Brasergasilus mamorensis sp. n. (COPEPODA: ERGASILIDAE) FROM THE NASAL CAVITIES OF *Hydrolycus pectoralis* (GUENTHER, 1866) (CHARACIFORMES: CYNODONTIDAE) FROM THE BRAZILIAN AMAZON, AND CONSIDERATIONS ABOUT ABERGASILINAE.

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ABSTRACT – *Brasergasilus mamorensis* sp. n., collected from the nasal cavities of *Hydrolycus pectoralis* (Guenther, 1866) in the Mamoré River, Rondônia State, Brazil, is described. This is the first time that a species from the genus *Brasergasilus* has been collected in the nasal cavities. This new species is the only one that has a spine on the first segment of the antenna, a simple seta on the basipodites of the first three pairs of legs and one pair of vestigial legs (leg 5) on the sixth thoracic somite.

Key-words: Copepoda, Poecilostomatoida, Fish Parasites, Mamoré River.

***Brasergasilus mamorensis* sp. n. (Copepoda: Ergasilidae) das Fossas Nasais de *Hydrolycus pectoralis* (Guenther, 1866) (Characiformes: Cynodontidae) da Amazônia Brasileira e Considerações Sobre Abergasilinae.**

RESUMO – *Brasergasilus mamorensis* sp. n. é descrito. Foi coletado das fossas nasais de *Hydrolycus pectoralis* (Guenther, 1866) no rio Mamoré, Estado de Rondônia, Brasil. Esta é a primeira vez que uma espécie do gênero *Brasergasilus* é coletada parasitando as fossas nasais de seu hospedeiro. A nova espécie é a única que apresenta um espinho no primeiro segmento da antena, uma seta simples nos basipóditos dos três primeiros pares de pernas e um par de pernas vestigiais (perna 5) no sexto somito torácico.

Palavras-chave: Copepoda, Poecilostomatoida, parasita de peixes, rio Mamoré.

INTRODUCTION

South American freshwater fish parasitic copepod species are included in 4 families and 13 genera. Family Ergasilidae includes 8 genera: *Ergasilus* Nordmann, 1832; *Acusicola* Cressey, 1970; *Brasergasilus* Thatcher & Boeger, 1983; *Amplexibranchius* Thatcher & Paredes, 1985; *Rhinergasilus* Boeger & Thatcher, 1988; *Prehendorastrus* Boeger & Thatcher, 1990; *Miracetyma* Malta, 1993 and *Pindapixara* Malta, 1994. Family Vaigamidae has 4 genera: *Vaigamus* Thatcher & Robertson, 1984; *Gamidactylus* Thatcher & Boeger, 1984; *Gamispinus* Thatcher & Boeger, 1984 and *Gamispatulus* Thatcher & Boeger, 1984. Family Therodamasidae has 2 genera: *Therodamas* Kroyer, 1863 and *Amazonicopeus* Thatcher, 1986. Family Lernaeidae has 4 genera: *Areotrachelus* Brian, 1902; *Taurocheros* Brian, 1924; *Perulernaea* Thatcher & Paredes, 1985 and a single species of the genus *Lernaea* Linnaeus, 1756 (Boxshall *et al.*, 1997; Malta & Varella, 1998; Thatcher, 1998).

Thatcher & Boeger (1983) proposed a new subfamily, Abergasilinae including 2 genera, *Abergasilus* Hewitt, 1977 with 1 species, *A. am-*

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plexus, and *Brasergasilus* with 4 species, because they have the same caracteristics: antenna with 2 segments and a well developed claw, a small body and 3 pairs of legs. The fifth species belonging to the genus *Brasergasilus* is described in this paper.

MATERIAL AND METHODS

Fish were captured during an expedition to Rondônia State. The collections were carried out in the Mamoré River, near Surpresa, from September 15 to October 4 1985, during low water. Fish samples were obtained using gillnets. Fish were identified and fork length and weight were recorded. The tissue surrouding the nasal cavities was removed and fixed in 10% formalin.

