

ON THE GENUS *IPHITIME* (POLYCHAETA:
IPHITIMIDAE) AND DESCRIPTION OF
IPHITIME SARTORAE SP. NOV. A COMMENSAL OF
BRACHYURAN CRABS

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ABSTRACT

A new species of the family Iphitimidae, *Iphitime sartorae*, is described herein, extending the occurrence of the genus *Iphitime* to the South Atlantic. The specimens were found in the branchial chambers of the crabs *Libinia spinosa* and *Portunus spinicarpus*. *Iphitime cuenoti* Fauvel, 1914, from the Eastern Atlantic and Mediterranean, seems to be the juvenile form of *I. doderleini* Marenzeller, 1902 known from Japan.

Key words: Polychaeta, Iphitimidae, *Iphitime sartorae*, branchial chamber, commensal, Brachyura, Brazil, São Paulo.

INTRODUCTION

The genus *Iphitime* Marenzeller, 1902 is characterized by the presence of a rounded or truncate prostomium, with a pair of short antennae and one or two peristomial segments. *Iphitime* species have two types of setae: simple falcate and composite falcate with a short article. *Iphitime hartmanae* Kirkegaard, 1977, has no composite setae, being, according to Orensanz (1990) doubtfully referred to the genus. The pharyngeal apparatus has eunicean-shaped mandibles fused medially and two to four pairs of maxillae.

The status of the genus *Iphitime* was confused. It was originally included in the family Lysaretidae (Marenzeller 1902, Fauvel 1923, Hartman 1952, Imajima & Hartman 1964, Day 1967) until related species could be found to clarify the phylogenetic relationships between the genus and pre-existing families. Probably, the lack of new discoveries about these relationships, and the unsuitable reference to the family Lysaretidae induced Fauchald (1970) to erect the family Iphitimidae, thus creating one more eunicean family. Afterwards, Gaston & Benner (1981) included the genus in the family Dörvilleidae, based on the resem-

blance between *Iphitime* and *Eteonopsis* (also a commensal of brachyuran crabs) and on the discovery of a branchiate dorvilleid species. Recently, Orensanz (1990) opted for the maintenance of Iphitimidae, extending the familial diagnosis. In this way, the extended family includes now some pre-existing genera formerly included in the family Dorvilleidae (*Eteonopsis* Esmark, *Exallopus* Jumars, *Ophryotrocha* Claparède & Mecznikow, and *Paraophryotrocha* Hartmann-Schröder) new genera described by Orensanz (1990) (*Mammiphitime*, *Palpiphitime* and *Pinniphitime*) and the former Iphitimidae genera: *Iphitime* Marenzeller and *Veneriserva* Rossi.

At present six species of *Iphitime* are known:

I. doderleini Marenzeller, 1902.

I. cuenoti Fauvel, 1914.

I. paguri Fage & Legendre, 1934.

I. loxorhynchi Hartman, 1952.

I. holobranchiata Pilger, 1971.

I. hartmanae Kirkegaard, 1977.

All of them except *I. hartmanae*, which lives under the tail of *Hyas araneus* and *Hyas coarctatus* (Kirkegaard 1977) and *I. paguri* occasionally found inside shells occupied by the hermit crab *Eupagurus bernhardus* (Comely & Ansell 1989), live inside the branchial chambers of brachyuran and anomuran crustaceans.

A new species, *I. sartorae*, from the southeastern coast of Brazil, is described in this paper. A brief discussion of the family as well as a key to the genus *Iphitime* will also be presented.

The holotype is deposited in the "Centro de Biologia Marinha da Universidade Federal do Paraná" under the register MCBM - BPO - 728. Five paratypes are in the Benthos section of the "Instituto Oceanográfico da Universidade de São Paulo" and two in the "Smithsonian Institution" in Washington D.C., USA.

Type Locality: Ubatuba, State of São Paulo, 23°24'S 44°45'W, Southeastern coast of Brazil.

The worms were found in the branchial chamber of several specimens of *Libinia spinosa* H. Milne Edwards (Crustacea, Decapoda, Majidae) and one of *Portunus spinicarpus* (Stimpson) (Crustacea, Decapoda, Portunidae).

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MATERIAL

Holotype: st. 61 - 23.04.87, 23°34'S 44°45'W, 46 meters, 17.39°C, very fine sand, in *L. spinosa* (carapace length - 59,5 mm, female).

