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Neotropical Monogenea. 8. Revision of *Urocleidoides* (Dactylogyridae, Ancyrocephalinae)

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ABSTRACT: *Urocleidoides* Mizelle and Price, 1964, is restricted to species possessing a sinistral vaginal sclerite, overlapping (tandem?) gonads, counterclockwise cirral rings, simple anchors, and hooks (pairs 1 and 5 usually reduced) with enlarged shanks. *Urocleidoides* contains the type species, *U. reticulatus* Mizelle and Price, 1964, *U. anops* Kritsky and Thatcher, 1974, and *U. curimatae* Molnar, Hanek, and Fernando, 1974. In addition, *U. eremitus* sp. n. and *U. paradoxus* sp. n., herein described from *Hoplias malabaricus* (Bloch) and *Rhytiodus microlepis* Kner, respectively, are included in the genus. Fish hosts of the superfamily Characoidea (Cypriniformes) are considered to be the natural hosts of *Urocleidoides* species. *Ancyrocephalus dyki* Lucký, 1972, and *Gussevia minuta* Kohn and Paperna, 1964, are junior synonyms of *U. reticulatus*. *Vancleaveus* gen. n. is proposed for ancyrocephaline species infesting the gills of siluriform fishes and possessing a ventral vagina, overlapping gonads, an elongate seminal vesicle and prostatic vesicle, dorsal anchors with conspicuous folds on the superficial roots, and hooks with shanks inflated along their entire length. The genus includes *V. janauacaensis* sp. n. (type) from *Pterodoras granulosus* (Valenciennes), *V. cicinnus* sp. n. from *Phractocephalus hemiliopterus* (Bloch and Schneider), *V. fungulus* sp. n. from *Pseudoplatystoma tigrinum* (Cuvier and Valenciennes) and *P. fasciatum* (Linnaeus), and *V. platyrhynchi* sp. n. from *Hemisorubim platyrhynchos* (Valenciennes). *Cosmetocleithrum* gen. n. is proposed from siluriform fishes and is characterized by species possessing a dorsal bar with two submedian posterior projections, a sinistral vagina, tandem gonads, and hooks with undilated shanks. The following new species of *Cosmetocleithrum* are described: *C. gussevi* (type), *C. confusus, C. parvum, C. rarum,* and *C. sobrinus,* all from *Oxydoras niger* (Valenciennes), and *C. bulbocirrus* from *Pterodoras granulosus* (Valenciennes). *Gussevia* Kohn and Paperna, 1964 is resurrected for *G. spiralocirra* Kohn and Paperna, 1964 (type) from *Pterophyllum scalare* (Lichtenstein); *G. alii* (Molnar, Hanek, and Fernando, 1974) comb. n., *G. cichlasomatis* (Molnar, Hanek, and Fernando, 1974) comb. n., and *G. dobosi* (Molnar, Hanek, and Fernando, 1974) comb. n. from *Cichlasoma bimaculatum* (Linnaeus); *G. obtusa* sp. n. and *G. elephus* sp. n. from *Uaru amphiacanthoides* (Heckel); *G. longihaptor* (Mizelle and Kritsky, 1969) comb. n., *G. undulata* sp. n., *G. arilla* sp. n., and *G. tucunarense* sp. n. from *Cichla ocellaris* Bloch and Schneider; and *G. alioides* sp. n., *G. dispar* sp. n., and *G. disparoides* sp. n. from *Cichlasoma severum* (Heckel). *Gussevia* is characterized by having overlapping gonads, a haptor with anterior and posterior lobes, modified ventral anchors with well-developed anchor filaments, modified (reduced) hook pair 5, and a clockwise cirrus coil. All known species of *Gussevia* occur on fishes of the family Cichlidae. *Ancyrocephalus pterophylii* Lucký, 1970 is a junior synonym of *G. spiralocirra*; and *Longihaptor* Mizelle and Kritsky, 1969 is considered a junior synonym of *Gussevia*. *Urocleidoides affinis* Mizelle, Kritsky, and Crane, 1968, *U. amazonensis* Mizelle and Kritsky, 1969, *U. carapus* Mizelle, Kritsky, and Crane, 1968, *U. catus* Mizelle and Kritsky, 1969, *U. chavarriai* (Price, 1938) Molnar, Hanek, and Fernando, 1974, *U. corydori* Molnar, Hanek, and Fernando, 1974, *U. costaricensis* (Price and Bussing, 1967) Kritsky and Leiby, 1972, *U. gymnotus* Mizelle, Kritsky, and Crane, 1968, *U. heteroancistrium* (Price and Bussing, 1968) Kritsky and Leiby, 1972, *U. kabatai* Molnar, Hanek, and Fernando, 1974, *U. lebedevi* Kritsky and Thatcher, 1976, *U. mamaevi* Kritsky and Thatcher, 1976, *U. margolisi* Molnar, Hanek, and Fernando, 1974, *U. megorchis* Mizelle and Kritsky, 1969, *U. microstomus* Mizelle, Kritsky, and Crane, 1968, *U. robustus* Mizelle and Kritsky, 1969, *U. stictus* Mizelle, Kritsky and Crane, 1968, *U. strombicirrus* (Price and Bussing, 1967) Kritsky and Thatcher, 1974, *U. travassosi* (Price, 1938) Molnar, Hanek, and Fernando, 1974, *U. trinidadensis* Molnar, Hanek, and Fernando, 1974, *U. variabilis* Mizelle and Kritsky, 1969, and *U. virescens* Mizelle, Kritsky, and Crane, 1968 are considered incertae sedis based on the generic revision provided herein.

Urocleidoides Mizelle and Price, 1964 represents the second genus of Monogenea proposed from Neotropical freshwater fishes. As frequently happens in investigations of new regions, subsequent workers realized difficulty in understanding morphologic limits of the taxon, with Mizelle et al. (1968) greatly expanding the generic bounds in their emended diagnosis. Kritsky and Thatcher (1983) listed 30 species of *Urocleidoides* (all Neotropical) from fishes repre-

senting four teleost orders. Based on this host occurrence and the fact that most Dactylogyridae exhibit relatively high host specificity, Gussev (1978) suggested that species currently assigned to *Urocleidoides* represent several genera and possibly subfamilies. Our collections from Brazil, Colombia, Peru, and El Salvador, made over a 15-year period (see also Kritsky and Thatcher, 1974, 1976), have provided a large number of species that fall into the broad generic definition proposed by Mizelle et al. (1968). Studies on the comparative morphology of this material have allowed the revision of *Urocleidoides* presented herein; a historical account of the genus is included.

Historical Review

Urocleidoides was proposed by Mizelle and Price (1964) for their new species, *U. reticulatus,* collected from the gills of *Poecilia reticulata* (Poeciliidae). The genus was characterized by possessing a sinistral vagina and an articulated cirrus and accessory piece and was considered to be intermediate to the North American *Urocleidus* Mueller, 1934 (as emended by Mizelle and Hughes, 1938) and *Cleidodiscus* Mueller, 1934. The generic revision by Mizelle et al. (1968) allowed inclusion of their new species: *U. affinis* from *Creatochanes affinis* (Characidae), *U. carapus* and *U. gymnotus* from *Gymnotus carapo* (Gymnotidae), *U. microstomus* from *Hemigrammus microstomus* (Characidae), *U. stictus* from *Hyphessobrycon stictus* (Characidae), and *U. virescens* from *Eigenmannia virescens* (Gymnotidae). All subsequent reports on the genus have followed the generic boundaries established by the latter authors.

Mizelle and Kritsky (1969) described five additional species: *U. amazonensis* and *U. catus* from *Phractocephalus hemiliopterus,* Pimelodidae; *U. megorchis* from *Sorubim lima,* Pimelodidae; *R. robustus* from *Rhamdia* sp., Pimelodidae; and *U. variabilis* from *Symphysodon discus,* Cichlidae. Within 5 years of the original proposal of the genus, the taxon contained species infesting fishes of the orders Atheriniformes, Cypriniformes, Perciformes, and Siluriformes.

In a report on Monogenea of *Astyanax fasciatus* (Characidae), Kritsky and Leiby (1972) synonymized *Palombitrema* Price and Bussing, 1968 with *Urocleidoides* and transferred its type species, *P. heteroancistrium* Price and Bussing, 1968 and *Cleidodiscus costaricensis* Price and Bussing, 1967 to the genus. Molnar et al. (1974) described eight new species (*U. alii, U. cichlasomatis,* and *U. dobosi* from *Cichlasoma bimaculatum,* Cichlidae; *U. corydori* and *U. margolisi* from *Corydoras aeneus,* Pimelodidae; *U. curimatae* from *Curimata argentea,* Curimatidae; and *U. kabatai* and *U. trinidadensis* from *Astyanax bimaculatus,* Characidae) and transferred *Cleidodiscus chavarriai* Price, 1938 and *C. travassosi* Price, 1938 both from *Rhamdia* spp. (Pimelodidae) into *Urocleidoides.* Kritsky and Thatcher (1974) described *U. anops* from *Characidium caucanum* (Characidae) and placed *Cleidodiscus strombicirrus* Price and Bussing, 1967 from *Astyanax fasciatus* (Characidae) in the genus.

Considerable diversity in the structure of the internal organ systems of species of *Urocleidoides* was indicated by Kritsky and Thatcher (1976), who presented whole-mount illustrations of their new species, *U. lebedevi* from *Pimelodus grosskopfi* (Pimelodidae) and *U. mamaevi* from *Cephalosiluris zungaro* (Pimelodidae). In 1983, Kritsky and Thatcher listed 30 species in *Urocleidoides,* which included their transfer of *Gussevia spiralocirra* Kohn and Paperna, 1964 from *Pterophyllum eimekei* (Cichlidae) and *G. minuta* Kohn and Paperna, 1964 from *Poecilia reticulata* (Poeciliidae) into the genus. Kritsky and Thatcher (1983) considered *Gussevia* Kohn and Paperna, 1964 a junior synonym of *Urocleidoides* as emended by Mizelle et al. (1968).

In a series of papers, Lucký (1970, 1972, 1973) reported on the following ancyrocephalines from aquarium fishes in Czechoslovakia: *Ancyrocephalus xiphophori* from *Xiphophorus maculatus* (Poeciliidae); *A. pterophylli* and *A.* sp. from *Pterophyllum eimekei* (Cichlidae); *A. kostomarovi* from *Symphysodon discus* (Cichlidae); and *A. dyki* from *Poecilia reticulata* (Poeciliidae). Investigators in the western hemisphere have not commented on these species even though they clearly show close resemblance to *Urocleidoides* spp.

Materials and Methods

Fish hosts were collected by hook-and-line, seine, or net from locations in Brazil and Peru during the period 1977–1984. Gills were removed, placed in finger bowls, and covered with a 1:4,000 formalin solution. After ½ hour, gills were agitated in this liquid and then removed from the bowl. Helminths were allowed to settle to the bottom and were subsequently removed with the aid of a small probe and dissecting microscope. They were immediately fixed and stored in AFA. Some were mounted unstained in Gray and Wess' medium for study of sclerotized structures. Other specimens were

stained with Semichon's carmalum, Mayer's acid carmalum, or Gomori's trichrome to determine internal structures. Illustrations were prepared with the aid of a camera lucida or microprojector. Measurements, all in micrometers, were made according to the procedures of Mizelle and Klucka (1953) except as described below. The measurements of the cirrus include: (1) the diameter of the proximal ring of the coil, depicted on the respective drawings as the interval between the solid straight lines, and (2) an approximation of total length of the cirrus obtained by using a Minerva curvimeter on camera lucida drawings. Dimensions of organs and other structures represent the greatest measurement in dorsoventral view; lengths of curved structures (bars, accessory piece) represent a straight-line measurement between extreme ends; the hook measurement represents the total hook length; greatest body width is that of the trunk region (excluding the haptor); and values for the ovary and testis represent the length followed by width, respectively. Average measurements are followed by ranges in parentheses. Haptoral terminology is that of Kritsky and Mizelle (1968) and Mizelle et al. (1968).

