

# Parasite Copepods of Southern Brazilian Fishes

## I. *Ergasilus euripedesi* n.sp (Copepoda, Cyclopidea) \*

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### SUMMARY

This paper describes a new species of parasitic copepod of the family Ergasilidae found on the larvae of *Brevoortia pectinata* (JENYNS, 1842), *Micropogonias furnieri* (DESMAREST, 1823), *Lycengraulis grossidens* (AGASSIZ, 1829) and *Gobiesox* sp. Both sexes are described and illustrated.

### RESUMO

Descreve-se uma nova espécie de copépode parasito, pertencente à família Ergasilidae encontrado sobre larvas de *Brevoortia plectinata* (JENYNS, 1842), *Micropogonias furnieri* (DESMAREST, 1823), *Lycengraulis grossidens* (AGASSIZ, 1829) e *Gobiesox* sp. Os dois sexos são descritos e ilustrados.

### MATERIAL AND METHODS

This paper is based on zooplankton and ichthyoplankton samples collected in the Lagoa dos Patos estuary, Rio Grande do Sul (RS), Brazil) during the course of the "Projeto Lagoa" in summer (December, January, February), 1977.

Some 250 specimens (200 females, 50 males) of what proves to be a new species of *Ergasilus* were examined. These included ovigerous and non-ovigerous females and adult males. The ovigerous females were found attached to the pectoral, dorsal and caudal fins of larvae of *Brevoortia pectinata* (JENYNS, 1842), with 3.8 and 4cm in length, and larvae of *Micropogonias furnieri* (DESMAREST, 1823), *Lycengraulis grossidens* (AGASSIZ, 1829) and *Gobiesox* sp. with 1.5 to 1.8cm length. Some ovigerous females, all the non-ovigerous ones and the males examined came from the lagoon plankton where they were found in the free state.

The females and the males studied are in the collection of the Museu Oceanográfico of the Fundação Universidade do Rio Grande, RS, Brazil (MOFURG) under the following denomination: holotype (female) MOFURG - CP 100; allotype (male) MOFURG - CP 101, one lot of females MOFURG - CP 100 A and another lot of males, MOFURG - CP 101 B. Two paratypes are in the collection of the Base Oceanográfica Atlântica, RS, (BOA): one female, BOA - CP 100; one male, BOA - CP 101; and two further lots, one of females, BOA - CP 100 A and one of males, BOA - CP 101 B. This new species is dedicated to Prof. Eurípedes Falcão Vieira, ex-General Coordinator of the "Projeto Atlântico"

### DESCRIPTION

*Ergasilus euripedesi* n.sp. (Figs. 1-20)

\* Contribuição n° 13 - Base Oceanográfica Atlântica (FURG) - Rio Grande, RS, Brasil. Aceito para publicação em 17/VII/1979.

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## FEMALE

The measurements correspond to the averages of 100 adult specimens.

Total length (from the frontal part to the caudal segment extremity): 785.4  $\mu\text{m}$ .

Cephalothorax segment length: 292.4  $\mu\text{m}$ , width: 120.4  $\mu\text{m}$ .

Second thoracic segment length: 77.4  $\mu\text{m}$ , width: 197.8  $\mu\text{m}$ .

Third thoracic segment length: 60.2  $\mu\text{m}$ , width: 154.8  $\mu\text{m}$ .

Fourth thoracic segment length: 51.6  $\mu\text{m}$ , width: 111.8  $\mu\text{m}$ .

Fifth thoracic segment length: 94.6  $\mu\text{m}$ , width: 103.2  $\mu\text{m}$ .

Genital complex-length: 94.6  $\mu\text{m}$ , width: 103.2  $\mu\text{m}$ .

First abdominal segment length: 17.2  $\mu\text{m}$ , width: 94.6  $\mu\text{m}$ .

Second abdominal segment length: 9  $\mu\text{m}$ , width: 94.6  $\mu\text{m}$ .

Third abdominal segment length: 17.2  $\mu\text{m}$ , width: 94.6  $\mu\text{m}$ .

Caudal segment length: 44.2  $\mu\text{m}$ , width: 17.2  $\mu\text{m}$ .

Ovisac; length: 232.2  $\mu\text{m}$ , width: 94.6  $\mu\text{m}$ .

