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ORIGINAL ARTICLE

Species of *Excorallana* (Isopoda, Corallanidae) from northern and northeastern Brazil, with description of a new species, *Excorallana lemoscastroi* sp. nov.

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ABSTRACT

Several Brazilian specimens of the genus *Excorallana* Stebbing, 1904, were revised based on material deposited in the carcinological collection of the Museu de Oceanografia Prof. Petrônio Alves Coelho, Universidade Federal de Pernambuco, Recife, Brazil. The material examined was collected during oceanographic expeditions off northern and northeastern Brazil between 1965 and 2000. Seven species were identified: *Excorallana bicornis* Lemos de Castro & Lima, 1971; *Excorallana costata* Lemos de Castro, 1960; *Excorallana oculata* (Hansen, 1890); *Excorallana richardsoni* Lemos de Castro, 1960; *Excorallana subtilis* (Hansen, 1890); *Excorallana warmingii* (Hansen, 1890); and a putative new species, *Excorallana lemoscastroi* sp. nov. The new species was found in Paraíba and Pernambuco and shares characters with *Excorallana antillensis* (Hansen, 1890), in having the head and pereon unornamented; the pleon with tubercles; and the pleotelson triangular, with a lateral incision and with four tubercles on the anterior margin. However, the two species differ in the head size, length of the antenna, shape of the frontal lamina, and number and arrangement of tubercles on the pleon.

KEY WORDS

Benthic isopod, identification key, marine species, new taxon, south Atlantic.

INTRODUCTION

The members of the genus *Excorallana* Stebbing, 1904 (family Corallanidae) are marine isopods found on the Atlantic and Pacific coasts of the Americas (Lemos de Castro and Lima, 1971; Delaney, 1984; 1989). Eleven of the 25 described species are found in Brazilian waters (Pires-Vanin, 1998): *Excorallana acuticauda* Miers, 1881; *Excorallana angusta* Lemos de

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Castro, 1960; *Excorallana bicornis* Lemos de Castro & Lima, 1971; *Excorallana costata* Lemos de Castro, 1960; *Excorallana longicornis* Lemos de Castro, 1960; *Excorallana oculata* (Hansen, 1890); *Excorallana quadricornis* (Hansen, 1890); *Excorallana richardsoni* Lemos de Castro, 1960; *Excorallana stebbingi* Lemos de Castro & Lima, 1976; *Excorallana subtilis* (Hansen, 1890); and *Excorallana warmingii* (Hansen, 1890).

Study of the material of *Excorallana* in the collection of the Museu de Oceanografia Prof. Petrônio Alves Coelho yielded new records from northern and northeastern Brazil, as well as the new species described herein.

Material and Methods

Material. The specimens examined were collected by the following ships and expeditions along the northern and northeastern coast of Brazil: Akaroa (1965–1969); R/V *Almirante Saldanha* (1968); NHi Canopus (1965); Geomar (1968–1971); Itamaracá (1969–1972); Paraíba (1968–1971); Pernambuco (1968–1971); Recife (1966–1967); REVIZEE–NE I, II, III, IV (1995–2000) (Evaluation of the Sustainable Potential of Living Resources in the Exclusive Economic Zone Program - Northeast Score).

Identification and illustrations. The specimens were observed under a stereomicroscope fitted with a *camera lucida*, and the drawn specimens were stained with chlorazol black, dissected, and mounted in glycerin-gelatin slides. Digital illustrations were made according to Coleman (2003). The type material is deposited in the Crustacea collection of the Museu de Oceanografia Prof. Petrônio Alves Coelho da Universidade Federal de Pernambuco, Recife, Brazil (MOUFPE).

The terminology follows Delaney (1984) and Watling (1989). In "material examined", the term "sex undefined" is used when it was not possible to observe the male appendage on pleopod 2, due to poor preservation or because the individual was a manca. Diagnoses are given for previously described species. In the geographic distribution, the new records are in bold.

The following abbreviations were used in the text and figures: An, antennula; Ant, antenna; Hb, habitus; mHb, male habitus; fHb, female habitus; FL, frontal lamina; Md, mandible; Mx, maxilla; Mxp, maxilliped; P, pereopod; U, uropod; Pt, pleotelson; d, dorsal view; l, lateral view. Oceanographic campaigns: AKA, Akaroa; AS, Almirante Saldanha; CAN, Canopus; GM, Geomar; ITA, Itamaracá; NE, Nordeste; PB, Paraíba; PE, Pernambuco; REC, Recife; REVIZEE, Evaluation of the Sustainable Potential of Living Resources in the Exclusive Economic Zone Program - Northeast Score.

Systematics

Order Isopoda Latreille, 1817

Suborder Cymothoida Wägele, 1989

Superfamily Cymothoidea Leach, 1814

Family Corallanidae Hansen, 1890

***Excorallana* Stebbing, 1904**

Excorallana bicornis
Lemos de Castro & Lima, 1971
(Figs. 1, 2)

Excorallana bicornis Lemos de Castro and Lima, 1971: 136, figs. 1–14. – Pires-Vanin, 1998: 611.

Material examined. 1 adult male (MOUFPE 15.138), AS #2017, Amapá, 3°56'00"N 50°00'07"W, 81 m depth. 1 adult male, 5 females (2 adults and 3 ovigerous), 34 juveniles (undefined sex) (MOUFPE 976), GM 189, Amapá, 3°50'00"N 49°55'0"W, 69 m depth. 1 adult male and 1 adult female (MOUFPE 873), GM 22, Pará, 00°00'00"N 45°37'00"W, 65 m depth. 3 males (2 adults and 1 juvenile), 32 females (23 adults, 8 juveniles, 1 ovigerous) (MOUFPE 876), GM 28, Pará, 00°20'00"N 46°03'05"W, 51 m depth. 2 adult males (MOUFPE 874), AS # 1729, Ceará, 2°10'30"S 41°27'00"W, 82 m depth. 1 adult male, 1 adult female (MOUFPE 872), AS # 1731 A, Ceará, 2°30'00"S 41°51"00"W, 25 m depth. 2 adult males, 5 females (1 adult, 1 ovigerous, 3 juveniles) (MOUFPE 871), AS 1773A, Ceará, 2°40'30"N 48°03"W, 103 m depth. 4 adult males, 12 females (11 adults, 1 juvenile) (MOUFPE 870), PB# 32 II, Paraíba, 7°39'30"S 034°47'30"W, 76 m depth. 1 adult female (MOUFPE 869), Recife 108, Pernambuco, 7°59'00"S 34°43'07"W, 29 m depth. 1 adult male (MOUFPE 875), Candeias PE, Pernambuco, 08°06'46"S 35°00'53"W.

