

BEAUFORTIA

INSTITUTE FOR SYSTEMATICS AND POPULATION BIOLOGY
(ZOOLOGICAL MUSEUM) UNIVERSITY OF AMSTERDAM

Vol. 48, no. 6

November 14, 1998

THE GENUS *LEUCOTHOE* (CRUSTACEA, AMPHIPODA, LEUCOTHOIDAE) ON THE BRAZILIAN COAST

CRISTIANA S. SEREJO

Museu Nacional/UFRJ, Invertebrate Department, Quinta da Boa Vista, Rio de Janeiro, 20940-040, Brazil.

Keywords: Amphipoda, Leucothoidae, *Leucothoe*, distribution, taxonomy, Brazil.

ABSTRACT

This study comprises the description of four new species of *Leucothoe* Leach, 1814 (*L. basilobata* n. sp., *L. cheiriserra* n. sp., *L. leptosa* n. sp., and *L. urospinosa* n. sp.), redescrptions of *L. liliue* Barnard (1970), *L. tridens* Stebbing (1888), and *L. spinicarpa* (Abildgaard, 1789), and a new record of *L. laurensi* Thomas & Ortiz (1995) for the Brazilian coast. Considerations on geographic distribution are given.

INTRODUCTION

According to Barnard & Karaman (1991), the genus *Leucothoe* comprises 61 species, in two subgenera, with a cosmopolitan distribution. Species within this genus are usually inquilinous in sponges and ascidians. Only three species of this genus were previously recorded on the Brazilian coast: *L. spinicarpa* (Abildgaard, 1789), *L. tridens recifensis* (= *L. tridens* Stebbing, 1888), and *L. campii* Mateus & Mateus (1986) (Schellenberg, 1938a; Wakabara et al., 1991; Valério-Berardo, 1992; Serejo, 1995). This study treats the systematics of the genus *Leucothoe*. It describes new species and redescrines known species in several sam-

ples collected between latitudes 8° S to 18° S, along the northeastern coast of Brazil, in depths varying from 10 to 30 m. The material was obtained from washed sponges and corals. Specimens of *L. spinicarpa* from the states of Espírito Santo, Rio de Janeiro and São Paulo, were compared morphologically. All the measurements of the specimens were taken from the tip of the rostrum to the base of the telson according to the technique used by Asochakov (1994). Type material is lodged in the collections of the Museu Nacional, Rio de Janeiro (MNRJ), the National Museum of Natural History, Smithsonian Institution (USNM) and the Zoologisch Museum, Amsterdam (ZMA). The abbreviations

cited in the text are the following: Brazilian states: PE - Pernambuco; AL - Alagoas; BA - Bahia; ES - Espírito Santo; RJ - Rio de Janeiro

and SP - São Paulo. A list of the *Leucothoe* species with their distributions is presented below in Table 1.

Table 1. World species of *Leucothoe* Leach (sensu lato) and their distributions.

| Species | Distribution |
|--|--|
| <i>acanthopus</i> Schellenberg, 1928 | Red Sea (Suez Canal) |
| <i>acutilobata</i> Ledoyer, 1978 | Indian Ocean and Red Sea |
| <i>affinis</i> Stimpson, 1856 | South Africa |
| <i>alata</i> Barnard, 1959 (syn: <i>L. minima</i> sensu Barnard, 1952, not Schellenberg, 1925) | Northeastern Pacific |
| <i>alcyone</i> Imbach, 1969 | Vietnam |
| <i>angusticoxa</i> (Ledoyer, 1972) | Madagascar |
| <i>assimilis</i> Barnard, 1974 | New Caledonia, Loyalty Islands and Southeastern Australia |
| <i>bannwarthi</i> (Schellenberg, 1928b) | Indo-Pacific |
| <i>bidens</i> Hirayama, 1985 | Japan |
| <i>boolpooli</i> Barnard, 1974 (syn: <i>L. spinicarpa</i> sensu Chilton, 1923. | Southeastern Australia |
| <i>campi</i> Mateus & Mateus, 1986 (syn: <i>L. denticulata</i> sensu Mateus & Mateus, 1966; not <i>L. denticulata</i> sensu Costa, 1853; <i>L. mateusae</i> Barnard & Karaman, 1991) | Sao Tomé and Príncipe Islands and Southwestern Atlantic (Brazil) |
| <i>commensalis</i> Haswell, 1879 | New Caledonia, Loyalty Islands and Southern Australia |
| <i>crassimana</i> Kossmann, 1880 | Red Sea and Mediterranean |
| <i>crenatipalma</i> Ledoyer, 1972 | Madagascar |
| <i>ctenochasma</i> Moore, 1987 | Tasmania |
| <i>ctenochir</i> K.H. Barnard, 1925 | Southwestern Indian Ocean |
| <i>dentata</i> Ledoyer, 1973 | Madagascar |
| <i>diemenensis</i> Haswell, 1879 | Tasmania |
| <i>dolichoceras</i> K.H. Barnard, 1916 | South Africa |
| <i>euryonyx</i> Walker, 1901 (syn: <i>L. dentitelson</i> Chevreux, 1925; <i>L. quadrimana</i> Ruffo, 1946) | Atlantic Ocean (Senegal), Mediterranean and Madagascar |
| <i>furina</i> (Savigny, 1816. (syn: <i>L. procerata</i> Bate, 1857) | Indo-Pacific and Red Sea |
| <i>gavialis</i> Myers, 1985 | Fiji |
| <i>germanalcyone</i> Hirayama, 1992 | Hong Kong |
| <i>goowera</i> Barnard, 1974 | Western Australia |
| <i>gracilis</i> Haswell, 1879 | Tasmania and Southwestern Australia |
| <i>grandimana</i> Stimpson, 1853 | Northwestern Atlantic |
| <i>homelli</i> Walker, 1904 | Ceylon, Gambier Islands |
| <i>hyhelia</i> Barnard, 1965 | Indo-Pacific |
| <i>incisa</i> Robertson, 1892 | Northeastern Atlantic, Mediterranean and Japan |
| <i>laurensi</i> Thomas & Ortiz, 1995 | Atlantic Ocean (Brazil and Ascension Island), Caribbean Sea (Cuba) and the Carolinas to the Florida Keys |
| <i>laticoxa</i> Ledoyer, 1978 | Madagascar |
| <i>lihue</i> Barnard, 1970 | Southwestern Atlantic (Brazil) and Indo-Pacific |
| <i>lilljeborgi</i> Boeck, 1861 (syn: <i>L. imparicornis</i>) | Northeastern Atlantic to Norman, 1889 |
| <i>macrodonta</i> Ledoyer, 1986 | Mediterranean |
| | Madagascar |

Table 1. continued

| Species | Distribution |
|--|---|
| <i>madrasana</i> Sivaprakasam, 1969 | Indian Ocean |
| <i>micronesiae</i> Barnard, 1965 | Indo-Pacific |
| <i>mersi</i> Stebbing, 1888 | South Indian Ocean and South Atlantic Ocean |
| <i>minima</i> Schellenberg, 1925 | Southeastern Atlantic |
| <i>minuscule</i> Schellenberg, 1938b | Pacific Ocean |
| <i>nagatai</i> Ishimaru, 1985 (syn: <i>L. alata</i> sensu Nagata, 1965) | East coast of Japan |
| <i>neptunea</i> Moore, 1987 | Tasmania |
| <i>oboa</i> Karaman, 1971 | Mediterranean |
| <i>occulta</i> K. Schickel, 1975 | Atlantic Ocean (France) and Mediterranean |
| <i>orkneyi</i> Watling & Holman, 1983 | South Orkney Islands, Antarctic |
| <i>pachycera</i> Della Valle, 1893 | Mediterranean |
| <i>pacificca</i> Nagata, 1963 | East coast of Japan |
| <i>panpulco</i> Barnard, 1961 | Panama (Pacific) |
| <i>predenticulata</i> Ledoyer, 1978 | Madagascar |
| <i>procera</i> Bate, 1857 (syn: <i>L. furina</i> sensu Bate, 1857 and Bate & Westwood, 1862; <i>L. richiardii</i> sensu Lincoln, 1979) | British Isles |
| <i>richiardii</i> Lessona, 1865 | Eastern Atlantic, Indian Ocean and Mediterranean |
| <i>rostrata</i> Chevreux, 1908 | Northeastern Atlantic (Azores) |
| <i>safie</i> Lyons & Myers, 1991 | Red Sea |
| <i>serraticarpa</i> Della Valle, 1893 | Mediterranean |
| <i>spincarpa</i> (Abildgaard, 1789. (syn: <i>L. articulatus</i> Montagu, 1804; <i>L. denticulata</i> Costa, 1853; <i>L. antarctica</i> Pfeffer, 1888; <i>L. occidentalis</i> Reid, 1951) | Cosmopolitan |
| <i>spinulosa</i> Chevreux, 1919 | Southeastern Atlantic |
| <i>squalidens</i> Ledoyer, 1984 | South Pacific (New Caledonia and Madagascar) |
| <i>stegoceras</i> Walker, 1904 | Indian Ocean (Gulf of Aden) |
| <i>stylifera</i> Stimpson, 1856 | East coast of Japan |
| <i>tarte</i> Barnard, 1974 | Southeastern Australia |
| <i>trailli</i> Thomson, 1882 | New Zealand |
| <i>tridens</i> Stebbing, 1888 | Southwestern Atlantic (Brazil), South Tropical Pacific (Hawaii, Philippines and Gilbert Islands), off New Zealand |
| <i>uschakovi</i> Gurjanova, 1951 | Greenland Sea |
| <i>venetiarum</i> Soika, 1949 | Mediterranean |
| <i>basilobata</i> n. sp. | Southwestern Atlantic (Brazil) |
| <i>cheiriserra</i> n. sp. | Southwestern Atlantic (Brazil) |
| <i>leptosa</i> n. sp. | Southwestern Atlantic (Brazil) |
| <i>urospinosa</i> n. sp. | Southwestern Atlantic (Brazil) |

SYSTEMATIC DESCRIPTIONS

Genus *Leucothoe* Leach, 1814

Diagnosis: Antenna 1 as long or longer than antenna 2. Epistome triangular. Upper lip of bilobed shape. Mandibles with asymmetrical lacinia mobilis, the right one reduced, molar obsolete. Maxilla 1, inner lobe small, with one seta, palp biarticulate, but often with indistinct suture between the two articles. Maxilliped inner lobe small, partly coalesced, outer lobe very small, reaching less than halfway of palp article 1. Coxa 2 variable, broad or long, acute or rounded below.

KEY TO THE SUBGENERA OF *LEUCOTHOE*

- Coxa 2 short, broader than long, with sharp corner(s).....
(*Leucothoella*)
 Coxa 2 ordinary, as long as broad, with rounded corner(s)
 (*Leucothoe*)

KEY TO THE BRAZILIAN SPECIES OF *LEUCOTHOE*

- 1a. Dactylus of gnathopod 1 at least 1/3 of propodus length3
 1b. Dactylus of gnathopod 1 reaches 1/4 or less of propodus length 2
- 2a. Propodus of gnathopod 1 with posterior margin strongly dentate bearing 2 rows of triangular teeth and long spines (fig. 14i). Outer lobe of inner margin of maxilliped finely dentate (fig. 14g). Article 3 of mandibular palp about 2/3 of article 2*L. cheiriserra* n. sp.
 2b. Propodus of gnathopod 1 with posterior margin smooth, with only small setae (fig. 6p). Outer lobe of inner margin of maxilliped smooth (fig. 6o). Article 3 of mandibular palp between 1/3 and 1/4 of article 2 (fig. 6h)*L. liliue* Barnard
- 3a. Lateral cephalic lobe projected in a sharp angle. Anteroventral margins of coxae 2-4 forming a 90° angle (fig. 3a). Telson tridentate (fig. 4l)
 *L. (Leucothoella) tridens* Stebbing
- 3b. Lateral cephalic lobe rounded or angular. Anteroventral margins of coxae 2-4 rounded. Telson tip not tridentate4
- 4a. Gnathopod 1, carpal spur stout and short with a very long medial seta (fig. 8a).
 Gnathopod 2, propodus with palm nearly transverse, with an anterodistal blade-like process; dactylus inner margin finely serrate (fig. 8b)
*L. laurensi* Thomas and Ortiz

- 4b. Gnathopod 1, carpal spur slender and elongate, without long medial seta.
 Gnathopod 2, propodus with palm oblique, without terminal blade-like process; dactylus inner margin smooth 5
- 5a. Article 3 of antenna 1 distally enlarged (fig. 16b).
 Gnathopod 2, carpus dentate
 on distal half (fig. 17c). Coxae 3-4 crenulate on distal margin (figs 16e, f).
 Posteroventral corner of epimeron 3 finely notched (fig. 17l) *L. leptosa* n. sp.
- 5b. Article 3 of antenna 1 not distally enlarged. Gnathopod 2, carpus smooth. Coxae 3-4 smooth.
 Posteroventral corner of epimeron 3 rounded 6
- 6a. Gnathopod 1, propodus posterior margin dentate with one row of small triangular teeth (fig. 10q). Male gnathopod 2, basis with a well-developed lobe on anterior margin (fig. 11a). Telson tip minutely excavated (fig. 11l) *L. basilobata* n. sp.
- 6b. Gnathopod 1, propodus with posterior margin finely crenulate. Male gnathopod 2 basis without lobe on anterior margin. Telson tip rounded 7
- 7a. Lateral cephalic lobe beveled. Article 3 of mandibular palp very short, about 1/5 of article 2 (fig. 18g). Distal margin of coxa 4 oblique (fig. 18e). Uropod 1, rami with 4 to 6 spines in sequence on distal half (fig. 19n) *L. urospinosa* n. sp.
- 7b. Lateral cephalic lobe rounded. Article 3 of mandibular palp, medium, about 2/5 of article 2 (fig. 1c). Distal margin of coxa 4 convex (fig. 2b). Uropod 1, rami with 6 to 8 spines regularly distributed (fig. 2g)
 *L. spinicarpa* (Abildgaard)

Leucothoe spinicarpa (Abildgaard, 1789)

Figs. 1-2

Gammarus spinicarpus Abildgaard, 1789: 66, pl. 119, figs 1-4, 17.

Leucothoe miersi Stebbing, 1888: 772, pl. 46; 1906: 165.

Leucothoe spinicarpa Sars, 1895: 283, pl. 100-101, fig. 1 (as *L. articulosa* only on plates); Chevreux & Fage, 1925: 122, fig. 118-119; Krapp-Schickel, 1975: 95, pl. 1-2; 1989: 454, fig. 309; Ledoyer, 1986: 676-677, figs. 246, 260.