Numbering of hook pairs follows that recommended by Mizelle (1936). This sequencing is preferable because it is the only proposed method currently in use that considers both anteroposterior and dorsoventral positions of respective hook pairs in the adult haptor. An ancyrocephaline distribution of haptoral hooks refers to the usual distribution of hook pairs in the Ancyrocephalinae described by Mizelle (1936). Direction of the cirrus coil (counterclockwise vs. clockwise) was determined using the procedure proposed by Kritsky et al. (1985). Type specimens were deposited in the collections of the Instituto Nacional de Pesquisas da Amazônia (INPA), the U.S. National Museum Helminthological Collection (USNM), and the University of Nebraska State Museum (HWML) as indicated in the respective descriptions.

For comparative purposes, type specimens of the following species were examined: 3 cotypes(?), *Ancyrocephalus dyki* Lucký, 1972 (USNM 78794); cotype(?), *A. kostomarovi* Lucký, 1973 (USNM 78793); cotype(?), *A. pterophylli* Lucký, 1970 (USNM 78801); paratype, *Cleidodiscus bulbus* Rogers and Rawson, 1969 (USNM 71363); holotype, *C. microcirrus* Price and Schlueter, 1967 (USNM 60890); 3 paratypes, *Longihaptor longihaptor* Mizelle and Kritsky, 1969 (USNM 71000); paratype, *Trinidactylus cichlasomatis* Hanek, Molnar, and Fernando, 1974 (USNM 73181); 2 paratypes, *Urocleidoides affinis* Mizelle, Kritsky, and Crane, 1968 (HWML 22936); 2 paratypes, *U. alii* Molnar, Hanek, and Fernando, 1974 (USNM 73163); 2 paratypes, *U. amazonensis* Mizelle and Kritsky, 1969 (HWML 22932); holotype, *U. anops* Kritsky and Thatcher, 1974 (USNM 72841); 10 paratypes, *U. carapus* Mizelle, Kritsky, and Crane, 1968 (HWML 22934); 15 paratypes, *U. catus* Mizelle and Kritsky, 1969 (HWML 22942); 2 paratypes, *U. cichlasomatis* Molnar, Hanek, and Fernando, 1974 (USNM 73165); 2 paratypes, *U. curimatae* Molnar, Hanek, and Fernando, 1974 (USNM 73169); 2 paratypes, *U. dobosi* Molnar, Hanek, and Fernando, 1974 (USNM 73171); 6 paratypes, *U. megorchis* Mizelle and Kritsky, 1969 (HWML 22935); 4 paratypes, *U. microstomus* Mizelle, Kritsky, and Crane, 1968 (HWML 22939); 3 paratypes, *U. reticulatus* Mizelle and Price, 1964 (HWML 22938); 11 paratypes, *U. robustus* Mizelle and Kritsky, 1969 (HWML 22941); 4 paratypes, *U. stictus* Mizelle, Kritsky, and Crane, 1968 (HWML 22937); 2 paratypes, *U. trinidadensis* Molnar, Hanek, and Fernando, 1974 (USNM 73177); 15 paratypes, *U. variabilis* Mizelle and Kritsky, 1969 (HWML 22943); 6 paratypes, *U. virescens* Mizelle, Kritsky, and Crane, 1968 (HWML 22933); holotype, *Urocleidus aequidens* Price and Schlueter, 1967 (USNM 60894); and holotype, *U. cavanaughi* Price, 1966 (USNM 61204).

Urocleidoides Mizelle and Price, 1964

EMENDED DIAGNOSIS: Dactylogyridae, Ancyrocephalinae. Body divisible into cephalic region, trunk, peduncle, and haptor. Tegument thin, smooth. Cephalic lobes, head organs, cephalic glands present. Eyes present or absent. Mouth subterminal, midventral; pharynx muscular, glandular; esophagus present; intestinal caeca 2, confluent posterior to testis, lacking diverticula. Gonads intercaecal, overlapping or (?) tandem; testis dorsal or posterior to ovary. Vas deferens looping left intestinal caecum; seminal vesicle an inconspicuous dilation of vas deferens; copulatory complex comprising a coiled cirrus and accessory piece; cirrus coil counterclockwise; accessory piece serving as cirrus guide distally. Oviduct short, uterus delicate; vagina dextral or sinistral; seminal receptacle present. Vaginal sclerite present, sinistral. Vitellaria well developed. Haptor armed with dorsal and ventral pair of unmodified anchors, dorsal and ventral bars, seven pairs of hooks with ancyrocephaline distribution. Hook pairs 1, 5 usually reduced in size. Parasites primarily of gills of freshwater cypriniform fishes.

TYPE SPECIES AND HOST: *Urocleidoides reticulatus* Mizelle and Price, 1964 from the guppy, *Poecilia* (*Lebistes*) *reticulata* (Peters), Poeciliidae.

OTHER SPECIES: *U. anops* Kritsky and Thatcher, 1974 from *Characidium caucanum* Eigenmann, Characidae; *U. curimatae* Molnar, Hanek, and Fernando, 1974 from *Curimata argentea* (Gill), Curimatidae; *U. eremitus* sp. n. from *Hoplias malabaricus* (Bloch), Erythrinidae; *U. paradoxus* sp. n. from *Rhytiodus microlepis* Kner, Anostomidae.

REMARKS: *Urocleidoides* is herein restricted to species possessing a sinistral vaginal sclerite, overlapping (tandem?) gonads, counterclockwise cirral rings, unmodified anchors, and hooks (pairs 1, 5 usually reduced) with enlarged shanks. Ex-

cept for the type species, members of the genus have been reported only from fishes of the superfamily Characoidea (Cypriniformes), which appear to be their natural hosts.

Reports of the type species, *U. reticulatus,* from the atheriniform host, *Poecilia* (*Lebistes*) *reticulata* by Mizelle and Price (1964), Kohn and Paperna (1964), and Lucký (1972) may represent spurious infestations of the guppy. In the above reports, the hosts were obtained from aquaria in California, Israel, and Czechoslovakia, respectively, and the parasite has never been recorded from guppies collected from native habitats in Trinidad (listed as the type locality). The guppy, as well as many species of Characoidea, is a common aquarium fish kept in community-type tanks where interspecific transfer of monogeneans could easily occur. Because our examination of numerous guppies collected from the Arouca River in Trinidad during 1982 (hosts provided by Dr. M. Beverley-Burton) failed to show infestation by the parasite, we suggest that studies of the gill parasites of other characoid fishes commonly found in community-type aquaria may be necessary to demonstrate the natural host of *U. reticulatus.*

Urocleidoides reticulatus Mizelle and Price, 1964

SYNONYMS: *Ancyrocephalus dyki* Lucký, 1972; *Gussevia minuta* Kohn and Paperna, 1964; *Urocleidoides minuta* (Kohn and Paperna, 1964) Kritsky and Thatcher, 1983.

HOST: Guppy, *Poecilia* (*Lebistes*) *reticulata* (Peters), Poeciliidae.

TYPE LOCALITY: Trinidad; aquarium fish descended from Trinidad stock in California.

SPECIMENS STUDIED: Three paratypes, HWML 22938; three cotypes(?) of *Ancyrocephalus dyki* Lucký, 1972, USNM 78794.

REMARKS: The original specimens on which this species is based are unstained and mounted in glycerine jelly, and details of the anatomy of the reproductive system could not be verified with certainty. Although Mizelle and Price (1964) state that the gonads are tandem (testis postovarian), the gonads in one specimen available for study appeared to be overlapping under phase contrast microscopy. However, we cannot state with certainty that this is the case and suggest that examination of living specimens or fresh material stained to show internal features will be necessary to verify this character. Nonetheless, the comparative morphology of the sclerotized structures of the haptor, vagina, and copulatory complex strongly suggests a close relationship of this species with others we presently include in the genus.

Examination of three cotype specimens (on one slide and mounted in Malmberg's Ammonium Picrate Solution) of *Ancyrocephalus dyki* Lucký, 1972 has shown this species to be conspecific with *U. reticulatus.* Sclerotized structures of the haptor and copulatory complex of *A. dyki* are indistinguishable from those of the paratypes of the type species; details of the reproductive system could not be determined. Although type material of *Gussevia minuta* Kohn and Paperna, 1964 (*U. minuta* of Kritsky and Thatcher, 1983) was not available for study, this species is also undoubtedly a synonym of *U. reticulatus* based on the comparison of the original drawings provided by Kohn and Paperna (1964) and available type specimens of *U. reticulatus* and *A. dyki.*

Urocleidoides anops Kritsky and Thatcher, 1974

HOST: *Characidium caucanum* Eigenmann, Characidae.

TYPE LOCALITY: Rio Pance, Cali, Valle, Colombia.

SPECIMEN STUDIED: Holotype, USNM 72841.

REMARKS: *Urocleidoides anops* possesses a sinistral vaginal sclerite, counterclockwise cirral rings, unmodified anchors, and hooks with enlarged shanks. Kritsky and Thatcher (1974) state that the gonads were indistinct, and we were not able to determine their limits in the unstained holotype. Nonetheless, we consider this species a member of *Urocleidoides* because it possesses the primary characters distinguishing the genus as emended herein.

Urocleidoides curimatae Molnar, Hanek, and Fernando, 1974

HOST: *Curimata argentea* (Gill), Curimatidae.

TYPE LOCALITY: Arouca River near D'Abadie, Trinidad.

SPECIMENS STUDIED: Two paratypes, USNM 73169.

REMARKS: Based on the presence of a sinistral vaginal sclerite and the morphology of the haptoral armament and copulatory complex, this species is considered a member of *Urocleidoides.* Molnar et al. (1974) consider the sclerite as the vagina in this species. However, our examination

of the paratypes confirms that it is a hook-shaped structure morphologically similar to those of *U. eremitis* and *U. paradoxus* spp. n. The type specimens are unstained and details of the internal anatomy could not be confirmed; the original authors state that the gonads are ovate and the testis is postovarian.

Urocleidoides eremitus sp. n. (Figs. 1-9)

HOST: Traíra, *Hoplias malabaricus* (Bloch), Erythrinidae.

TYPE LOCALITY: Janauacá Lake near Manaus, Amazonas, Brazil (April 18, 1980).

TYPE SPECIMENS: Holotype, INPA PA260-1; paratypes, INPA PA260-2, PA260-3, USNM 78764, HWML 22940.