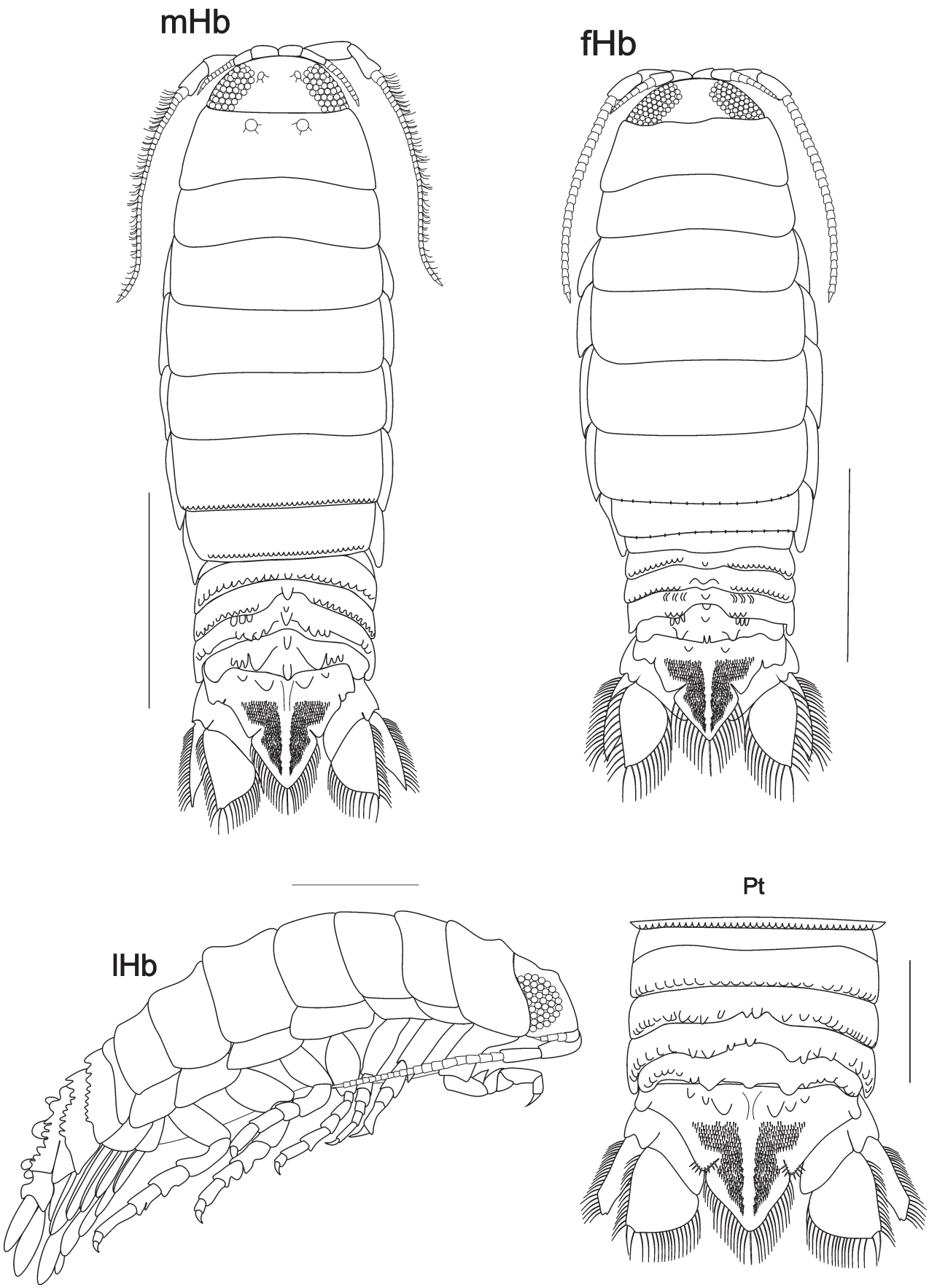

Figure 1. *Excorallana bicornis* Lemos de Castro and Lima, 1971. (MOUFPE 874), habitus of male and female. Scale = 5 mm. (MOUFPE 870), lateral view of female with variation. (MOUFPE 876), pleotelson of female with variation. Scales = 2 mm.

Figure 2. Distribution of *Excorallana bicornis* Lemos de Castro and Lima, 1971 for Brazilian waters.

Diagnosis [modified from Lemos de Castro and Lima (1971)]. Body approximately 3x as long as wide. Head with medium sized eyes, distinctly separated, with two dorsal tubercles situated between eyes. Frontal lamina 2.5x longer than wide, lateral margins almost parallel, apex rounded (Fig. 17). Antennular peduncle with article 1 not dilated. Antenna reaching pereonite 3. Pereonite 1 with two dorsal tubercles more developed than head, near anterior margin. Pleonites with longitudinal lines of small tubercles and deep median longitudinal groove. Pleotelson triangular with lateral incisions and four tubercles on anterior margin. Uropods and pleotelson margins heavily coated with long setae.

Remarks. This species has marked sexual dimorphism. Important variations were found in the material examined. According to Lemos de Castro and Lima (1971), males have two tubercles on the head and two on the pereonite 1, while the female is devoid of tubercles. However, similarly to males, some females examined had two tubercles on the head and two on the pereonite 1, but less developed (females showing male characteristics: MOUFPE 876 – 9 females, MOUFPE 871 – 2 females, MOUFPE 976 – 5 females). Furthermore, according to Lemos de Castro and Lima (1971), males have more tubercles on the pleon than the females, but the same female specimens cited above had tubercles, as in the males (Fig. 1).

Geographic distribution. Brazil: **Amapá**, Pará, Ceará, Paraíba, Pernambuco (Lemos de Castro e Brasil Lima, 1971; Pires-Vanin, 1998; this study) (Fig. 2).

Depth range. 25–103 m.

***Excorallana costata* Lemos de Castro, 1960**
(Figs. 3, 4)

Excorallana costata Lemos de Castro, 1960: 66, figs. 28–37. – Carvacho and Yañez, 1971: 130. – Coelho and Koening, 1972: 253. – Delaney, 1984: 3. – Delaney 1989: 6. – Pires-Vanin, 1998: 611. – Campos, 2003: 84.

Material examined. 1 sex undefined (MOUFPE 975), AS#1857, Amapá, 3°35'00"S 37°57'00"W, 49 m depth. 6 sex undefined (MOUFPE 877), AS# 2017, Amapá, 3°56'00"N 50°00'07"W, 81 m depth. 1 sex undefined (MOUFPE 940), GM 188, Amapá, 3°57'00"N 50°01'00"W, 87 m depth. (MOUFPE 951), AS# 1793 A, Amapá, 4°29'05N 50°12'W, 140 m depth. 2 sex undefined (MOUFPE 958), GM 208,

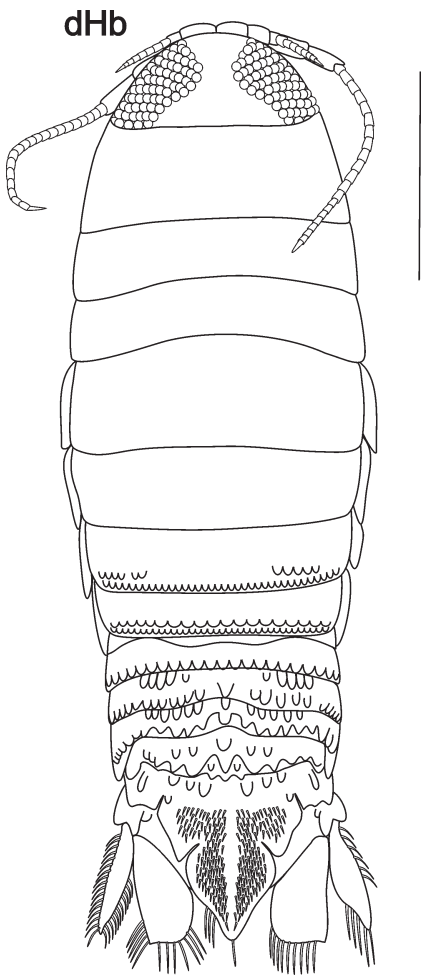

Figure 3. *Excorallana costata* Lemos de Castro, 1960. Male, 12 mm. (MOUFPE 957), habitus and frontal lamina. Scale = 2 mm .

Figure 4. Distribution of *Excorallana costata* Lemos de Castro, 1960 for Brazilian waters.

Amapá, 4°52'00"N 50°31'05"W, 113 m depth. 1 sex undefined (MOUFPE 974), AS# 1754, Pará, 0°06'00"S 45°50'00"W, 114 m depth. 1 sex undefined (MOUFPE 961), AS#1762 A, Pará, 0°13'00"N 46°55'00"W, 36 m depth. 3 females (2 adults, 1 juvenile), 1 sex undefined (MOUFPE 952), GM 21, Pará, 0°14'05"N 45°04'02"W, 73 m depth. 3 sex undefined (MOUFPE 944), AS# 2467, Pará, 0°52'05"N 47°16'00"W, 43 m depth. 11 females (2 adults, 9 juveniles), 1 sex undefined (MOUFPE 971), GM 2529, Pará, 1°02>00"N 47°11'05"W, 40 m depth. 1 adult female (drawn) (MOUFPE 957), AS# 1767, Pará, 1°32'30"N 47°24'30"W, 63 m depth. 1 adult female (MOUFPE 942), AS# 1722, Ceará, 2°13'30"S 40°43'30"W, 54 m depth. 1 sex undefined (MOUFPE 956), AS#1773, Ceará, 2°40'30"N 48°03'00"W, 103 m depth. 1 adult male (MOUFPE 950), CAN 32, Ceará, 2°52'05"N 38°49'00"W, 72 m depth. 1 adult female (MOUFPE 991), AS#1999, Ceará, 2°57'00"N 49°04'00"W. 6 females (4 adults, 2 juveniles), 4 sex undefined (MOUFPE 969), GM II 116, Ceará, 2°57'05"N 48°45'00"W. 1 sex undefined (MOUFPE 960), GM II 2413, Ceará, 4°18'08"N 40°43'30"W, 88 m depth. 1 sex undefined(MOUFPE 962), PE30 A, Pernambuco, 7°45'00"S 34°43'05"W, 19 m depth. 1 sex undefined (MOUFPE 963), REC 126, Pernambuco, 8°04'08"S 34°47'02"W, 22 m depth. 16 females (15 adults, 1 ovigerous) and 30 sex undefined (MOUFPE 973), SUAPE # 02, Pernambuco, 8°09'01"S 34°50'07"W, 18 m depth. 1 adult female (MOUFPE 943), REC 117, 8°13'07"S 34°51'03"W, 23.5 m depth. 1 sex undefined (MOUFPE 948), ITA 80, Pernambuco, 7°38'58"S 34°49'00"W. 1 sex undefined (MOUFPE 967), ITA 79, Pernambuco, 7°38'58"S, 34°49'00"W, 0.5 m depth. 2 juvenile females (MOUFPE 955), ITA 73, Pernambuco, 7°41'12"S 34°48'18"W, 3.75 m depth. 1 adult female (MOUFPE 945), ITA 45, Pernambuco, 7°43'34"S 34°49'06"W, 2.1 m depth. 3 sex undefined (MOUFPE 954), PE 29 B, 7°44'00"S 34°46'07"W, 14 m depth. 2 adult females, 1 sex undefined (MOUFPE 964), PE 29 A, Pernambuco, 7°45'00"S 34°46'08"W, 15 m depth. 4 juvenile females (MOUFPE 970), ITA 16 A, Pernambuco, 7°51'00"S 34°49'00"W, 3.9 m depth. 1 adult female (MOUFPE 946), CAN 7, Pernambuco, 8°06'46"S 35°00'53"W, 35 m depth. 1 sex undefined (MOUFPE 13.232), NE III 53/ 2° P, Pernambuco, 8°08'05"S 34°49'07"W, 19.5 m depth. 1 adult male (MOUFPE 953), CAN 8, Pernambuco, 8°15'02"S 34°50'00"W, 27 m depth. 1 sex undefined (MOUFPE 968), REC 111, Pernambuco, 8°16'02"S 34°51'08"W, 25 m depth. 1 sex undefined (MOUFPE 972), Recife 144, Pernambuco, 8°20'09"S 34°48'03"W, 33.5 m depth.