The elongated body is approximately three times as long as wide. The cephalothorax is almost triangular. The first thoracic segment is separated from the head. The cephalothoracic anterior extremity protrudes forwards between the first and the second pair of antennae. The eyes are situated adjacent to the anterior border and are not easily seen. On each side of the head, posterolaterally has a pair of short setae. The thoracic segments decrease gradually in size towards the posterior extremity (Figs. 5,6). The genital segment is almost as wide as long and appears rounded when seen from above. The abdomen is composed of three approximately equal segments and the third apparently shows a longitudinal division which cuts it in two parts. The caudal rami are provided with three setae, the length of the internal or median one being four times that of the last segment. The antennules (Fig. 2), somewhat recurved downwards and forwards, are composed of six segments provided with setae whose total number ranges between 20 and 23. The antennae (Fig. 1) are composed of four segments. The basal segment is short and wide, having a median spine. The second segment is longer and wider and its diameter reduces abruptly near the articulation with the third segment. This is the longest, a little thinner than the second and recurved. The fourth or distal segment is the shortest and has a pointed extremity provided with a subterminal spine on its inner face which makes it hook like. The mandibles (Fig. 4) are semicircular with toothed margins. The mandibular palps are shorter and have short setae. The first maxillae are reduced to two thick spines, the interior being shorter than the exterior. The second maxillae have on their border and anterior extremity strong setae. The labrum is semicircular and U-shaped, originating near the mandibles.

The first four pairs of legs are biramous, the fifth pair are uniramous and has two long setae. The legs present the following setal and spinal formula (the setae are in Arabic and the spines in Roman numerals):



	EXOPODITE	ENDOPODITE
Leg 1	0 + I . 1 + 0 . 5 + II	1 + 0 . 5 + II
Leg 2	0 + I . 1 + 0 . 6 + I	1 + 0 . 2 + 0 . 4 + I
Leg 3	0 + I . 1 + 0 . 6 + I	1 + 0 . 2 + 0 . 4 + I
Leg 4	0 + 0 . 5 + I	1 + 0 . 2 + 0 . 3 + I

The first pair of legs (Fig. 7) presents a basipodite levelled dorso-ventrally and has a long seta on the inferior exterior border. The exopodite is three-segmented. Its exterior border has a row of short spines. The first segment has a spine with thin teeth on the exterior distal extremity, and a group of thin and long setae on its exterior border. The second segment bears a long plumose seta, the third a denticulate spine, a smooth spine and five long plumose setae. The two segmented endopodite has a very short spines on the internal border. The first segment bears a plumose seta and the second (resulting from the fusion of the second and the third) two small denticulate spines and five plumose setae.

In the second pair of legs (Fig. 8) there is a row of small teeth on the internal basal border of the basipodite and a plumose seta on the external border. The exopodite is similar to that of leg. 1. The external borders of the three segments are spiny and the internal border of the first segment is setose. Segment 1 has a spine on the distal extremity, segment 2 a plumose seta on the internal border and segment 3 a spine and six terminal plumose setae. The endopodite is three segmented and has a setose internal edge.

The third pair of legs (Fig. 9) has a row of spinules on the external border of the three segments of the endopodite. The 3-segmented endopodite is similar to that of the second pair.

The fourth pair of legs (Fig. 10) have on the internal inferior edge of the basipodite a row of spines and near the external border a plumose seta. The exopodite has two segments whose external edge is setose. The endopodite is 3-segmented and the first segment is setose on the outer edge.

The fifth legs (Fig. 11) are reduced to a very short segment provided with two long terminal setae.

## MALE

The measurements correspond to the averages of 50 adult specimens. Total length (from the frontal part to the caudal segmented extremity): 765.4  $\mu\text{m}$ . Cephalothorax segment length: 275.2  $\mu\text{m}$ , width: 292.4  $\mu\text{m}$ . First thoracic segment length: 129  $\mu\text{m}$ , width: 223.6  $\mu\text{m}$ . Second thoracic segment length: 77.4  $\mu\text{m}$ , width: 189.2  $\mu\text{m}$ . Third thoracic segment length: 86  $\mu\text{m}$ , width: 146.2  $\mu\text{m}$ . Fourth thoracic segment length: 60.2  $\mu\text{m}$ , width: 103.2  $\mu\text{m}$ .



Fifth thoracic segment: 17.2  $\mu\text{m}$ , width: 68.8  $\mu\text{m}$ .