DESCRIPTION (based on 13 specimens): Body fusiform; cephalic margin with two terminal, two bilateral cephalic lobes poorly developed. Eyes 2–4, poorly developed, subequal; members of posterior pair usually farther apart than those of anterior pair; eye granules frequently dissociated, small, usually ovate; accessory granules (granules not associated with the eyes) present in cephalic region and anterior trunk. Pharynx subovate; esophagus moderately long. Peduncle broad; haptor hexagonal. Ventral anchor with large superficial root, small deep root, curved shaft, short point. Dorsal anchor with elongate superficial root, incipient deep root, slightly curved shaft, point moderate in length. Ventral bar with bulbous terminations, anteromedial indentation; dorsal bar broadly U-shaped, with terminations directed laterally. Hooks similar, each with delicate shaft and point, protruding thumb, dilated shank; hook pairs 1, 5 reduced in size; FH loop ⅓ shank length (pairs 2, 3, 4, 6, 7), ½ shank length (pairs 1, 5). Cirrus a coil of about 2¼ rings, base with lateral flange, tube delicate; accessory piece flabellate. Vagina sinistral, a tortuous tube; vaginal sclerite a flexible rod with distal hook, subterminal short projection, proximal portion with longitudinal groove.

MEASUREMENTS: Body 581 (480–681) long, greatest width 83 (75–106) in posterior half of trunk. Pharyngeal diameter 23 (21–24). Haptor 73 (65–84) long, 102 (85–140) wide. Ventral anchor 45 (44–47), base width 28 (26–30); dorsal anchor 40 (38–42), base width 21 (19–23). Ventral bar 36 (32–39); dorsal bar 33 (30–36). Hook pairs 2, 3, 4, 7—26 (25–27); hook pairs 1, 5—18 (17–19); hook pair 6—24 (23–25). Cirrus 136 long, ring diameter 16 (13–18); accessory piece 20 (18–21) long. Testis 106 × 20–21; ovary 64 × 20–21. Vaginal sclerite 35 (30–40) long.

REMARKS: Based on the comparative morphology of the anchors and copulatory complexes, the closest relative of this species is apparently *U. reticulatus* Mizelle and Price, 1964. *Urocleidoides eremitus* differs from this species by possessing hook shanks inflated along their entire length and anchors with distinct angular unions of the points and shafts. The specific name is from Latin (*eremitus* = solitary).

Urocleidoides paradoxus sp. n. (Figs. 10-18)

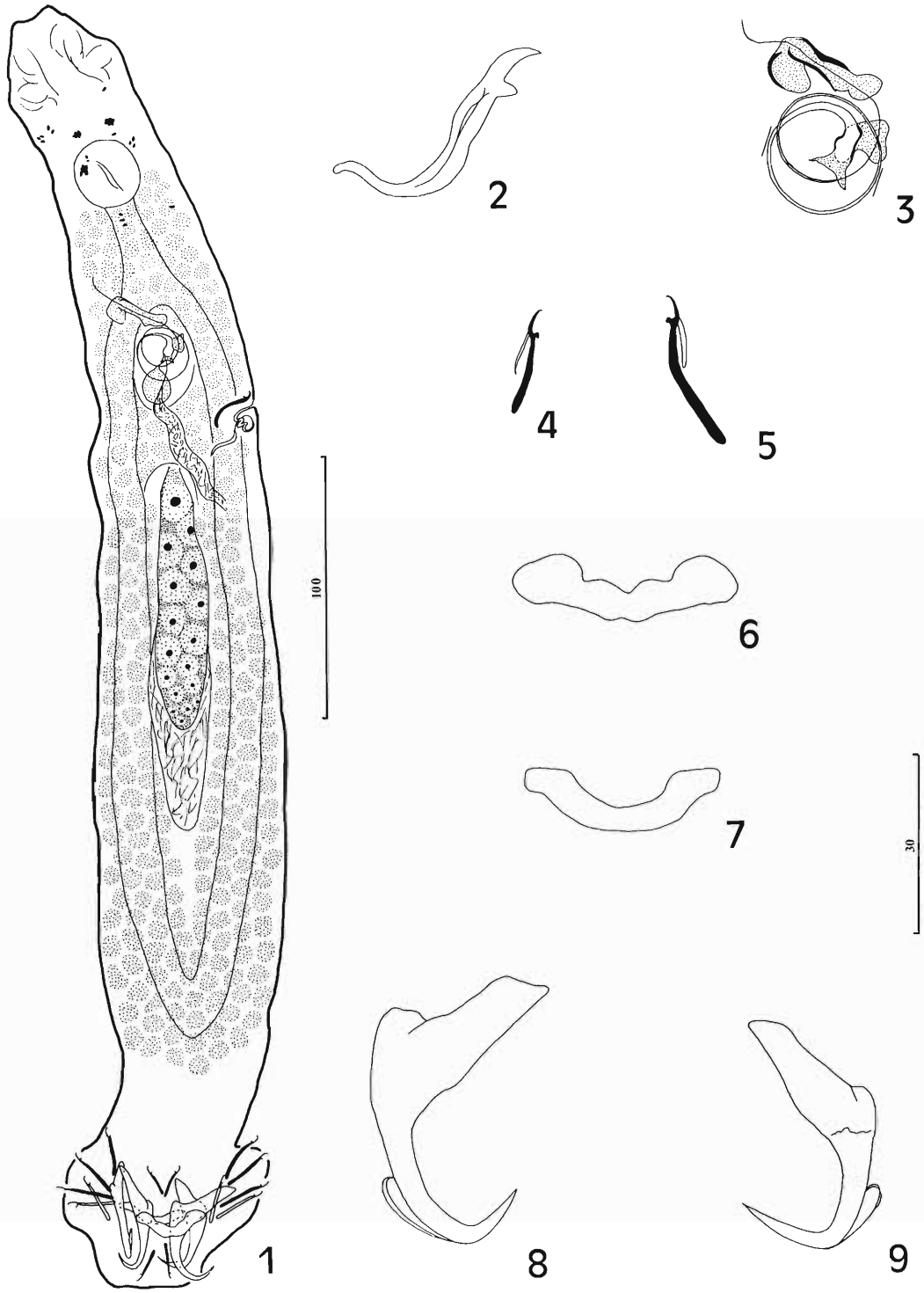
HOST: Aracu pau de negro, *Rhytiodus microlepis* Kner, Anostomidae.

TYPE LOCALITY: Rio Solimões near Ilha Marchantaria, Manaus, Amazonas, Brazil (June 8, 1983); also collected from same host at Furo do Catalão, near Encontro das Águas, Manaus, Amazonas, Brazil (October 16, 1982).

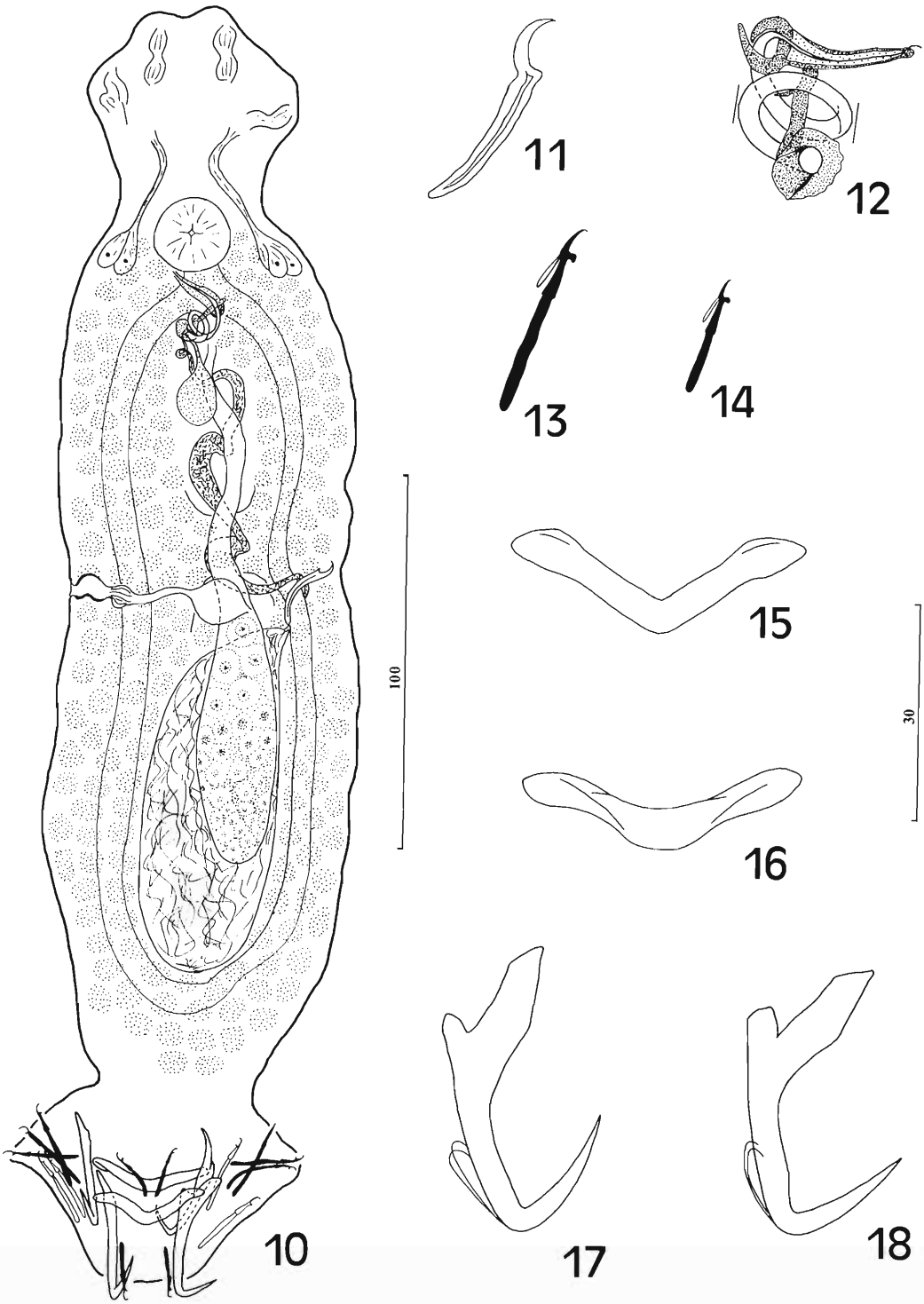
TYPE SPECIMENS: Holotype, INPA PA261-1; paratypes, INPA PA261-2 to PA261-4, USNM 78765 and 78766, HWML 22944, 22945.

DESCRIPTION (based on 28 specimens, 20 measured): Body robust; cephalic margin usually expanded or with subterminal narrowing; two terminal, two bilateral cephalic lobes poorly developed. Eyes absent; accessory granules absent or widely scattered throughout trunk and cephalic region, variable in size, ovate. Pharynx spherical; esophagus short. Peduncle board, haptor hexagonal. Anchors similar; each with elongate superficial root, small deep root, elongate straight shaft, sharply recurved point. Ventral bar broadly V-shaped, ends slightly expanded; dorsal bar broadly U-shaped, with ends directed laterally. Hooks similar; each with delicate point and shaft, depressed thumb, inflated shank comprising two distinct parts; hook pairs 1, 5 reduced in size; FH loop ¼–⅓ shank length. Cirrus coiled, with about two rings; base with anteriorly directed process which may articulate with accessory piece, tube with large diameter sharply attenuated distally. Accessory piece grooved, with two proximal arms. Vagina dextral, a lightly sclerotized tube of varying diameter, possessing internal sclerotized ridges proximal to distal funnel; vaginal sclerite lying near left body margin, composed of grooved rod with sickle-shaped termination.