Diagnosis [modified from Lemos de Castro (1960)]. Head without tubercles, with large eyes, almost continuous in the midline of the head. Antennular peduncle with article 1 not dilated. Antenna reaching pereonite 2. Frontal lamina bell-shaped, narrower at middle (Fig. 17). Pereonites 1–5 smooth dorsally, 6 and 7 with double line of tubercles on posterior margin. Pleonite 1 smooth dorsally. Pleonites 2–5 with two transversal lines of tubercles. Pleonite 3 with carina, median longitudinal groove bearing tubercle. Pleotelson triangular, with six tubercles on anterior margin and two lateral incisions. Uropods margins heavily coated with long setae, reaching apex of pleotelson.

Geographic distribution. Brazil: **Amapá**, **Pará**, Maranhão, **Ceará**, Rio Grande do Norte, **Pernambuco**, Espírito Santo, Rio de Janeiro, São Paulo (Lemos de Castro, 1960; Coelho and Koening, 1972; this study) (Fig. 4).

Depth range. 0.5–140 m.

***Excorallana lemoscastroi* sp. nov.**
(Figs. 5–8)

Etymology. In honor of the late Dr. Alceu Lemos de Castro, for his great contribution on the taxonomic studies of the isopods from the Brazilian coast.

Type locality. Brazil, Paraíba (7°39'30"S 34°47'30"W).

Material examined. Holotype: ovigerous female (MOUFPE 870), PB #32 II, Paraíba, 7°39'30"S 34°47'30"W, 76 m depth. Paratype: 1 specimen, sex undefined due to damaged pleopods (MOUFPE 118), Pernambuco, Itamaracá Island, Forte Orange, in coastal sandstone reefs, 7°47'30"S 34°49'27"W.

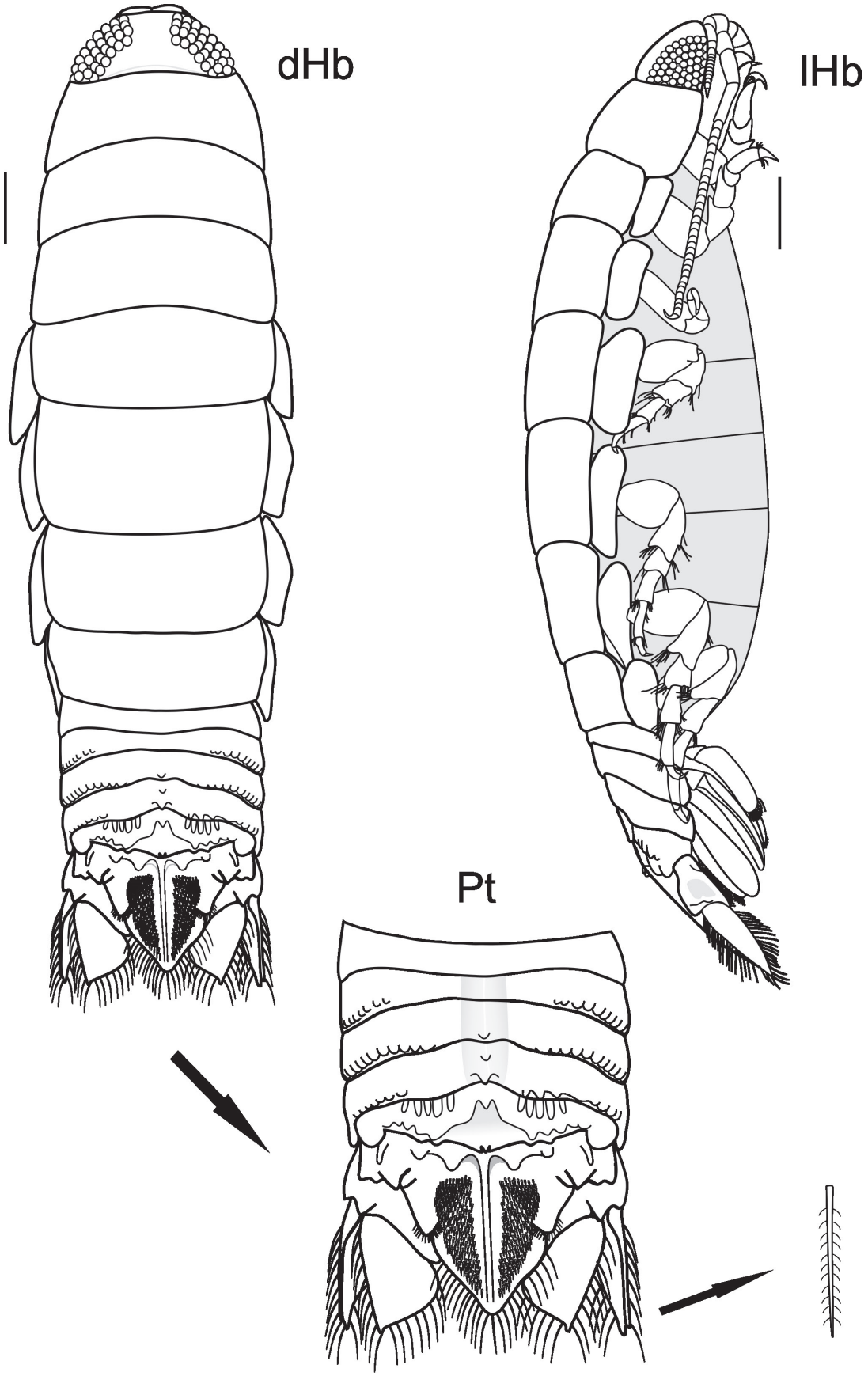

Figure 5. *Excorallana lemoscastroi* sp. nov., holotype, ovigerous female, 22 mm. (MOUFPE 870), habitus, lateral view and pleotelson detail. Scale = 1 mm.

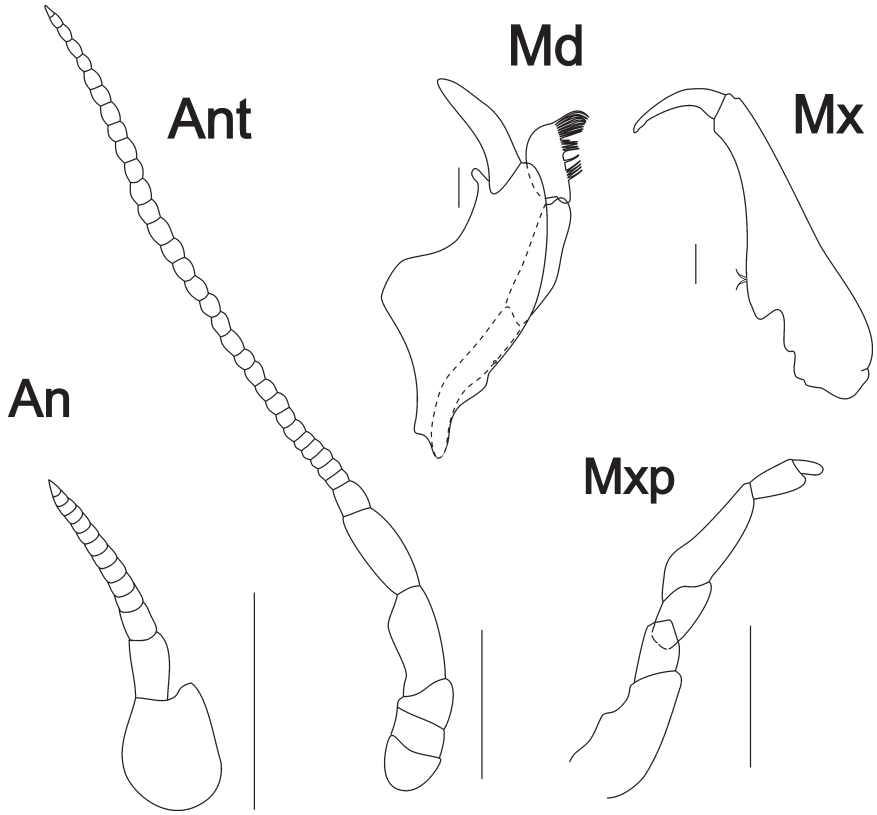

Figure 6. *Excorallana lemoscastroi* sp. nov., paratype male, 10 mm, (MOUFPE 118), antennula, antenna and mouthparts. Scale = 1 mm.

