



## ***Loureiophonte psammophila*, a new species of Laophontidae T. Scott, 1904 (Copepoda: Harpacticoida) from Baja California, Mexico**

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### **Abstract**

*Loureiophonte psammophila* n. sp. was collected from coarse sediments of a beach near La Paz, Baja California, Mexico. The species belongs to the 'subterranea-group' as defined by Fiers (1993). It differs from the other representative of the group, *L. subterranea* (Lang, 1965) in the presence of an outer dentiform process on 2nd segment of the antennula, the chaetotaxy of P.2–P.5 and the 1-segmented male endopodite P.4. A map with the distribution of the eleven species known so far is provided.

### **Introduction**

At present, the genus *Loureiophonte* Jakobi (1953) includes 10 species (Fiers, 1993; Bodin, 1997). They have been found in various sand and phytal samples; *L. majacola* Fiers (1993) lives in association with the crab *Maja squinado*.

Knowledge of the species diversity of Mexican marine benthic Copepoda is still limited. The genus *Loureiophonte*, however, has already been recorded from Mexico by Fiers (1993) who described *L. majahualensis* from Quintana Roo, at the Caribbean side of the country. The present new species is the first of the Mexican west coast and, in addition to *L. subterranea* (Lang, 1965) and *L. isabelensis* Mielke (1981) the third representative of the eastern Pacific.

During a short survey of some beach habitats in Baja California, an unknown *Loureiophonte* species was found, which is described in detail below.

### **Materials and methods**

The animals were obtained from coarse sediments of Punta Arena de la Ventana near La Paz, Baja California, Mexico. The specimens were washed from the sediment and fixed in a 4% formalin/seawater solution. Three females and two males were dissected and

embedded in W15 medium (Zeiss); the cover slip was sealed with Eukitt and DePeX. Drawings were made with the aid of a camera lucida. The material is deposited in the collections of the Zoological Museum of the University of Göttingen. The interpretation of body and its appendages is adopted from Lang (1948, 1965). With respect to the mouth parts, the interpretation of the components according to Huys & Boxshall (1991) is given in parentheses.

Additional findings of Laophontidae: *Afrolaophonte* sp. (exposed beach of San José del Cabo, 25 February 1991); *Galapalaophonte* sp. (Playa Tecolote, near Pichilingüe, about 20 km north of La Paz, 2 March 1991).

Laophontidae T. Scott, 1905

*Loureiophonte* Jakobi, 1953

*Loureiophonte psammophila* n. sp. (Figs 1–4)

### **Material examined**

Thirteen females and two males from Punta Arena de la Ventana, situated about 50 km south-east of La Paz, Baja California, Mexico, collected on 1 March 1991. Holotype: Dissected female, reg. no. I BC 1. Paratypes: Two dissected females (reg. nos. I BC 2, I BC 3); two dissected males (reg. nos. I BC 4, I BC 5).