Paratypes: st. 10 - 20.01.86, 23°44'S 45°00'W, 45 m, 15.66°C, coarse silt; st. 13 - 21.01.86, 23°50'S 45°09'W, 38 m, 15.62°C, very fine sand; st. 14 - 21.01.86, 23°47'S 45°10'W, 35 m, 15.7°C, very fine sand; st. 49 - 06.01.87, 23°54'S 45°07'W, 45 m, 17.15°C, very fine sand; st. 60 - 24.04.87, 23°40'S 45°14'W, 15 m, 25.38°C, coarse silt. All in *L. spinosa* (carapace length - 63-97 mm); st. 61 - 23.04.87, 23°34'S 44°45'W, 46 meters, 17.39°C, very fine sand, in *Portunus spinicarpus* (carapace length - 26.1 mm, female).

DESCRIPTION

Iphitime sartorae sp. nov.

Body elongated (Fig. 1.1), dorsoventrally compressed with short segments. Holotype: 36 mm long, 2 mm wide for 148 setigers. Paratypes: 29-104 mm long, 1.8-25 mm wide for 133-315 setigers.

Prostomium rounded with a pair of small antennae (Fig. 1.2). There are two peristomial rings; setae first present from the third apparent segment. Dorsolateral branchiae are first present from setiger 3, small in the first segments but long and digitiform thereafter (may be slightly foliaceous in median setigers).

Parapodia uniramous (Fig. 1.3) with one or two large and conspicuous aciculae. Upper setae simple falcate (Fig. 1.7) lower ones compound with a short article (Fig. 1.6) numbering 15 or more in each parapodium.

Pygidium rounded with two small divergent anal cirri, generally inconspicuous in fixed material.

The pharyngeal apparatus (Fig. 1.4 and 1.5) consists of a pair of mandibles which are broadly expanded and fused at the anterior end; a small, enclosed foramen at the middle of the broad frontal cutting edge is present. The first pair of maxillae is fused to the carriers, which are fused to each other medially, giving rise to a "V"-shaped structure (forceps). Dorsal to the forceps a pair of short rounded pieces with the inner edges serrated represent maxillae II. The maxillae III and IV are very small, having one and two teeth respectively.

The specific name honours Dr. Silvia Maria Sartor who found and gave us the studied specimens.

DISCUSSION

Although the family Iphitimidae underwent radical modifications with the emendation on its diagnosis, the genus *Iphitime* remained unchangeable. Yet some doubts still exist like the status of *I. hartmanae* whose simple setae (unique in the genus) were not included in the former genus diagnosis.