MEASUREMENTS: Body 353 (295–463) long,



Figures 1–9. ***Urocleidoides eremitus*** **sp. n. 1. Ventral view of holotype. 2. Vaginal sclerite. 3. Copulatory complex. 4. Hook (pairs 1, 5). 5. Hook (pairs 2, 3, 4, 6, 7). 6. Ventral bar. 7. Dorsal bar. 8. Ventral anchor. 9. Dorsal anchor. All figures are drawn to the same scale (30 micrometers) except Figure 1 (100 micrometers).**



Figures 10–18. ***Urocleidoides paradoxus*** **sp. n. 10. Composite drawing of whole mount (ventral). 11. Vaginal sclerite. 12. Copulatory complex. 13. Hook (pairs 2, 3, 4, 6, 7). 14. Hook (pairs 1, 5). 15. Ventral bar. 16. Dorsal bar. 17. Ventral anchor. 18. Dorsal anchor. All illustrations are to the same scale (30 micrometers) except Figure 10 (100 micrometers).**

greatest width 83 (67–94) in anterior or posterior half. Pharyngeal diameter 19 (17–21). Haptor 59 (53–67) long, 75 (66–83) wide. Ventral anchor 38 (36–40), base width 18 (17–19); dorsal anchor 39 (37–40), base width 17 (16–18). Ventral bar 39 (37–40); dorsal bar 37 (35–40). Hook pair 1—21–22; hook pairs 2, 3, 4, 6—27 (25–30); hook pair 5—18–19; hook pair 7—31 (29–32). Cirrus 77 long, ring diameter 16 (14–17); accessory piece 26 (21–28) long. Testis 79 (73–85) × 29 (24–34); ovary 59 (52–66) × 24 (23–26). Vaginal sclerite 31 (28–32) long.

REMARKS: This is the only described species of *Urocleidoides* with a dextral vagina, sinistral vaginal sclerite, and hooks bearing a shank of two distinct parts. Based on the comparative morphology of the anchors and bars and the absence of eyes, this species most closely resembles *U. anops* Kritsky and Thatcher, 1974. In addition to the respective positions of the vagina, *U. paradoxus* is differentiated from this species by lacking a subterminal branch on the vaginal sclerite. The specific name, from Greek (*paradoxus* = incredible), refers to the fact that this species differs significantly from other congeneric forms by having a dextral vagina and sinistral vaginal sclerite.

Vancleaveus gen. n.

DIAGNOSIS: Dactylogyridae, Ancyrocephalinae. Body divisible into cephalic region, trunk, peduncle, and haptor. Tegument thin, smooth. Head organs, cephalic lobes present; cephalic glands unicellular, comprising two bilateral groups posterolateral to pharynx. Eyes incipient or absent. Mouth subterminal, midventral; pharynx muscular, glandular; esophagus present; intestinal caeca 2, confluent posterior to testis, lacking diverticula. Gonads overlapping, intercaecal; testis dorsal to ovary. Vas deferens looping left intestinal caecum; seminal vesicle an elongate dilation of vas deferens; prostatic reservoir elongate, with proximal and distal terminations directed anteriorly. Cirrus comprising a base from which a coiled tube arises, tube with less than one to several rings, rings counterclockwise; accessory piece not articulated to cirrus, a fleshy rod serving as cirrus guide distally. Common genital pore midventral at level of intestinal bifurcation. Oviduct short; uterus delicate, extending anteriorly along midline; seminal receptacle near anterior end of ovary; vagina ventral, weakly sclerotized. Vitellaria well developed, coextensive with gut. Haptor armed with dorsal and ventral pairs of anchors, ventral and dorsal bars, seven pairs of hooks with ancyrocephaline distribution. Superficial root of dorsal anchor with conspicuous basal fold; hooks with inflated shank along entire length. Parasites of gills of siluriform fishes.

TYPE SPECIES AND HOST: *Vancleaveus janauacaensis* sp. n. from *Pterodoras granulosus* (Valenciennes), Doradidae.

OTHER SPECIES: *Vancleaveus fungulus* sp. n. from *Pseudoplatystoma tigrinum* (Cuvier and Valenciennes) (type host) and *P. fasciatus* (Linnaeus), Pimelodidae; *V. cicinnus* sp. n. from *Phractocephalus hemiliopterus* (Bloch and Schneider), Pimelodidae; *V. platyrhynchi* sp. n. from *Hemisorubim platyrhynchos* (Valenciennes), Pimelodidae.

REMARKS: Including the fact that members of *Vancleaveus* are parasitic on the gills of siluriform fishes, features distinguishing the genus include the combined presence of (1) a ventral vagina comprising a tube with an inconspicuous distal funnel, (2) overlapping gonads, (3) an elongate seminal vesicle, (4) a conspicuous, elongate prostatic vesicle, (5) dorsal anchors with conspicuous basal folds on the superficial roots, and (6) hooks with shanks inflated along their entire length. There are no other species in *Urocleidoides,* sensu Mizelle, Kritsky, and Crane (1968), that may be included in this genus. The genus is named for the late Dr. Harley J. Van Cleave who provided the first description of a monogenean from freshwater fishes of North America.

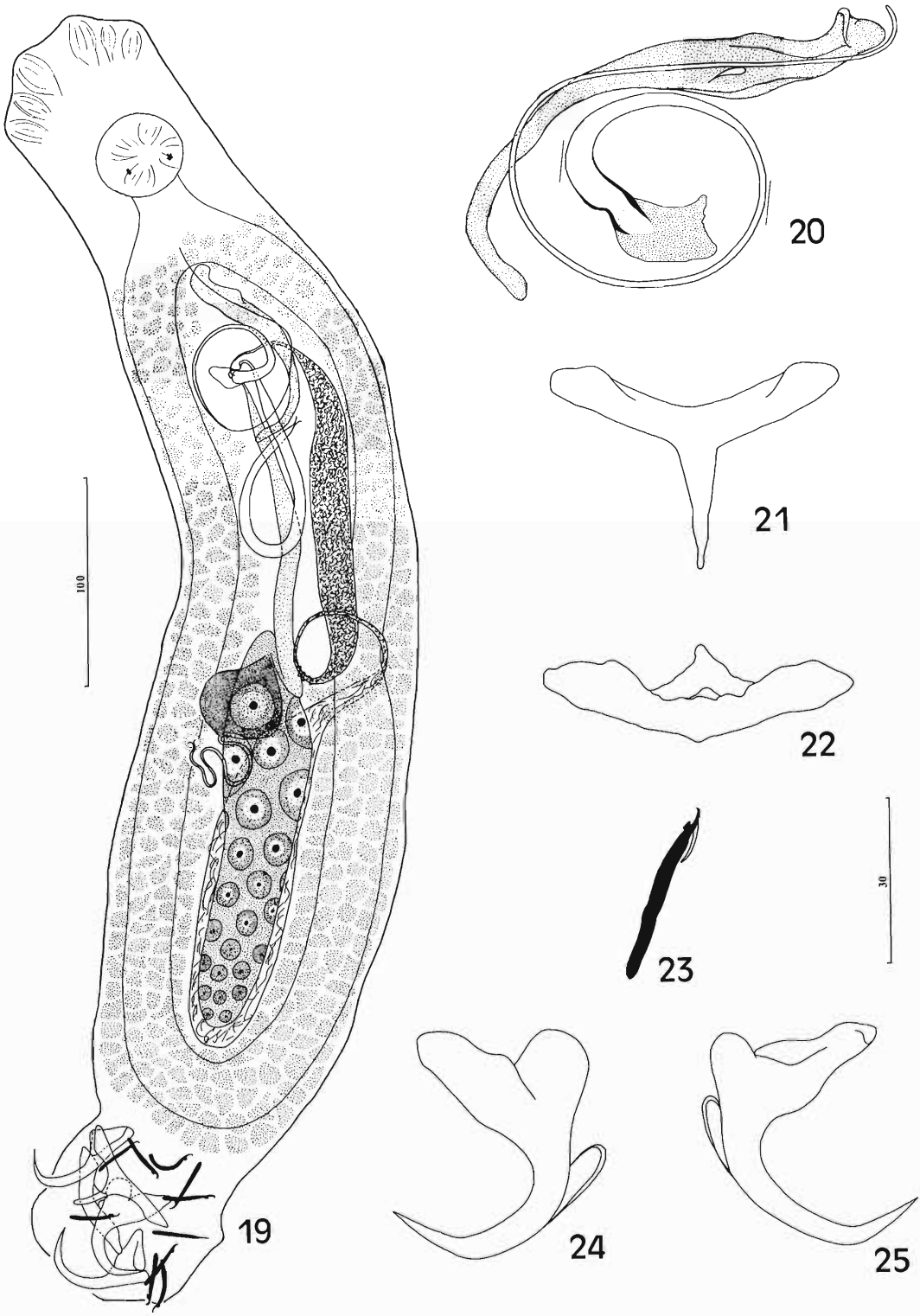
Vancleaveus janauacaensis sp. n. (Figs. 19–25)

HOST: Bacú liso, *Pterodoras granulosus* (Valenciennes), Doradidae.

TYPE LOCALITY: Janauacá Lake near Manaus, Amazonas, Brazil (March 22, 1978; May 4, 1978).

TYPE SPECIMENS: Holotype, INPA PA262-1; paratypes, INPA PA262-2, PA262-3, USNM 78767, HWML 22946.

DESCRIPTION (based on 23 specimens; 20 measured): Body fusiform; cephalic area rounded or with two pairs of poorly developed lobes. Eyes 2, 3, or absent, dorsal to pharynx when present; eye granules usually dissociated, small, irregular; accessory granules few in anterior trunk. Pharynx subovate, with long axis oriented dorsoventrally; esophagus short. Peduncle broad; haptor hexagonal. Ventral anchor robust, with short shaft and point, well-developed deep and superficial roots. Dorsal anchor with bent shaft, short point,



Figures 19–25. ***Vancleaveus janauacaensis*** **sp. n. 19. Composite illustration of whole mount (ventral). 20. Copulatory complex (dorsal). 21. Ventral bar. 22. Dorsal bar. 23. Hook. 24. Ventral anchor. 25. Dorsal anchor. Illustrations are drawn to the 30-micrometer scale, except Figure 19 (100 micrometers).**

superficial root with conspicuous inner hump. Ventral bar broadly V-shaped with large posteromedial projection; dorsal bar with expanded ends, short anteromedial projection. Hooks similar, pair 5 somewhat reduced; each with recurved point, terminally flattened thumb, expanded shank; FH loop ¼ shank length. Gonads bacilliform. Cirrus coil with about 1½ rings, base with subrectangular flange; accessory piece variable, flattened distally. Vas deferens with external spiral filament at junction with seminal vesicle. Seminal receptacle pyriform; vagina dextroventral.

MEASUREMENTS: Body 606 (547–661) long, greatest width 138 (105–197) near midlength. Greatest diameter of pharynx 41 (33–48). Haptor 90 (72–118) long, 115 (83–138) wide. Ventral anchor 45 (41–48), base width 32 (29–36); dorsal anchor 43 (40–47), base width 30 (27–33). Ventral bar 57 (53–60); dorsal bar 52 (48–56). Hook pairs 1, 2, 3, 4, 6, 7—33 (30–36); hook pair 5—25 (24–26). Cirrus 230 long, ring diameter 43 (36–48); accessory piece 81 (69–90). Testis 144 (127–153) × 30 (24–35); ovary 115 (82–144) × 32 (29–34).