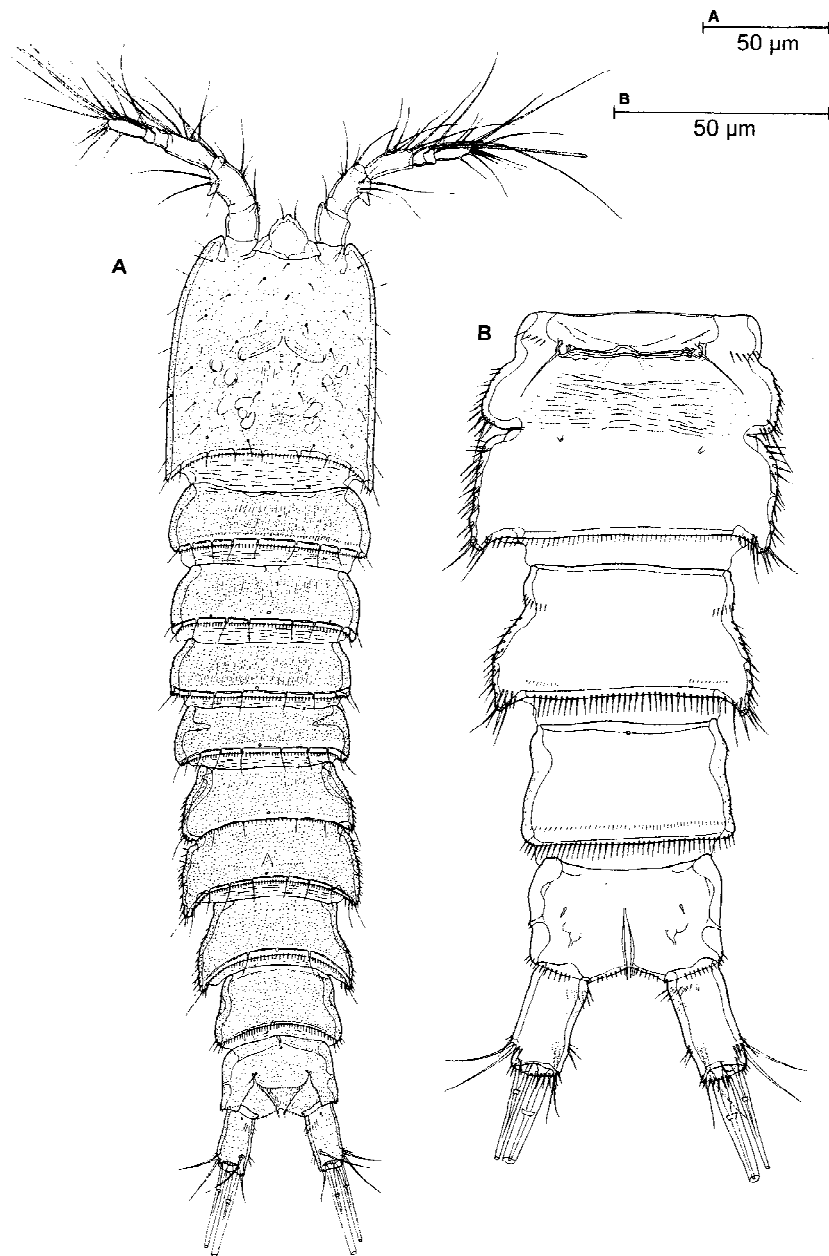


Figure 1. *Loureirophonte psammophila* n. sp., Female. (A) Habitus, dorsal side; (B) Abdomen, ventral side.

### Etymology

The specific name refers to the occurrence of the animals in a habitat consisting of coarse sand.

### Description

*Female*: Body slender, tapering posteriorly. Length of dissected specimens from tip of rostrum to end of

furcal rami 0.36–0.37 mm. Rostrum (Fig. 2A) triangular, with basal surface suture; subapically with two setules and a bifid tip; the latter exhibits a short hyaline tube. Dorsal surface of cephalothorax and following somites irregularly ornamented with minute denticles. Genital double-somite with a transverse surface ridge dorsolaterally. Posterior margins of somites developed as a narrow strip (frill), fringed with fine setules (except penultimate and anal somites), and with a row

