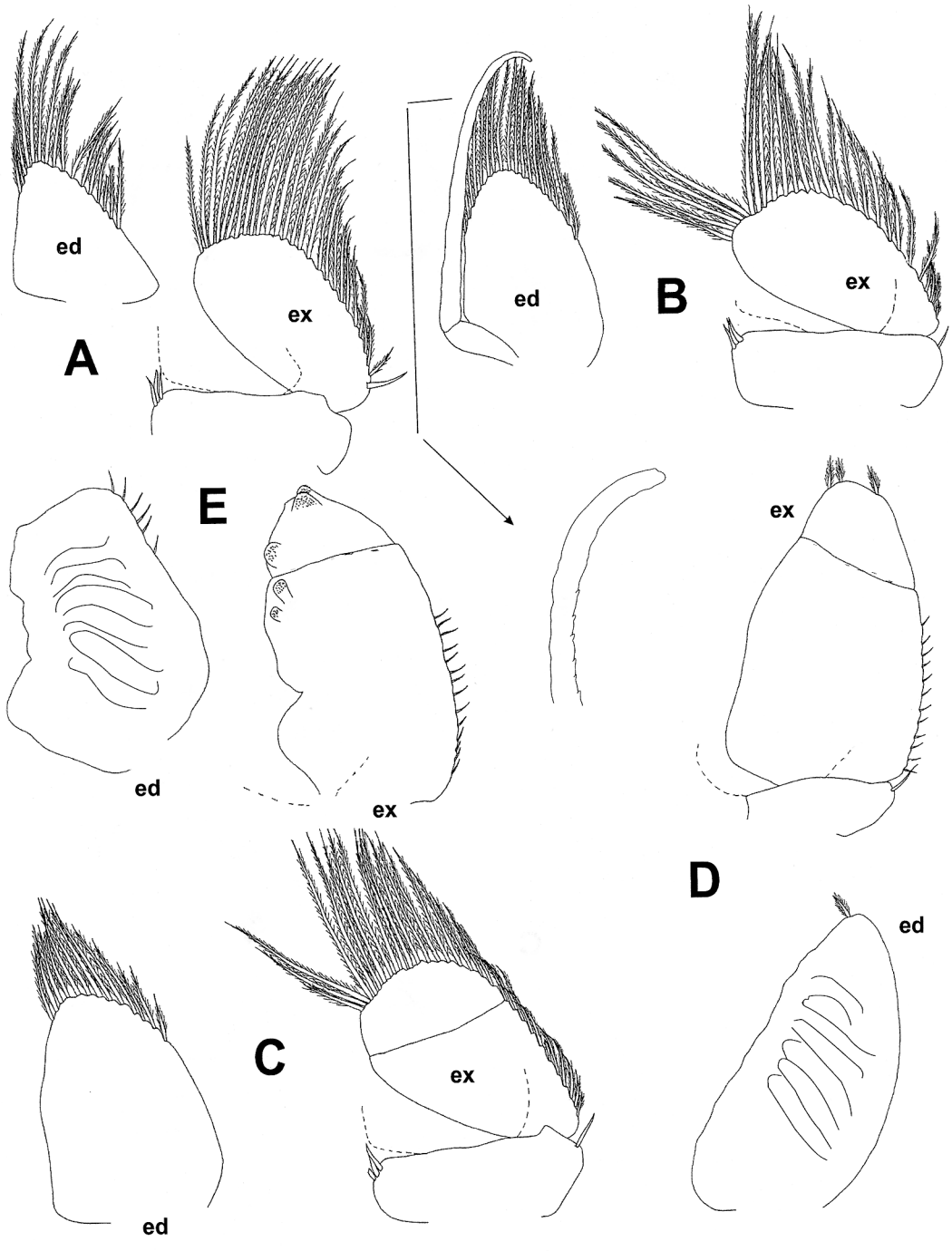

Fig. 5. *Exosphaeroma bruscai,* new species, male holotype (EMU-4745). A, right pleopod 1; B, right pleopod 2; C, right pleopod 3; D, right pleopod 4; E, right pleopod 5 (ed = endopod; ex = exopod).

has also been registered in gravels, off mangrove lagoons in Costa Rica (Brusca & Iverson 1985). In the Gulf of California, Mexico, *Exosphaeroma* has been taken under shell fragments on sandy stretches of tidal flats (Brusca & Iverson 1985). Records for *E. bruscai* are from algae on rocky beaches from intertidal zone to at least 3 m; environmental data available at the time of sampling indicate epibenthic temperature range from 20.3 to 28.0°C.