Genital segment, length: 94.6  $\mu\text{m}$ , width: 103.2  $\mu\text{m}$ .

First abdominal segment length: 34.4  $\mu\text{m}$ , width: 60.2  $\mu\text{m}$ .

Second abdominal segment length: 25.8  $\mu\text{m}$ , width: 51.6  $\mu\text{m}$ .

Third abdominal segment length: 20.2  $\mu\text{m}$ , width: 43  $\mu\text{m}$ .

Caudal segment length: 25.8  $\mu\text{m}$ , width: 17.2  $\mu\text{m}$ .

Median setae length: 258  $\mu\text{m}$ .

Body elongate and three time as long as wide. The head is separate from the first thoracic segment and has a sub-square shape, the posterior part being wider than the anterior. On each side postero-laterally a pair of short setae similar those of the female (Fig. 12). The thoracic segments diminish gradually in size and width towards the posterior part.

The genital segment is ovoid and wider than long.

The abdomen is formed of three short and wide segments. The third has a division in the middle similar that of the female.

The caudal rami are as long as wide and bear three setae. The internal seta is the longest.

The antennules (Fig. 14) are short and six-segmented. They have various sensitive setae their number being higher than in the females: between 22 and 24. The second segment is wider than the others. The antenna (Fig. 15) is four-segmented. The first segment is short and wide, the second is the longest and widest and has a spine in the inner edge. The third segment has two internal spines proximally and another distally. The distal segment takes the form of a tick curved spine.

The buccal parts are similar those of the female, though they are a little smaller and the labrum has a straighter margin (Fig. 13).

Legs 1 to 4 have the following setal and spinal formula (the setae are in Arabic and the spines in Roman numerals):

	EXOPODITE	ENDOPODITE
Leg 1	I . 1 + I . 4 + II	1 + 0 . 4 + II
Leg 2	∪ + I . 1 + 0 . 6 + 0	1 + 0 . 2 + 0 . 4 + I
Leg 3	0 + I . 1 + 0 . 5 + 0	1 + 0 . 2 + 0 . 5 + 0
Leg 4	0 + I . 5 + 0	0 + 0 . 2 + 0 . 3 + I

All legs are characterized by having the coxa and the basipodite flattened dorso-ventrally. The first pair of legs (Fig. 16) has a seta on the basipodite near the external border. The exopodite has three segments, and the second one with a short row of spinules. the two endopodite segments have a setose internal border.

The second pair of legs (Fig. 17) also has a seta on the external part of the basipodite and a row of setules on the inner border. On the basis between the



exopodite and the endopodite there is a triangular prominence. The exopodite is 3-segmented. The first has the internal border provided with setules. Segment one of the endopodite is setose internally.

The third pair of legs is provided with a seta on the external border of the basipodite (Fig. 18) and has a row of spinules on the internal border. The exopodite is three segmented. The first has a setose inner margin. Endopodite similar to that of leg 2 but distal segment bearing 5 plumose setae and no spine.

The fourth pair of legs (Fig. 19) has a row of little denticles on the external border of the basipodite. The exopodite is two-segmented. The first has a setose internal border. The endopodite is three-segmented, each segment having a setose inner border.

The fifth legs (Fig. 20) are reduced to only one segment with a short seta on the external proximal part and two longer setae in the terminal part.

### DIAGNOSIS AND DISCUSSION

*Ergasilus euripedesi* can be diagnosed by the female characteristics, as follows: cephalothorax almost triangular; presence of two fine setae at both sides of the cephalothorax; presence of a subterminal hooklike spine on the fourth antennal segment; endopodite of first pair of legs bi-segmented and ornamentation characteristic of the exopodal and endopodal segments of the first four pairs of legs.

The two segmented first endopod characteristic is shared with *E. versicolor* (WILSON, 1911), *E. megaceros* (WILSON, 1916), *E. elongatus* (WILSON, 1916), *E. mugilis* (VOGT, 1877), *E. tenax* (ROBERTS, 1965), *E. cerastes* (ROBERTS, 1969) and *E. chautauquaensis* (FELLOWS, 1887). But *Ergasilus euripedesi* is more similar to *Ergasilus megaceros* (WILSON, 1916) in body shape and in the general structure of the first and second pairs of legs, but differs in the ornamentation of the segments and in the shape, proportion, and number of spines of the antennal segments.