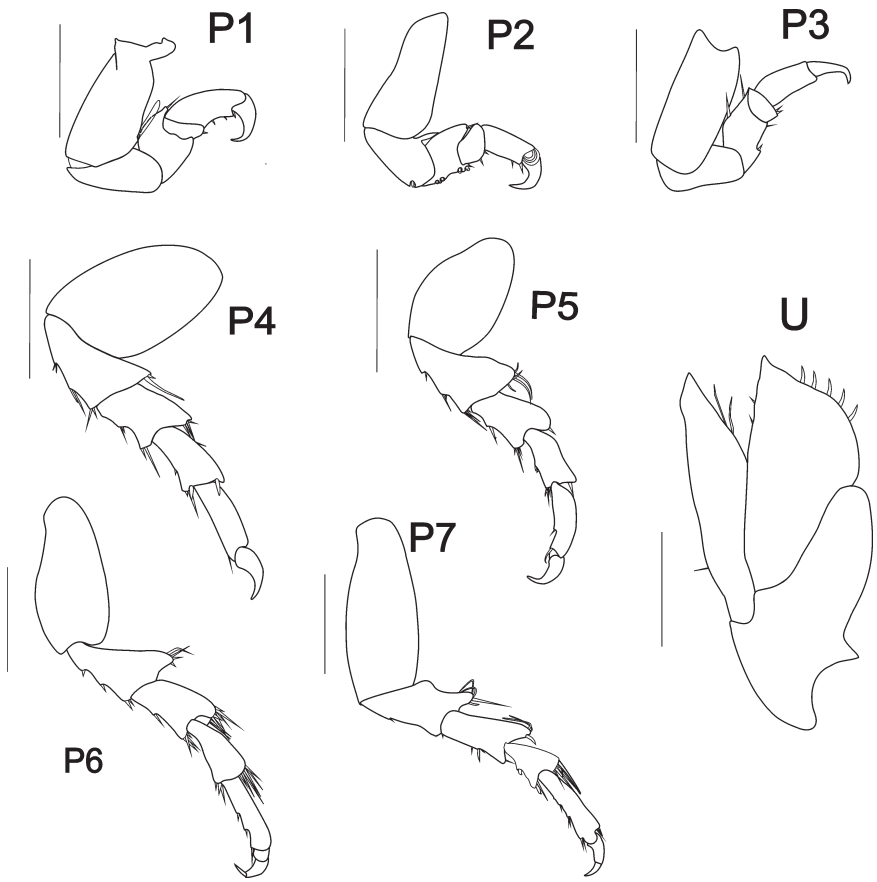

Figure 7. *Excorallana lemoscastroi* sp. nov., paratype male, 10 mm, (MOUFPE 118), pereopods and uropod. Scale = 1 mm.

Figure 8. Distribution of *Excorallana lemoscastroi* sp. nov. for Brazilian waters.

Diagnosis. Head without tubercles, with small eyes. Antennular peduncle with article 1 not dilated. Antenna reaching pereonite 4. Frontal lamina 3x longer than wide, narrower in the middle, apex rounded (Fig. 17). Pereon dorsally smooth. Pleonites 2–4 with tubercles on posterior margin. Pleonite 3 with one median tubercle; pleonite 4 with two median tubercles. Pleonite 5 with two groups (5-5) of small carinae on anterior margin; posterior margin with six tubercles, in two groups (3-3) and one median tubercle. Pleotelson triangular with rounded apex and lateral incision, four tubercles on anterior margin arranged in two groups (2-2). Uropods slightly surpassing apex of pleotelson; margins covered with plumose setae.

Description (based on female, 22 mm, MOUFPE 870). Head 0.4x wider than long; small eyes. Antennular peduncle 3-articulated, article 1 not dilated; flagellum 10-articulated. Antenna reaching pereonite 4; peduncle 5-articulated; flagellum with 31 articles. Frontal lamina 1.6x longer than wide, narrower in the middle, apex rounded. Maxilla 1 forming large recurved spine; inner lobe simple, with slightly bulbous end. Maxilliped composed of seven articles, with third article of palp approximately 2.5x longer than wide. Mandible with elongated incisor process, slightly curved.

Pereon dorsally smooth. Pereopod 1 with basis moderately inflated, 1.7x longer than wide; ischium smooth, approximately 2.2x longer than wide; merus almost as long as wide, posterodistal angle with one simple seta; carpus 2.6x wider than long, anterior margin with one small simple seta; propodus with anterior margin bearing two small simple setae, and one simple seta on anterodistal angle; dactylus robust, hook-shaped, about 2.5x longer than wide. Pereopod 2 with basis moderately inflated, 2.1x longer than wide; ischium 1.9x longer than wide, with one small, robust setae on anterodistal angle; merus 1.2x longer than wide, anterior margin with two groups of robust setae (2-2), posterodistal angle with two simple setae, anterodistal angle with one simple seta; carpus anterior margin with two small simple setae; propodus 2.1x longer than wide, anterior margin with one small simple seta, anterodistal angle with one simple seta; dactylus moderately curved, about 2.4x longer than wide. Pereopod 3 with basis smooth, 2.3x longer than wide; ischium smooth, about 2x longer than wide; merus 1.4x longer than wide, anterior margin with two simple setae, posterior margin with two long simple setae; carpus 0.5x wider than long, anterodistal angle with two small simple setae; propodus 2.1x longer than wide, smooth; dactylus 2.8x longer than wide,

smooth, moderately curved. Pereopod 4 with basis ovate, 1.7x longer than wide; ischium 1.3x longer than wide, anterior margin with two groups of simple setae (2-2), anterodistal angle with two simple setae and posterodistal angle with two simple (one short and other long) setae; merus almost as long as wide, anterior margin with two simple setae, anterodistal angle with two simple (one short and other long) setae, posterodistal angle with four simple setae; carpus 1.7x longer than wide, anterior and posterior margin with one small simple seta, anterodistal angle with three (one robust and two simple) setae, posterodistal angle with one simple seta; propodus 4.5x longer than wide, one seta close to anterodistal angle; dactylus moderately curved, approximately 2.4x longer than wide. Pereopod 5 with basis moderately ovate, 1.6x longer than wide, smooth; ischium approximately 2.6x longer than wide, anterior margin with two groups of simple setae (1-2), anterodistal angle with three simple setae, posterodistal angle with five (three short and two long) simple setae; carpus with anterior margin bearing two simple setae; propodus 3x longer than wide, anterior margin with one simple seta, anterodistal angle with four simple seta, one long and three short; dactylus moderately curved, about 3.3x longer than wide, narrower than ischium. Pereopod 6 with basis ovate, 2x longer than wide, smooth; ischium about 1.7x longer than wide, anterior margin with two simple setae, anterodistal angle with two simple setae and posterodistal angle with four (two long and two short) simple setae; merus 1.4x longer than wide, one anterior simple seta, anterodistal angle with four (one short and three long) setae, posterodistal angle with eight (two short robust and six simple) setae; carpus 2.1x longer than wide, anterodistal angle with three (two short and one long) setae, posterodistal angle with six long simple setae; propodus 4x longer than wide, anterior margin with two small simple setae, anterodistal angle with one simple seta; dactylus moderately curved, 2.4x longer than wide, narrower than propodus. Pereopod 7 with basis ovate, 2.5x longer than wide, smooth; ischium about 1.5x longer than wide, anterior margin with one simple seta, anterodistal angle with two small simple setae and posterodistal angle with four (three long and one short) simple setae; merus 2.2x longer than wide, three anterior simple setae, anterodistal angle with one seta, posterodistal angle with three (one robust and two simple) setae; carpus 1.4x longer than wide, anterior margin with one robust seta, anterodistal angle with two (one short and one long) setae, posterodistal angle with five long simple setae; propodus 3.3x longer than wide, anterior margin with three groups of simple setae (1-2), antero and posterodistal angles with two simple setae; dactylus moderately curved about 3.3x longer than wide, less wide than propodus.