Material examined. - 8 females, 4 males and 9 juveniles, Viçosa Reef, Nova Viçosa, BA, MNRJ 8555; 8560; 8562-8563; 4 females, 2 males and 1 juvenile, Abrolhos, 17°59'S 038° 45'W, BA, MNRJ 8556; 1 specimen, Todos os Santos Bay, Itaparica, BA, MNRJ 8557; 3 females, 3 males, 3 juveniles, Paredes Reef, Abrolhos, BA, MNRJ 8558; 1 male, Popa Verde Reef,

Abrolhos, BA, MNRJ 8565; 4 females, 4 males, Rasinho do Coiceiro, Porto de Galinhas, PE, MNRJ 8559; 1 female, 21°18'S 40°28'W, off Itapemirim, ES, MNRJ 8561; 1 male, Ubatuba, SP, MNRJ 8564.

Diagnosis.- Antenna 1 about 1/3 of body length. Lateral cephalic lobe rounded. Mandibular palp article 3 about 2/5 of article 2. Coxa 4 distally enlarged with posterior margin excavate. Dactylus of gnathopod 1 reaching 1/3 to 1/2 of propodus length. Basis of pereopods 6-7 with posterior margin finely crenulate and angulose, especially the last one. Posterior corner of epimeron 3 rounded-quadrate. Telson elongate, more than twice as long as broad, narrowing distally, apex acute with 2 small setae.

Description.- Female (6.5 to 7.0 mm). Antenna 1 about 1/3 of body length, flagellum with 9-11 articles. Antenna 2 shorter than antenna 1, flagellum with 5-7 articles. Rostrum small. Lateral cephalic lobe round. Eyes large, irregularly oval (Fig. 1a).

Epistome triangular (Fig. 1b), 1.5 longer than broad. Upper lip (Fig. 1b) of bilobed form with distal row of setae. Mandibular palp article 3 about 2/5 of article 2 length (Fig. 1c). Mandibles with lacinia mobilis asymmetrical, being the right one reduced (Fig. 1d). Outer lobe of lower lip setose apically, mandibular lobes distally rounded (Fig. 1e). Maxilla 1 (Fig. 1f) inner plate with a single seta; palp of outer plate ending in 4 spines with indistinct suture between articles 1-2. Maxilla 2 (Fig. 1g) inner plate broader than outer plate with several spines, outer plate with 3 distal spines and many setae. Maxilliped (Fig. 1h) outer plate and palp article 1 with bipectinate and normal setae.

Gnathopod 1 (Fig. 1i), coxa overlapping head, anterior margin slightly excavate; carpal spur with minute setae; propodus inner margin finely crenulate, supporting several setae and a strong spine near dactylus insertion; dactylus reaching 1/3 to 1/2 of propodus length. Gnathopod 2 (Fig. 1j), coxa subquadrate; carpus setose internally, ending with small cusps and one spine; palm in female crenulate bearing tiny setae. Pereopods 3-4 similar (Figs. 2a, b), coxa 3 subrectangular with posterior corner pronounced,

coxa 4 distally enlarged with posterior margin excavate. Propodus of pereopods 3-7 (Figs. 2a-e) spinose, bearing 2 large spines distally. Basis of pereopods 5-7 oval expanded. Pereopod 7 with posterior margin finely crenulate and angulose.

Epimeron 1 U-shaped with a small bunch of setae near anterior corner. Posteroventral corner of epimeron 2 pronounced. Epimeron 3 rounded-quadrate (Fig. 2f). Uropods 1-3 spinose (Figs. 2g-i). Rami of uropod 1 with spines regularly distributed (Fig. 2g). Rami of uropod 3 much smaller than peduncle (Fig. 2i). Telson more than twice as long as broad, tip with two small setae (Figs. 2j, l). Branchiae large, elongated.

Male.- Gnathopod 2 (Fig. 2m) robust, with dentition on the palm more developed.

Remarks.- Barnard (1974) discussed the cosmopolitan *L. spinicarpa* complex and pointed out the insufficient data to conclude if the several phenotypes from different localities were actually distinct species. More investigation is required with comparative material and especially with genetic techniques.

Some morphological variations were found when the Brazilian specimens are compared with material examined by Sars (1895), who did a detailed description of this species. The first presents carpus of gnathopod 2 with one distal spine, instead of not having spine; dactylus of pereopods 3-7 about half of propodus length, not very short and epimeron 1 with a bunch of setae near anterior corner, not observed in Sars specimens.

L. spinicarpa has a cosmopolitan distribution. In Brazil this species is recorded from the states of PE, BA, ES, RJ, SP.

Leucothoe (Leucothoella) tridens Stebbing, 1888, Figs. 3-5

Leucothoe tridens Stebbing, 1888: 777, pl. 47; Schellenberg, 1938b: 21, fig. 11; Barnard, 1970: 210, fig. 137.

Leucothoe tridens recifensis Schellenberg, 1938a: 205.

Material examined.- 1 male and 1 female, Paredes Reef, Abrolhos, BA, MNRJ 8566; 2 males and 3 females, off Porto de Galinhas, PE, 30m, MNRJ 8567.



Fig. 1. *Leucothoe spincarpa* (Abildgaard), female, 7.0 mm; a. head with antennae and coxa 1; b. epistome and upper lip; c. left mandible; d. detail of right mandible; e. lower lip; f. maxilla 1; g. maxilla 2; h. maxilliped; i. gnathopod 1; j. gnathopod 2. Bars a, i-j = 0.5 mm; b, d-g, h = 0.1 mm; c = 2.8 mm.

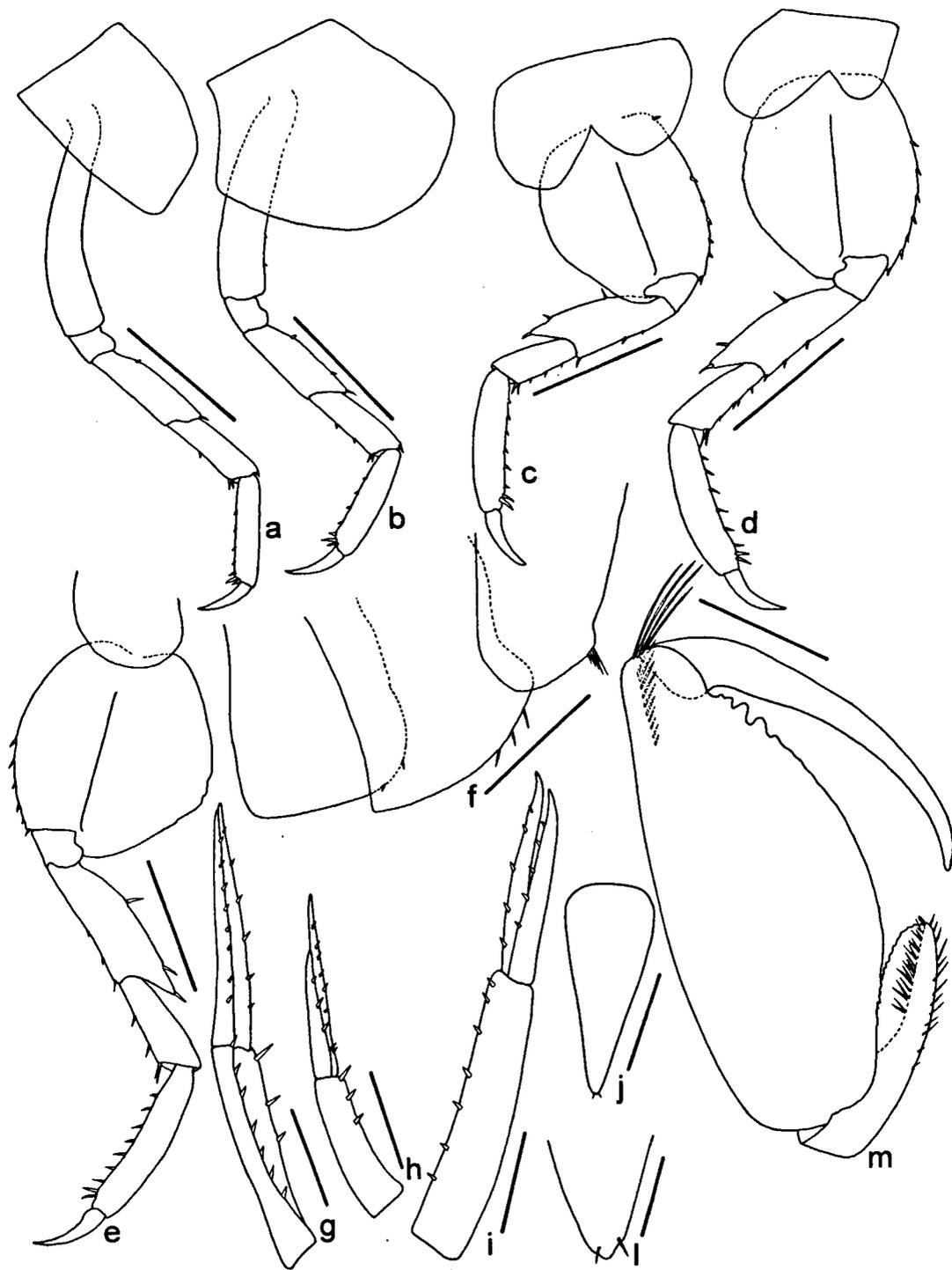


Fig. 2. *Leucothoe spincarpa* (Abildgaard), female, 7.0 mm; a-e. pereopods 3-7; f. epimera; g-i. uropods 1-3; j-l. telson. Male, 6.8 mm; m. gnathopod 2. Bars a-f, m = 0.5 mm; g-j = 0.25 mm; l = 0.05 mm.

Diagnosis.- Antennae 1-2 of the same size, reaching 1/3 of body length. Article 1 of antenna 1 with strong terminal spine and one tooth. Lateral cephalic lobe projected in a sharp angle. Coxa 2-4 rectangular, wider than long. Dactylus of gnathopod 1 almost 1/2 of propodus length. Gnathopod 2 palm with short rounded teeth and small setae. Telson with two pairs of dorsal plumose setae, apex tridentate bearing two smooth setae.

Description.- Male (3.6 to 4.6 mm). Antenna 1-2 of the same length, reaching 1/3 of body length (Fig. 3a). Antennular article 1 with a terminal spine, one tooth and pectinate setae (Fig. 3b). Rostrum small. Lateral cephalic lobe projected in a sharp angle. Eyes of medium size, round (Fig. 3a). Coxa 1 (Figs. 3a, c) obliquely overlapping head, coxae 2-4 (Figs. 3a, c-e) anteroventral corner acute, forming a 90° angle, coxa 4 with distal margin oblique.

Epistome (Fig. 3g) triangular, as long as wide. Upper lip (Fig. 3g) of characteristic bilobed shape with a row of long distal setae. Article 3 of mandibular palp 2/3 of article 2 length, with 2 distal setae, one long and other short. Lacinia mobilis more developed in the left mandible (Fig. 3h). Outer lobe of lower lip apically setose; mandibular lobes well-developed (Fig. 3i). Maxilla 1 (Fig. 3j) inner plate with one distal seta, outer plate with large and conical spines and thin setae, palp ending with 4 setae. Maxilla 2 (Fig. 3l) inner plate with 7-9 spines, outer plate with sparse setae and 3 spines. Inner plate of maxilliped with 3 apical and 2 medial spines, outer plate subulate with one bipectinate spine, palp article 1 also with bipectinate spines (Fig. 3m).

Gnathopod 1 (Fig. 4a) carpal spur with minute setae; propodus finely crenulate, bearing 3 to 4 long spines, small setae and a spine at base of dactylus insertion, the last one reaches half of propodus length. Gnathopod 2 (Figs. 3a, 4b, c) basis short, about half size of propodus, with long setae on anterodistal margin, carpus ending in small cusps and one tooth, inner surface moderately setose, palm with short wave like teeth, each one bearing 2 short spines. Pereopods 3-4 similar, dactylus about 2/3 of propodus length (Figs. 4d, e). Basis of pereopods 5-7 weakly enlarged (Fig. 4f).

Posteroventral corner of epimeron 2 slightly pronounced and of epimeron 3 rounded-quadrate (Fig. 4g). Rami of uropod 1 elongated, with sparse spines, outer ramus slightly shorter than inner ramus (Fig. 4h). Outer ramus of uropod 2 2/3 of inner ramus length, supporting 2 spines (Fig. 4i). Uropod 3 missing. Telson (Figs. 4j, l) with two pairs of dorsal plumose setae, apex tridentate bearing two terminal smooth setae.

Female.- No apparent differences from the male.

Remarks.- Barnard & Karaman (1991) considered this species in the subgenus *Leucothoe*. This species is treated in this study as part of *Leucothoella* as it presents the coxa 2 distinctly broader than long with sharp corners.

Schellenberg (1938a) briefly described *L. tridens recifensis* from Recife, PE, Brazil, without illustrations, and pointed out only few differences from *L. tridens*. Barnard & Karaman (1991) considered this subspecies a synonym of *L. tridens*, with which I also agree.

The specimens from Brazil here examined differ from those observed by Schellenberg (1938a) in the presence of one apical spine in the carpus of the second gnathopod and the entire palm being crenulate. Schellenberg's specimens did not present this spine on gnathopod 2 carpus and the palm was described bearing two distal humps, but not crenulate. They differ also from the type material (Stebbing, 1888) in presenting gnathopod 1 dactylus 1/2 of propodus length and maxilla 2 inner plate with 7-9 spines, instead of dactylus reaching 1/3 of propodus length and maxilla 2 inner plate with 3 spines. The telson tip is tridentate, but the three teeth are not equal in size, having an acute projecting middle member, similar to the specimens from Hawaii observed by Barnard (1970).

L. tridens was described originally from off New Zealand (Stebbing, 1888); and also recorded from Philippine and Gilbert Islands (Schellenberg, 1938b) and the Hawaiian Islands (Barnard, 1970). In Brazil its distribution is for PE and BA states (fig. 5).



Fig. 3. *Leucothoe tridens* Stebbing, male, 3.6 mm; a. entire body; b. distal end of antenna 1 article 1; c-f. coxae 1-4. Female 4.6 mm; g. epistome and upper lip. Male, 3.6 mm; h. left mandible; i. lower lip; j. maxilla 1. Female, 4.6 mm; k. maxilla 2. Male, 3.6 mm; m. maxilliped. Bars a = 0.5 mm; b = 0.05; c-f = 0.2 mm; g-m = 0.1 mm.