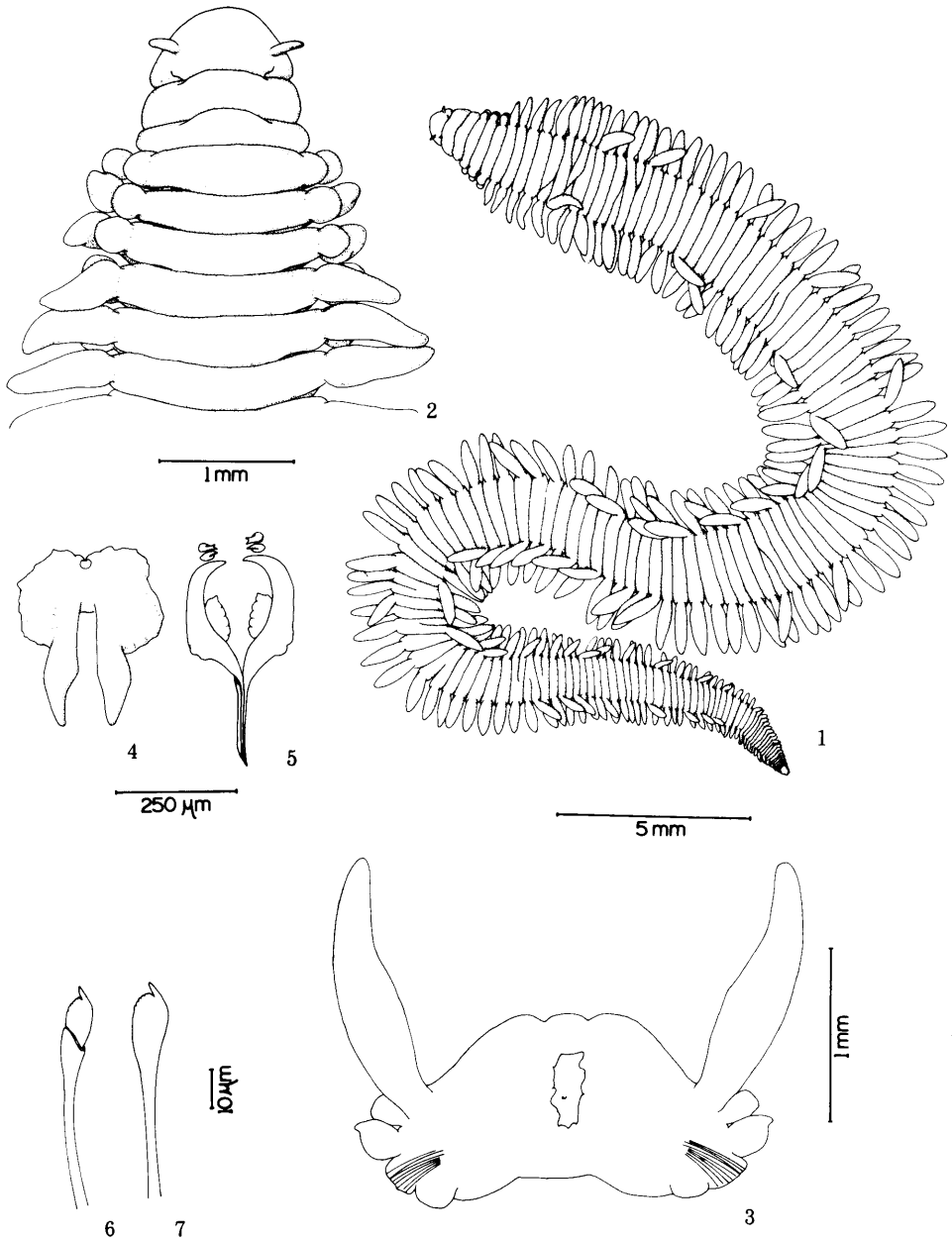


Fig. 1. *Iphitime sartorae* sp. nov. 1 - Entire worm (dorsal view). 2 - Anterior end (dorsal view). 3 - Median segment (transverse section). 4 - Mandible. 5 - Maxillae. 6 - Lower seta (composite). 7 - Upper seta (simple).

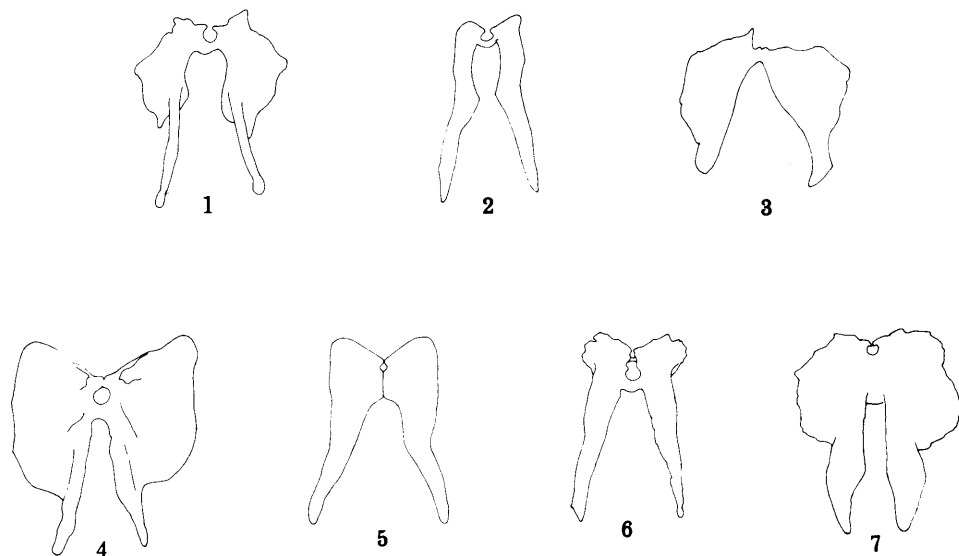


Fig. 2. Mandibles of the known species of the genus *Iphitime*. 1 - *I. doderleini* (redrawn from Marenzeller 1902). 2 - *I. cuenoti* (redrawn from Fauvel 1914). 3 - *I. loxorhynchi* (redrawn from Hartman 1952). 4 - *I. paguri* (redrawn from Moore & Gorzula 1973). 5 - *I. holobranchiata* (redrawn from Pilger 1971). 6 - *I. hartmanae* (redrawn from Kirkegaard 1977). 7 - *I. sartorae* sp. nov.

Doubtful is also the separation between *I. doderleini* and *I. cuenoti*.