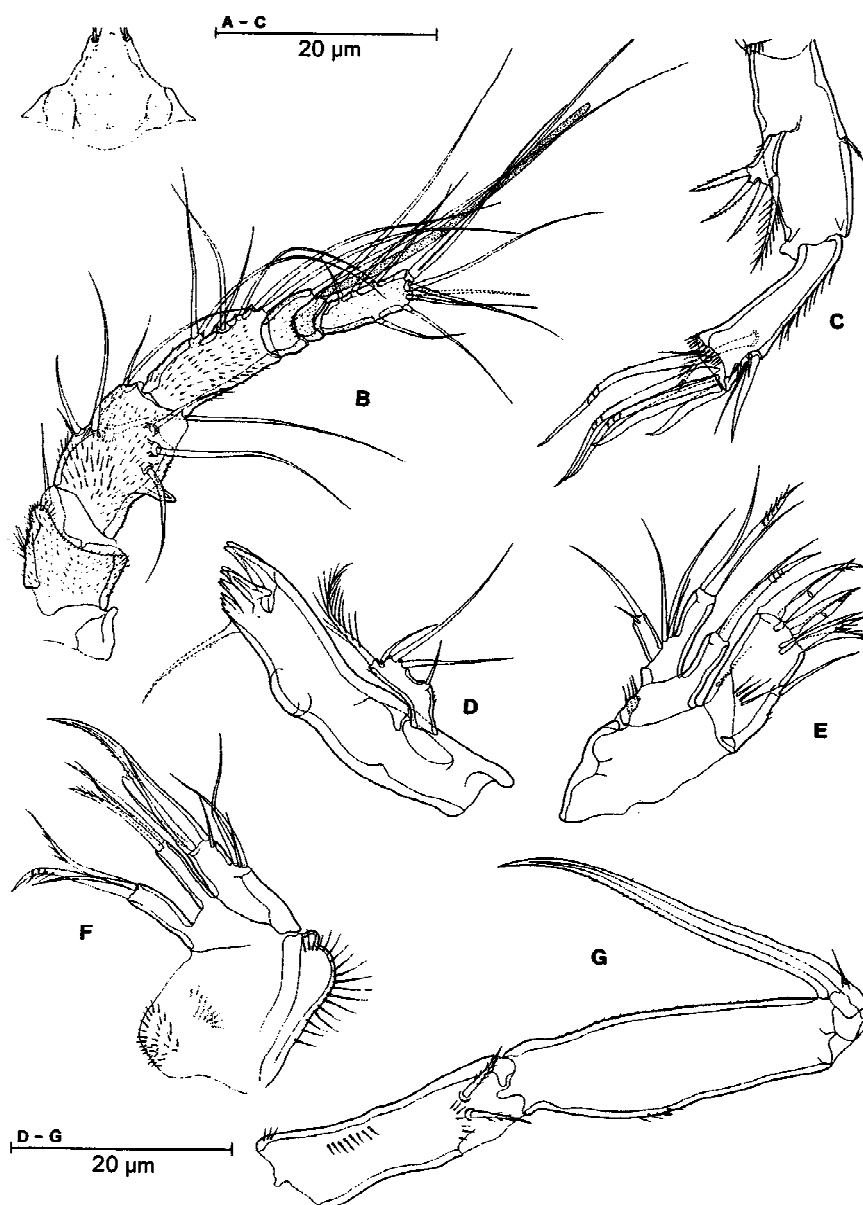


Figure 2. *Loureirophonte psammophila* n. sp., Female. (A) Rostrum; (B) Antennula; (C) Antenna; (D) Mandible; (E) Maxillula; (F) Maxilla; (G) Maxilliped.

of small spinules. Ventral posterior margin of genital double-somite with a row of very weak spinules, that of following somites with long spinules. Genital area with transverse chitinous ridges. P.6 a small lobe bearing one slender seta. Anal operculum with small spinules; a small sensillum inserting basally on each side. Furcal rami about twice as long as wide. Inner proximal and subapical part furnished with some slender spinules, distal margin with a row of spinules.

Outer margin subapically with 1 short setule, 2 juxtaposed slender setae and some spinules. Distal edge bearing three setae, middle one of which is about as long as entire abdomen; inner seta short. Seta VII bipartite at base (Figs 1A,B).

