

The parasitic Crustaceans of fishes from the Brazilian Amazon,
14, *Gamispinus diabolicus* gen. et sp. nov. (Copepoda: Poecilostomatoida:
Vaigamidae) from the nasal fossae of *Ageneiosus brevifilis* VALENCIENNES

by

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Abstract

The female of *Gamispinus diabolicus* gen. et sp. nov. (Copepoda: Poecilostomatoida: Vaigamidae) is described from the nasal fossae of an Amazonian fish, *Ageneiosus brevifilis* VALENCIENNES. The new genus differs from the other two genera of the family (*Vaigamus* and *Gamidactylus*) in having a five-segmented antennule and an antenna which terminates in one fixed and two moveable spines.

Keywords: Nasal parasite, copepods, fishes, Amazon.

The family Vaigamidae and the genus *Vaigamus* were proposed by THATCHER & ROBERTSON (1984) for ergasiloid copepods in which the females have prominent thoracic retrostylets and inhabit the nasal fossae of Amazonian fishes. THATCHER & BOEGER (1984) described the new genus and species, *Gamidactylus jaraquensis*, as the second genus for the family. The present contribution describes a third genus of vaigamid from the nasal fossae of an Amazonian catfish.

Materials and Methods

The nasal cavities of fish were opened and the mucous removed by forceps and by flushing. Vaigamids were individually taken from the mucous using fine needles and a dissecting microscope. The copepods were fixed in AFA (alcohol-formalin-acetic acid) and studied in fenol-fuchsin. Permanent preparations were made by passing the specimens through fenol-balsam. Color determinations were made with reference to SMITHE (1974). Drawings were made with the aid of a camera lucida and measurements with a measuring ocular. All measurements are expressed in micrometers (μm).

Systematic Section
Suborder Poecilostomatoida KABATA, 1979
Family Vaigamidae THATCHER & ROBERTSON, 1984
Gamispinus gen. nov.

Generic diagnosis. Vaigamidae. Female: Cephalothorax with dorso-lateral retrostylets; rostrum unarmed. Antennule 5-segmented. Antenna 4-segmented; second segment spinous on side bearing sensillum; third segment with fixed spine and moveable claw-like spine; fourth segment claw-like with simple pore-like sensillum. Legs: first endopod 2-segmented; first exopod 3-segmented; fourth endopod 2 or 3-segmented; fourth exopod 1 or 2-segmented; all rami of legs 2 and 3 of three segments; leg 5 reduced to one or two setae; sixth leg absent. Male: unknown. Female parasitic in nasal fossae of fishes; male presumably free-living.
Type species: *Gamispinus diabolicus* sp. nov.

Gamispinus diabolicus sp. nov.
(Figs. 1 - 10)

Host: *Ageneiosus brevifilis* VALENCIENNES.

Site: Nasal fossae.

Locality: Amazon River, near Manaus, Amazonas, Brazil.

Holotype (female): Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, Amazonas, Brazil.

Paratypes: INPA and Museu de Zoologia da Universidade de São Paulo, S. P., Brazil.

Male: Unknown.

Etymology: "Gami" is an amerindian name for a parasitic crustacean and spinous refers to the spines on the antenna. Diabolicus is in reference to the trident-like appearance of the termination of the antenna.

Species diagnosis (based on 37 females studied and 10 measured; Tables I and II): Cephalothorax elongate, tapering at both ends; head fused with first two thoracic segments (Fig. 2). Eye trilobed, spectrum blue (Color 69 of SMITHE, 1974). Spectrum blue pigment scattered in small spots throughout cephalothorax and first three free thoracic segments (Fig. 2). Retrostylets short, dorso-lateral (Figs. 2 and 10).

Free thorax elongate, five-segmented but intersegmental borders indistinct (Fig. 2). Penultimate segment sub-rectangular; bears fifth leg consisting of two setae of unequal length (Fig. 6). Genital segment sub-spherical with dorso-lateral indentations posteriorly (Fig. 6).

Abdomen (Fig. 6) 3-segmented; provided with spinules ventrally extending along lateral borders to dorsal side. Uropod (Fig. 6) with one large seta, one small seta, one setule and several spinules.