Although it seems reasonable to assume that all specimens of *Exosphaeroma* previously reported from the region belong to *E. bruscai,* the habitat of specimens described here differs from the typical sandy beach habitat reported previously by Dexter (1974, 1979) and Brusca & Iverson (1985). Furthermore, three species of *Exosphaeroma* from the Caribbean are known from sand (*E. diminuta*) or from algae on rocks (*E. alba* Menzies & Glynn, 1968 and *E. productatelson* Menzies & Glynn, 1968), but none has been reported from both habitats (Kensley & Schotte 1989). Although we believe that previous reports of *Exosphaeroma* from Panama, Costa Rica and Colombia correspond to *E. bruscai,* a comparison of specimens from these localities to type specimens of *E. bruscai* is desirable.

Distribution.—The species is known with certainty from Sonora (27°56.5′N, 111°05.5′W) to Los Arcos (Banderas Bay), Jalisco, on the east coast of the Gulf of California, and from La Paz, South Baja California. It is also known from the west coast of Costa Rica to Colombia.

Remarks.—The type species of *Exosphaeroma, Sphaeroma gigas* Leach, 1818, was recently redescribed (Brandt & Wägele 1989). *Exosphaeroma bruscai* expresses the typical generic characters considered by Brandt & Wägele (1989), in particular the ridges or folds of pleopods 4 and 5, and the two posteriorly directed submedian flat lobes on pleonite 1 (see Bruce 1994). *Exosphaeroma bruscai* is very similar to *E. diminuta* which occurs in the western Atlantic and with which is was originally confused. The illustration of the dorsal habitus provided by Brusca & Iverson (1985: fig. 10, B) differs somewhat from our specimens; the Costa Rica specimens have an anteriorly inflated pleon, a character not so clearly marked in our specimens. This may be due to overshading of the original illustration, as demonstrated by the lateral view of the same pleon (Brusca & Iverson, 1985: fig. 10 D) provided by these authors, which is much more similar to our illustration (see Fig. 1). Comparison of original illustrations of *E. diminuta* by Menzies & Frankenberg (1966) with the new species show the following variations: antenna and antennula are similar in size in *E. diminuta,* while the antenna of *E. bruscai* is almost twice as long as the antennula; the rostrum is rounded in *E. diminuta,* acute in *E. bruscai;* endopod of first pleopod is triangular in *E. bruscai,* narrowly oval in *E. diminuta;* a transverse suture is present on exopod of pereopods 3–5 in *E. bruscai,* present only on pereopod 4 in *E. diminuta;* appendix masculina slender, much longer than pleopod 2 endopod in *E. bruscai,* stouter, just reaching apex of the endopod in *E. diminuta;* distal 2 articles of maxilliped palp slender in *E. diminuta.* According to Menzies & Frankenberg (1966: fig. 21 B), clypeus of *E. diminuta* is almost rectangular but it is figured by Kensley & Schotte (1989: fig. 100 H) as being widest in middle length, as in *E. bruscai.*

Exosphaeroma bruscai also differs from other American species of *Exosphaeroma* reported by Kensley & Schotte (1989). *Exosphaeroma alba* has a notched, and *E. yucatanum* (Richardson, 1901) a trilobate, margin of the posterior pleotelson; the pleotelson of *E. antillense* Richardson, 1912 bears two rounded submedial tubercles; *E. productatelson,* features broad lateral patches of pigment on pleotelson, not observed on any specimen of *E. bruscai.*

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