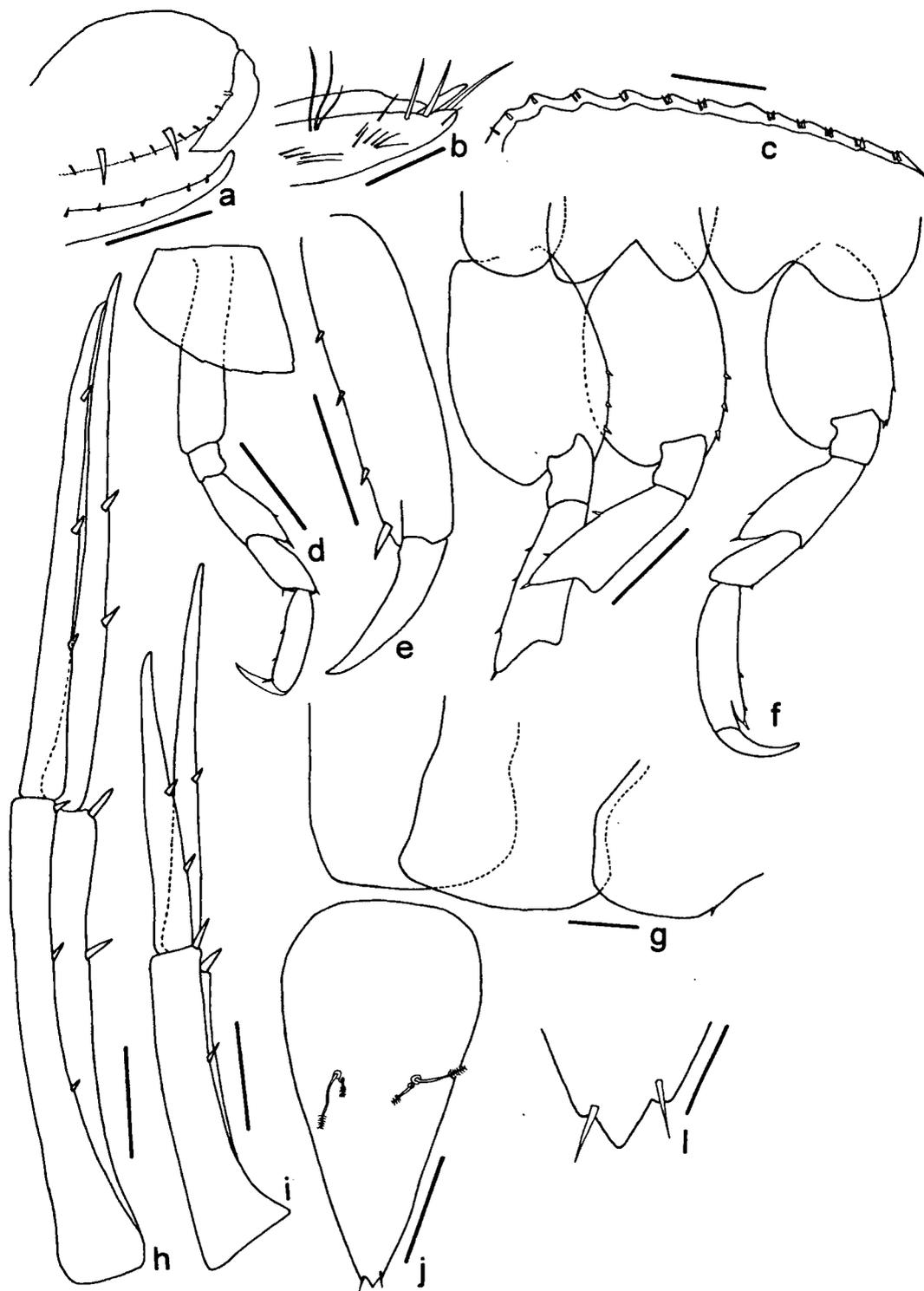


Fig. 4. *Leucothoe tridens* Stebbing, male, 3.6 mm; a. gnathopod 1; b. carpus end of gnathopod 2; c. palm of gnathopod 2; d. pereopod 4; e. propodus of pereopod 4. Female, 4.6 mm; f. pereopods 5-7. Male, 3.6 mm; g. epimera. Male, 4.7 mm; h-i. uropods 1-2. Female, 4.6 mm; j-l. telson. Bars a, c, e, g-j = 0.1 mm; b = 0.05 mm; d, f = 0.25 mm; l = 0.02 mm.

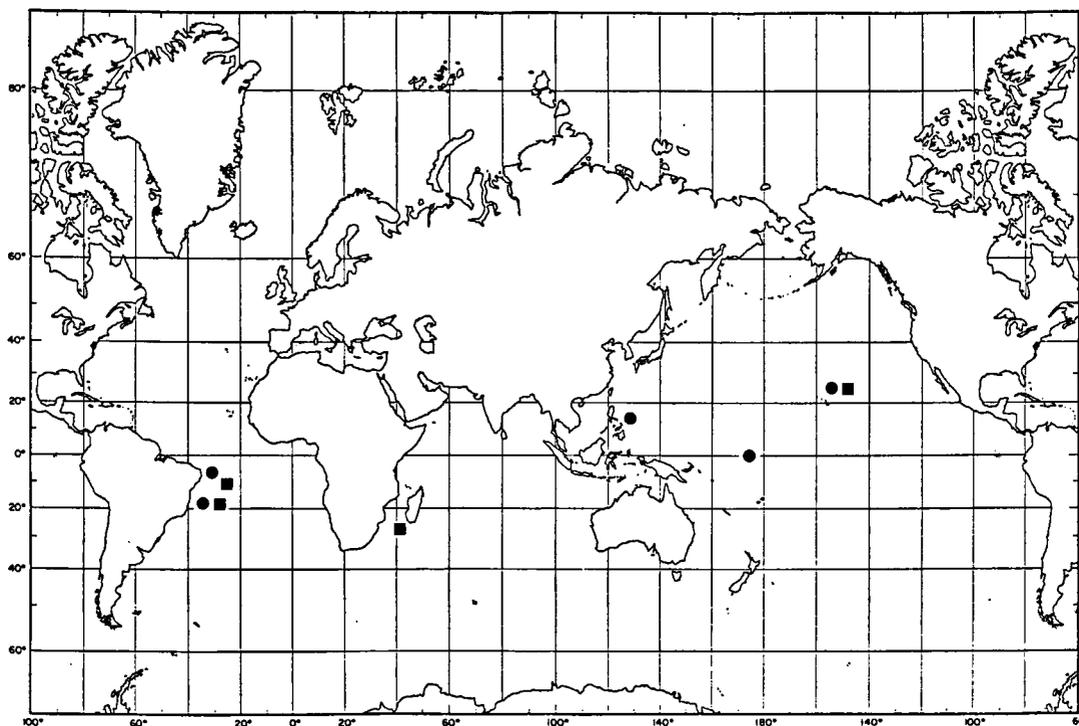


Fig. 5. Geographic distribution of *L. tridens* Stebbing (●), and *L. lihue* Barnard (■).

Leucothoe lihue Barnard, 1970

Figs. 5-7

Leucothoe lihue Barnard, 1970: 209, fig. 136; Ledoyer, 1978: 298; 1979: 102, fig.64; 1986: 663, figs. 247, 254.

Material examined.- 5 males, 15 fe-males, Abrolhos, 17°59'64.6''S 038°45'14.7''W, BA, MNRJ 8547-8548; 2 males and 1 female, Paredes Reef, Abrolhos, BA, MNRJ 8549; 1 male and 3 females, Popa Verde Reef, Abrolhos, BA, MNRJ 8554; 8550-8551; 1 female, Coroa Vermelha, Nova Viçosa, BA, MNRJ 8552; 1 male and 1 female, Praia do Francês, AL, MNRJ 8553.

Diagnosis.- Article 1 of antenna 1 with a terminal bidentate tooth. Article 2 of antenna 2 with a distal notch. Lateral cephalic lobe obtusely angular. Dactylus of gnathopod 1 very short, reaching 15% of propodus length. Male gnatho-

pod 2 carpus distally enlarged. Palm with three truncate processes and small humps proximally, each pointed with two setae. Epimeron 3 rounded-quadrated. Telson with two pairs of dorsal setae, apex rounded, bearing two setae.

Description.- Male (2.8 to 3.1 mm). Antenna 1 longer than antenna 2, reaching 1/3 of body length (Fig. 6a). Antennular article 1 with a terminal bidentate tooth (Fig. 6b). Rostrum small. Lateral cephalic lobe obtusely angular. Eyes of medium size, round (Fig. 6a). Coxae 1-3 (Figs. 6a, c-e) longer than wide, corners rounded, coxa 4 (Figs. 6a, f) with posterior margin excavate, distal margin semicircular.

Epistome (Fig. 6g) triangular, longer than wide and distally acute. Upper lip (Fig. 6g) weakly bilobed. Article 3 of mandibular palp 1/3 to 1/4 of article 2 with one long distal seta; mandible incisor process large, weakly dentate; spine row on the left mandible with 3 spines but with 9



Fig. 6. *Leucothoe lihue* Barnard, male, 3.1 mm; a. entire body; b. distal end of antenna 1 article 1; c-f. coxae 1-4. Female 2.8 mm; g. epistome and upper lip. Male, 3.1 mm; h. left mandible. Male, 2.9 mm; i. detail of left mandible. Male, 3.1 mm; j. detail of right mandible. Male, 2.9 mm; l. lower lip. Male, 3.1 mm; m. maxilla 1; n. maxilla 2; o. maxilliped. Female, 2.8 mm; p. gnathopod 1. Bars a = 0.5 mm; b, g-n = 0.05 mm; c-f, o-p = 0.1 mm.

to 10 spines on the right mandible and in the mandibles of the male with 2.9 mm length. Lacinia mobilis asymmetrical between the two mandibles (Figs. 6h-j). Lower lip (Fig. 6l) apically setose, mandibular lobes blunt. Maxilla 1 (Fig. 6m) inner plate with a single seta; outer plate with 7 spines, palp biarticulate, ending with 4 setae. Maxilla 2 (Fig. 6n) normal for the genus with inner plate with 5 spines and outer with 3 spines and some setae. Maxilliped (Fig. 6o) inner plate with 3 distal setae, outer plate not alate.

Gnathopod 1 (Fig. 6p) carpal spur with small setae, propodus smooth, supporting minute setae and a spine at base of the dactylus, the latter is small, reaching 15% of propodus length. Gnathopod 2 (Figs. 7a-e) basis with a small posterodistal hump, ischium semi-triangular, bearing 2-4 setae terminally, carpus enlarged distally, distal end of variable shape, propodus oval, palm with small humps and three truncated processes distally, each one pointed with 2 setae; dactylus long, reaching carpus end, bent distally. Pereopods 3-4 similar, propodus with 4 spines (Fig. 7f), basis of pereopods 5-6 rounded (Figs. 7g-h), posteroventral margin of pereopod 7 angular (Fig. 7i).

Epimeron 1 with one weak serration posteriorly and one strong spine on anteroventral margin, epimeron 3 rounded-quadrate (Fig. 7j). Uropod 1-2 (Figs. 7l, m) outer ramus shorter than inner ramus. Peduncle of uropod 3 of equal length of outer ramus, both rami with one medial spine (Fig. 7n). Telson triangular (Fig. 7o), more than twice as long as broad, supporting 3 pairs of dorsal setae, 2 plumose pairs medially and one smooth near the apex. Telson tip rounded, bearing two setae.

Female.- Gnathopod 2 (Fig. 7p) carpus not enlarged distally, but ending in an acute tooth; palm crenulate, without defined processes, dactylus shorter, not reaching carpus end.

Remarks.- In Brazil, this species can be clearly distinguished from the other known species by the short dactylus of gnathopod 1 and the smooth posterior margin of propodus. The original description by Barnard (1970) differs in some aspects when compared with the Brazilian specimens. The former presents a small bidentate

tooth on distal end of antennular article 1. Barnard (1970) described the antennular article 1 with "obsolescent terminal cusps". The pereopod 7 has the basis with posteroventral margin oblique but not distinctly concave, resembling the specimens examined by Ledoyer (1986). The epimeron 1 has one weak serration, instead of 2 serrations, and the telson has 2 mediodorsal setae with tip rounded, not minute trilobate as in Barnard (1970).

Ledoyer (1978, 1986) did not mention the small bidentate tooth on antennular article 1 and the 2 pairs of mediodorsal setae on the telson, but the telson tip is rounded as observed in the local specimens. Despite these differences noted in the Brazilian specimens, I consider those specimens as *L. lihue*, especially considering the high morphological variability within the species of this genus.

L. lihue was previously recorded from the Hawaiian Islands (Barnard, 1970) and Madagascar (Ledoyer, 1986) and herein its distribution is enlarged to the northeastern Brazilian coast (AL, BA) (Fig. 5).

Leucothoe laurensi Thomas & Ortiz, 1995
Figs. 8-9

Material examined.- 5 females and 3 males, Coroa Vermelha Reef, Nova Viçosa, BA; MNRJ 7710; 8 females and 3 males, Nova Viçosa Reef, Nova Viçosa, BA, MNRJ 7713-7712, 7716; 11 males and 6 females, Off Porto de Galinhas, PE, 30m, MNRJ 7711; 7718; 4 females and 1 male, Paredes Reef, Abrolhos, BA, MNRJ 7714-7715; 1 female, Popa Verde Reef, Nova Viçosa, BA, MNRJ 7717.

Diagnosis.- see Thomas & Ortiz, 1995: 613.

Remarks.- This species was recently described by Thomas & Ortiz (1995) from Cuba. The specimens collected from the Brazilian coast differ from the original description in some aspects. The gnathopod 1 (Fig. 8a) carpus is slightly thicker on the distal end; the propodus presents a strong distal spine, which was not described by Thomas & Ortiz (1995). Furthermore, the male gnathopod 2 (Fig. 8b) shows the