I. doderleini was described from Japan by Marenzeller in 1902 and *I. cuenoti* from Western Europe by Fauvel in 1914. Moreover, Izuka described in 1912 *Coelobranchus papillosus* from Japan that is considered a synonym of *I. doderleini* (Imajima & Hartman 1964) since both inhabit the same area (Japan), are commensal on the same host (*Macrocheira kaempferi*), and have characteristic large palmated branchiae. Izuka was probably not aware of Marenzeller's paper on *I. doderleini* prior to describing *C. papillosus*.

The distinction between *I. doderleini* and *I. cuenoti* was based on the number of setae (4-5 in *I. cuenoti* and 14-15 in *I. doderleini*) but *C. papillosus* has 5-7 simple setae, which is similar to *I. cuenoti*. Another character considered distinctive would be the branchiae (simple in *I. cuenoti* and palmated in *I. doderleini*). However, Fage & Legendre (1934) have described palmate branchiae in *I. cuenoti* and later authors (Belloni & Mori 1985, Abelló et al. 1988) also found such branchiae. The single specimen used by Fauvel in the original description of *I. cuenoti* may have been a juvenile one, as first suggested by Gravier (1921).

Bearing the above in mind, it seems to us that either *I. cuenoti* is a synonym of *I. doderleini*, in spite of the distinct geographic distribution (Mediterranean and Eastern Atlantic for *I. cuenoti* and Japan for *I. doderleini*), or they are closely similar species not currently separable. A detailed examination of the type materials of

both species is advisable in order to establish new characters not considered in the literature.

I. sartorae sp. nov., *I. holobranchiata* and *I. paguri* are the only three species in the genus with simple branchiae. In *I. paguri* the branchiae are inserted dorsally while in the other species they are dorsolateral. *I. holobranchiata* has only one peristomial segment, while *I. sartorae* and all other species have two. *I. sartorae* also differs from *I. holobranchiata* in the shape of the simple and composite setae.

The characteristics of the pharyngeal apparatus are seldom used in the diagnoses of the species of the genus, since they have been assumed to show intraspecific variability in the number of teeth and shape. For instance, the pharyngeal apparatus described by Hartman for *I. loxorhynchi* is different from that attributed by Gaston & Benner to the same species (see Hartman 1952, fig. 6 and Gaston & Benner 1981, fig. 7). Figure 2 shows the mandibles of the seven known species of *Iphitime*.

There is no sign of damage in the hosts' branchiae in our material, thus confirming the observations of other authors (Pilger 1971, Abelló et al. 1988) and suggesting again a commensal relationship between the crabs and the polychaete.

The preference of *I. sartorae* for a particular crab host is not clear. The infestation rate is very low, so it is possible that the polychaete can infest other species of crabs. There is a preference for the worm to occur in the largest specimens of *Libinia spinosa*. Consequently they are more common in males since these are larger than the females.

The occurrence rate (number of hosts infected per overall number of hosts) was about 0.25% in *Libinia spinosa* and 0.03% in *Portunus spinicarpus*. These rates are very low compared to the rates found by Abelló et al. (1988) for *I. cuenoti* (5.5% in *Liocarcinus depurator* and 12.3% in *Macropipus tuberculatus*), by Moore & Gorzula (1973) for *I. paguri* (2% in *Eupagurus bernhardus*) and by Comely & Ansell (1989) for *I. cuenoti* (90.5% in *Liocarcinus puber*, 91.1% in *L. corrugatus*, 35.8% in *L. depurator*, 69% in *Hyas araneus* and 50% in *Carcinus maenas*).

The relative rarity of the commensal, allied to the necessity to open the crabs' carapace in order to find it, may explain the lack of records of the genus in the South Atlantic until now, and suggest a distribution area wider than that preliminarily referred to in this study.

KEY TO THE SPECIES OF THE GENUS *IPHITIME*

- | | |
|---|--------------------------|
| 1. With both simple and composite setae | 2 |
| - Without composite setae | <i>I. hartmanae</i> |
| 2. Two peristomial achaetous rings | 3 |
| - One peristomial ring | <i>I. holobranchiata</i> |
| 3. Branchiae palmate or branching | 4 |
| - Branchiae cirriform | 5 |

4. Branchiae palmate *I. doderleini* and *I. cuenoti*
 - Branchiae with few branches only *I. loxorhynchi*
 5. Branchiae inserted dorsally, first present from the fourth setiger *I. paguri*
 - Branchiae inserted laterally, first present from the third setiger *I. sartorae* sp. nov.

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