*Antennula* (Fig. 2B): Six-segmented, spinulose. Second and third segments longest, fifth segment shortest. Second segment has an outer dentiform pro-

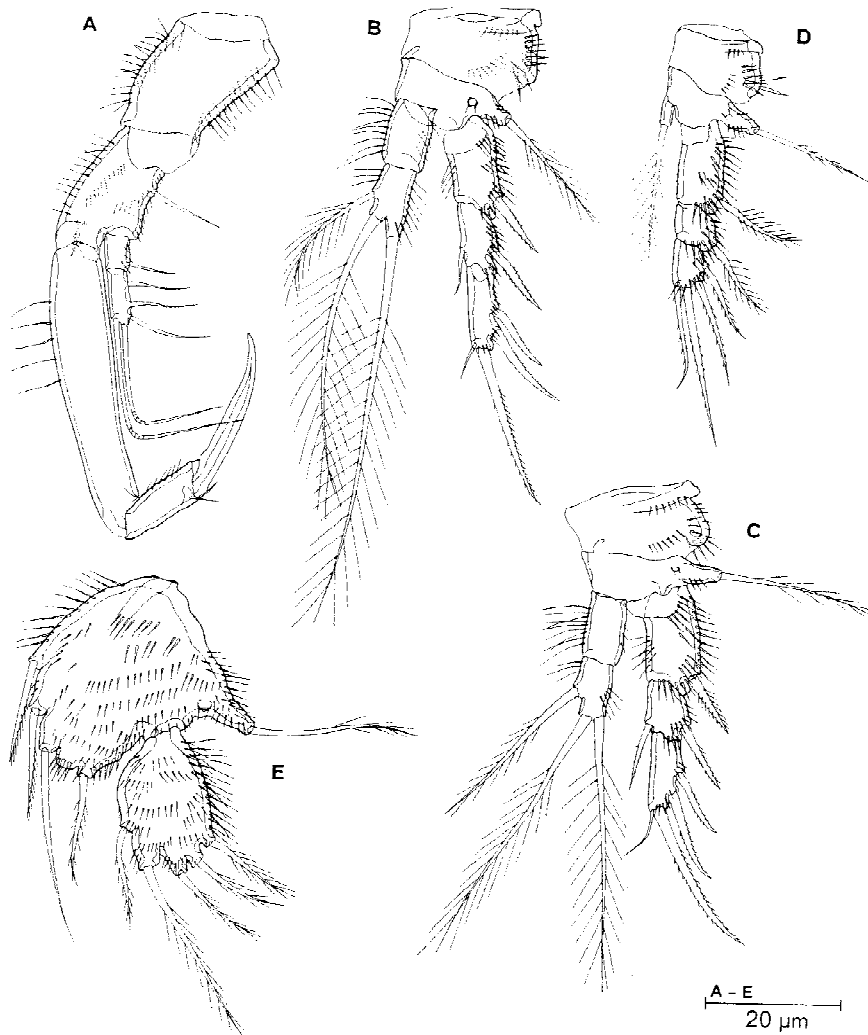


Figure 3. *Loureirophonte psammophila* n. sp., Female. (A) P.1; (B) P.2; (C) P.3; (D) P.4; (E) P.5.

cess. Fourth segment bearing a slender aesthetasc. Setal ornamentation: 1-9-7-1+aesth.-1-11.

*Antenna* (Fig. 2C): At about middle of inner margin of allobasis a short seta inserts. Free endopodal segment subapically with two spines and one hair-like seta. Distal margin with two curved spines and three geniculate setae, outer of which basally fused with one hair-like seta. Exopod one-segmented, with four setae.

*Mandible* (Fig. 2D): Gnathobase of praecoxa (coxa) with slender teeth and one seta. Palp one-segmented: Coxa-basis (basis) has one plumose seta. Exopod represented by one, endopod by three setae.

*Maxillula* (Fig. 2E): Arthrite of praecoxa with one inner and one outer seta and a row of spinules on posterior surface. Distal edge armed with seven

spines. Coxa with two, basis with three setae. Exopod one-segmented, with two setae of different lengths. Endopod represented by three setae.

*Maxilla* (Fig. 2F): Syncoxa with two endites, each bearing three setae. Basis (allobasis) with one claw and three setae. Endopod represented by three setae.

*Maxilliped* (Fig. 2G): Basis (syncoxa) with several rows of spinules and two short plumose setae. Endopod (basis) with spinules on inner and outer margins. Distally, one slender claw inserts; basally furnished with a small setule.