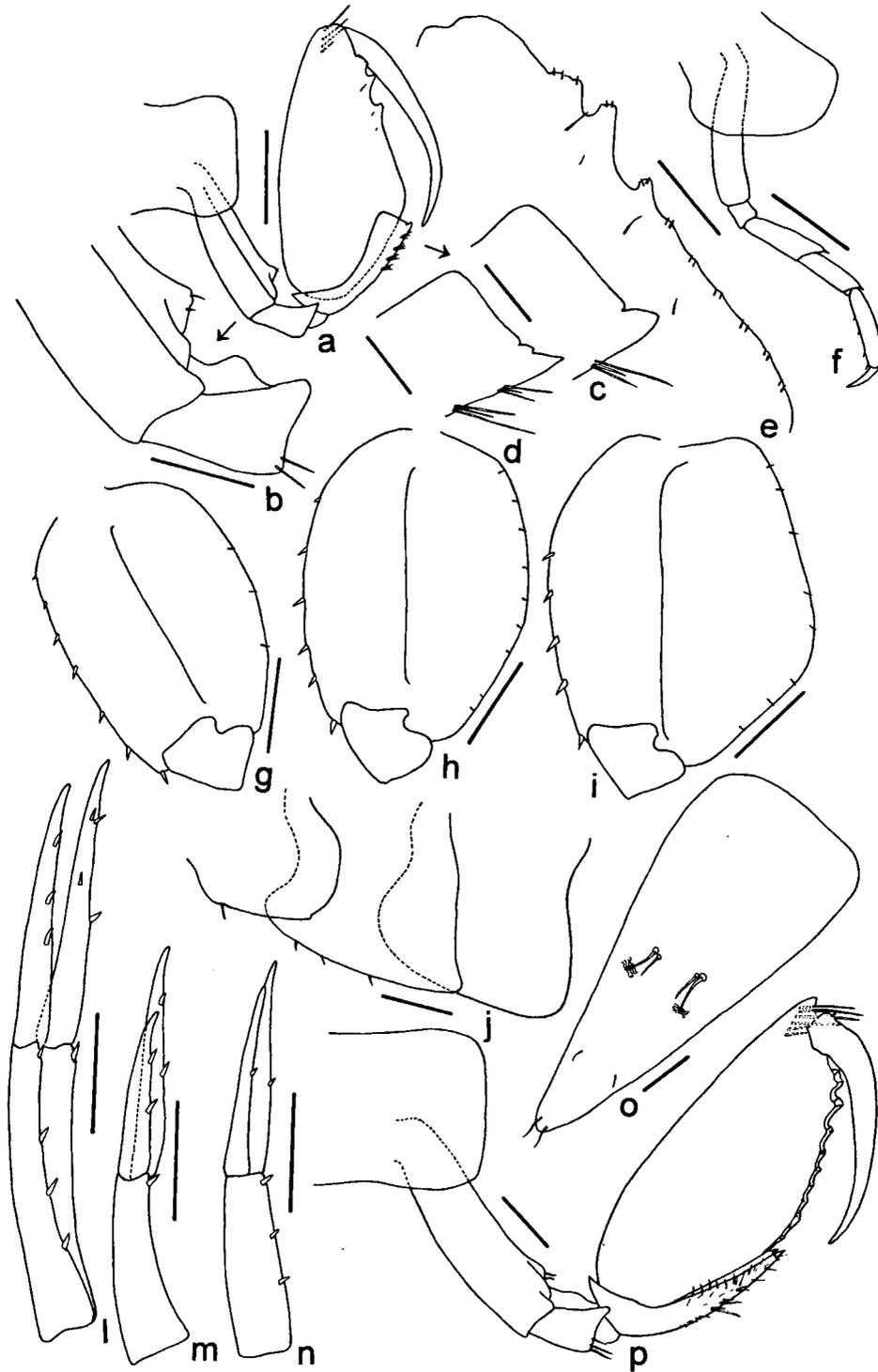


Fig. 7. *Leucothoe lihue* Barnard, male, 3.1 mm; a. gnathopod 2; b. detail of basis and ischium; c. distal end of carpus. Male, 2.9 mm; d. distal end of carpus. Male, 3.1 mm; e. palm; f. pereopod 4; g-i. basis of pereopods 5-7; j. epimera; l-m. uropods 1-3; o. telson. Female, 2.8 mm; p. gnathopod 2. Bars a, f = 0.25 mm; b, e, g-n, p = 0.1 mm; c-d = 0.05 mm; j = 0.1 mm; o = 0.03 mm.

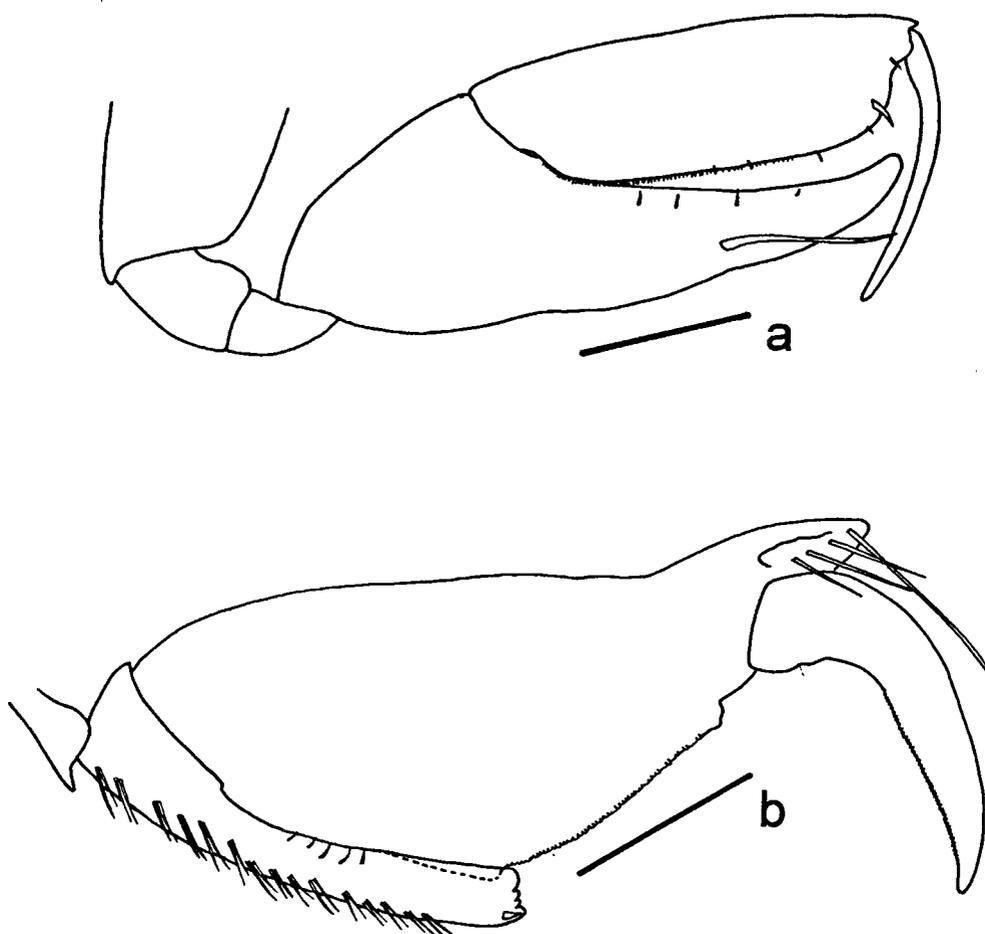


Fig. 8. *Leucothoe laurensi* Thomas & Ortiz, female, 2.7 mm; a. gnathopod 1. Male, 2.6 mm; b. gnathopod 2. Bars a = 0.1 mm; b = 0.2 mm.

palm slightly more oblique, reaching 59% along anterior margin and not 64% as in the specimens from Cuba. So, the differences in the inclination angle in the palm, between male and female, in the Brazilian specimens, are quite remarkable.

This species is relatively small, ranging from 2.1 to 3.2 mm in the specimens observed.

L. laurensi was previously recorded from Cuba, Ascension Island and from the Florida Keys to the Carolinas (Thomas & Ortiz, 1995). In this study, its distribution is enlarged to the northeast-

ern Brazilian coast (PE, BA) (Fig. 9).

***Leucothoe basilobata* n. sp.**

Figs. 10-12

Material examined.- Holotype, male, 3.3 mm, Abrolhos Reef, 17°59'S 038°45'W, BA, 10-20 m, P.S. Young et al. collectors, March, 1995, MNRJ 8539. Paratypes: 2 females, Porto de Galinhas, PE, 30 m, MNRJ 8541; 1 female, California Reef, BA, on *Callyspongia vaginalis*,

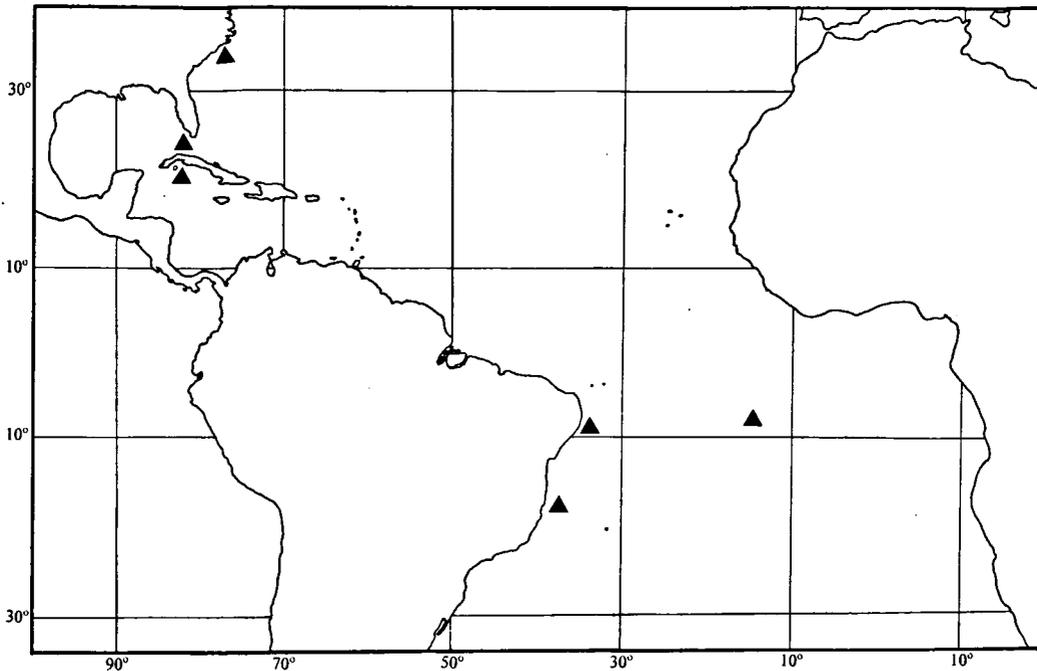


Fig. 9. Geographic distribution of *L. laurensi* Thomas & Ortiz (▲).

MNRJ 11499; 1 female, California Reef, BA, on *Dictyonella* sp., MNRJ 11500; 1 female, Porto de Galinhas, PE, 30 m, USNM 282800; 1 male and 1 female, Abrolhos Reef, 17°59'S 38°45'W, BA, ZMA Amph. 203829.

Diagnosis.- Article 3 of mandibular palp reaching 4/5 of article 2. Gnathopod 1 propodus with posterior margin finely dentate, supporting 4 long spines and one shorter near dactylus insertion; dactylus reaching more than 1/3 of propodus length. Male gnathopod 2 basis with a well-developed lobe on anterior margin, dactylus robust, a little shorter than the palm. Dactylus of pereopod 3-4 nearly half of propodus length.

Description.- Holotype (male 3.3 mm). Antenna 1 (Fig. 10a) article 3 reaching 2/5 of article 1, flagellum 7-articulate with aesthetascs. Antenna 2 (Fig. 10b) articles 3-4 with a small distal notch, flagellum 5-articulate. Rostrum small. Lateral cephalic lobe rounded. Eyes large and oval (Fig. 10c). Coxa 1 (Figs. 10c, d) trapezoidal with lateral margins slightly concave, coxa 2

(Figs. 10c, e) rectangular, coxa 3 (Figs. 10c, f) longer than wide, margins rounded, coxa 4 (Figs. 10c, g) rounded anteriorly, posteroventral margin oblique.

Epistome triangular. Upper lip (Fig. 10h) bilobed with a row of small setae. Article 3 of mandibular palp reaching 4/5 of article 2, with 2 terminal setae (Fig. 10i). Mandibles with asymmetrical lacinia mobilis (Figs. 10i-j). Lower lip (Fig. 10l) with mandibular lobe subacute. Maxilla 1 (Fig. 10m) palp with indistinguishable suture between the two articles, ending in 4 spines, inner lobe with one distal seta. Maxilla 2 (Fig. 10n) with 7 spines on inner lobe and 3 spines on outer one. Maxilliped (Figs. 10o, p) inner lobe with 3 strong spines distally and 2 spines medially, outer lobe finely crenulate along inner margin, palp slender with article 3-4 setose.

Gnathopod 1 (Figs. 10c, q) carpal spur with minute setae, propodus posterior margin dentate, with small triangular teeth, bearing 4 long spines and one shorter near dactylus insertion, dactylus reaching more than 1/3 of propodus length. Gnathopod 2 (Figs. 11a, b) robust, basis with a

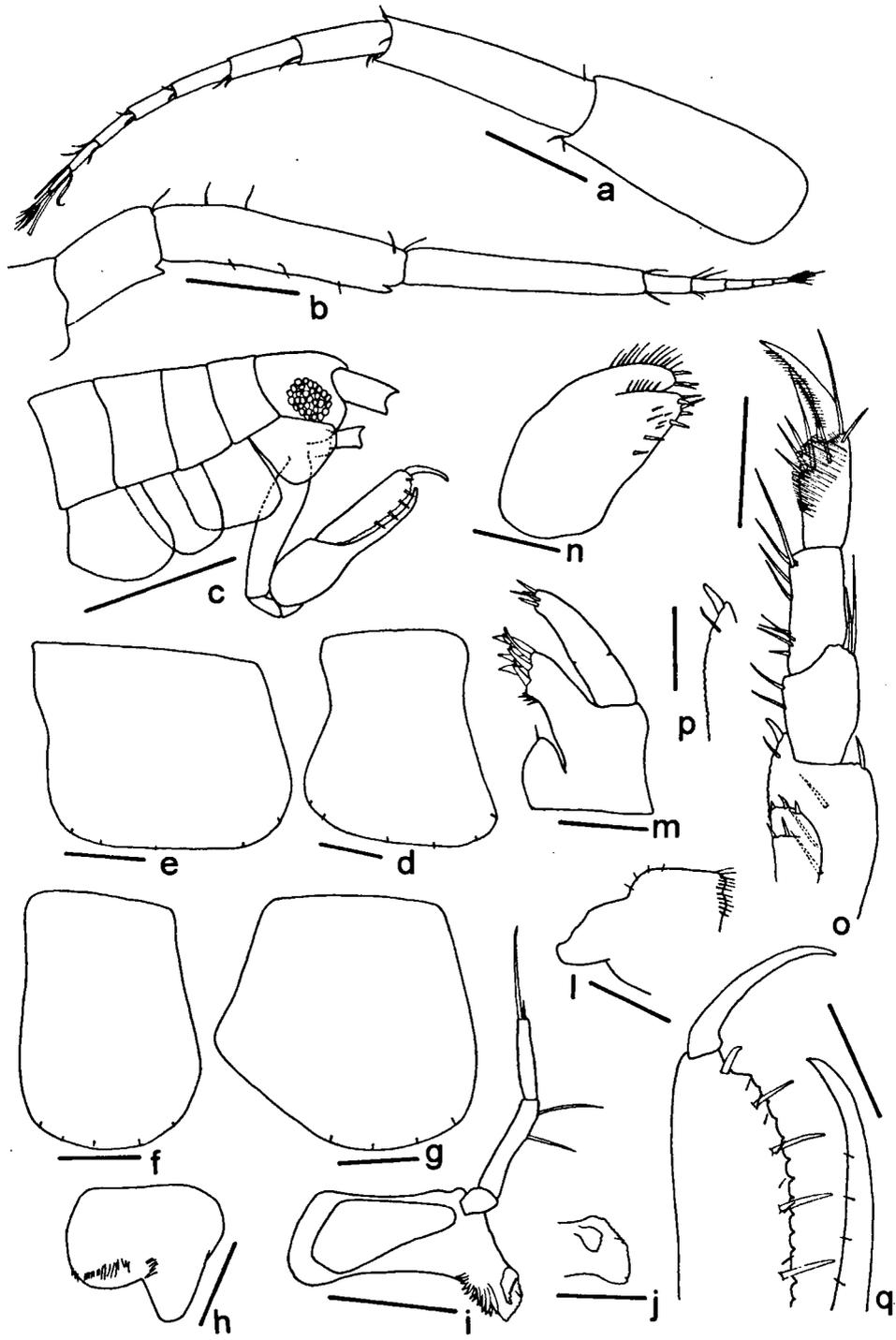


Fig. 10. *Leucothoe basilobata* n. sp. Holotype, male, 3.3 mm; a. antenna 1, b. antenna 2; c. anterior part of the body; d-g. coxae 1-4; h. upper lip; i. left mandible; j. detail of right mandible; l. lower lip; m. maxilla 1; n. maxilla 2; o. maxilliped; p. detail of maxilliped; q. gnathopod 1. Bars a, b, d-g, i, o, q = 0.1 mm; c = 0.5 mm; h, j-n, p = 0.05 mm.