Concerning the males, we did not have bibliographic material to establish comparisons because males of the related species are undescribed. Diagnostic features of the male include: presence of a pair of fine setae at both sides of the head, the form of the mouth parts, leg 1 with bi-segmented endopodite, and the proportions of the caudal setae.

### ACKNOWLEDGEMENTS

We want to express our thanks to Dr. Geoffrey Fryer (Freshwater Biological Association Ambleside, England) for his critical review of the manuscript, suggestions and also the english correction; and to Mrs. Lucia Pacheco Pereira and Paulo Nei M. Guimarães for the collaboration given in the present study.

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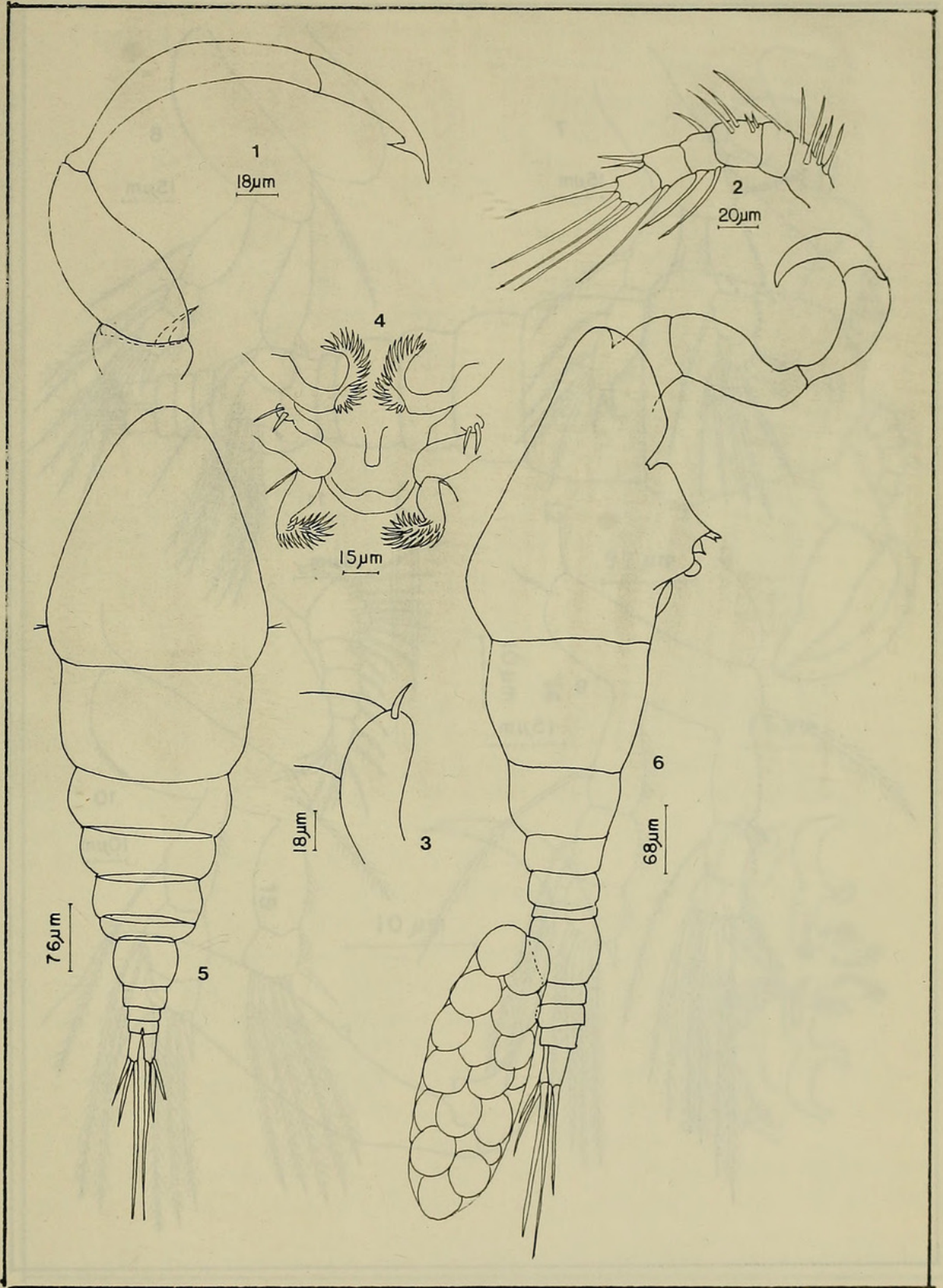
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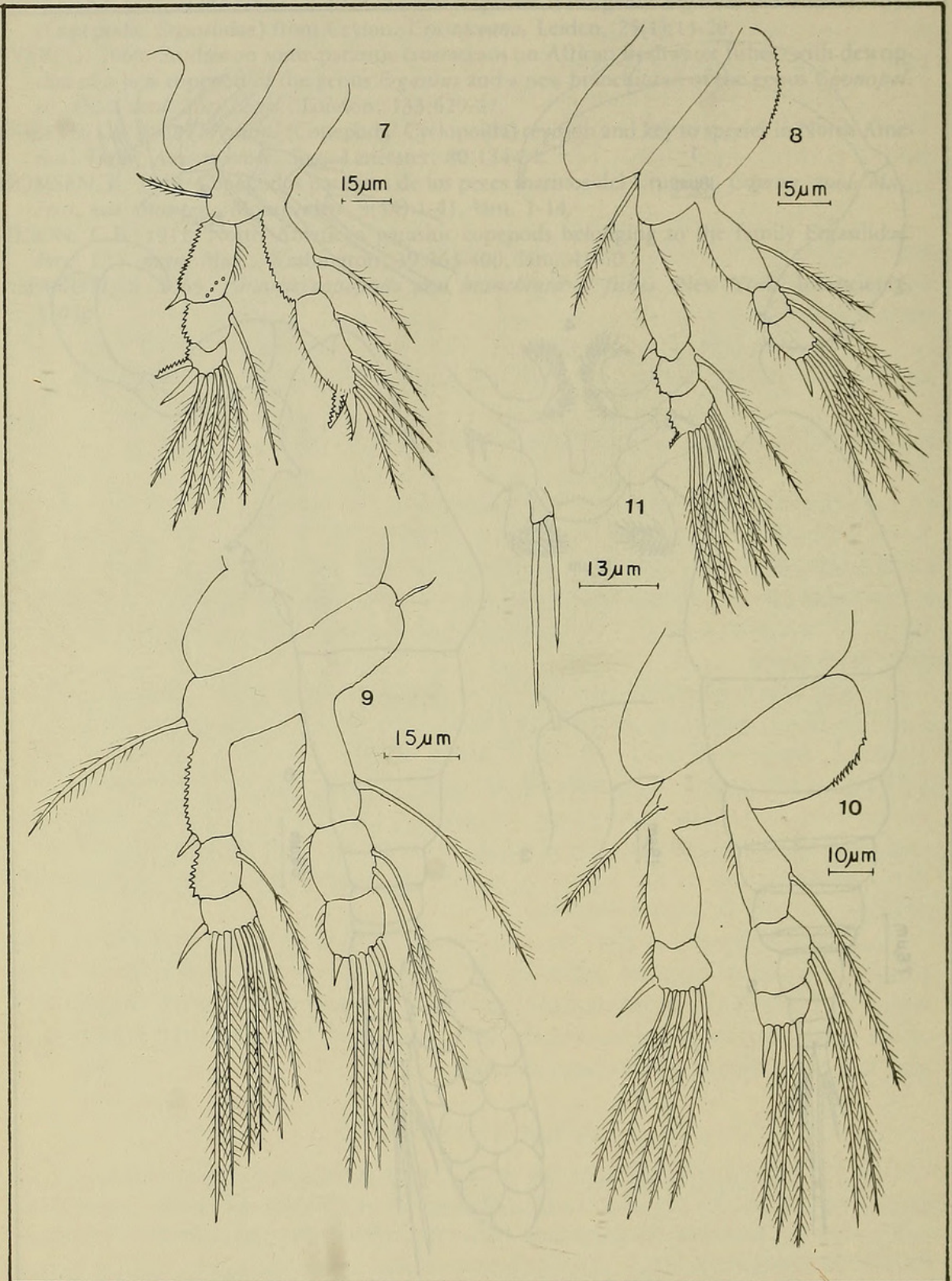
#### ACKNOWLEDGMENTS