*P.1* (Fig. 3A): Coxa elongate, inner and outer margins with rows of slender spinules. Basis with rows of spinules, one outer seta and one short seta on anterior surface. Exopod two-segmented. Small basal segment

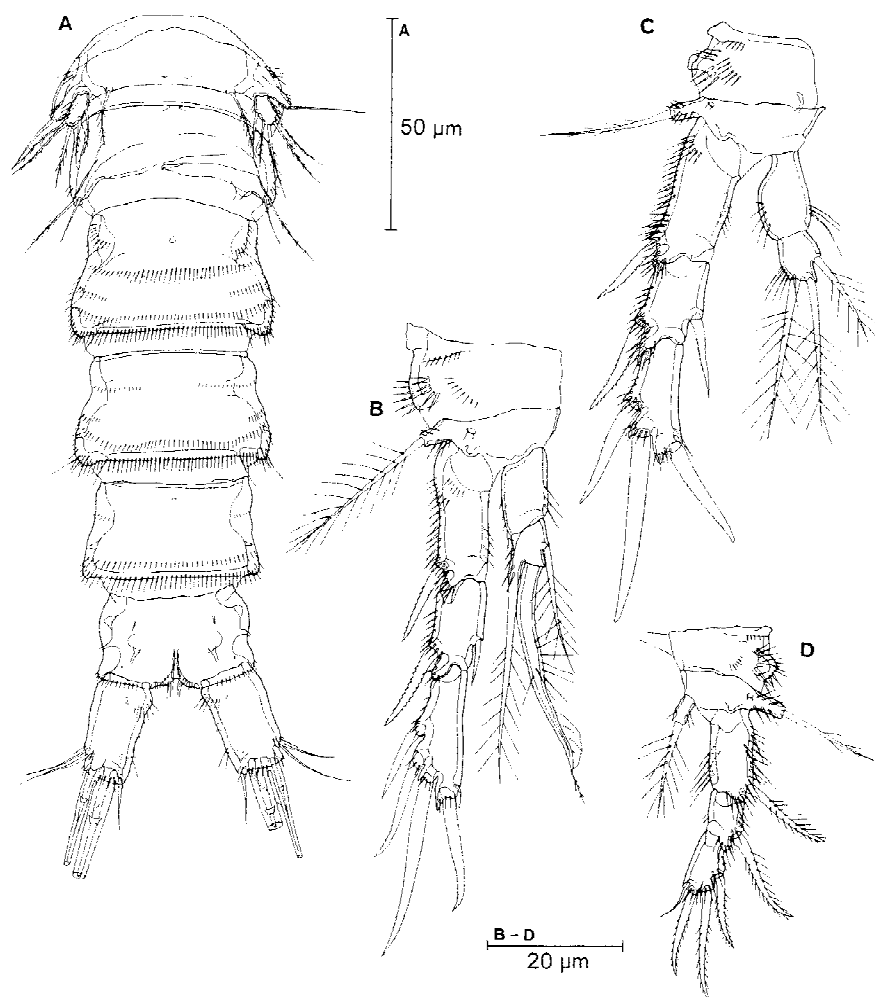


Figure 4. *Loureirophonte psammophila* n. sp., Male. (A) Abdomen with P.5-bearing somite (urosome); (B) P.2; (C) P.3; (D) P.4.

with one outer seta; distal segment with three outer setae and two apical geniculate setae. Proximal segment of endopod stout, with several slender spinules on inner margin. Distal segment with some spinules on outer margin, distal edge with one claw, one inner spinule and one accompanying setule.