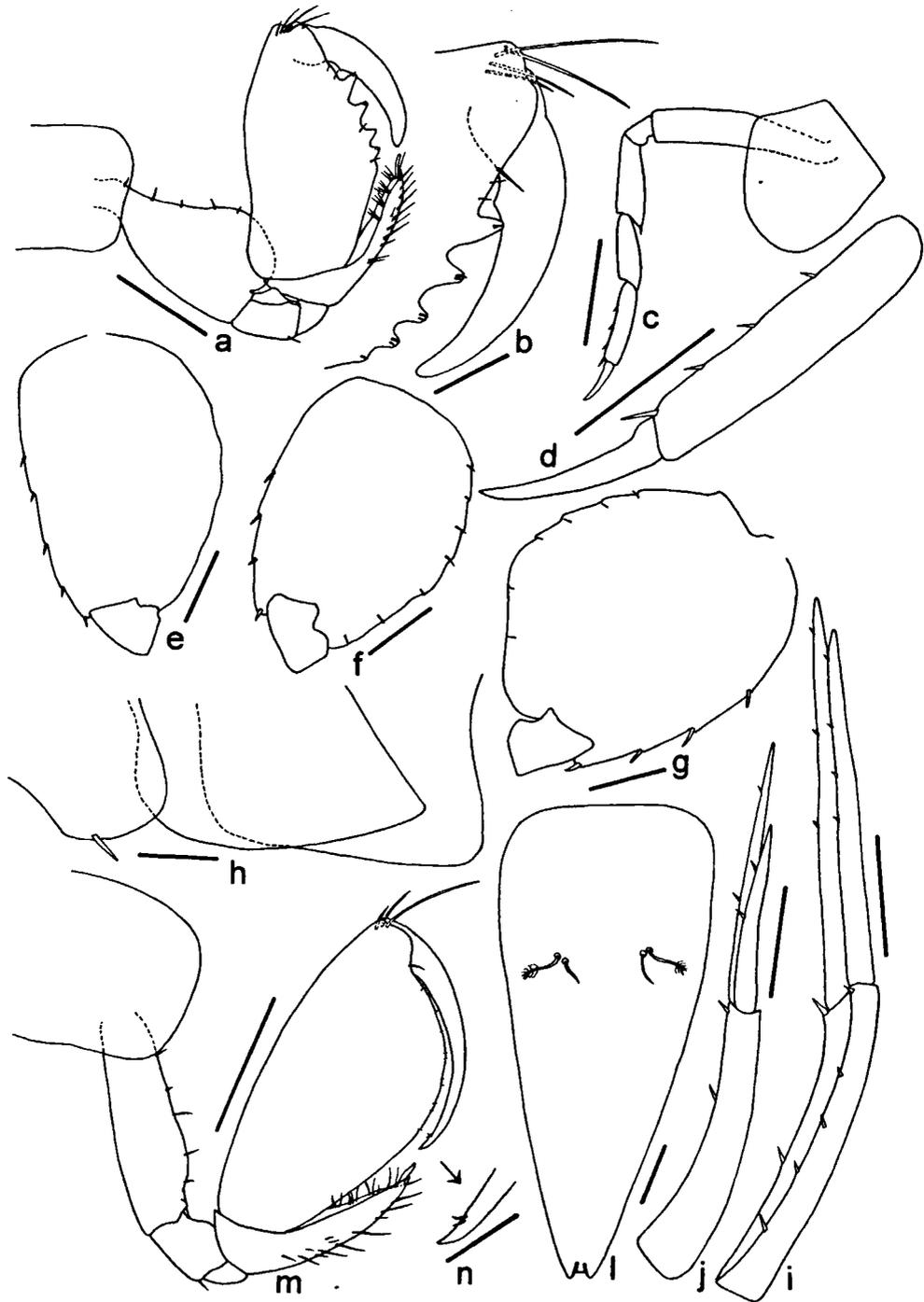


Fig. 11. *Leucothoe basilobata* n. sp. Holotype, male, 3.3 mm; a. gnathopod 2; b. detail of palm and dactylus; c. pereopod 4; d. propodus of pereopod 4; e-g. basis of pereopods 5-7; h. epimera. Female, 2.8 mm; i. uropod 1. Male, 3.3 mm; j. uropod 2. Female, 3.0 mm; l. telson. Female, 2.8 mm; m. gnathopod 2; n. detail of dactylus gnathopod 2. Bars a, c, m = 0.25 mm; b, d-j = 0.1 mm; l = 0.03 mm; n = 0.05 mm.

well-developed lobe on anterior margin, bearing marginal setae, carpus setose ending in a long spine, propodus subrectangular, palm with 4 blunt teeth which increase in size in direction of the dactylus insertion; dactylus robust, shorter than the palm, bearing a small hump on the inner margin. Pereopods 3-4 similar, propodus with 4 spines, dactylus long, about 1/2 of propodus length (Figs. 11c, d). Basis of pereopods 5-6 (Figs. 11e, f) weakly broadened. Basis of pereopod 7 with posterior margin oblique (Fig. 11g).

Epimeron 1 U-shaped, bearing one large spine distally, epimeron 3 rounded-quadrate (Fig. 11h). Uropod 1 (Fig. 11i) outer ramus a little shorter than inner ramus, rami with sparse spines. Uropod 2 (Fig. 11j) peduncle about the same size as inner ramus, outer ramus much shorter than inner ramus. Uropod 3 missing. Telson (Fig. 11l) supporting two pairs of medio-dorsal plumose setae, apex minutely excavate bearing two smooth setae.

Female. - Gnathopod 2 (Figs. 11m, n) basis without lobe, propodus oval, palm bearing tiny setae, dactylus thinner than in males, without small hump on inner margin, ending with 2 small setae.

Etymology. - The name of the species refers to the well-developed lobe on the basis of male gnathopod 2.

Remarks. - The male gnathopod 2 basis with a well-developed lobe in *L. basilobata* n. sp. is a unique character for this species, distinguishing it from the other species of *Leucothoe*. On the other hand, females of *L. basilobata* n. sp. lack this gnathopod 2 structure and resemble the specimens of *L. cheiriserra* n. sp. as following; the outer lobe of maxilliped is finely crenulated along inner margin, gnathopod 1 propodus dentate, similar structure of gnathopod 2 and the telson tip. However, females of *L. basilobata* n. sp. can be distinguished from *L. cheiriserra* n. sp. by the following characters: gnathopod 1 carpal spur and propodus not so elongated, propodus with only one series of small teeth, lacking large teeth, dactylus long, reaching more than 1/3 of propodus length, different shape of coxa 4 and basis of pereopod 7 not so expanded and with postero-

ventral margin oblique.

In Brazil, *L. basilobata* n. sp. occurs at BA and PE (Fig. 12).

***Leucothoe cheiriserra* n. sp.**

Figs. 12-15

Material examined. - Holotype, female, 2.8 mm, Paredes Reef, Abrolhos, BA, P.S. Young collector, March 1994, MNRJ 8542; Paratypes: same locality, 1 female, MNRJ 8544; 1 male, Coroa de Pedra, Baía de Todos os Santos, BA, MNRJ 8543; 1 male and 8 females, Abrolhos Reef, 17°59'64.6"S 038°45'14.7"W, BA, MNRJ 8545; 1 female, Viçosa Reef, BA, MNRJ 8546; 1 male and 2 females, Abrolhos Reef, 17°59'64.6"S 038°45'14.7"W, BA, USNM 282801; 1 male and 2 females, Paredes Reef, Abrolhos, BA, ZMA Amph. 203833.

Diagnosis. - Antenna 1 slightly longer than antenna 2. Article 3 of mandibular palp 2/3 of article 2. Outer plate of maxilliped with crenulate inner margin. Gnathopod 1 propodus with posterior margin strongly dentate, bearing 2 rows, one of small teeth and another of large teeth and long spines; dactylus small, about 9% of propodus length in female and about 13% in males. Male gnathopod 2 carpus dentate on the distal half, ending with a strong spine. Telson tip minutely excavate, with 2 setae.

Description. - Holotype (female 2.8 mm). Antenna 1 slightly longer than antenna 2, reaching 1/3 of body length (Fig. 13a). Antenna 2 (Fig. 13b) peduncle article 4 with a posteroventral notch. Rostrum small. Lateral cephalic lobe round. Eyes oval, medium to large size (Fig. 13a). Coxae 1-4 (Figs. 13c-f) longer than broad, corners rounded. Coxa 4 (Fig. 13f) strait at the base, getting wider distally, forming a semicircular distal margin.

Epistome (Fig. 13g) triangular, about as long as wide. Upper lip (Fig. 13g) weakly bilobated. Article 3 of mandibular palp about 2/3 of article 2 with 2 distal setae. Mandibles with lacinia mobilis well-developed in the left side and reduced on the right side (Figs. 14a, b). Lower lip (Fig. 14c) with inner and outer lobe setose,

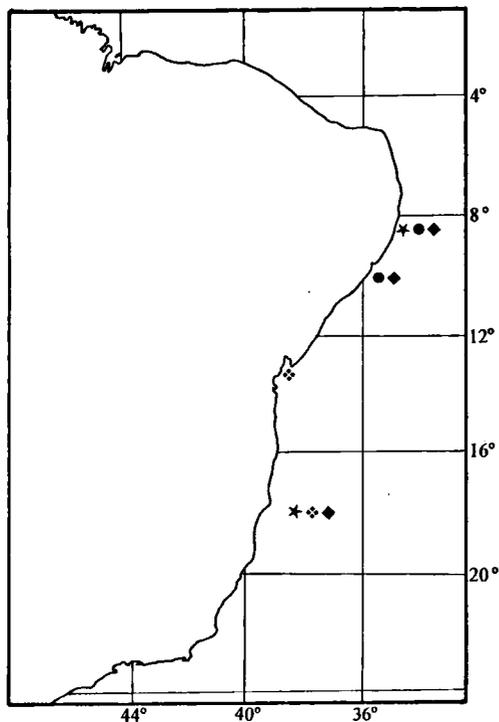


Fig. 12. Geographic distribution of *Leucothoe basilobata* n. sp. (★); *Leucothoe cheiriserra* n. sp. (✦); *Leucothoe leptosa* n. sp. (●); *Leucothoe urospinosa* n. sp. (■)

mandibular lobes blunt. Maxilla 1 (Fig. 14d) inner plate with one distal seta, outer plate with 6 spines, palp with indistinct suture between the two articles with four terminal setae. Maxilla 2 (Fig. 14e) inner plate with 5-7 spines and outer with 3 spines. Maxilliped (Figs. 14f, g) inner lobe with 2 strong distal spines, outer lobe crenulate along inner margin, palp articles 3-4 with marginal setae.

Gnathopod 1 slender (Figs. 13a, 14h, i), carpal spur and propodus elongate, the first bearing a row of minute setae and the second with posterior margin strongly dentate, with 2 rows, one of small teeth and another of large teeth and long spines. These small teeth on the propodus dentition are quite variable in number, and recover halfway or the entire propodus. Especially in females these spines are difficult to recognize because they are tiny and transparent. Gnatho-

pod 1 dactylus small, about 9% of propodus length, with small curved spine at its base. Gnathopod 2 (Figs. 13a, 14j, l) basis with sparse setae on anterior margin; carpus ending in a strong spine with inner margin setose; propodus oval, palm with small humps and long and small setae, dactylus ending with one tiny seta. Pereopods 3-4 similar, with minute setae on propodus, dactylus less than 1/2 of propodus length (Figs. 14m, n). Basis of pereopods 5-7 (Figs. 14o-q) expanded, especially of pereopod 7, which presents posterior margin finely crenulate and rounded, not angular.

Epimeron 1 U-shaped, epimeron 3 rounded-quadrate (Fig. 15a). Rami of uropods 1-2 feeble, often broken on specimens examined. Peduncle of uropod 1 with 3-5 spines, subequal to outer ramus, which is slender, bearing 4 spines, inner ramus broken (Fig. 15b). Uropod 2 peduncle about 3/4 of inner ramus, outer ramus reaching 60% of inner ramus (Fig. 15c). Uropod 3 missing. Telson tip (Figs. 15d, e) minutely excavate, with two setae.

Male. - Gnathopod 1 (Figs. 15f, g) carpus and propodus not so elongate as in females, propodus with stronger dentition on inner margin, dactylus reaching 13% of propodus length. Gnathopod 2 (Figs. 15h-j) carpus finely dentate on the distal half, the point ending with a spine.

Etymology. - The name of the species refers to the strong dentition on propodus

Remarks. - *L. cheiriserra* n. sp. falls in Ledoyer's (1978) group IV, with dactylus of gnathopod 1 small, less than 1/4 of propodus length, and epimeral plates rounded or quadrate. It lacks teeth or sinus on palm gnathopod 2 as the other group IV species proposed by this author. This species together with *L. ctenochasma* Moore (1987) form a new subgroup IV, where the palm of gnathopod 2 is crenulate and gnathopod 1 propodus is strongly dentate.