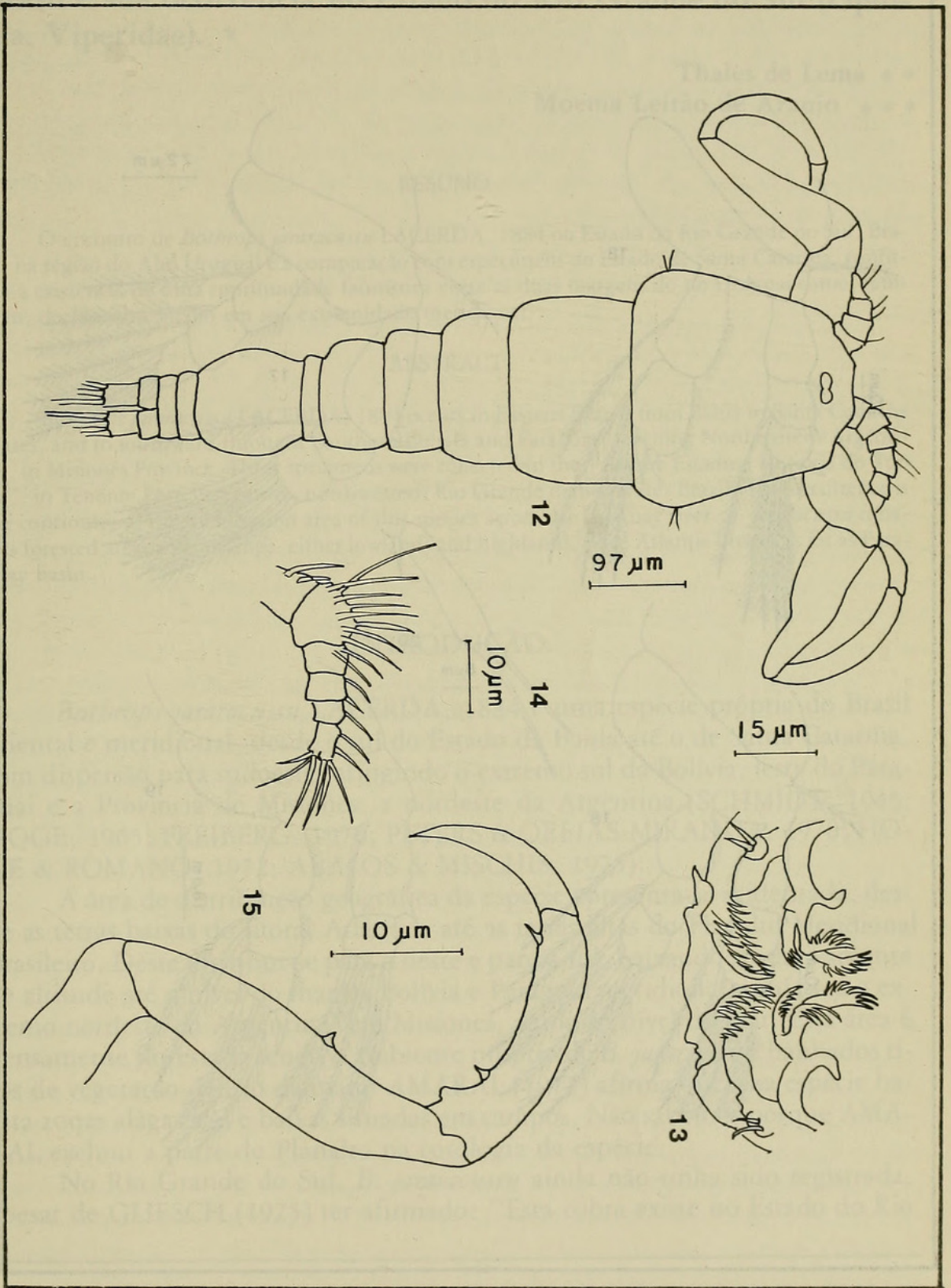
Figs. 1-6: *Ergasilus euripedesi* sp.n. Holotype O (MOFURG CP 100): 1 antenna; 2. antennule; 3. antenna, basal segment; 4. mouth parts; 5. body, dorsal view; 6. body, lateral view.