Antennule (Fig. 1) of five segments bearing simple setae; setal formula = 10 - 3 - 4 - 2 - 7; total = 26. Antenna (Fig. 3) 4-segmented; basal segment with single terminal spine; second segment with spine-like sensillum and numerous spinules on sensillar face; segment 3 with one fixed spine, one moveable spine and a spine-like sensillum; segment 4 claw-like with simple pore-like sensillum mid-way on concave surface: ratio of segmental lengths = 2 : 2, 3 : 1 : 1.

Mouthparts (Fig. 5) mandible 2-segmented; terminal segment ovoid and bristled; palp slender and bristled; maxillule not observed; maxilla elongate and bristled terminally.

Legs (Figs. 7 - 9). Coxae of first four legs with lateral spinules. Basipods each with one simple seta. All other setae on legs pinnate. Leg 1 (Fig. 7); endopod 2-segmented, exopod 3-segmented: first endopodal segment with spinules postero-laterally and with one seta medially; terminal segment with spinules laterally and with two slender spines and five setae: first exopodal segment with one lateral spine and lateral spinules; second segment with lateral spinules and one medial seta; terminal segment with two lateral spines, few spinules and five medial setae. Leg 2 = Leg 3 (Fig. 8); both rami 3-segmented; endopodal segment 1 with spinules postero-laterally and one medial seta; second segment with postero-lateral spinules and two medial setae; terminal segment with one spine, few spinules and four seta: first exopodal segment with one slender spine and few spinules laterally; second segment with

spinules postero-laterally and one medial seta; terminal segment with few spinules and six setae. Leg 4 (Fig. 9); endopod 2-segmented, exopod one-segmented; first endopodal segment pilose laterally and with few spinules posteriorly and one seta medially; terminal segment with few spinules and four setae: exopod with few hairs medially, few spinules laterally and four setae posteriorly. Leg 5 reduced to one long and one short seta.
Egg sac (Fig. 4) a single row of up to 24 eggs.

Discussion

Gamispinus diabolicus gen. et sp. nov. can be distinguished from the other known genera of Vaigamidae (namely: *Vaigamus* THATCHER & ROBERTSON and *Gamidactylus* THATCHER & BOEGER) by the following characters: (1) the antenna has numerous spinules and terminates in one fixed and two moveable spines, (2) the antennule has five segments rather than six, (3) the retrostylets are shorter and more dorsally situated and (4) the free thorax is more attenuated and less distinctly segmented. Additionally, *Gamispinus* gen. nov. and *Gamidactylus* lack rostral spination which serves to separate both from *Vaigamus*.

Resumo

A fêmea de *Gamispinus diabolicus* gen. et sp. nov. (Copepoda: Poecilostomatoida: Vaigamidae) é descrita das fossas nasais de um peixe amazônico, *Ageneiosus brevifilis* VALENCIENNES. O novo gênero distingue-se dos outros dois gêneros desta família (*Vaigamus* e *Gamidactylus*) por ter uma primeira antena de cinco segmentos e uma segunda antena terminando em um espinho fixo e dois que mexem.

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Table I: Measurements (μm) of 10 Adult Females of *Gamispinus diabolicus* gen. et sp. nov.

	Length	Width
Body (less caudal setae)	570 - 710 (632)	160 - 220 (194)
Cephalothorax	267 - 312 (283)	160 - 220 (194)
Retrostylet	97 - 107 (104)	-
Free thoracic segments		
III	62 - 77 (71)	122 - 167 (152)
IV	55 - 72 (64)	90 - 120 (108)
V	50 - 62 (56)	70 - 87 (81)
VI	22 - 25 (24)	52 - 75 (62)
VII (genital)	47 - 57 (54)	67 - 77 (73)
Abdominal segments		
I	17 - 25 (21)	45 - 52 (49)
II	15 - 20 (17)	42 - 47 (46)
III	10 - 12 (11)	37 - 40 (39)
Uropod	20 - 27 (24)	15 - 17 (16)
Caudal setae	152 - 187 (172)	-
Egg sac	750 - 1101 (870)	-

Table II: Antennal measurements (μm) of 10 Adult Females of *Gamispinus diabolicus* gen. et sp. nov.