The copepods were removed from the nasal cavity tissue by using jets of water and, separated with a dissecting microscope. They were stored in 70% alcohol. Specimens were stained with a mixture of eosin and orange G in 95% ethanol. Permanent preparations were made by dehydrating in phenol, clearing in methyl salicylate, and mounted in balsam (Thatcher, 1991). Drawings were made with the aid of a camera lucida. Measurements were made with an ocular micrometer and are expressed in micrometers. The parasitological terms were expressed according to Margolis *et al.* (1982) modified by Bush *et al.* (1997).

Type specimens were deposited in the Collection of the Instituto Nacional de Pesquisas da Amazônia (INPA-CR), Manaus, Amazonas and in the Museu de Zoologia da Universidade de São Paulo (MZUSP), São Paulo, São Paulo State.

RESULTS

Brasergasilus mamorensis sp. n.

Material examined: Holotype: female INPA-CR-625 (slide), from the nasal cavities of *Hydrolycus pectoralis* (Guenther, 1866) collected in Mamoré River, near Surpresa (11º52'S and 64º56'W), 25-ix-1985. Paratypes: 15 females INPA-CR-626a-p (slides) and 2 females MZUSP 10453a-b (slides), from the nasal cavities of 4 specimens of *Hydrolycus pectoralis* collected in the same type locality, 25-ix-1985. All collected by J.C.O. Malta.

Description: (based on 18 specimens studied and 10 measured (Tabs 1, 2). Cephalothorax (Figs. 1, 2) slightly tapered anteriorly. Head fused with first two thoracic somites. Pigmentation not observed. Thorax of five free somites (Fig. 1), including somites V and VI reduced and genital somite (Fig. 2); fifth somite without appendages, and sixth with 1 vestigial leg on each side. Genital somite subrectangular.

Abdomen of three somites, with thin spinules ventrally at lateral-posterior margins. Each uropod (Figs. 2, 3) with one long and one short seta, one long terminal spine and two rows of small ventral spinules, one distal and other median, reaching external margin.

Table 1. Measurements (mm) of 10 adult females of *Brasergasilus mamorensis* **sp. n.**, minimum-maximum (mean).

	Length	Width
Body (less caudal setae)	432-512 (468)	144-224 (195)
Cephalothorax	238-282 (262)	144-224 (195)
Free thoracic somites		
III	37-52 (45)	111-150 (130)
IV	41-56 (47)	74-100 (88)
V	6-12 (10)	42-57 (48)
VI	6-14 (10)	42-60 (48)
VII (genital)	34-39 (37)	54-70 (61)
Abdominal somites		
I	6-14 (9)	30-44 (38)
II	4-10 (7)	33-42 (37)
III	8-14 (11)	32-42 (37)
Uropods	22-27 (24)	14-18 (16)
Caudal setae	148-180 (162)	
Egg sacs	136-254 (180)	34-50 (44)