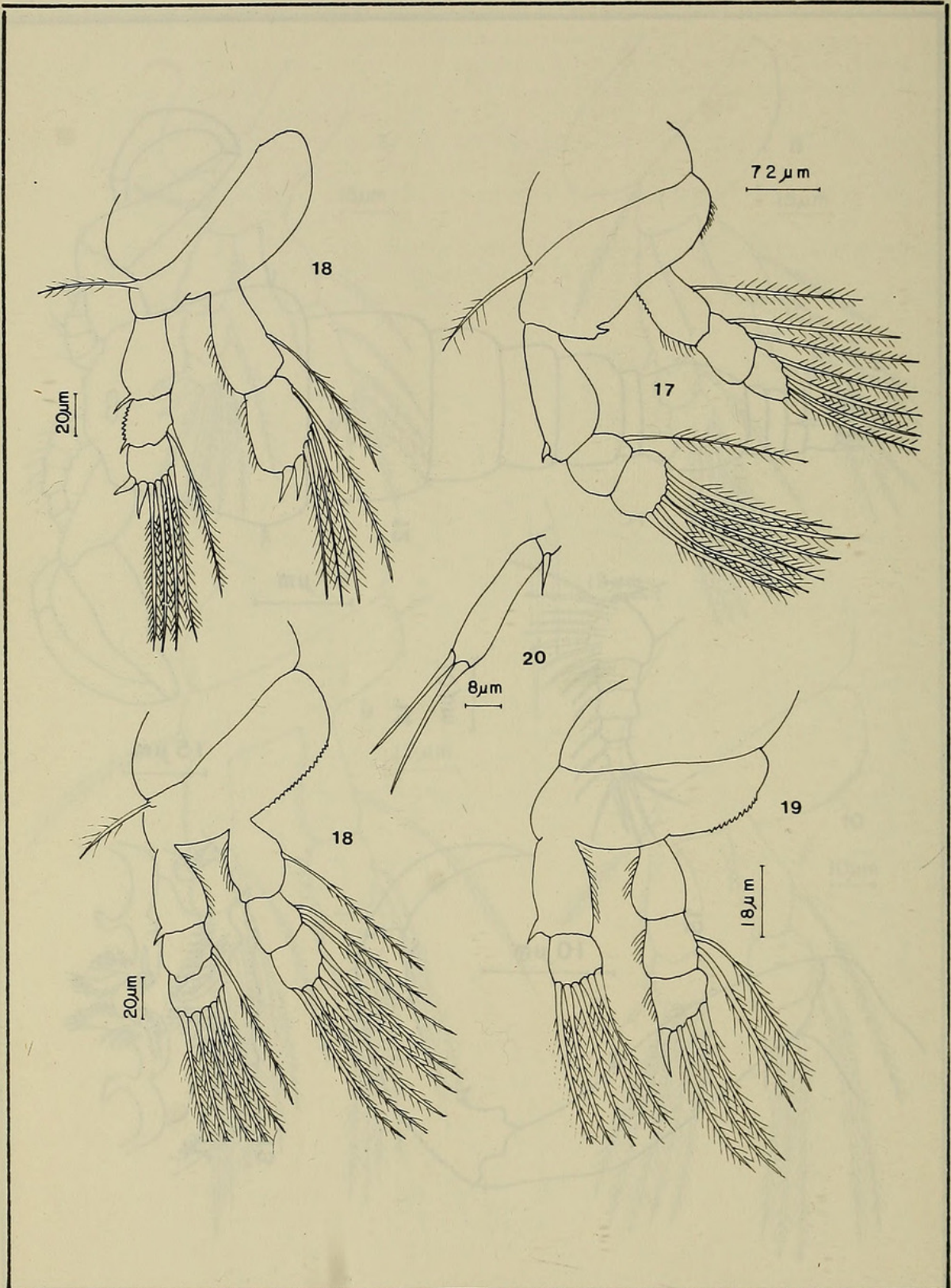
Figs. 7-11: *Ergasilus euripedesi* sp.n. Holotype O (MOFURG CP 100): 7. first leg; 8. second leg; 9. third leg; 10. fourth leg; 11. fifth leg.





Figs. 12-15: *Ergasilus euripedesi* sp.n. Holotype O (MOFURG CP 101): 12. body, dorsal view; 13. mouthparts; 14. antennule; 15. antenna.





Figs. 16-20: *Ergasilus euripedesi* sp.n. Holotype O (MOFURG CP 101): 16. first leg; 17. second leg; 18. third leg; 19. fourth leg; 20. fifth leg.





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