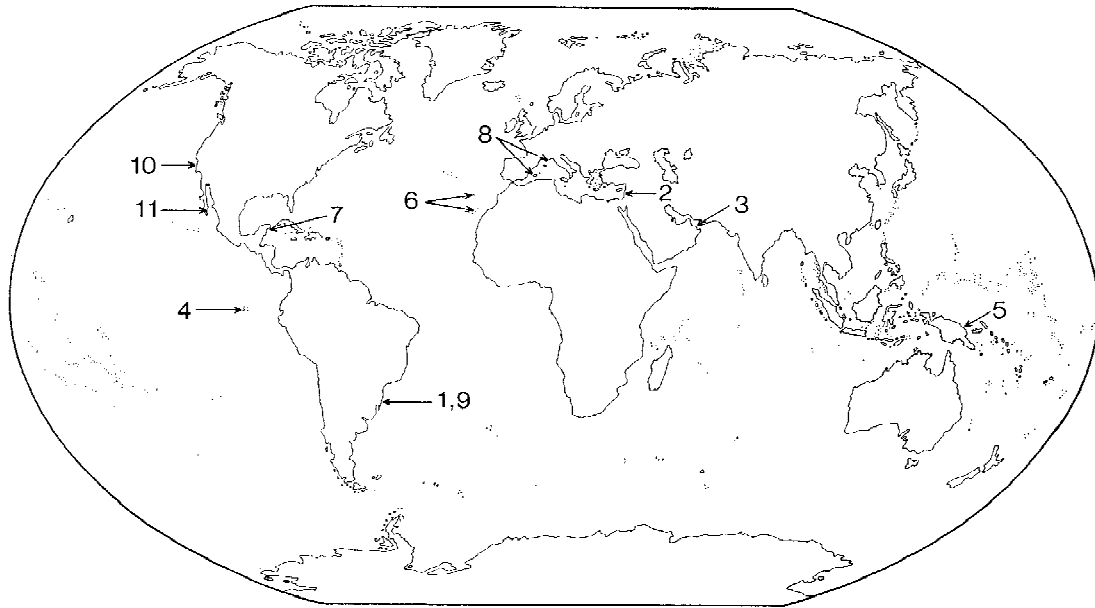
*P.2 and P.3* (Figs 3B,C): Coxa armed with a few rows of spinules. Basis with outer plumose seta. Basal segment of exopod strongly spinulose. Middle segment also spinulose on outer part, with one inner seta. Distal segment only slightly spinulose, with two slender outer spines, one long slender apical spine and one short seta at inner distal corner. Endopod with two segments, both with slender spinules on inner and outer margins. Terminal segment with three plumose setae.

*P.4* (Fig. 3D): Exopod three-segmented, all segments spinulose. Outer elements of basal and middle segments seta-like compared to P.2 and P.3. Terminal segment with two outer and two apical setae. Endopod consisting of one reduced segment, with one plumose seta.

Seta and spine formula:

Exopod	Endopod
P.2 (0.1.022)	(0.210)
P.3 (0.1.022)	(0.120)
P.4 (0.0.022)	(010)

*P.5* (Fig. 3E): Surface and margins of baseoendopod spinulose. Outer extension with one slender seta and a tube pore basally. Inner and distal margins each



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|--|---|
| 1 <i>Loureirophonte catharinensis</i> Jakobi, 1953 | Itapocoroi, Porto Belo; Santa Catarina (Brazil)           |
| 2 <i>Loureirophonte cesareae</i> (Por, 1964)       | Cesarva (Israel)  |
| 3 <i>Loureirophonte furcata</i> Fiers, 1993        | Muscat, Qurm (Oman)                                       |
| 4 <i>Loureirophonte isabelensis</i> Mielke, 1981   | Isabela; Galapagos Archipelago (Ecuador)                  |
| 5 <i>Loureirophonte laingensis</i> Fiers, 1993     | Laing Island (Papua New Guinea)                           |
| 6 <i>Loureirophonte majacola</i> Fiers, 1993       | Fuerteventura, Canary Islands (Spain); Madeira (Portugal) |
| 7 <i>Loureirophonte majahuilensis</i> Fiers, 1993  | Majahual; Quintana Roo (Mexico)                           |
| 8 <i>Loureirophonte mediterranea</i> Fiers, 1993   | Canadel-sur-Mer (France); Mallorca (Spain)                |
| 9 <i>Loureirophonte paranaensis</i> Jakobi, 1953   | Itapocoroi, Porto Belo; Santa Catarina (Brazil)           |
| 10 <i>Loureirophonte subterranea</i> (Lang, 1965)  | Tomales Bay, Monterey Bay; California (USA)               |
| 11 <i>Loureirophonte psammophila</i> n. sp.        | near La Paz; Baja California (Mexico)                     |