	Length	Width
Antennule	95 - 107 (100)	15 - 22 (21)
Antenna		
Segment I	40 - 60 (49)	30 - 50 (41)
2	57 - 62 (60)	17 - 22 (20)
3	20 - 25 (23)	10 - 12 (11)
4	20 - 25 (23)	-

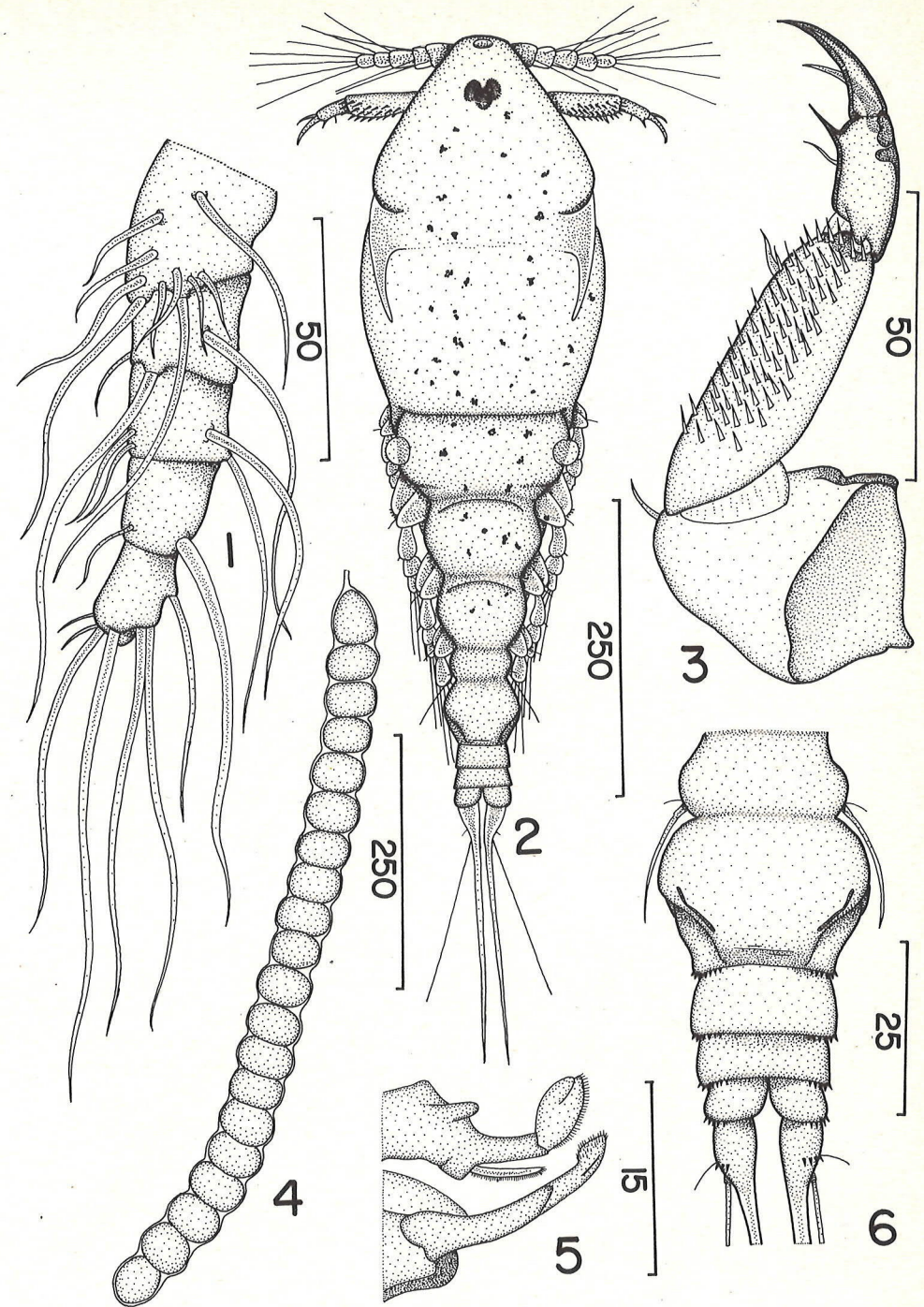


Fig. 1 - 6:
Gamispinus diabolicus gen. et sp. nov. (female).
 Fig. 1: Antennule; Fig. 2: Dorsal view of entire specimen; Fig. 3: Antenna; Fig. 4: Egg sac;
 Fig. 5: Mouthparts; Fig. 6: Genital segment, abdomen and uropods. (scale in μm).