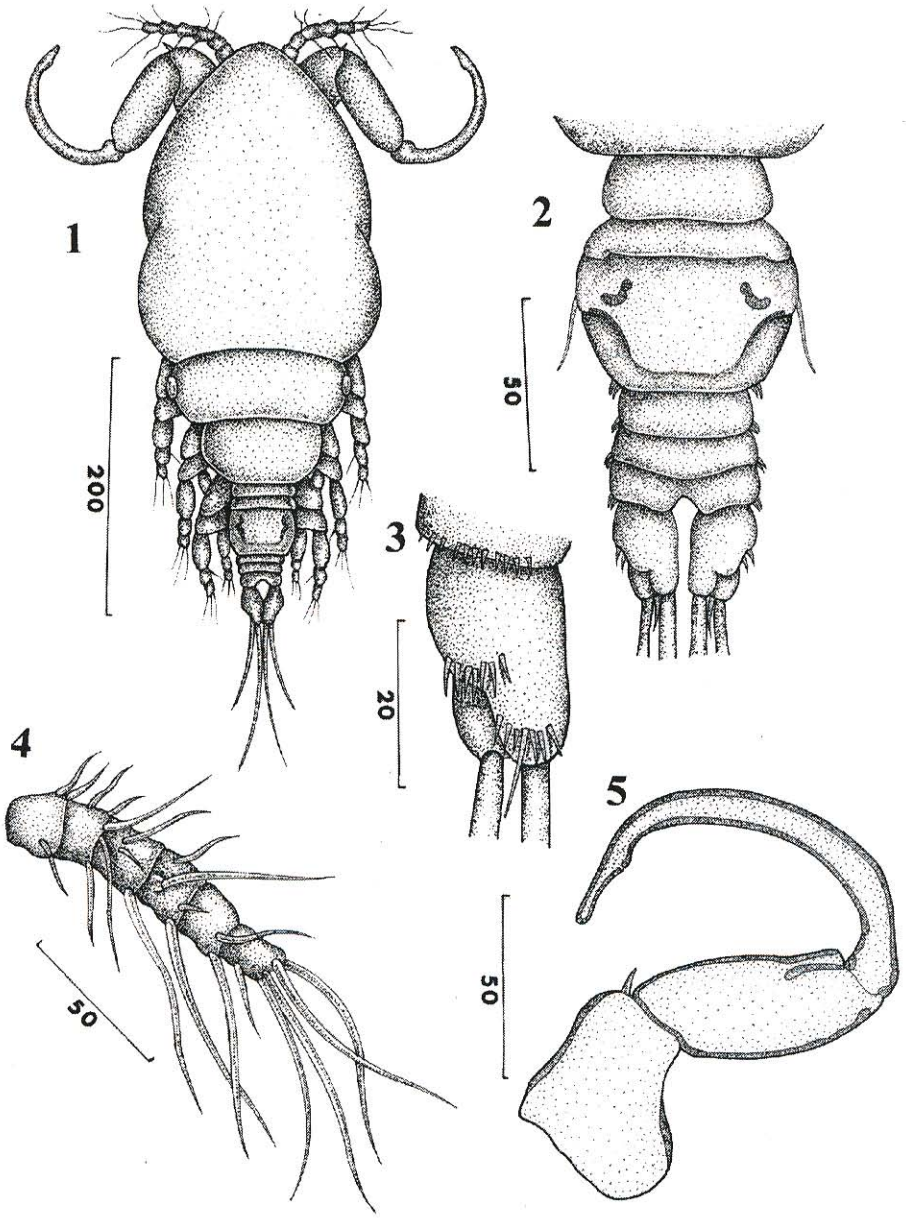
Table 2. Antennal measurements (mm) of 10 adult females of *Brasergasilus mamorensis* sp. n., minimum-maximum (mean).

	Length	Width
Antennule	72-92 (83)	14-20 (17)
Antenna		
Segment 1	40-74 (51)	34-47 (41)
2	71-92 (82)	28-34 (31)
Claw	96-116 (109)	12-12 (12)

Antennules of six segments (Fig. 4), with 22 simple (aesthetascs) setae. Setal formula per segment: 3-5-3-4-2-5. Antenna two segmenteds (Fig. 5). First segment with distal spine, second segment wide and smooth and claw strongly curved at its two extremities, with an enlargement near to distal pore, giving it the appearance of half an arrow head. Ratios of lengths of segments: 1:1.6:2.2.

Mouthparts (Fig. 6). Mandible bi-segmented, with a terminal bifurcate segment with bristles on its distal margin. Short palp, bristled posteriorly. Maxillule absent. Maxilla bi-segmented, distal segment with a bristled tip.

Legs (Figs. 7 - 10 and Tab. 3).



Figures 1-5. *Brasergasilus mamorensis* sp. n. (female). 1 - Dorsal view. 2 - Genital somite, abdomen and uropods. 3 - Detail of the uropod (ventral). 4 - Antennule. 5 - Antenna.

First three pairs natatory and biramous, with coxopodites having 1 row of spinules on external margin and basipodites with 1 simple seta on outer proximal region. Leg I (Fig. 7). Endopod of two segments, with small spines and bristles on external margin. First segment with four plumose setae and two strong, pectinate spines on distal region. Exopod with three segments, first two segments with two rows of spinules on external margin. First segment with simple distal spine externally and bristles on internal margin. Second segment with plumose median internal seta, and third segment with two strong pectinate spines and five plumose distal setae. Leg II (Fig. 8), both branches with three segments. All endopodal segments with 1 rows of small spinules on external margins. First segment with 1 plumose seta and second segment with two, on internal margin. Third segment with 1 pectinate spine and four plumose distal setae. First exopod segment with bristles on internal margin and 1 simple spine and small spinules on distal region of external margin. Second segment with 1 median internal seta and small spines distal to the external margin. Third segment with 1 spine and six distal plumose setae. Leg III (Fig. 9), differing only by the absence of a larger spine on the first exopod segment. Leg IV lacking. Leg V (Fig. 10) reduced to papilla, with 1 simple seta on each side (vestigial leg) of VI thoracic somite.