Pleonite 1 not visible. Pleonite 2 with tubercles on posterior region. Pleonite 3 with tubercles on posterior margin and one median tubercle. Pleonite 4 with three short carinae on anterior margin; lateral tubercles on posterior margin and two median tubercles. Pereonite 5 with four short carinae on anterior margin; posterior margin with three tubercles on each side of median line and one median tubercle. Pleotelson triangular with rounded apex and lateral incision, four tubercles on anterior margin of pleotelson divided into two groups (2-2). Uropods slightly surpassing apex of pleotelson, margins covered with plumose setae.

Remarks. This species shares some characters with *Excorallana antillensis* (Hansen, 1890) from the Caribbean Sea, but they differ regarding (characters of *E. antillensis* in brackets): (i) the head is 0.4x as wide as long (0.7x as wide as long); (ii) the antenna reaches the pereonite 4 (pereonite 3); (iii) the frontal lamina is 1.6x longer than wide, narrowing in the middle and with a rounded apex (triangular with rounded edges); (iv) pleonite 4 three small carinae (without carinae); (v) pereonite 5 with four short carinae on the anterior margin (without carinae); (vi) endopod and exopod of the uropods acute (rounded); and (vii) pleotelson and uropod margins covered with plumose setae (simple setae).

Geographic distribution. Brazil: Paraíba and Pernambuco (Fig. 8).

Depth. Intertidal to 76 m.

Excorallana oculata (Hansen, 1890)
(Figs. 9, 10)

Corallana oculata Hansen, 1890: 386, fig. 6.
Excorallana oculata. – Richardson, 1905: 152. – Carvacho and Yañez, 1971: 129. – Lemos de Castro and Lima, 1971: 139, fig. 4. – Coelho and Koening, 1972: 253. – Koening, 1972: 241. – Delaney, 1984:

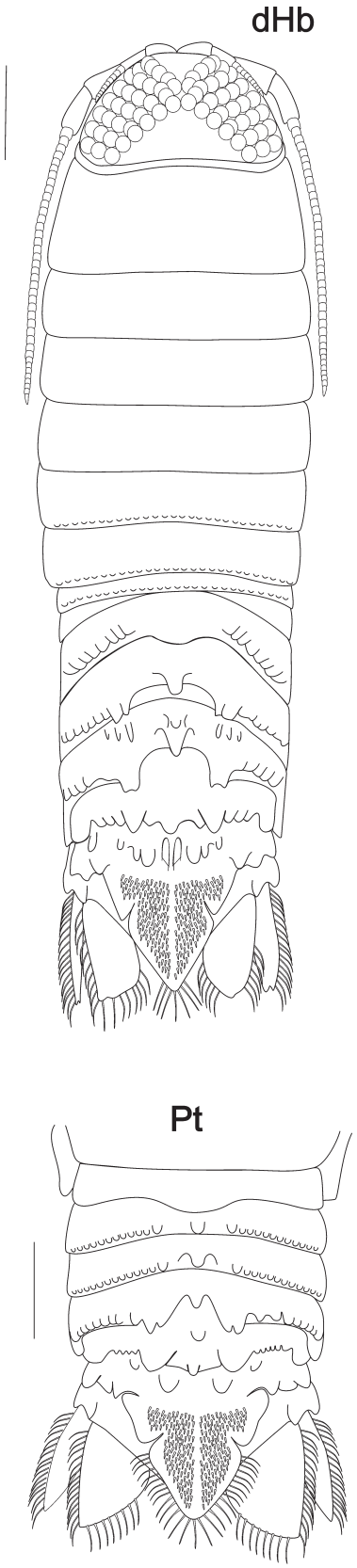

Figure 9. *Excorallana oculata* (Hansen, 1890), male, 15 mm, (MOUFPE 13.339), habitus, pleotelson, with variations about the number of tubercles on the base. Scales = 2 mm.

Figure 10. Distribution of *Excorallana oculata* (Hansen, 1890) for Brazilian waters.

3 and 15. – Guzman *et. al.*, 1988: 77. – Kensley and Schotte, 1989: 163. – Stone and Heard, 1989: 208. – Delaney, 1989: 6. – Pires-Vanin, 1998: 611.

Material examined. 1 adult male, 1 adult female (drawn) (MOUFPE 895), GM 193, Amapá, 03°37'00"N 50°01'00"W, 73 m depth. 4 adult females, 3 sex undefined (MOUFPE 891), GM 189, 03°50'00"N 49°55'00"W, 69 m depth. 1 adult female (MOUFPE 915), AS# 1913, Amapá, 03°59'00"N 49°35'00"W, 102 m depth. 1 sex undefined (MOUFPE 886), GM 22, Pará, 00°00'00"N 45°37'00"W, 65 m depth. 2 adult females (MOUFPE 906), AS# 1804 B, Pará, 00°24'00"N 48°10'00"W, 18 m depth. 1 adult female (MOUFPE 13.308), NE I 3252/ 7° P (REVIZEE), 00°37'05"N 45°40'05"W. 1 sex undefined (MOUFPE 13.341), NE I # 220/ 6°P, Pará, 00°37'05"N 45°38'05"W. 1 adult female (MOUFPE 13.233), NE I # 220/6°P (REVIZEE), Pará, 00°37'05"N 45°38'05"W. 3 adult females (MOUFPE 916), AS#1755, 00°37'30"N 45°38'30"W, 240 m depth. 1 sex undefined (MOUFPE 894), AS 2529, Pará, 01°02'00"N 47°11'05"W, 40 m depth. 1 sex undefined (MOUFPE 13.304), NE III # 93 3ª p REVIZEE ANTARES BENTOS, Pará, 01°37'48"S 38°10'12"W, 70 m depth. 1 adult male (drawn) (MOUFPE 13.339), REVIZEE NE III # 59/2°P, Pará, 01°37'48"S 38°10'12"'W, 22 m depth. 1 adult female (MOUFPE 921), AS# 1701, Pará, 01°57'00"S 37°46'00"W, 55 m depth. 1 sex undefined (MOUFPE 904), AS# 1967, Pará, 01°58'00"S, 37°46'00"W. 1 adult female (MOUFPE 888), AS# 1723, Ceará, 02°00'00"S 41°1'00"W, 82 m depth. 1 adult female (MOUFPE 885), PB 32 II, Paraíba, 07°39'30"S 34°47'00"W, 76 m depth. 1 adult male (MOUFPE 889), Fernando de Noronha, Pernambuco, 03°50'25"S 32° 24'41"W. 1 juvenile female (MOUFPE 887), ITA 74, Pernambuco, 07°41'00"S 34°47'00"W, 5.2 m depth. 1 adult female (MOUFPE 893), ITA 17, Pernambuco, 07°51'00"S 34°49'00"W, 3.9 m depth. 1 sex undefined (MOUFPE 913), REC 126, Pernambuco, 08°04'08"S 34°47'02"W, 22 m depth. 3 sex undefined (MOUFPE 900), CAN 23 BARCO 11, Pernambuco, 08°14'05"S 34°53'04"W, 17.5 m depth. 1 adult female (MOUFPE 896), REC 140, Pernambuco, 08°19'09"S 34°53'05"W, 19 m depth. 1 sex undefined (MOUFPE 920), PE 6B, Pernambuco, 08°40'00"S 35°00'02"W, 19 m depth. 1 sex undefined (MOUFPE 901), REC 125, Pernambuco, 08°04'04"S 34°48'06"W, 18 m depth. 1 sex undefined (MOUFPE 897), REC 89, Pernambuco, 08°05'00"S 34°51'08"W, 9.5 m depth. 1 sex undefined (MOUFPE 911), CAN 80, Pernambuco, 08°09'07"S

34°53'00"W, 12.5 m depth. 1 adult male (MOUFPE 907), REC 97, Pernambuco, 08°16'00"S 34°55'00"W, 11 m depth. 1 adult female (MOUFPE 909), CAN 48, Pernambuco, 08°12'08"S 34°52'03"W, 13.5 m depth. 2 adult females (MOUFPE 910), CAN # 17, Pernambuco, 08°14'05"S, 34°50'06"W, 27 m depth. 1 sex undefined (MOUFPE 152), CAN 19, Pernambuco, 08°16'01"S 34°16'01"W, 23 m depth. 1 adult female (MOUFPE 899), CAN 25, Pernambuco, 8°16'09"S 34°53'07"W, 19.5 m depth. 1 sex undefined (MOUFPE 903), AKA# 49, Alagoas, 9°37'00"S 35°30'40"W, 23 m depth. 1 sex undefined (MOUFPE 902), AKA# 58, Alagoas, 9°46'10"S 35°29'40"W, 41 m depth. 1 adult female (MOUFPE 905), AKA # 59, Alagoas, 9°46'10"S 35°34'40"W, 31 m depth.