Figure 5. Map of the world showing the sampling stations of the eleven presently known *Loureirophonte* species.

with two setae. Between both terminal setae, a hyaline tube arises. Exopod furnished with five plumose setae.

**Male:** Body length of two dissected specimens 0.33 and 0.36 mm. Ventral surface of abdominal somites with additional rows of spinules (Fig. 4A).

*Antennula* seven-segmented, subchirocer.

**P.2** (Fig. 4B): Exopod longer than in female; distal segment with four slender spines and one vestigial inner seta. Distal outer edge of basal segment of endopod with a hyaline tube. Middle seta of distal segment distinctly modified. Apical plumose seta shorter than in female.

**P.3** (Fig. 4C): Segments and spines of exopod more robust than in female. Inner seta of distal segment vestigial. Basal segment of endopod broadened. Plumose setae of distal segment clearly shorter than in female.

**P.4** (Fig. 4D): Setae of distal segment of exopod shorter than in female. Plumose seta on one-segmented endopod reaching beyond middle segment of exopod.

**P.5** (see Fig. 4A): Both P.5 confluent. Inner part of each baseoendopod represented by one plumose seta. Exopod furnished with five slender setae.

**P.6** (see Fig. 4A): Each P.6 consisting of a transverse plate, one of which is fused with the somite. One dissected male exhibits the left version, the other male the right one. Outer lobe bearing two slender setae.

### Variability

Distal segment of one P.2 of one female has three outer spines.

### Discussion

The genus *Loureirophonte* was erected by Jakobi (1953) to accommodate two new laophontid species of the Brazilian coast. Its validity was later questioned by Vervoort (1964) and Lang (1965). On the other hand,

Mielke (1981) and Fiers (1993) supported the distinctiveness of Jakobi's taxon. The following features are emphasized: (1) Second segment of antennula with an outer tooth-like extension (situation of *L. catharinensis* Jakobi, 1953 unclear; *L. subterranea* (Lang, 1965) apparently without tooth); (2) exopod P.1 two-segmented; (3) endopods P.2 – P.3 two-segmented, endopod P.4 one-segmented (male of *L. subterranea* has two segments); (4) endopod of the male P.2 characteristically transformed; (5) exopods P.2 – P.4 of the male modified. The structure of the male enp. P.2 seems to be the main reason for the taxonomic justification of *Loureirophonte*.

Fiers (1993) who states that *Loureirophonte* is "closely allied" with *Paralaophonte* divided the genus into three species-groups. According to this subdivision the present new species has to be assigned to the currently monospecific 'subterranea-group' because of the existence of only two outer spines on the exopods P.2 and P.3. *L. psammophila* n. sp. is easily discernible from *L. subterranea* by having an outer tooth on second segment of the antennula, by the chaetotaxy P.2 – P.5, and by the unisegmented endopod of the male P.4.

#### Distribution (Fig. 5)

Thus far, 11 species of *Loureirophonte* are known. They are widely distributed in both tropical and temperate regions, suggesting the existence of a much higher number of representatives of the genus. At present, the northernmost recorded site is situated at about 43° (*L. mediterranea* Fiers, 1993), the most

southern point at about 27° (*L. catharinensis* Jakobi, 1953; *L. paranaensis* Jakobi, 1953) of latitude. According to the three species-groups sensu Fiers (1993), the 'cesareae-group' (Mediterranean, Fuerteventura, Madeira) and the 'subterranea-group' (Pacific coast of California and Baja California) occupy relatively limited areas compared to the wide-spread members of the 'catharinensis-group'.

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