Egg sac (Fig. 11), two rows of oval eggs, with an average of 10 eggs in 11 sacs observed.

Male: unknown.

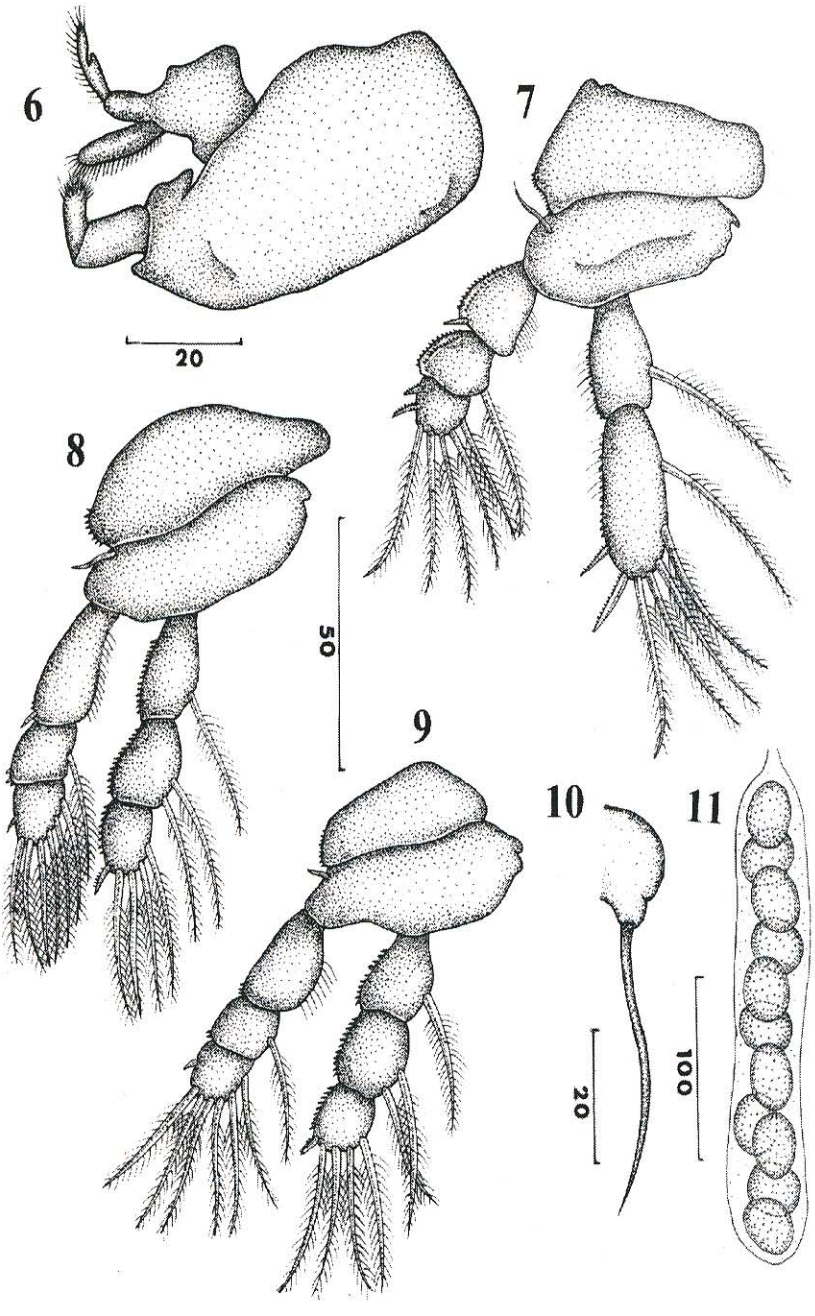
Etymology: the specific name is derived from the Mamoré River where the specimens were collected.