Diagnosis [modified from Hansen (1890)]. Head without tubercles, with very large and continuous eyes, except for small anterior area. Frontal lamina approximately 3x longer than wide, narrower in the middle, apex rounded (Fig. 17). Antennular peduncle with article 1 not dilated. Antenna reaching pereonite 3. Pereonites 1–4 dorsally smooth, 5–7 with one line of tubercles on posterior margin. Pleon with longitudinal groove bearing tubercles. Pleonite 1 dorsally smooth. Pleonite 2 with transversal tubercles on posterior margin. Pleonites 3, 4 with double line of small tubercles. Pleotelson triangular, with lateral incision, anterior margin with six tubercles arranged in two groups (3-3) separated by one groove; lateral margins heavily coated with long setae, apex slightly rounded. Uropods margins heavily coated with setae, reaching apex of pleotelson.

Remarks. Two variations were observed regarding the number of tubercles on the pleotelson. According to Hansen (1890), two tubercles are present on the anterior margin of the pleotelson. In the material examined, some specimens had four tubercles, two on each side of the midline, and some had six tubercles, three on each side of the midline. Moreover, some adult specimens of the same size had tubercles that were less developed (Fig. 9).

Geographical distribution. Caribbean Sea: Bahamas, Cuba, Puerto Rico; Barbados; Brazil: **Amapá**, **Pará**, Maranhão, Piauí, **Ceará**, **Paraíba**, **Pernambuco**, **Alagoas**, Bahia, Espírito Santo (Hansen, 1890; Richardson, 1905; Lemos de Castro, 1971; Coelho and Koening, 1972; Koening, 1972; Kensley and Schotte, 1989; this study) (Fig. 10).

Depth range: 39–240 m.

Excorallana richardsoni Lemos de Castro, 1960 (Figs. 11, 12)

Excorallana richardsoni Lemos de Castro, 1960: 64–66, figs. 19–27. – Delaney, 1984: 2, 3, 5 and 15.– Carvacho and Yañez, 1971: 130. – Coelho and Koening, 1972: 253. – Pires-Vanin, 1998: 611.

Corallana acuticauda. – Richardson, 1900: 157, fig. 1-2. Pires-Vanin, 1998: 612. [not *Corallana acuticauda* Miers, 1881]

Excorallana richardsonae. – Delaney, 1989: 6 (misspelling).

Material examined. 2 adult and 3 juvenile females (MOUFPE 149), GM 189, Amapá, 03°50'00"N 49°55'00"W, 69 m depth. 1 adult female (MOUFPE 119), AS # 1923, Amapá, 03°55'30"N 50°20'00"W, 88 m depth. 1 adult male (MOUFPE 13.289), NE III # 93/3°P, Amapá, 03°55'5"N 50°20'03"W; 70 m depth. 1 adult male, 1 adult female (MOUFPE 13. 297), NE I # 213/6°P (REVIZEE), Pará, 00°13'00"N 46°40'00"W, 87 m depth. 1 adult male (MOUFPE 117), GM 28, Pará, 00°20'00"N 46°03'05"W. 1 adult female (MOUFPE 139), AS# 1763, Pará, 00°25'00"S 47°17'W, 23 m depth. 1 adult female (MOUFPE 134), GM 200, Pará, 00°30'10.7"S 48°15'19.2"W, 92 m depth. 1 sex undefined (MOUFPE 128), AS# 1751, Pará, 00°37'00"S 44°40'00"W, 44 m depth. 1 adult female (MOUFPE 124), GM 42, Pará, 01°28'00"N 46°51'00"W, 47 m depth. 1 juvenile female (MOUFPE 13.298), NE III # 75A/ 3°P, Pará, 01°28'00"S 38°40'00"W, 54 m depth. 1 sex undefined (MOUFPE 12.961), AS 1767, Pará, 01°32'05"N 47°24'05"W, 63 m depth. 1 adult male, 4 adult females (MOUFPE 120), GM 45, Pará, 01°32'00"N 47°34'00"W, 67 m depth. 1 adult female (MOUFPE 125), AS# 1767 A, Pará, 01°32'30"N 47°24'30"W, 63 m depth. 1 sex undefined (MOUFPE 12.969), AS 1701, Pará, 01°57'00"S 037°46'00"W, 57 m depth. 1 sex undefined (MOUFPE 138), AS# 1719 A, Ceará, 02°15'00"S 40°33'30"W, 55 m depth. 1 female (MOUFPE 127),

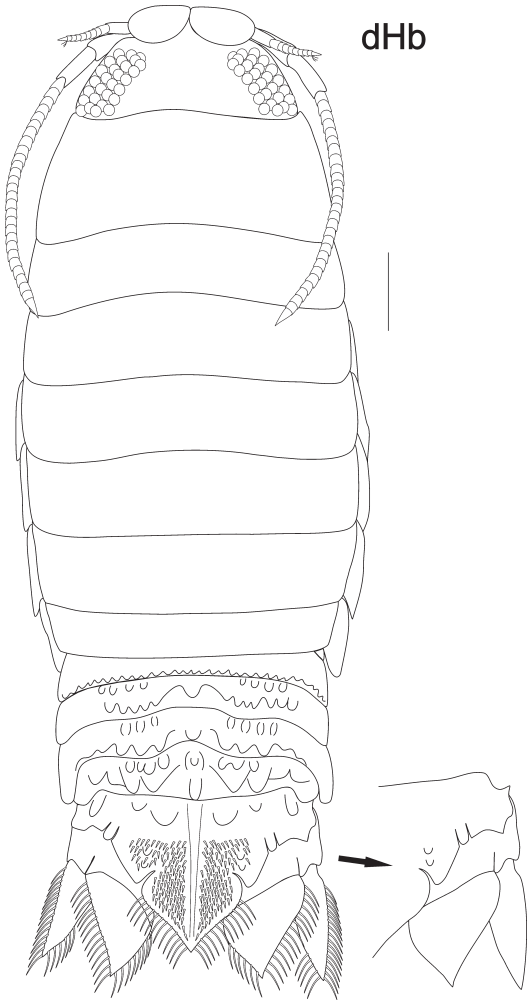

Figure 11. *Excorallana richardsoni* Lemos de Castro, 1960, male, 11 mm, (MOUFPE 123), habitus. Detail showing two small tubercles prior to lateral incisions. Scale= 1 mm.

Figure 12. Distribution of *Excorallana richardsoni* Lemos de Castro, 1960 for Brazilian waters.

GM 116, Ceará, 02°57'05"N 48°45'00"W, 81.5 m depth. 1 adult male, 1 adult female (MOUFPE 136), AS# 1857, Ceará, 03°35'00"S 37°57'00"W, 49 m depth. 1 juvenile female (MOUFPE 131), ITA 92, Pernambuco, 07°36'00"S 34°48'00"W, 0.65 m depth. 2 sex undefined (MOUFPE 140), ITA 74, Pernambuco, 07°41'00"S 34°47'00"W, 5.2 m depth. 1 adult female (MOUFPE 148), ITA 46, Pernambuco, 07°43'36"S 34°49'24"W, 3.7 m depth. 1 juvenile female (MOUFPE 144), ITA 43, Pernambuco, 07°44'00"S 34°48'00"W, 1.6 m depth. 1 adult female, 1 adult male (MOUFPE 116), PE. 29 A, Pernambuco, 07°45'00"S 34°46'08"W, 14 m depth. 1 adult female (MOUFPE 150), ITA 27, Pernambuco, 07°49'00"S 34°49'13"W, 0.8 m depth. 1 sex undefined (MOUFPE 118), ITA Forte Orange reefs, Pernambuco, 7°49'00"S 34°49'13.0"W. 1 adult female (MOUFPE 115), ITA 11, Pernambuco, 7°50'00"S 34°49'00"W, 1 m depth. 1 adult female (MOUFPE 137), Candeias 27 – 108, Pernambuco, 7°50'08"S 34°42'00"W. 1 sex undefined (MOUFPE 151), ITA 17, Pernambuco, 7°51'00"S 34°49'00"W, 3.9 m depth. 2 adult females (MOUFPE 133), CAN 95, Pernambuco, 8°09'07"S 34°45'00"W, 31.5 m depth. 1 adult female (MOUFPE 147), REC 95, Pernambuco, 8°09'07"S 34°45'00"W, 31.5 m depth. 1 juvenile female (MOUFPE 122), REC 4, Pernambuco, 8°09'09"S 34°45'08"W, 27 m depth. 1 sex undefined (MOUFPE 129), CAN 19, Pernambuco, 8°10"00"S 34°42'00"W. 1 sex undefined (MOUFPE 126), CONDEPE Suape # N17, Pernambuco, 8°10'00"S 34°51'05"W, 13 m depth. 1 sex undefined (MOUFPE 121), CONDEPE Suape #9, Pernambuco, 8°30'00"S 34°58'00"W, 9 m depth. 1 adult male (drawn) (MOUFPE 123), Pina-PE_03, Pernambuco, 8°47'05"S 34°55'00"W, 36 m depth.