REMARKS: *Vancleaveus janauacaensis* sp. n. is the type species for the genus. It most closely resembles *V. fungulus* sp. n., from which it differs by possessing a cirrus with 1½ rings (about one ring in *V. fungulus*) and a ventral bar with an elongate posteromedial process (absent in *V. fungulus*). The specific name is derived from the type locality.

Vancleaveus cicinnus sp. n. (Figs. 26–32)

HOST: Pirarara, *Phractocephalus hemiliopterus* (Bloch and Schneider), Pimelodidae.

TYPE LOCALITY: Solimões River near Manaus, Amazonas, Brazil (October 16, 1982).

TYPE SPECIMENS: Holotype, INPA PA263-1; paratypes, INPA PA263-2, PA263-3, USNM 78768, HWML 22947.

DESCRIPTION (based on 11 specimens): Body flat, robust; cephalic lobes poorly developed, usually two terminal, two bilateral. Eyes absent. Pharynx subspherical; esophagus moderately long. Peduncle broad, short; haptor hexagonal. Ventral anchor with large roots, angular bend near junction of curved shaft and point. Dorsal anchor with curved shaft and point, incipient deep root, large basal fold on superficial root. Ventral bar with enlarged ends, elongate anteromedial process; dorsal bar with dorsal keel on each termination, anteromedial knob. Hooks similar, each with inflated shank, robust point and shaft, strongly depressed thumb; FH loop about ⅓ shank length. Gonads bacilliform; cirrus appearing sigmoid, representing a loose coil of about one ring; accessory piece increasing in breadth distally with ornate termination. Seminal receptacle irregular, vagina midventral.

MEASUREMENTS: Body 491 (427–585) long, greatest width 91 (75–113) at various points along trunk. Pharyngeal diameter 32 (27–38). Haptor 88 (75–107) long, 110 (87–130) wide. Ventral anchor 47 (43–54), base width 32 (28–35); dorsal anchor 46 (43–48), base width 32–33. Ventral bar 56 (51–65); dorsal bar 56 (47–61). Hook pairs 1, 2, 3, 4, 6, 7—33 (31–38); hook pair 5—21–22. Cirrus 89 long, ring diameter 24 (22–27); accessory piece 59 (54–66) long. Testis 122 × 26; ovary 162 × 33–34.

REMARKS: *Vancleaveus cicinnus* sp. n. most closely resembles *V. platyrhynchi* sp. n., from which it differs in the comparative size and morphology of the anchors and the position of the gonads. It differs from *V. janauacaensis* sp. n. by having a small sigmoid cirrus and a dorsal bar with a short median protuberance. Characters which separate it from *V. fungulus* sp. n. include the relative positions of the gonads and the presence of an elongate anteromedial projection on the ventral bar. The specific name is from Greek (*cicinn/o* = a curl of hair) and refers to the shape of the cirrus.

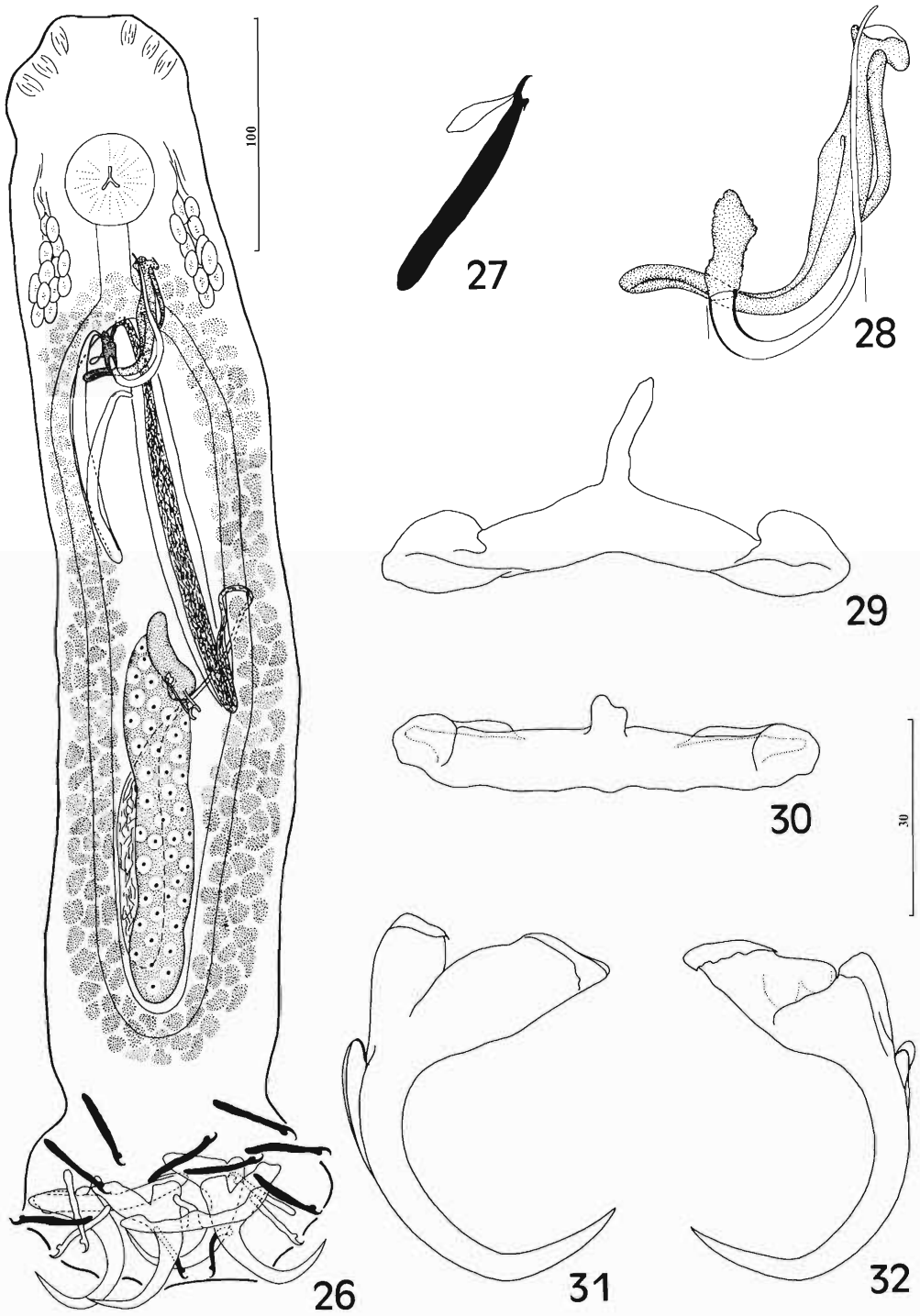
Vancleaveus fungulus sp. n. (Figs. 33–39)

HOST: Caparari, *Pseudoplatystoma tigrinum* (Cuvier and Valenciennes) (type) and sorubim, *P. fasciatum* (Linnaeus), Pimelodidae.

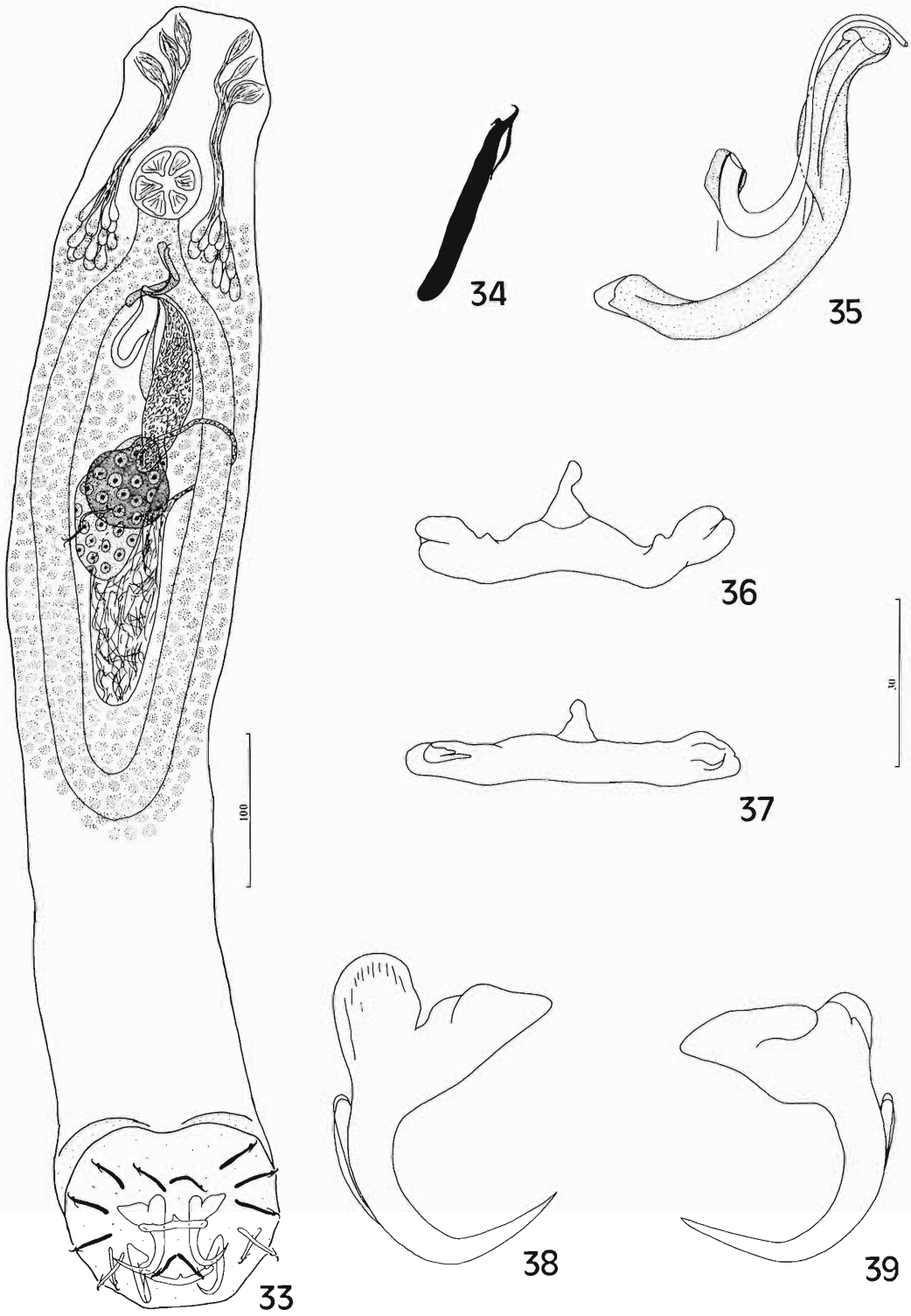
TYPE LOCALITY: Janauacá Lake near Manaus, Amazonas, Brazil (April 7, 1978; April 23, 1980; June 7 and 8, 1983).

TYPE SPECIMENS: Holotype, INPA PA264-1; paratypes, INPA PA264-2 to PA264-5, USNM 78769 and 78770, HWML 22948.