DISCUSSION

There are four known species of the genus *Brasergasilus* Thatcher & Boeger, 1983: *B. jaraquensis* Thatcher & Boeger, 1983, collected from the gill filaments of *Semaprochilodus insignis* (Schomburgk, 1841), in the Solimões River, near Manaus, Amazonas State; *B. anodus* Thatcher & Boeger 1983, collected from the gill filaments and gill rakers of *Anodus elongatus* Spix, 1829, in the Tocantins River, Pará State; *B. oranus* Thatcher

Table 3. Ornamentation on legs in *Brasergasilus mamorensis* sp. n., algarism roman refer to spines and arabic to setae.

	Exopod	Endopod
Leg I	I-0, 0-1, II-5	0-1, II-5
II	I-0, 0-1, I-6	0-1, 0-2, I-4
III	0-0, 0-1, I-6	0-1, 0-2, I-4



Figures 6-11. *Brasergasilus mamorensis* sp. n. (female). 6 - Mouthparts. 7 - Leg I. 8 - Leg II. 9 - Leg III. 10 - Leg V. 11 - Egg sac.

& Boeger 1984, collected from the gill filaments and gill rakers of *Anodus elongatus*, in the Solimões River, near Manaus; and *B. guaporensis* Malta, 1995, collected from the gill filaments of *Leporinus fasciatus* (Bloch, 1890), in the Guaporé River, Rondônia State. These species of the genus *Brasergasilus* are endemic to the Neotropical Region (Malta, 1995; Malta & Varella, 1998).

B. mamorensis sp. n. is the fifth species that has been described for this genus, but it is the first time it has been found in nasal cavities. This is the first report on *Hydrolycus pectoralis* as a host for *Brasergasilus*.

Body length measurements of the new species were 432-512 (468), similar to those of *B. oranus* 420-510 (464), but longer than on *B. jaraquensis*, 340-410 (370), *B. anodus*, 320-370 (354) and *B. guaporensis*, 301-382 (335). The cephalothorax occupies 56% of the total length, whilst the proportion on other species is 62% in *B. oranus*, 55% in *B. guaporensis*, 53% in *B. jaraquensis* and 52% in *B. anodus*.

This new species is the only one that has: 22 setae in the antenulle, a spine on the first segment of the antenna; coxopodites of all legs with 1 row of spinules on the external margin, and basipodites with 1 simple seta on the outer proximal region; first two segments, of the exopod of leg 1, with two rows of spinules on the external margin and fifth legs on the sixth thoracic somite.

Malta (1995) described *B. guaporensis* as having the claw of the antenna resembling half an arrow head. This new species has the claws similar to those of *B. guaporensis*, but the extremity is a little shorter and not so curved. Both species were collected from the same region.

The diagnosis of the subfamily Abergasilinae is: Cyclopidea; Ergasilidae; with the following characters: female with 3 pairs of swimming legs; vestigial legs lacking. Second (prehensile) antenna 3-segmented. The type genus and species is *Abergasilus amplexus* (Thatcher & Boeger, 1983).

Hewitt (1978) reported that the female of *A. amplexus*: metasomal segment 4 bears one pair of hairs ventrally, which he had suggested might represent vestigial fourth legs. Jones (1981) redescribed the female of *A. amplexus* and found differences in the mandibles, ornamentation of legs 1-3 and uropods. Jones (1981) described the male of *A. amplexus*, legs 4-5 as for female (female = legs 4-5 or reduced to setae), leg 6 represented by setae.

The female of *B. mamorensis* sp. n. has a vestigial leg, (leg 5). The female of *A. amplexus* (legs 4-5) and male (legs 4-5-6) have vestigial legs too. Two species of this subfamily have vestigial legs. That is why the diagnosis of Abergasilinae reporting vestigial legs lacking, should be changed to: vestigial legs lacking or 1, 2 or 3 pairs of vestigial legs present. Another thing that should be changed is the antenna being 2 not 3-segmented.

We found no specific body adaptations on *B. mamorensis* sp. n. for liv-

ing in this new habitat (nasal cavities).

A total of 283 specimens of *Brasergasilus mamorensis* sp. n. were collected from the nasal cavities of 4 fish (*Hydrolycus pectoralis*), all from the Mamoré River. The parasitism indexes of the new species were: prevalence 100%; intensity of 14-117 per host, mean 71, and density 71.

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