Diagnosis [modified from Lemos de Castro (1960)]. Head without tubercles, with medium sized eyes, not reaching anterior margin of head. Antennular peduncle with article 1 very dilated. Antenna reaching pereonite 2. Frontal lamina trapezoidal (Fig. 17). Pereonites 1–5 smooth dorsally, 6 and 7 with small tubercles (nearly imperceptible) laterally on posterior margin. Pleonite 1 dorsally smooth. Pleonite 2 with small tubercles on posterior margin. Pleon with longitudinal groove in the middle, extending from pleonites 3–5, with longitudinal line of tubercles. Pleonites 3–5 with double transversal line of tubercles. Pleotelson triangular, acute apex, with lateral incision on each side; anterior margin with four tubercles, arranged in two groups (2-2); lateral margins heavily coated with setae; midline with soft groove; two small tubercles prior to lateral incisions. Uropods slightly surpassing tip of pleotelson, margins heavily coated with long setae.

Remarks. According to Lemos de Castro (1960), the uropods have the same length as the pleotelson, while in our material, they exceed the pleotelson. Also, the two rows of posterior tubercles on pereonites 6 and 7 found in *E. richardsoni* were not found, but instead one row of very small tubercles, and the median area was smooth dorsally. Lemos de Castro (1960) also noted that *E. richardsoni* has two rows of tubercles on pleonites 2–5, while the specimens examined herein have only two rows of tubercles on the posterior margin of the segment. Finally, Lemos de Castro (1960) reported that the males identified as *Corallana acuticauda* Miers, 1881 (now assigned to genus *Excorallana*) from Alagoas, Brazil, by Richardson (1900) was actually a misidentification, and the specimens belong to *E. richardsoni*. Pires-Vanin (1998) agreed with Lemos de Castro's observation, and therefore the geographical distribution of *E. acuticauda* should be restricted to the type locality (Hotspur Bank off southern Bahia, Brazil).

Geographic distribution. Brazil: **Amapá**, **Pará**, Maranhão, **Ceará**, Rio Grande do Norte, **Pernambuco**, Alagoas, Espírito Santo, Rio de Janeiro (Lemos de Castro, 1960; Coelho and Koening, 1972; Koening, 1972; Pires-Vanin, 1998; this study) (Fig. 12).

Depth range: 0.65–94 m.

***Excorallana subtilis* (Hansen, 1890)**
(Figs. 13, 14)

Corallana subtilis Hansen, 1890: 382, figs. 3–30. Richardson, 1901: 519.

Excorallana subtilis. – Richardson, 1905: 146, fig. 130. – Carvacho and Yañez, 1971: 130. – Delaney, 1984: 6. – Kensley and Schotte, 1989: 160. – Delaney, 1989: 3,5. – Pires-Vanin, 1998: 612. – Barriga and Briones, 1992: 370.

Excorallana sublitilis. – Lemos de Castro and Lima, 1971: 138, figs. 15–25 (misspelling).

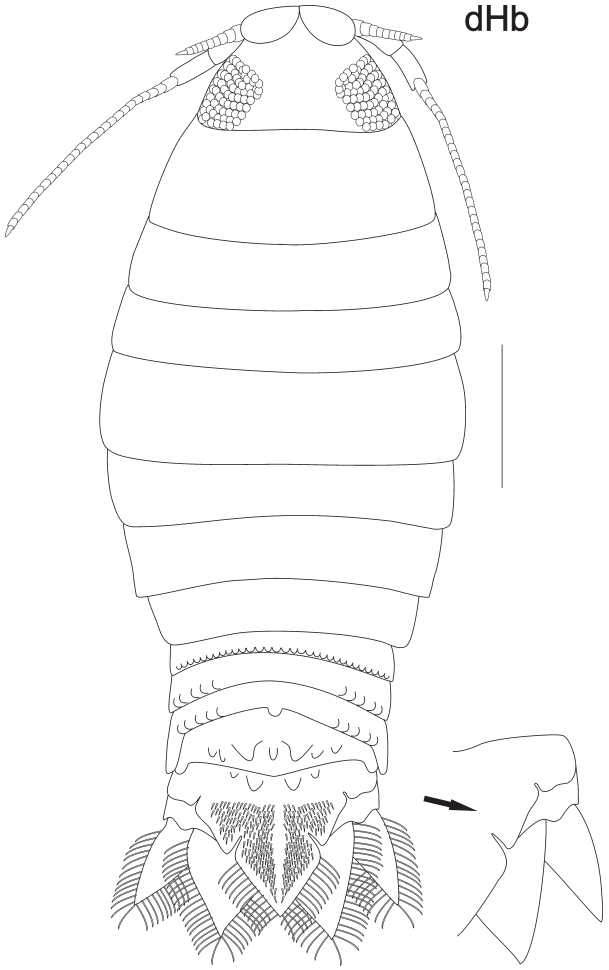

Figure 13. *Excorallana subtilis* (Hansen, 1890), female, 6 mm. (MOUFPE 13.012), habitus. Detail showing smooth area, without tubercles, prior to lateral incision. Scale= 1 mm.

Figure 14. Distribution of *Excorallana subtilis* (Hansen, 1890) for Brazilian waters.

Material examined. 2 adult females (1 drawn) (MOUFPE 13.012), NE IV III 4ªp. REVIZEE BENTOS, Amapá, 01°37'59"S 38°09'12"W.

Diagnosis [modified from Hansen (1890)]. Head without tubercles, with medium sized eyes. Frontal lamina wider than long, sub-trapezoidal (Fig. 17). Antennular peduncle with article 1 very dilated. Antenna reaching pereonite 3. Pereon smooth dorsally. Pleon with pleonite 1 not visible. Pleonites 2–5 with tubercles on posterior margin, but pereonite 3 smooth in the middle and pereonite 4 with only one median small tubercle. Pleonite 5 with one short median tubercle and three lateral tubercles. Pleotelson triangular, anterior margin with two tubercles, acute apex and lateral incision. Uropods slightly surpassing apex of pleotelson, margins coated with setae.

Remarks. The two specimens examined in this study showed some differences from the original description of Hansen (1890) and that by Lemos de Castro and Lima (1971) concerning the number of tubercles on pleonite 5 and on the anterior margin of the pleotelson. Hansen (1890) described this species as having the pleon smooth and only two tubercles on the anterior margin of the pleotelson. According to Richardson (1905), Hansen's material was a juvenile specimen, probably a female in the process of ecdysis (Kensley and Schotte, 1989). Lemos de Castro and Lima (1971) illustrated tubercles only on pleonite 5 and two tubercles on the anterior margin of the pleotelson. However, in the material examined, adult females measuring 5 mm and 6 mm, have tubercles on pleonites 1–5, very short tubercles on pleonites 1–4, and four tubercles on the anterior margin of the pleotelson. We consider these differences to be morphological variations between age and localities, so they do not differ sufficiently to warrant the establishment of a new species. Additional specimens from the vicinity of the type locality are needed for a species redescription.

Geographic distribution. USA: Florida; Caribbean Sea: Saint Thomas; Brazil: **Amapá**, Rio de Janeiro (Lemos de Castro, 1971; Kensley and Schotte, 1989; Pires-Vanin, 1998; this study) (Fig. 14).

Depth range. Unknown.

Excorallana warmingii (Hansen, 1890)
(Figs. 15, 16)

Corallana warmingii Hansen, 1890: 387, figs. 7–71.
Excorallana warmingii. – Lemos de Castro and Lima, 1971: 140, figs. 35–40. – Carvacho and Yañez, 1971: 130. – Delaney, 1984: 3 and 5. – Delaney, 1989: 6. – Coelho and Koening, 1972: 254. – Kensley and Schotte, 1989: 167 and 168. – Stone and Heard, 1989: 206 and 208 – Pires-Vanin, 1998: 612. Barriga and Briones, 1992: 370.

Material examined. 1 adult male (drawn) (MOUFPE 13.344), NE I # 218/6ºP (REVIZEE), Amapá, 00°37'05"N 044°38'05"W, 44.94 m depth. 1 sex undefined (MOUFPE 13.275), NE III 90A/3ºP Antares Bentos, Rio Grande do Norte, 3°48'00"S 33°40'00"W, 70 m depth. 1 adult female (MOUFPE 13.235), NE I # 70/3ºP REVIZEE, Rio Grande do Norte, 3°48'00"S 34°45'00"W, 63 m depth. 1 sex undefined (MOUFPE 880), Praia de Tambaú, Paraíba, 7°06'52.8"S 34°49'17.3"W. 1 sex undefined (MOUFPE 884), REC # 106, Pernambuco, 8°00'01"S 34°45'08"W. 1 adult male, 1 adult female (MOUFPE 883), Tamandaré, Pernambuco, 8°45'31"S 35°05'11"W.