DESCRIPTION (based on 41 specimens; 20 measured): Body elongate, fusiform; cephalic lobes 4, two terminal, two bilateral. Eyes absent; accessory granules small, subspherical, variable in size, scattered in cephalic area and anterior trunk. Pharynx subovate, with long axis oriented dorsoventrally; esophagus short. Peduncle elongate, broad; haptor circular to hexagonal. Ventral anchor with well-developed roots, curved shaft, short point; dorsal anchor with poorly developed



Figures 26-32. ***Vancleaveus cicinnus*** **sp. n. 26. Composite drawing, whole mount (ventral). 27. Hook. 28. Copulatory complex. 29. Ventral bar. 30. Dorsal bar. 31. Ventral anchor. 32. Dorsal anchor. Drawings of sclerotized parts are drawn to 30-micrometer scale; Figure 26 to 100-micrometer scale.**



Figures 33–39. ***Vancleaveus fungulus*** **sp. n. 33. Ventral view of holotype. 34. Hook. 35. Copulatory complex. 36. Ventral bar. 37. Dorsal bar. 38. Ventral anchor. 39. Dorsal anchor. All drawings are to the same scale (30 micrometers) except Figure 33 (100 micrometers).**

roots, curved shaft, short point. Bars similar, each variable with medial anterior projection. Hooks similar, pair 5 slightly reduced; each with recurved point, depressed thumb, inflated shank; FH loop flabellate, ⅓ shank length. Testis bacilliform; ovary pyriform. Cirrus sigmoid or a coil of about one ring; accessory piece variable, originating proximal to base of cirrus. Seminal receptacle fungulate; vagina ventral, slightly dextral.

MEASUREMENTS: Body 757 (440–1,104) long, greatest width 127 (81–179) in anterior half at level of gonads. Greatest diameter of pharynx 46 (41–54). Haptor 103 (74–147) long, 128 (102–160) wide. Ventral anchor 49 (47–53), base width 34 (32–37); dorsal anchor 47 (45–49), base width 32 (30–35). Ventral bar 55 (49–60); dorsal bar 53 (47–61). Hook pairs 1, 2, 3, 4, 6, 7—39 (32–43); hook pair 5—26–27. Cirrus 72 long, ring diameter 24 (21–28); accessory piece 69 (58–78). Testis 109 (85–131) × 48 (32–57); ovary 71 (59–85) × 33 (28–40).

REMARKS: *Vancleaveus fungulus* sp. n. is closely related to *V. cicinnus* sp. n. as shown by similarities of the copulatory complex, hooks, and bars. They are easily distinguished by the comparative morphology of the dorsal and ventral anchors, the positions of the gonads, and the nature of the peduncle. The specific name is from Latin (*fungulus* = a mushroom).

Vancleaveus platyrhynchi sp. n. (Figs. 40–46)

HOST: Braço de moça, *Hemisorubim platyrhynchos* (Valenciennes), Pimelodidae.

TYPE LOCALITY: Rio Solimões near Marchantaria Island, Manaus, Amazonas, Brazil (January 1984).

TYPE SPECIMENS: Holotype, INPA PA265-1; paratypes, INPA PA265-2 to PA265-4, USNM 78771, *HWML* 22949.

DESCRIPTION (based on 10 specimens): Body flat, robust; cephalic lobes poorly developed, usually two terminal, two bilateral. Eyes absent; accessory granules small, subovate, widely scattered in cephalic region and anterior trunk. Pharynx broad, elongate; haptor subcircular. Ventral anchor robust, with well-developed roots, angular bend near base of shaft and at junction of point and shaft; dorsal anchor with conspicuous superficial root, large basal fold, curved shaft, short point. Ventral bar with enlarged terminations, short anteromedial process; dorsal bar with flattened ends, anteromedial delicate keel. Hooks similar, each with inflated shank, delicate point and shaft, terminally flattened thumb; FH loop ¼ shank length. Testis bacilliform; ovary elongate, irregular. Cirrus appearing sigmoid, representing a loose coil of about one ring; accessory piece expanded distally, with ornate termination. Seminal receptacle irregular, vagina midventral.

MEASUREMENTS: Body 559 (462–716) long, greatest width 124 (108–142) usually in anterior half. Pharyngeal diameter 33 (32–36). Haptor 84 (75–96) long, 102 (87–120) wide. Ventral anchor 41 (40–42), base width 28 (26–29); dorsal anchor 38 (37–39), base width 26–27. Ventral bar 49 (47–52); dorsal bar 41 (39–46). Hook pairs 1, 2, 3, 4, 6, 7—31 (30–33); hook pair 5—22–23. Cirrus 96 long, ring diameter 22–23; accessory piece 64–65 long. Testis 56 × 26–27; ovary 146 (127–177) × 32 (30–33).

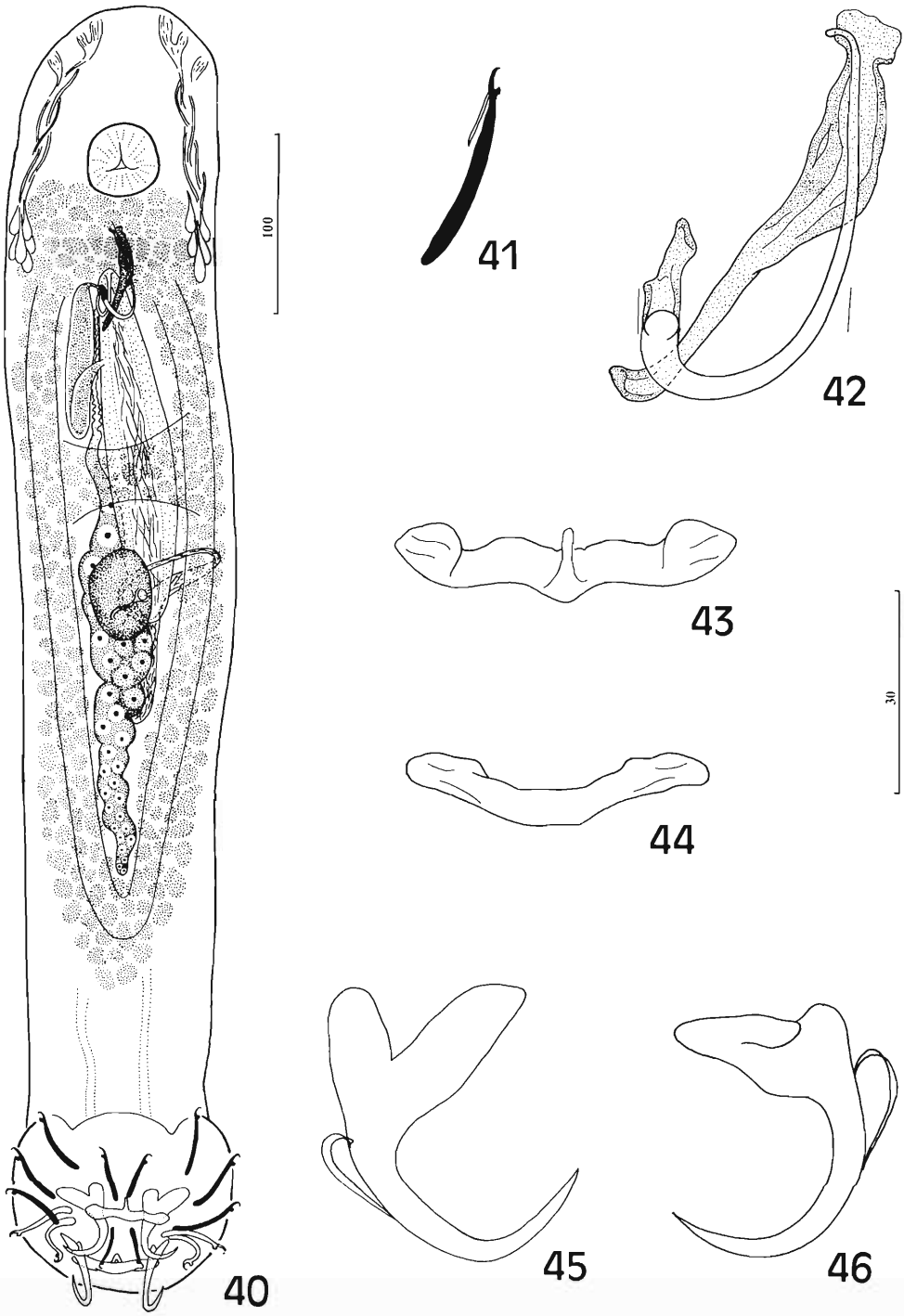
REMARKS: The closest relative of this species is *V. cicinnus* sp. n., from which it differs by possessing more robust but smaller anchors. The species is named for its host.

Cosmetocleithrum gen. n.

DIAGNOSIS: Dactylogyridae, Ancyrocephalinae. Body divisible into cephalic region, trunk, peduncle, and haptor. Tegument thin, smooth. Head organs, cephalic lobes present; cephalic glands unicellular, comprising two bilateral groups posterolateral to pharynx. Eyes incipient or absent. Mouth subterminal, midventral; pharynx muscular, glandular; esophagus present; intestinal caeca 2, confluent posterior to testis, lacking diverticula. Gonads tandem, intercaecal; testis postovarian. Vas deferens looping left intestinal caecum; seminal vesicle a dilation of vas deferens; prostatic reservoir present. Copulatory complex comprising a variably coiled cirrus with counterclockwise rings, elaborate accessory piece not articulated to cirrus base. Common genital pore midventral, immediately posterior to intestinal bifurcation. Oviduct short; uterus delicate, extending anteriorly along midline; seminal receptacle inconspicuous; vagina sinistral, weakly sclerotized. Vitellaria well developed, coextensive with gut. Haptor armed with two pairs of anchors (dorsal and ventral), 14 hooks with ancyrocephaline distribution, ventral and dorsal bars. Dorsal bar with two submedial projections arising from anterodorsal surface of bar, directed posteriorly or posterolaterally. Parasites of the gills of fishes of the Order Siluriformes.

TYPE SPECIES AND HOST: *Cosmetocleithrum gussevi* sp. n. from *Oxydoras niger* (Valenciennes), Doradidae.

OTHER SPECIES: *Cosmetocleithrum bulbocirrus*



Figures 40–46. ***Vancleaveus platyrhynchi*** **sp. n. 40. Holotype (ventral view). 41. Hook. 42. Copulatory complex. 43. Ventral bar. 44. Dorsal bar. 45. Ventral anchor. 46. Dorsal anchor. Figure 40 is drawn to the 100-micrometer scale; all others to the 30-micrometer scale.**

sp. n. from *Pterodoras granulosus* (Valenciennes), Doradidae; and *C. confusus, C. parvum, C. rarum,* and *C. sobrinus* sp. n. all from *Oxydoras niger* (Valenciennes), Doradidae.

REMARKS: *Cosmetocleithrum* gen. n. resembles the African genus *Cichlidogyrus* Paperna, 1960 in that members of both possess dorsal bars with two submedian projections. These genera are differentiated by the species of *Cosmetocleithrum* possessing (1) tandem gonads (overlapping in *Cichlidogyrus*), (2) undilated hook shanks (basally dilated or often modified in *Cichlidogyrus*), (3) a sinistral vagina (ventral, sinistroventral, or dextroventral in *Cichlidogyrus*), and (4) a vas deferens looping the left intestinal caecum (intercaecal in *Cichlidogyrus*). See the generic diagnosis of *Cichlidogyrus* provided by Yamaguti (1963).