L. cheiriserra n. sp. is quite similar to *L. basilobata* n. sp. (discussed above) and *L. ctenochasma* in presenting the propodus of gnathopod 1 dentate, the outer lobe of the maxilliped crenulate internally, the posterodistal notch on antenna 2 and the shape of the telson tip. However, *L. cheiriserra*

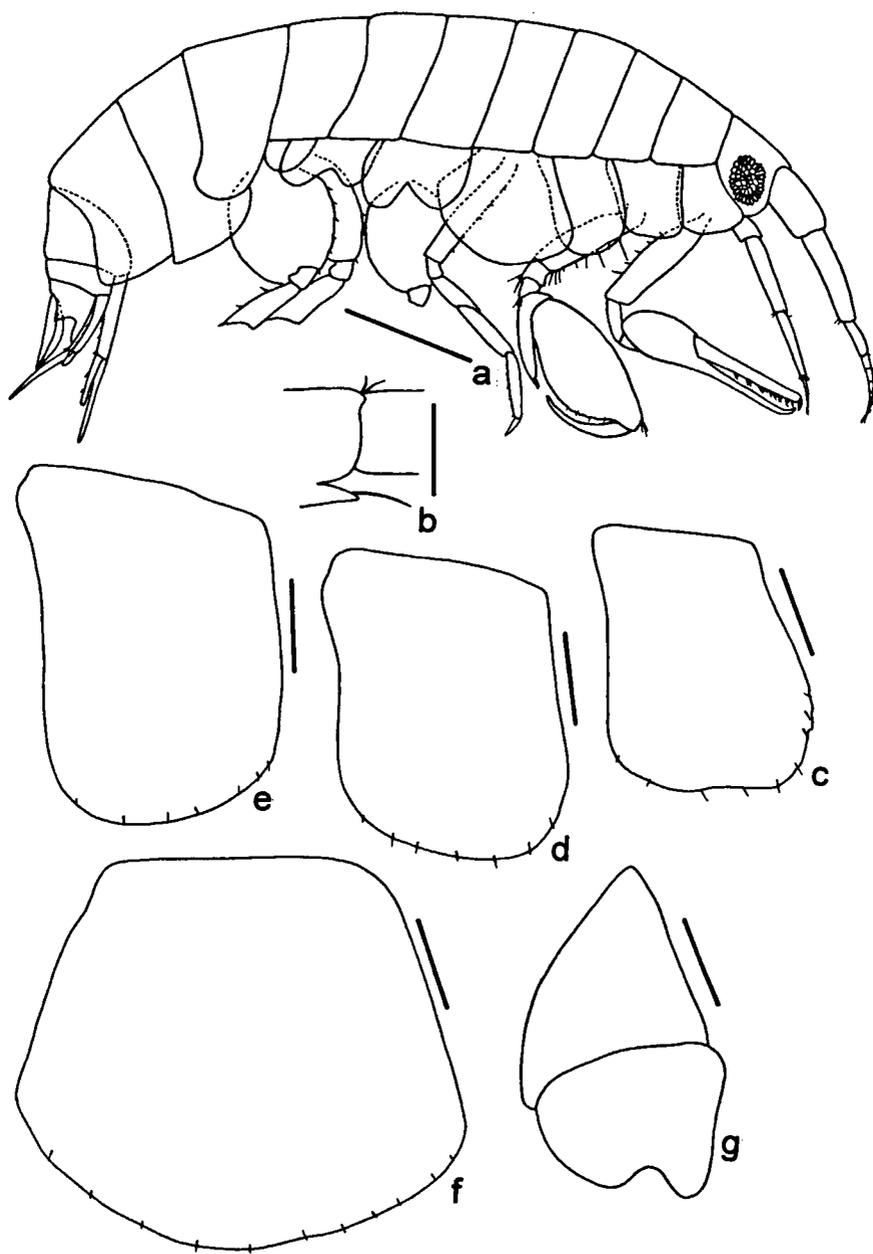


Fig. 13. *Leucothoe cheiriserra* n. sp. Holotype, female, 2.8 mm; a. entire body, b. distal end of article 4 antenna 2; c-f. coxae 1-4; g. epistome and upper lip. Bars a = 0.5 mm; b, g = 0.05 mm; c-f = 0.1 mm.

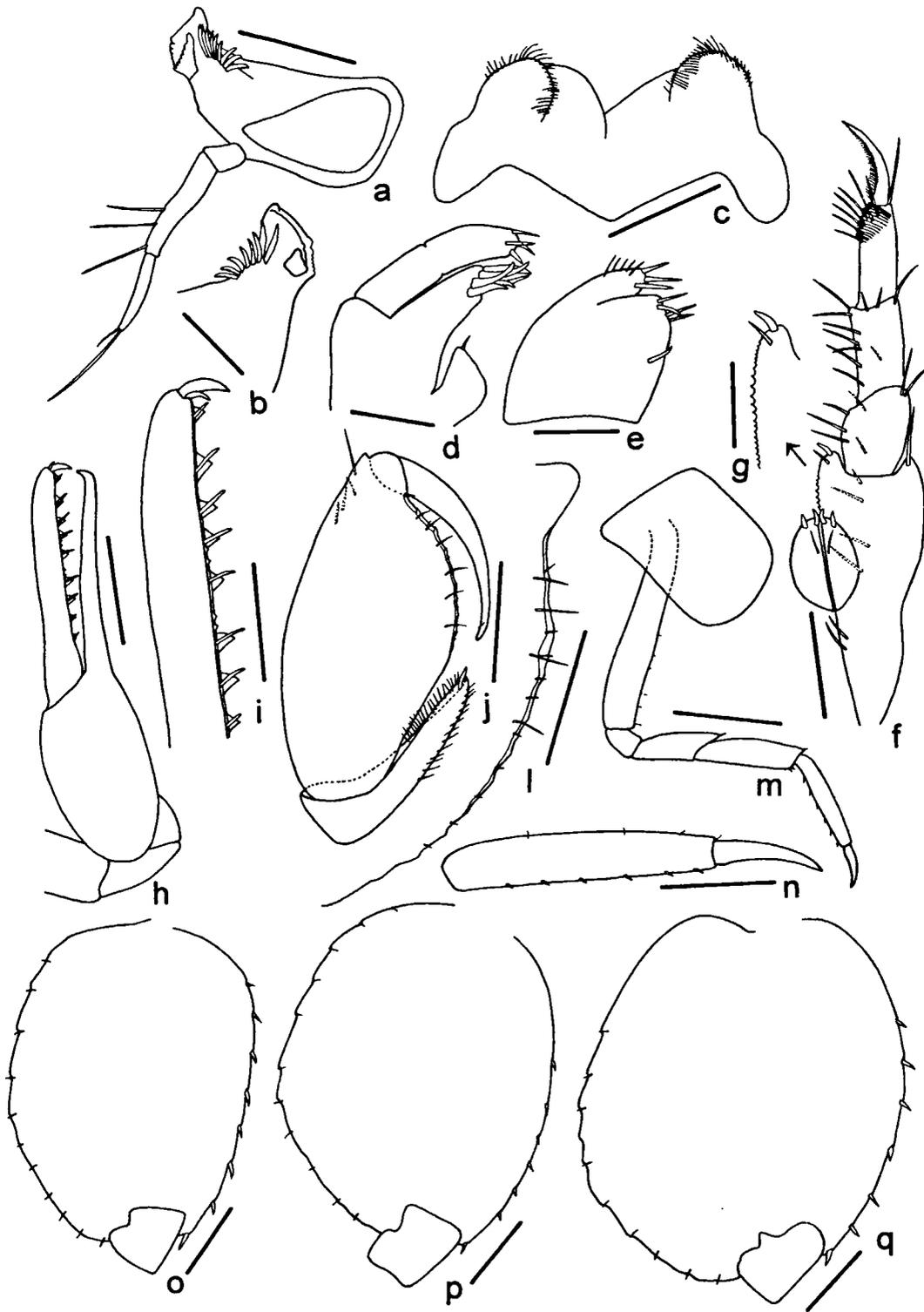


Fig. 14. *Leucothoe cheiriserra* n. sp. Holotype, female, 2.8 mm; a. left mandible; b. detail of right mandible; c. lower lip; d. maxilla 1; maxilla 2; f. maxilliped; g. detail of maxilliped; h. gnathopod 1; i. propodus of gnathopod 1; j. gnathopod 2; l. palm of gnathopod 2; m. pereopod 3; n. propodus of pereopod 3; o-q. basis of pereopods 5-7. Bars a, c, f, i, l, n, o-q = 0.1 mm; b, d-e, g = 0.05 mm; h, j = 0.2 mm; m = 0.25 mm.

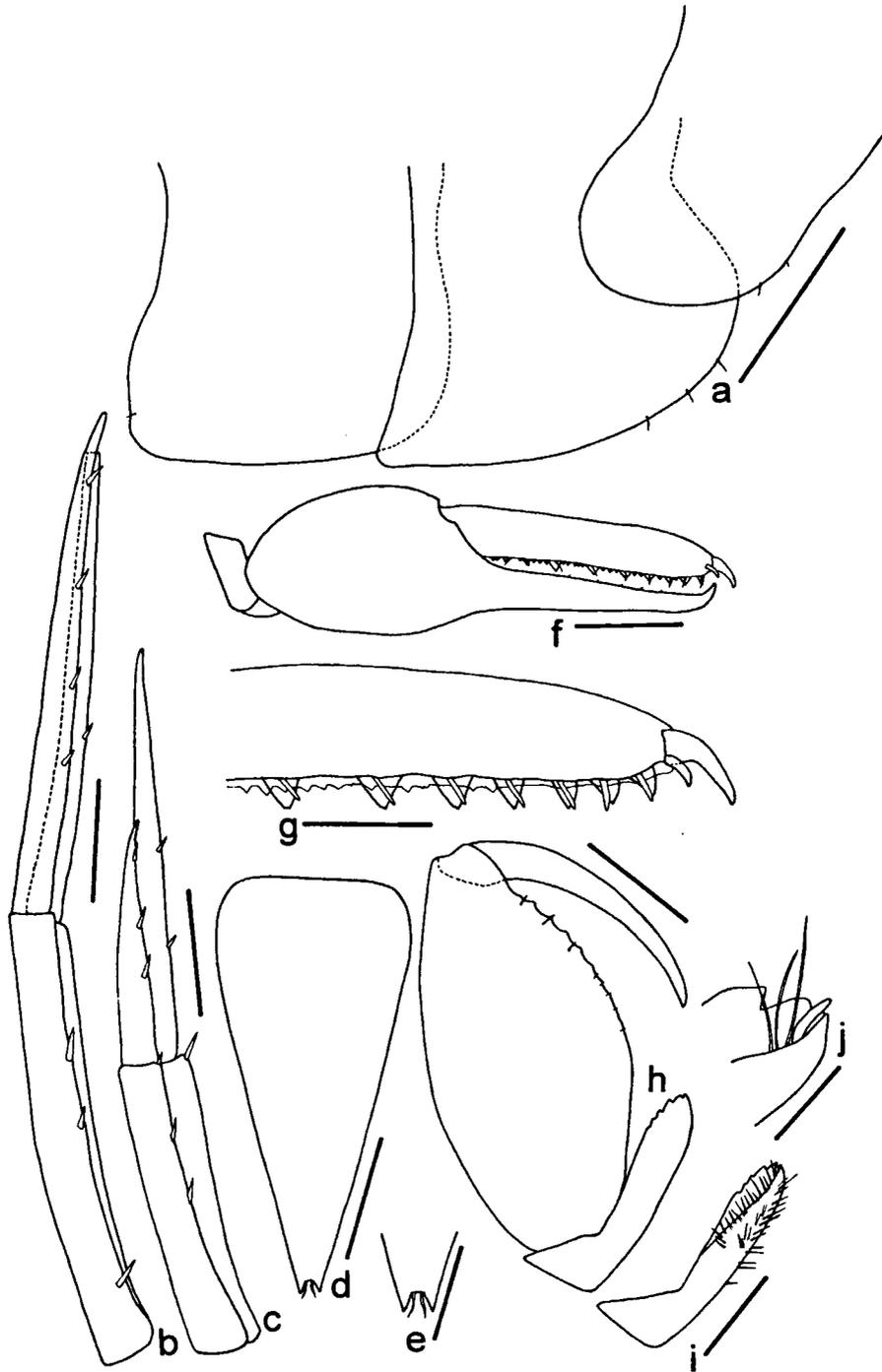


Fig. 15. *Leucothoe cheiriserra* n. sp. Holotype, female, 2.8 mm; a. epimera; b-c. uropods 1-2; d. telson; e. telson tip. Male, 4.6 mm; f. gnathopod 1; g. propodus of gnathopod 1; h. gnathopod 2; i. carpus inner view, j. carpus end. Bars a = 0.2 mm; b-d, g = 0.1 mm; e, i-j = 0.05 mm; f, h = 0.25 mm.

n.sp. can be distinguished by the following characters: article 3 of mandibular palp about 2/3 of article 2; coxa 4 enlarged distally, forming a semicircular margin; gnathopod 1 propodus with stronger dentition, larger teeth reaching the middle or the end of the spines; basis of pereopods 6-7 remarkably more expanded and telson without rows of dorsal setae, only two distal setae.

L. cheiriserra was registered only in BA, Brazil (fig. 12).

Leucothoe leptosa n. sp.

Figs. 12, 16-17

Material examined.- Holotype, male, 3.3 mm, off Porto de Galinhas, PE, P.S. Young and C. Serejo collectors, February, 1995, MNRJ 7294. Paratypes: same locality, 1 male and 1 juvenile, MNRJ 7295; 1 male, Pontal do Coruripe, Don Rodrigo Reef, AL, ZMA Amph. 203831.

Diagnosis.- Article 3 of antenna 1 enlarged distally. Article 2 of flagellum antenna 2 remarkably larger than the others, reaching 1.5 times of article 1 length. Coxae 3-4 crenulate on distal margin. Dactylus of gnathopod 1 reaching 1/4 of propodus length. Gnathopod 2 carpus dentate on distal half, ending in a strong spine, dactylus curved distally. Propodus of pereopods 3-4 with three strong distal spines. Posteroventral corner of epimeron 3 finely notched. Telson tip acutely projected with two setae.

Description.- Holotype (male 3.3 mm). Body slender. Antenna 1 a little shorter than antenna 2 (Fig. 16a). Antenna 1 article 3 enlarged distally (Fig. 16b), flagellum with 6 articles. Flagellum of antenna 2 (Fig. 16c) with 4 articles, being the second remarkably larger than the others, reaching 1.5 times of article 1 length. Rostrum obsolete. Lateral cephalic lobe rounded. Eyes large and round (Fig. 16a). Coxa 1 (Figs. 16a, d) slightly concave on posterior margin, coxa 2 rectangular, coxae 3-4 (Figs. 16e, f) distal margin finely crenulate.

Epistome (Fig. 16g) about 2 times longer than wide, acute distally. Upper lip (Fig. 16g) of bilobed shape with row of small setae distally. Mandibular palp article 3 about 1/3 of article 2,

ending in two setae (Fig. 16h). Mandibles with asymmetrical lacinia mobilis (Figs. 16h, i). Lower lip (Fig. 16j) setose apically, mandibular lobes acute. Maxilla 1 (Fig. 16l) inner lobe with a single seta, outer plate with large conical spines, palp ending with 3 spines. Maxilla 2 (Fig. 16m) inner lobe with 5 spines and outer lobe with 3 spines. Maxilliped (Fig. 16n) inner lobe with 3 blunt spines apically and 2 medial spines, outer plate not alate.

Gnathopod 1 (Figs. 16o, p) carpal spur with minute setae; propodus oval, posterior margin crenulated, bearing tiny setae and a spine at base of dactylus, the later reaching 1/4 of propodus length. Gnathopod 2 (Figs. 17a-d) basis with a posterodistal hump as in *L. lihue*, carpus dentate on distal half, with minute setae among the teeth, ending in a strong spine, palm with small humps and truncated teeth, each one ending with one or two setae, dactylus curved distally. Propodus of pereopods 3-4 with one medial spine and three strong distal spines (Fig. 17e), dactylus long, more than halfway of propodus length. Basis of pereopods 5-7 weakly enlarged (Figs. 17f-h). Propodus of pereopod 5 (Figs. 17i, j) with 2 medial spines and 2 larger spines distally. Carpus, propodus and dactylus of pereopods 6-7 missing.