Diagnosis [modified from Hansen (1890)]. Head without tubercles, continuous eyes, except small anterior median area. Frontal lamina linguiform, longer than wide, narrower in the middle and slightly rounded apex (Fig. 17). Antennular peduncle with article 1 not dilated. Antenna reaching pereonite 2. Pereon dorsally smooth. Pleon with few tubercles. Pleotelson narrow, long, without lateral incisions, with median groove; distal margin rounded, crenulated, apical crenulations more developed; anterior margin with four very small tubercles, without lateral incision. Uropods reaching apex of pleotelson.

Remarks. Lemos de Castro and Lima (1971) redescribed this species based on material collected in Amapá (02°57'N 49°04'W). In this description, they stated that the pleotelson has a lateral incision; however in their figures 35 and 36 the lack of any incision mentioned in their description is clear (p. 153). Additionally, the lateral incision is absent in the original description of Hansen (1890), as well as in the material studied herein.

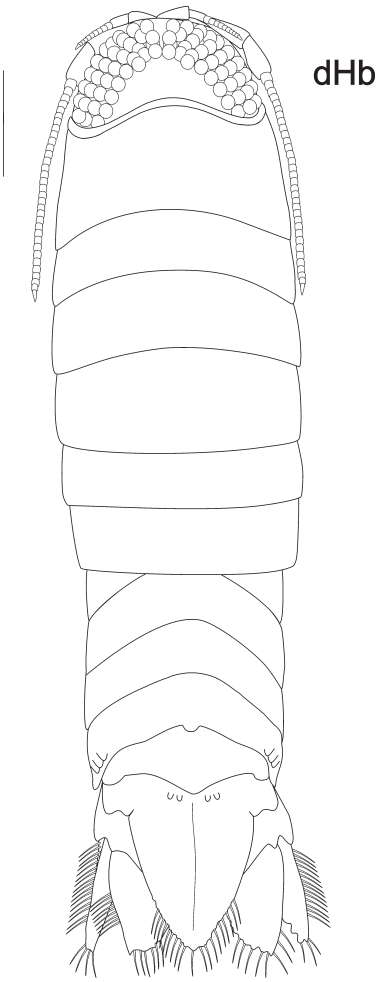

Figure 15. *Excorallana warmingii* (Hansen, 1890). Male, 10.2 mm. (MOUFPE 13.344), habitus. Scale = 1 mm.

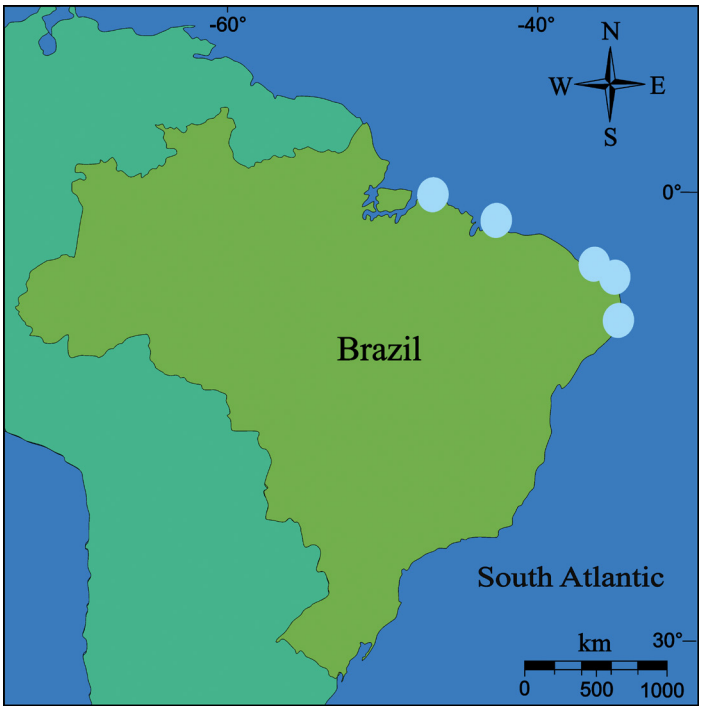

Figure 16. Distribution of *Excorallana warmingii* (Hansen, 1890) for Brazilian waters.

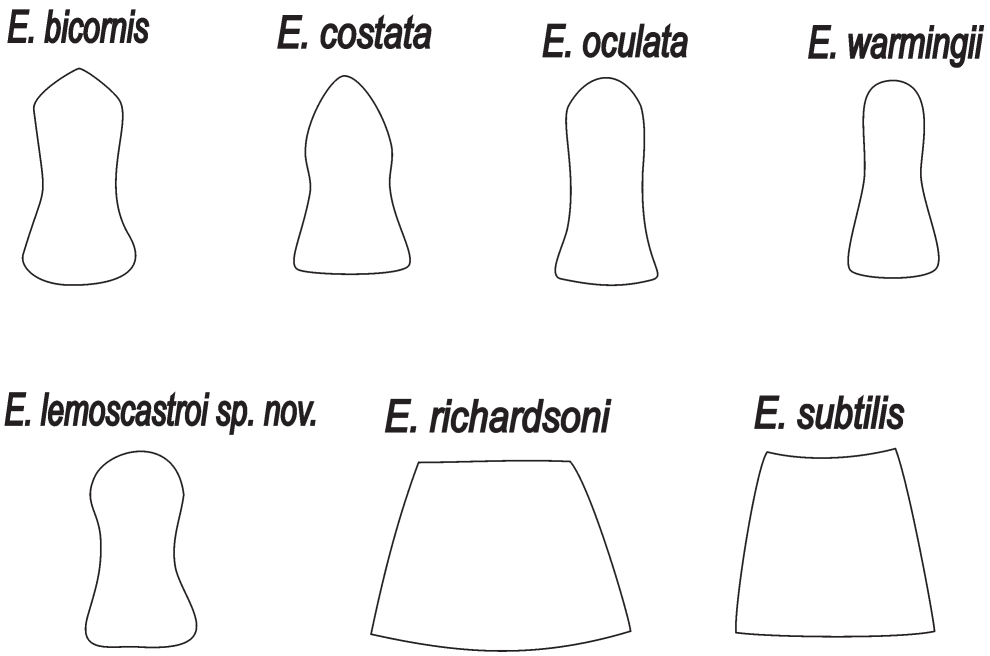

Figure 17. Morphological variation of the frontal lamina among the Brazilian species of the genus *Excorallana*.

Geographic distribution. Caribbean Sea: Bahamas, Cuba, Yucatan Peninsula, Puerto Rico, Brazil: Amapá, **Rio Grande do Norte**, **Paraíba**, Pernambuco (Hansen, 1890; Richardson, 1905; Coelho and Koening, 1972; Kensley and Schotte, 1989; Pires-Vanin, 1998; this study) (Fig. 16).

Depth range. 44–70 m.

Identification key for marine species of *Excorallana* from Brazilian coast

1. Pleotelson with two areas densely setose (pubescence) dorsally separated by a longitudinal groove, and bearing a lateral incision in each side 2
1'. Pleotelson without any areas densely setose (pubescence) dorsally, and lacking a lateral incision in each side 8
2. Eyes continuous ..... *E. oculata*
2'. Eyes not continuous 3
3. Antennular peduncle with article 1 dilated 4
3'. Antennular peduncle with article 1 not dilated 5
4. Pleotelson with two tubercles near lateral incision ..... *E. richardsoni*
4'. Pleotelson without tubercles near lateral incision ..... *E. subtilis*
5. Male (only) head and pereonite 1 tuberculate 6
5'. Male and female head and pereonite 1 without dorsal tubercles 7
6. Head and pereonite 1 with 2 tubercles dorsally ..... *E. bicornis*
6'. Head with 4 tubercles and pereonite 1 with 2 tubercles dorsally ..... *E. quadricornis*
7. Pleotelson with 1 basal tubercle in each side ..... *E. acuticauda*
7'. Pleotelson with more than 1 basal tubercle in each side 8

8. Tubercles present on posterior margin of pereonite 6, 7 and pleonites 1–5 ..... *E. costata*
8'. Tubercles present only on posterior margin of pleonites 2–5 ..... *E. lemoscastroi* sp. nov.
9. Eyes continuous; pleotelson apex with crenulation ..... *E. warmingii*
9'. Eyes not continuous; pleotelson apex without crenulation 10
10. Pleotelson without basal tubercles ..... *E. stebbingi*
10'. Pleotelson with 1 or 3 basal tubercles in each side 11
11. Male (only) head with 1 rostral and 2 anterior strong horns and pereonite 1 with 2 tubercles dorsally; pleotelson with 1 basal tubercle in each side ..... *E. longicornis*
11'. Male (only) head and pereonite 1 lacking ornamentation dorsally; pleotelson with 3 basal tubercles on each side ..... *E. angusta*

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