Although these genera phenotypically appear to be related, caution must be taken in proposing that the finding of *Cosmetocleithrum* species suggests common ancestry of Neotropical and Ethiopian Monogenea. Because members of the African genus occur naturally only on fishes of the family Cichlidae (Order Perciformes) and species of *Cosmetocleithrum* occur on doradid hosts of the Order Siluriformes, it is likely that these taxa represent ecomorphs (White and Keller, 1984) whose morphologic resemblances have resulted from convergence owing to the tracking of similar ecological resources.

Although *Cosmetocleithrum* is clearly a part of the *Urocleidoides* complex defined by Mizelle et al. (1968), there are no previously described species that could be included in the new genus. The generic name is from Greek (*cosmet/o* = adorned + *cleithrum* = bar) and refers to the characteristic dorsal bar.

Cosmetocleithrum gussevi sp. n. (Figs. 47–54)

HOST: Cuiú-cuiú, *Oxydoras niger* (Valenciennes), Doradidae.

TYPE LOCALITY: Janauacá Lake near Manaus, Amazonas, Brazil (June 3, 1978; August 1982).

TYPE SPECIMENS: Holotype, INPA PA266-1; paratypes, INPA PA266-2, USNM 78772, HWML 22950.

DESCRIPTION (based on eight specimens): Body fusiform; two terminal, two bilateral cephalic lobes moderately developed. Eyes, eye granules absent. Pharynx ovate; esophagus elongate. Peduncle elongate, broad; haptor ellipsoidal. Anchors similar; each with poorly developed roots, large base, evenly curved shaft and point. Ventral bar broadly V-shaped, with posteromedial rounded keel; dorsal bar with pointed posteromedial protuberance, posterior projections flattened. Hooks similar; each with tapered shaft and point, erect thumb, proximally tapered shank; FH loop ¾ shank length; hook pair 1 peduncular, hook pairs 5 and 6 apparently absent. Gonads subovate; seminal vesicle elongate. Cirrus a coil of 2–3 rings; accessory piece variable, usually Y-shaped. Vagina a sclerotized tube. Egg with moderately long proximal projection, end of projection flattened.

MEASUREMENTS: Body 1,012 (894–1,182) long, greatest width 160 (139–213) at level of testis in posterior half of trunk. Pharyngeal diameter 46 40–52). Haptor 88 (86–92) long, 129 (117–151) wide. Ventral anchor 49 (44–53), base width 34 (28–38); dorsal anchor 46 (39–48), base width 31 (24–33). Hook (all pairs) 16 (15–17). Cirrus 122 long, ring diameter 24 (22–26); accessory piece 45 (41–48). Testis 237 (221–252) × 119–120; ovary 63 (59–67) × 43–44. Egg 97 × 58.

REMARKS: This species is unique in that adults lack hook pairs 5 and 6 ; all other species in the genus possess seven pairs of haptoral hooks. *Cosmetocleithrum gussevi* sp. n. is the type species for the genus and is named in honor of Dr. A. V. Gussev, U.S.S.R. Academy of Sciences, Leningrad, a friend, in recognition of his important studies on Monogenea.

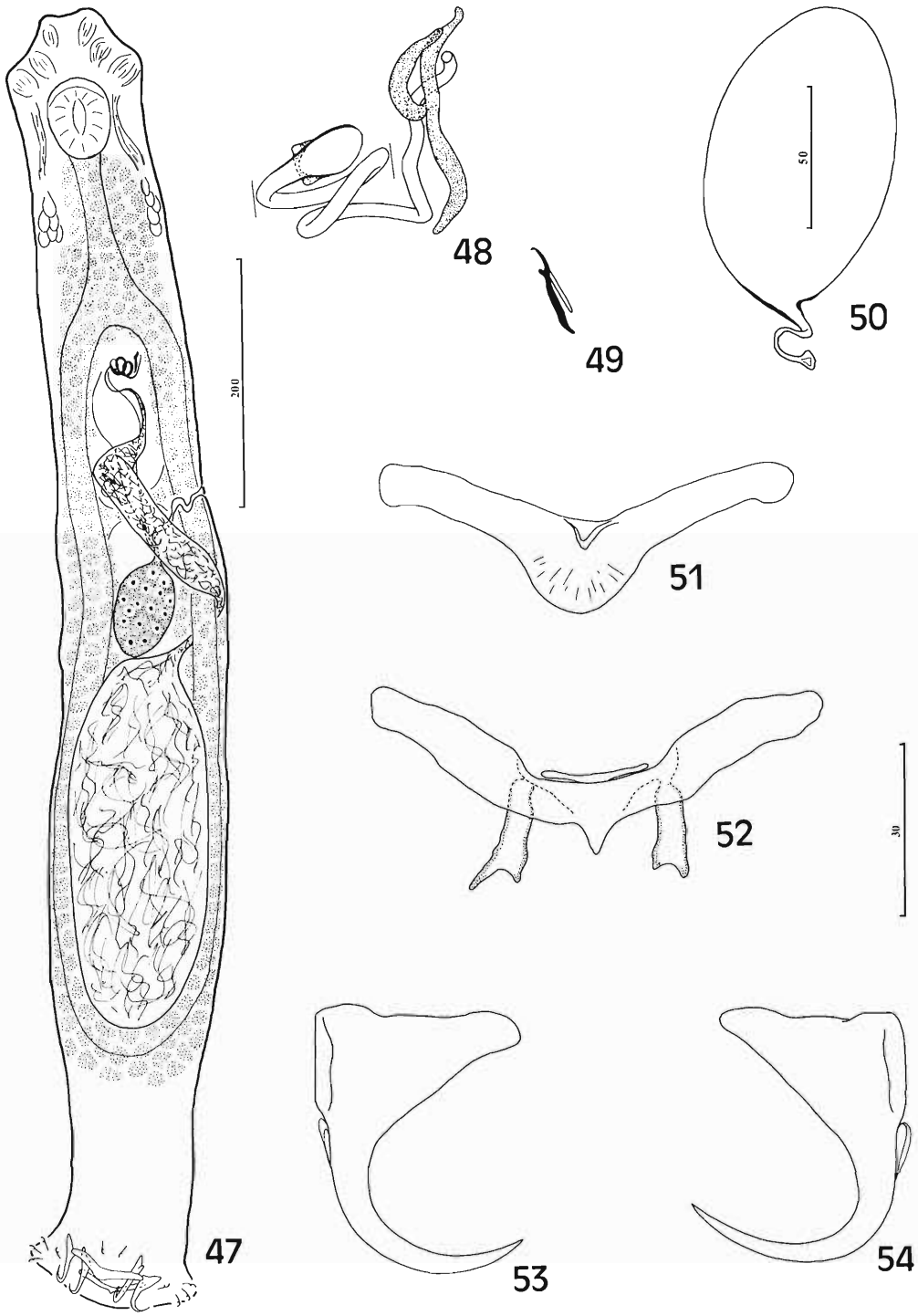
Cosmetocleithrum confusus sp. n. (Figs. 55-62)

HOST: Cuiú-cuiú, *Oxydoras niger* (Valenciennes), Doradidae.

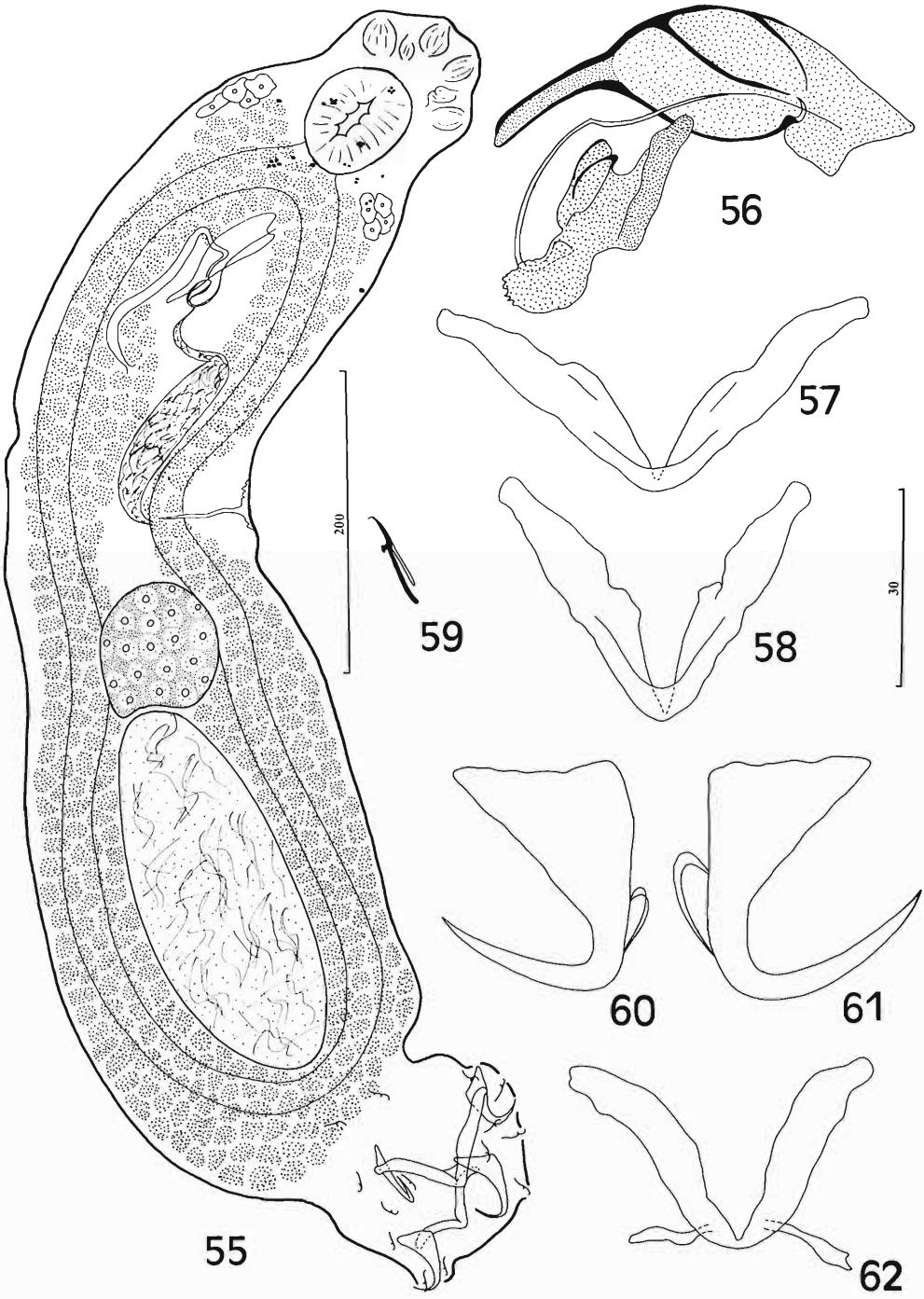
TYPE LOCALITY: Janauacá Lake near Manaus, Amazonas, Brazil (June 3, 1978; May 6, 1983; August 1982).

TYPE SPECIMENS: Holotype, INPA PA267-1; paratypes, INPA PA267-2, PA267-3, USNM 78773, HWML 22951.