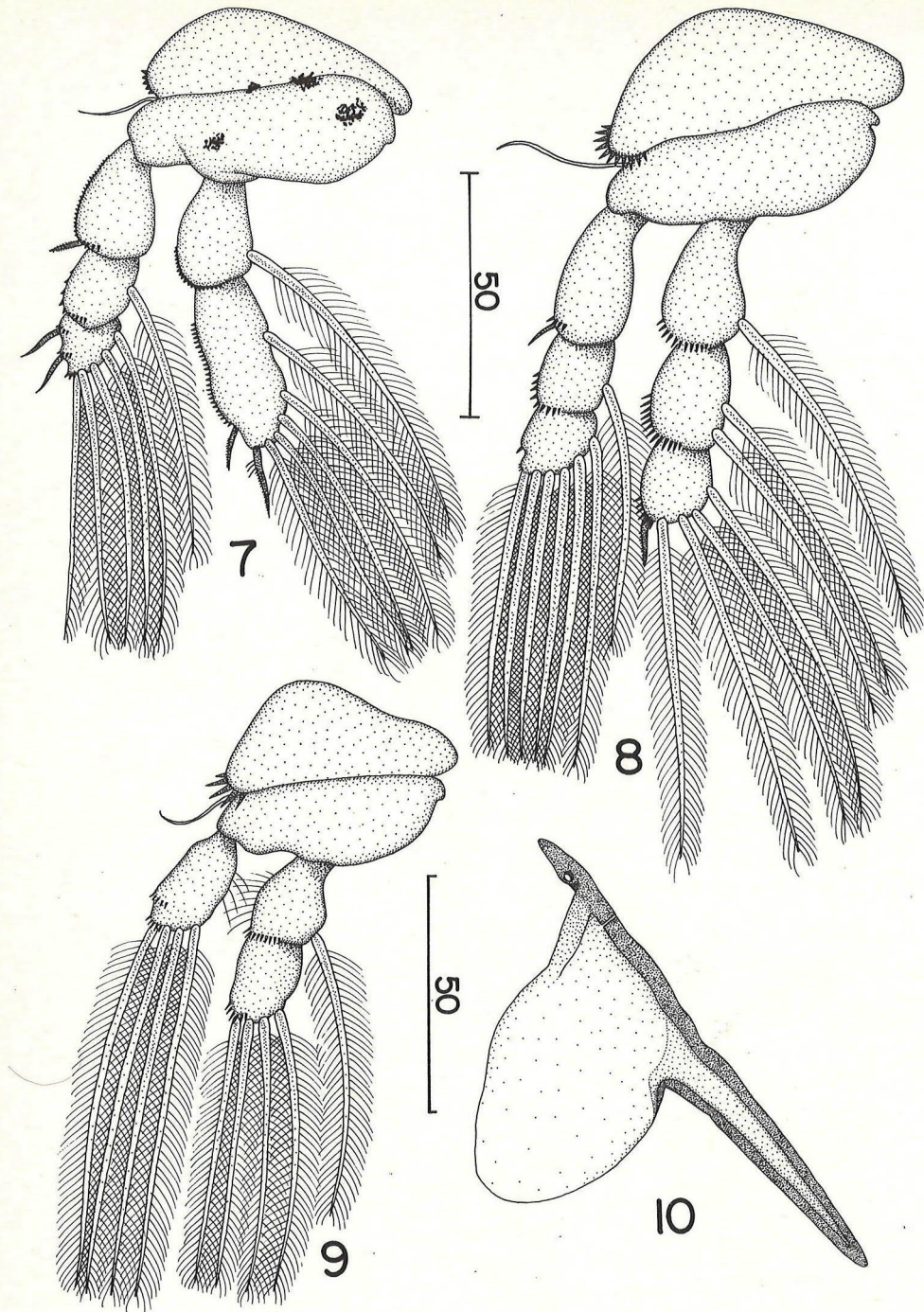


Fig. 7 - 10:
Gamispinus diabolicus gen. et sp. nov. (female).
 Fig. 7: Leg 1; Fig. 8: Leg 2 = Leg 3; Fig. 9: Leg 4; Fig. 10: Retrostylet. (scale in μm).