Posteroventral corner of epimeron 1 and 3 finely notched, bearing one seta (Fig. 17l). Uropod 1 (Fig. 17m) peduncle, nearly the same size as inner ramus, outer ramus a little shorter than inner ramus. Uropod 2 (Fig. 17n) outer ramus reaching 70% of inner ramus, each ramus with one spine. Uropod 3 missing. Telson tip (Fig. 17o) acutely projected with two setae.

Female.- Unknown.

Variation.- The juvenile specimen (2.3 mm) lacks crenulate coxae 3-4, gnathopod 2 (Fig. 17p) carpus smooth and palm with weaker dentition. Also the propodus of pereopod 3 presents 2 strong distal spines instead of 3 spines as observed in adults.

The male paratype (3.0 mm) with asymmetrical second gnathopods, being the right one reduced (Fig. 17q), similar to the juvenile specimen, and the left one normal as in the holotype. Furthermore, in this male specimen, the epime-

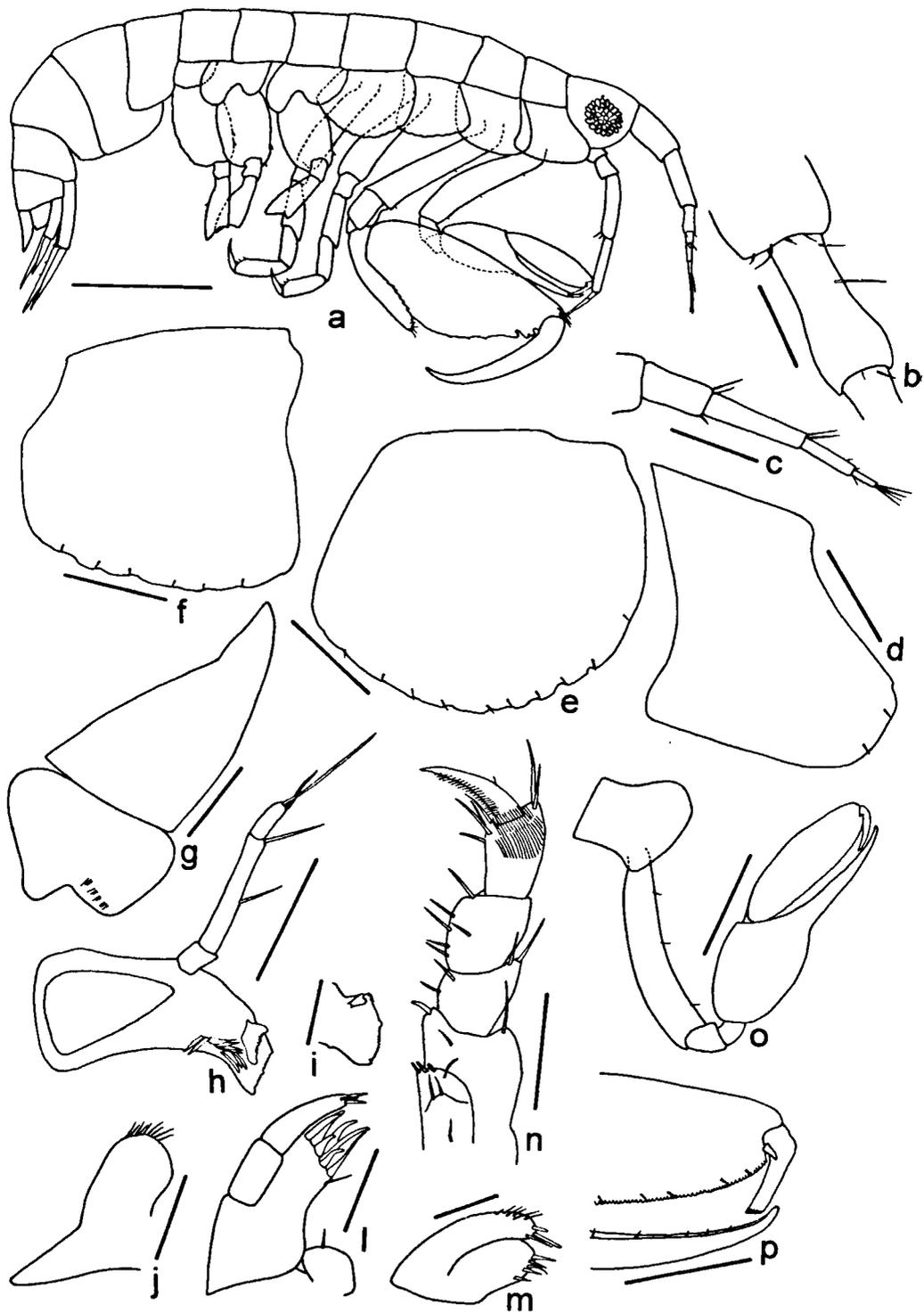


Fig. 16. *Leucothoe leptosa* n.sp. Holotype, male, 3.3 mm; a. entire body; b. antenna 1 article 3; c. flagellum of antenna 2; d-f. coxae 1, 3-4; g. epistome and upper lip; h. left mandible i. detail of right mandible; j. lower lip; l. maxilla 1; m. maxilla 2; n. maxilliped; o. gnathopod 1; p. detail of gnathopod 1. Bars a = 0.5 mm; b-c, g, i-m = 0.05 mm; d-f, h, n, p = 0.1 mm; o = 0.25 mm.

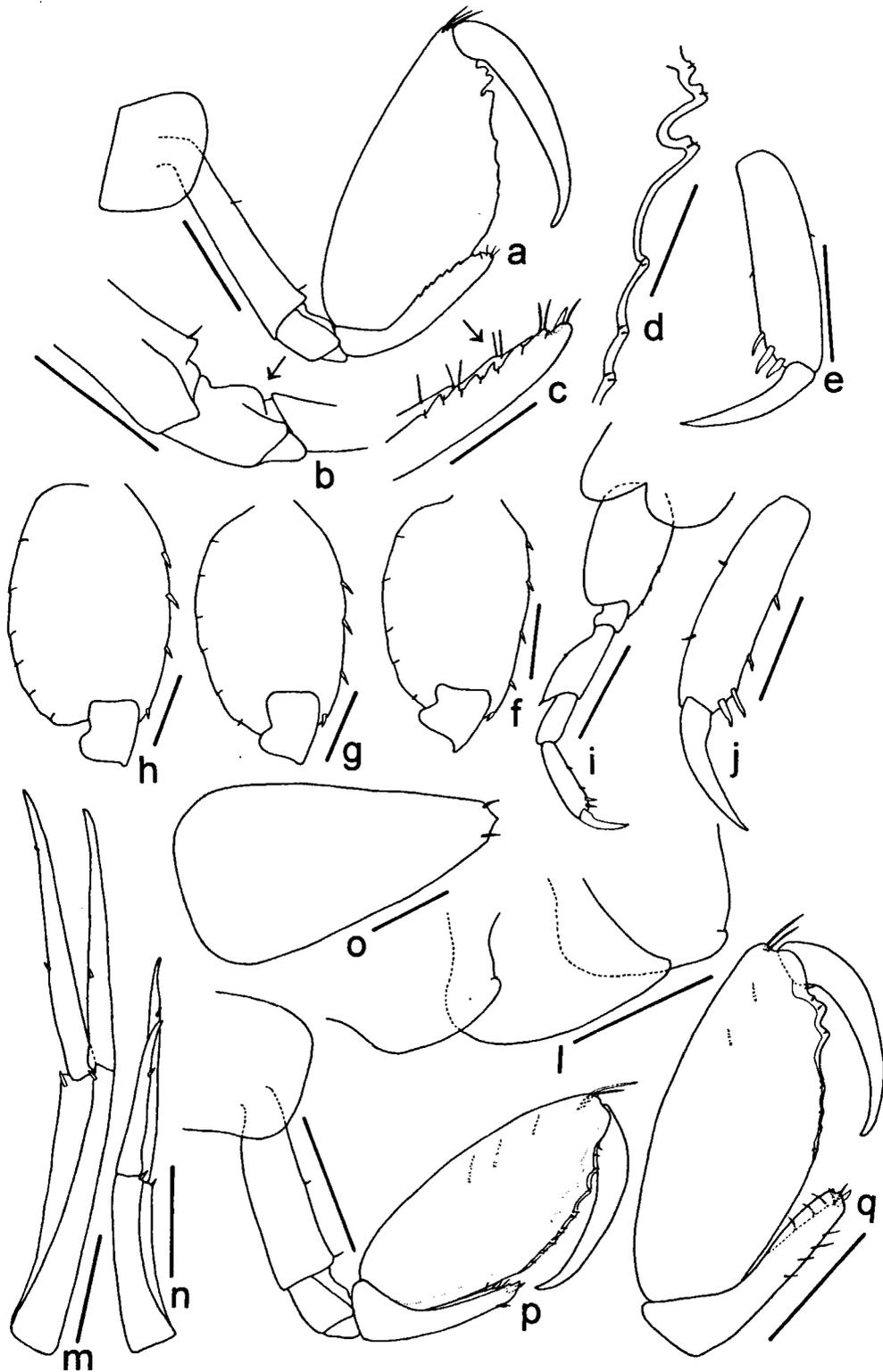


Fig. 17. *Leucothoe leptosa* n.sp. Holotype, male, 3.3 mm; a. gnathopod 2; b. detail of basis and ischium; c. carpus end; d. palm; e. propodus of pereopod 3; f-h. basis of pereopods 5-7; i. pereopod 5; j. propodus of pereopod 5; l. epimera; m-n uropods 1-2; o. telson. Juvenile, 2.3 mm. p. gnathopod 2. Male, 3.0 mm; q. right gnathopod 2. Bars a, i = 0.25 mm; b, l p-q = 0.2 mm; c-h, j, m-n = 0.1 mm; o = 0.05 mm.

ron 1 presents a spine near the anterior corner not seen in the holotype.

Etymology.- The name of the species refers to slender body. From the Greek leptos (slender).

Remarks.- *L. leptosa* n. sp. resembles *L. acanthopus* Schellenberg (1928) from the Suez Canal in the shape of the head and by acutely projected telson tip, bearing two setae. Despite the fact that Schellenberg (1928) examined only juvenile specimens (3.0 mm) which resemble very much the juvenile (2.3 mm) collected here, *L. leptosa* n. sp. can be distinguished by the following characters in juveniles: article 3 of antenna 1 enlarged distally; article 2 of flagellum antenna 2 markedly larger than the others, up to 1.5 times the length of article 1; coxa 1 strongly produced anteriorly; gnathopod 2 dactylus distally curved and not so thin and slender. Besides the above characters, the male adults (3.3 mm and 3.0 mm) can be distinguished from *L. acanthopus* in presenting coxae 3-4 finely crenulate on distal margin; propodus of pereopod 3 with 3 strong distal spines and the structure of gnathopod 2 which has the carpus dentate on distal half; palm with truncated teeth and dactylus distally bent.

L. leptosa n. sp. presents coxa 2 broader than long but without sharp corners. This character is an intermediate condition between the 2 subgenera proposed by Barnard & Karaman (1991) suggesting the weakness of this separation.

In Brazil, *L. leptosa* n. sp. occurs at PE and AL (Fig. 12).

***Leucothoe urospinosa* n. sp.**

Figs. 12, 18-19

Material examined.- Holotype, male, 4.3 mm, Paredes Reef, BA, P.S. Young collector, March, 1994, MNRJ 7297. Paratypes: 19 females, 3 males and 17 juveniles, same locality, MNRJ 8535; 8537; 14 females, 2 males and 9 juveniles, Abrolhos Reef, 17°59'64.6''S 038°45'14.7''W, BA, MNRJ 7299-7300; 8538; 2 females and 2 males, Praia do Francês, AL, MNRJ 8520; 1 female, Santo Aleixo Island, PE, MNRJ 8519; 6 females and 3 juveniles, Rasinho do Coiceiro, PE, MNRJ 8523; 8533; 1 juvenile,

Popa Verde Reef, Abrolhos, BA, MNRJ 7290; 2 males and 4 females, Abrolhos Reef, 17°59'64.6''S 038°45'14.7''W, BA, USNM 282802; 1 male and 2 females, California Reef, BA, on *Dysidea janiae*, 20-30 m, ZMA Amph. 203830.

Diagnosis.- Antennae 1 and 2 of the same length. Rostrum prominent, about 1/3 the size of article 1 of antenna 1. Lateral cephalic lobe beveled. Article 3 of mandibular palp about 1/5 of article 2. Dactylus of gnathopod 1 reaching 1/3 to 1/2 of propodus length. Coxa 4 with posteroventral margin oblique, corners round. Ramus of uropod 1 with a sequence of 4-6 spines on the distal half. Posteroventral corner of epimeron 3 rounded. Telson triangular, with a pair of tiny distal setae and two medial plumose setae.

Description.- Holotype (male 4.3 mm). Antennae 1-2 reaching 2/5 of the body length. Article 3 of antenna 1 about 1/5 of article 1. Rostrum prominent, about 1/3 of antennular article 1. Lateral cephalic lobe beveled. Eyes of medium size, oval (Fig. 18a). Coxae 1-2 (Figs. 18 b, c) rectangular, first with finely dentate corners, coxa 3 (Fig. 18d) truncated distally, coxa 4 (Fig. 18e) with posteroventral margin oblique, corners round.

Epistome (Fig. 18f) triangular, a little longer than broad. Upper lip (Fig. 18f) strongly bilobated with terminal row of setae. Article 3 of mandibular palp small, about 1/5 of article 2, with one terminal seta (Fig. 18g). Mandibles with asymmetrical lacinia mobilis (Figs. 18g, h). Lower lip (Fig. 18i) with inner and outer lobe setose, mandibular process blunt. Maxilla 1 (Fig. 18j) inner plate with one distal seta, outer plate with normal and bifid spines, palp with indistinct suture between the two articles and four setae distally. Maxilla 2 (Fig. 18l) inner plate with 7 spines and outer with 3 spines. Maxilliped (Figs. 18m, n) inner plate with 3 distal spines and one medial strong pectinate spine; outer plate subulate; palp article 3 with transverse and oblique group of setae.

Gnathopod 1 stout (Figs. 19a, b), propodus finely crenulated with 2-4 long spines and a short spine near the dactylus insertion; dactylus long, about 1/3 to 1/2 of propodus length. Gnathopod 2 (Figs. 19c-f) ischium slightly pro-

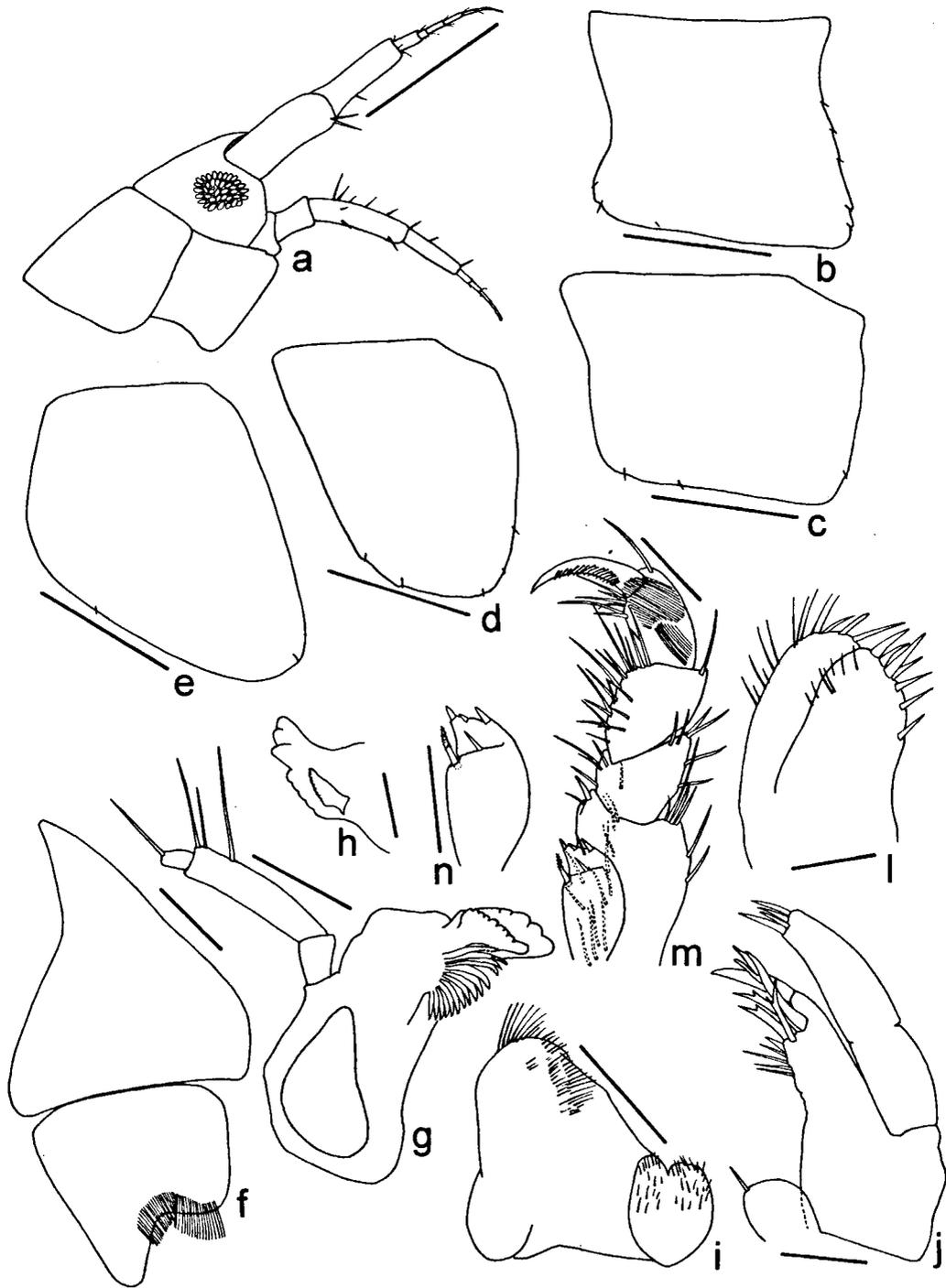


Fig. 18. *Leucothoe urospinosa* n. sp. Holotype, male, 4.3 mm; a. head with antennae; b-e. coxae 1-4. Female, 3.5 mm; f. episotome and upper lip. Male, 4.3 mm; g. left mandible; h. detail of right mandible; i. lower lip; j. maxilla 1; l. maxilla 2; m-n. maxilliped. Bars a = 0.5 mm; b-e = 0.2 mm; f, h, j-l = 0.05 mm; g, i, m-n = 0.1 mm.

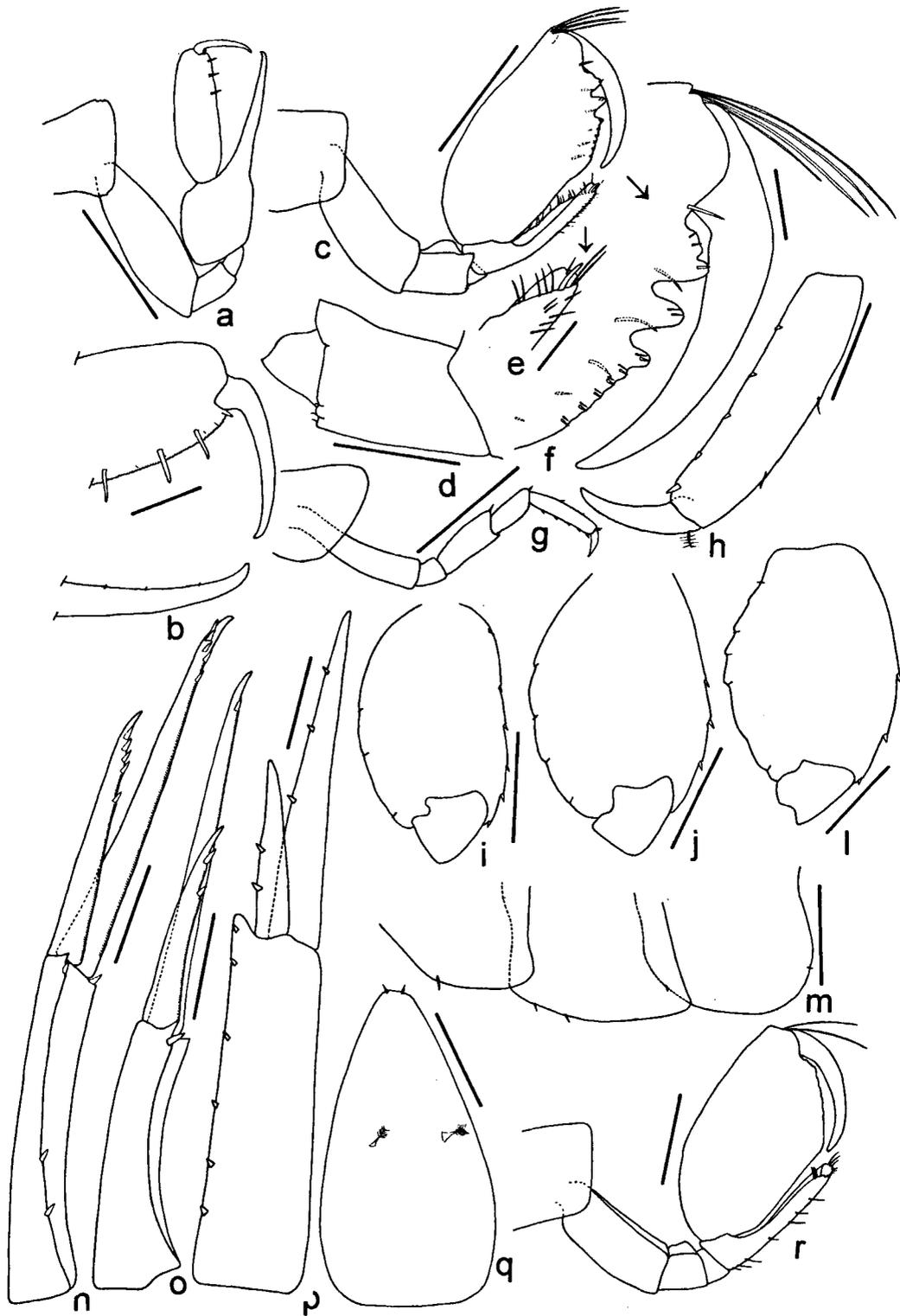


Fig. 19. *Leucothoe urospinosa* n. sp. Holotype, male, 4.3 mm; a. gnathopod 1; b. detail of gnathopod 1; c. gnathopod 2; d. ischium; e. carpus end; f. palm of gnathopod 2; g. pereopod 4; h. propodus of pereopod 4; i-l. basis of pereopods 5-7; m. epimera; n-o. uropod 1-2. Female, 3.9 mm; p. uropod 3. Male, 4.3 mm; q. telson. Female, 3.5 mm; r. gnathopod 2. Bars a, c, g = 0.5 mm; b = 0.4 mm; d, i-m = 0.2 mm; e-f, h, n-q = 0.1 mm; r = 0.25 mm.

jected anteriorly, carpus ending with one spine, propodus of subrectangular shape; palm oblique, with small humps, 3 well-developed blunt teeth and small setae. In females and juveniles the ornamentation of the palm is not so developed. Pereopods 3-4 similar, propodus with 5 spines on posterior margin, dactylus with one plumose seta (Figs. 19g, h). Pereopods 5-7 basis slightly expanded (Figs. 19i-l).

Epimeron 1 with one spine on anterior corner, posteroventral corner of epimeron 3 rounded (Fig. 19m). Rami of uropod 1 minutely serrate, with a sequence of 4-6 spines on the distal half; outer ramus reaching 2/3 of inner ramus (Fig. 19n). Rami of uropod 2 minutely serrate, outer ramus with 2 distal spines, surpassing a little the halfway of inner ramus, which has a single distal spine (Fig. 19o). Uropod 3 large (Fig. 19p), outer ramus about 1/2 of inner ramus, bearing 2 spines medially, inner ramus with 3 spines. Telson triangular (Fig. 19q), with a pair of tiny distal setae and two medial plumose setae.

Female. - Palm of gnathopod 2 (Fig. 19r) crenulate, without defined teeth.

Etymology. - The name of the species refers to the characteristic sequence of spines on uropod 1. From the Greek *oura* (tail) and the Latin *spina* (spine).

Remarks. - Ledoyer (1978) arranged the species of *Leucothoe* in groups, according to their morphology. *L. urospinosa* n. sp. would fit in the *L. spinicarpa* group (group VI), with the dactylus of gnathopod 2 long, epimeron 3 rounded and palm of gnathopod 2 denticulate. Despite this group being considered problematic, with several species difficult to distinguish, *L. urospinosa* n. sp. can be easily differentiated by the following characters: rostrum prominent, reaching 1/3 of antennular article 1; lateral cephalic lobe beveled; gnathopod 2 propodus subrectangular; article 3 of mandibular palp 1/5 of article 2; and rami of uropods 1-2 finely serrated, the first with a characteristic sequence of 4-6 spines on distal half.

Curiously, several examined specimens present some branchiae with small capsules attached on the margin, that could be diatoms

or bacteria. These capsules were observed only in this species.

In Brazil, *L. urospinosa* n. sp. occurs at PE, AL and BA (Fig. 12).

ACKNOWLEDGMENTS

I would like to thank Dr. P.S. Young (Museu Nacional/UFRJ, Rio de Janeiro), Dr. E. L. Bousfield (National Museum of Canada) and Dr. G. Krapp-Schickel (Museum Koenig, Bonn, Germany) who gave valuable comments and revised the manuscript. I also want to thank the Fundação Universitária José Bonifácio for financial support.

REFERENCES

- ABILDGAARD, P.C., 1789. Zoologica Danica seu animalium Daniae et Norvegiae rariorum ac minus notorum. Descriptiones et Historia, **3**: 1-71, pls. 1-120.
- ASOCHAKOV, I.A., 1994. Technique for measuring body length of Amphipods. Hydrobiol. J., **30** (3): 107-110.
- BARNARD, J.L., 1970. Sublittoral Gammaridea (Amphipoda) of the Hawaiian Islands. Smithsonian Contrib. Zool., **34**: 1-286.
- BARNARD, J.L., 1974. Gammaridean Amphipoda of Australia, Part II. Smithsonian Contrib. Zool., **139**: 1-148.
- BARNARD, J.L. & G.S. KARAMAN, 1991. The families and genera of marine gammaridean Amphipoda (except marine gammaroids), Parts 1 and 2. Rec. Aust. Mus., **13** (Suppl.): 1-866.
- CHEVREUX, E. & L. FAGE, 1925. Amphipodes. Faune France, Paris, **9**: 1-488.
- KRAPP-SCHICKEL, G., 1975. Revision of the Mediterranean *Leucothoe* species (Crustacea, Amphipoda). Boll. Mus. civ. Storia nat. Verona, **2**: 91-118.
- KRAPP-SCHICKEL, G., 1989. Family Leucothoidae. In: S. Ruffo (ed.). The Amphipoda of the Mediterranean, Gammaridea (Haustoriidae to Lysianassidae). Mém. Inst. Océanogr., **13** (2): 443-458.
- LEDOYER, M., 1978. Amphipodes gammariens (Crustacea) des biotopes cavitaires organogènes récifaux de l'île Maurice (Océan Indien). Bull. Mauritius Inst., **8** (3): 197-332.
- LEDOYER, M., 1979. Les gammariens de la pente externe du Grand Récif de Tuléar (Madagascar) (Crustacea, Amphipoda). Mem. Mus. civ. Storia nat. Verona (2, Ser. Sci. Vita), **2**: 1-150.
- LEDOYER, M., 1986. Crustacés amphipodes gamma-

- riens. Families des Haustoriidae à Vitjazianidae. Faune Madagascar, **59** (2): 599-1112.
- SARS, G.O., 1985. Amphipoda. An account of the Crustacea of Norway with short descriptions and figures of all the species, **1**: 1-711.
- SCHELLENBERG, A., 1928. Report on the Amphipoda. Trans. Zool. Soc. London, **22**: 633-692.
- SCHELLENBERG, A., 1938a. Brasilianische Amphipoden, mit biologischen Bemerkungen. Zool. Jahrb., **71** (3): 203-218.
- SCHELLENBERG, A., 1938b. Litorale Amphipoden des Tropischen Pazifiks. Kungl. Svenska Vetensk. Handl., (3), **16** (6): 1-105.
- SEREJO, C.S., 1995. Fauna de Amphipoda (Crustacea) associada à esponja *Dysidea* sp. em Arraial do cabo, RJ - Taxonomia e composição da comunidade. MSc. Thesis, Museu Nacional/UFRJ: i-xvi + 1-96.
- STEBBING, T.R.R., 1888. Report on the Amphipoda collected by H.M.S. Challenger during the years 1873-76. Rept. Sci. Res. Voyage Challenger 1873-76, Zoology, **29**: i-xxiv + 1-1737 (3 volumes).
- THOMAS, J.D. & ORTIZ, M., 1995. *Leucothoe laurensi*, a new species of leucothoid amphipod from Cuban waters (Crustacea: Amphipoda: Leucothoidae). Proc. Biol. Soc. Wash., **108** (4): 613-616.
- VALÉRIO-BERARDO, M.T., 1992. Composição e distribuição da fauna de Amphipoda de fundos não consolidados da região de Ubatuba (SP, Brasil). PhD Thesis, Universidade de São Paulo, Instituto Oceanográfico, São Paulo: 1-148.
- WAKABARA, Y., A.S. TARARAM, M.T. VALÉRIO-BERARDO & W. DULEBA, 1991. Gammaridean and Caprellidean fauna from Brazil. Hydrobiologia, **223**: 69-77.

Received: April 1, 1998