DESCRIPTION (based on 20 specimens): Body robust; cephalic lobes poorly developed, two terminal, two bilateral. Eyes 2 or absent; eye granules small, subspherical; accessory granules scattered throughout cephalic area and anterior trunk. Pharynx subovate; esophagus short to absent. Peduncle short, broad; haptor hexagonal. Anchors similar; each with poorly developed roots, large base, short shaft, elongate point. Bars V-shaped; dorsal bar projections variable. Hooks



Figures 47–54. ***Cosmetocleithrum gussevi*** **sp. n. 47. Holotype (ventral). 48. Copulatory complex. 49. Hook. 50. Egg. 51. Ventral bar. 52. Dorsal bar. 53. Ventral anchor. 54. Dorsal anchor. All drawings are to the same scale (30 micrometers) except Figure 47 (200 micrometers) and Figure 50 (50 micrometers).**



Figures 55–62. ***Cosmetocleithrum confusus*** **sp. n. 55. Ventral view of holotype. 56. Copulatory complex. 57, 58. Ventral bars. 59. Hook. 60. Ventral anchor. 61. Dorsal anchor. 62. Dorsal bar. All figures are drawn to the same scale (30 micrometers) except Figure 55 (200 micrometers).**

similar, each with tapered shaft and point, depressed thumb, slender shank; FH loop ¾ shank length; hook pair 1 peduncular. Testis ovate; ovary subspherical, closely appressed to anterior margin of testis; seminal vesicle elongate; prostatic reservoir narrow, elongate. Cirrus a loose, poorly defined coil of about 1–1½ rings; shaft delicate, base large. Accessory piece appearing as a hollow structure with sclerotized walls and truncate termination. Vagina lightly sclerotized, with wide lateral opening.

MEASUREMENTS: Body 564 (449–706) long, greatest width 158 (81–185) in anterior or posterior half. Greatest diameter of pharynx 46 (45–47). Haptor 84 (70–95) long, 107 (97–123) wide. Ventral anchor 34 (31–36), base width 25 (21–27); dorsal anchor 38 (36–43), base width 24 (22–26). Ventral bar 59 (47–74), dorsal bar 53 (47–62). Hook (all pairs) 15 (14–16). Cirrus 75 long, accessory piece 61 (53–64). Testis 155 (103–193) × 62 (39–96); ovary 59 (46–92) × 57 (46–76).

REMARKS: *Cosmetocleithrum confusus* sp. n. is closely related to *C. parvum* and *C. sobrinus* spp. n. as shown by the comparative morphology of the copulatory complexes. It differs from *C. parvum* by possessing anchors with comparatively short shafts and poorly developed roots and by having a delicate cirral tube with enlarged base. It is differentiated from *C. sobrinus* by being significantly smaller, lacking anchor roots and the exaggerated baglike accessory piece.

Cosmetocleithrum confusus exhibits a great deal of variation in size of its sclerotized haptoral parts, although morphology is relatively stable. Variation in the distance between the ends of each haptoral bar reflects differences in the angles of the V-shaped structures (compare Figs. 57 ,58). In individual specimens, differences in sizes between the ventral and dorsal anchors ranged from 1.4 to 6.5 micrometers, with the dorsal anchor always being the larger. No useful measurement of the cirral ring diameter could be made because the coil was extremely loose and frequently distorted as a result of coverslip pressure.

The specific name reflects the possible confusion of the accessory piece for the cirrus.

Cosmetocleithrum bulbocirrus sp. n. (Figs. 63–69)

HOST: Bacú liso, *Pterodoras granulosus* (Valenciennes), Doradidae.

TYPE LOCALITY: Janauacá Lake near Manaus, Amazonas, Brazil (March 22, 1978).

TYPE SPECIMENS: Holotype, INPA PA268-1; paratypes, INPA PA268-2, USNM 78774, HWML 22952.

DESCRIPTION (based on 14 specimens): Body fusiform; cephalic lobes poorly developed, two terminal, two bilateral. Eyes absent; accessory granules large, subspherical, present in anterior trunk and cephalic area. Pharynx subspherical to ovate; esophagus short. Peduncle short, broad; haptor subspherical. Anchors similar, each with elongate point, straight shaft, well-developed roots. Ventral bar broadly V-shaped, with expanded terminations; dorsal bar V-shaped, with medial narrow region, projections delicate usually directed laterally. Hooks similar, each with recurved point, erect thumb, slender shank; FH loop $^{9}/_{10}$ shank length; hook pair 1 peduncular. Testis ovate, ovary pyriform; seminal vesicle an indistinct dilation of vas deferens; prostatic reservoir gourd-shaped, with smooth wall. Cirrus a coil of about two rings, with terminal bulbous expansion; accessory piece a variable fleshy rod. Vagina unsclerotized, a tube with distal sphincter.

MEASUREMENTS: Body 544 (452–617) long, greatest width 99 (81–132) in posterior half. Greatest diameter of pharynx 32 (25–35). Haptor 68 (54–82) long, 79 (77–82) wide. Ventral anchor 32 (31–34), base width 18 (17–19); dorsal anchor 31 (29–34), base width 16 (14–18). Ventral bar 44 (41–49), dorsal bar 44 (37–50). Hook (all pairs) 16 (14–17). Cirrus 136 long, ring diameter 26 (24–31); accessory piece 21 (20–23). Testis 102 (93–107) × 41 (36–48); ovary 51 × 28.

REMARKS: This species is distinct from other species in the genus in that the dorsal bar projections are delicate and generally directed laterally. It most closely resembles *Cosmetocleithrum rarum* sp. n. in the morphology of the copulatory complex and anchors, but is readily separated from it by the comparative shapes of the bars and the terminal portion of the cirrus shaft. The specific name, *bulbocirrus,* refers to the terminal inflation of the cirrus shaft.

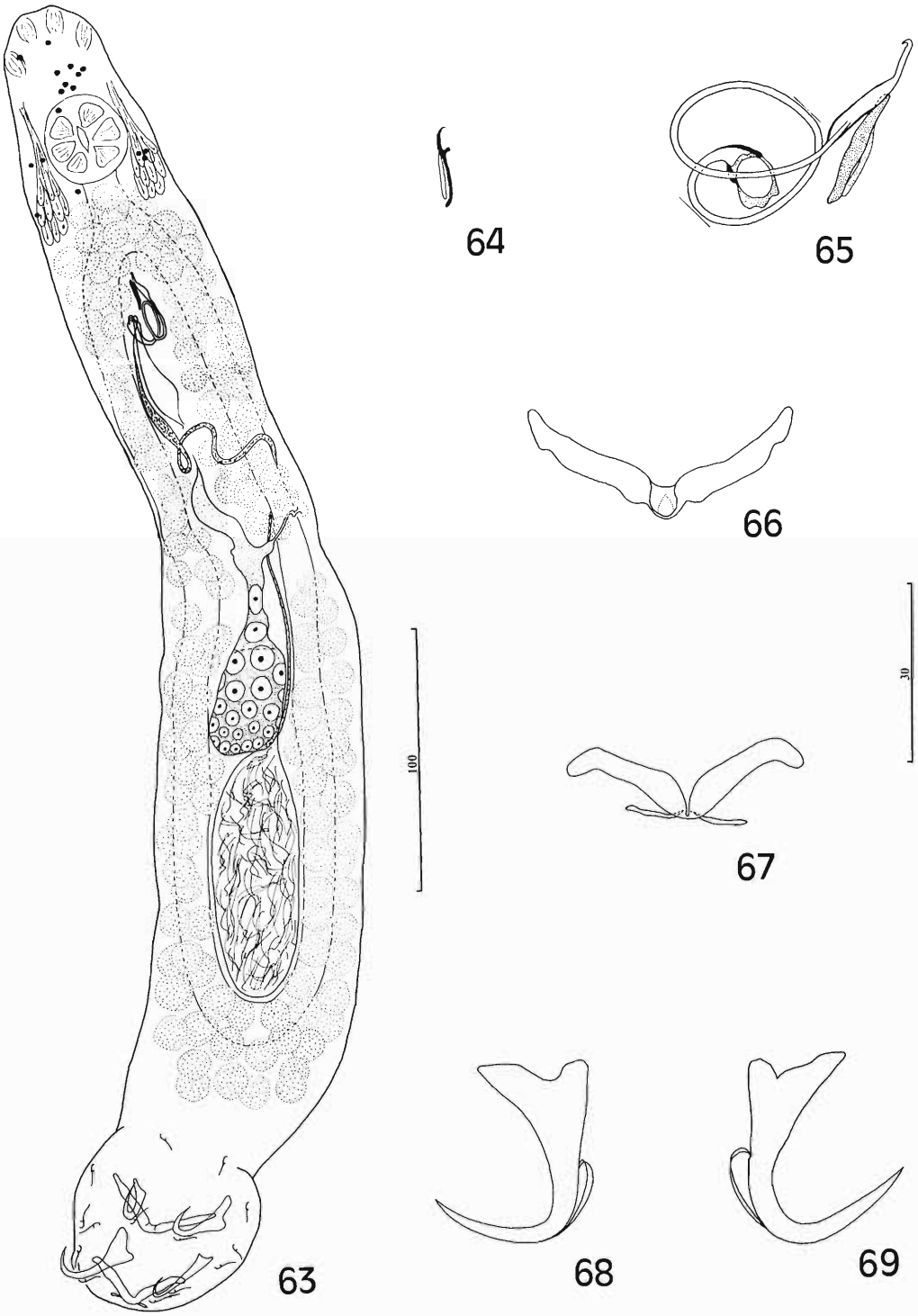
Cosmetocleithrum parvum sp. n. (Figs. 70–75)

HOST: Cuiú-cuiú, *Oxydoras niger* (Valenciennes), Doradidae.

TYPE LOCALITY: Janauacá Lake near Manaus, Amazonas, Brazil (February 9, 1979; August 1982; May 6, 1983).

TYPE SPECIMENS: Holotype, INPA PA269-1; paratypes, INPA PA269-2, PA269-3, USNM 78775, HWML 22953.

DESCRIPTION (based on 20 specimens): Body



Figures 63–69. ***Cosmetocleithrum bulbocirrus*** **sp. n. 63. Ventral view of holotype. 64. Hook. 65. Copulatory complex. 66. Ventral bar. 67. Dorsal bar. 68. Ventral anchor. 69. Dorsal anchor. All figures are to the same scale (30 micrometers) except Figure 63 (100 micrometers).**

bacilliform or fusiform; cephalic margin usually rounded or with two terminal, two bilateral incipient lobes. Eyes absent; accessory granules varying in size from minute to small, subovate, occasionally scattered throughout cephalic and trunk regions. Pharynx subspherical; esophagus moderately long. Peduncle short, frequently constricted; haptor subpyramidal. Anchors similar, each with elongate point, short shaft, small base, well-developed roots. Ventral bar V-shaped, with narrowed terminations; dorsal bar U-shaped, with elongate projections directed posteriorly. Hooks similar, each with tapered shaft and point, slightly depressed thumb, slender shank; FH loop ½ shank length; hook pair 1 peduncular. Testis elongate ovate, ovary pyriform; seminal vesicle indistinct. Cirrus a poorly defined coil of about one ring; accessory piece with proximal arm, hollow bulbous portion distally. Vagina comprising a relatively large bag distally with numerous infoldings into lumen.

MEASUREMENTS: Body 475 (338–573) long, greatest width 86 (63–116) in trunk. Pharyngeal diameter 28 (27–29). Haptor 73 (65–84) long, 89 (70–107) wide. Ventral anchor 25 (24–27), base width 16 (14–18); dorsal anchor 27 (25–29), base width 15 (13–18). Ventral bar 43 (34–49); dorsal bar 34 (26–40). Hook pairs 1, 2, 3, 4, 6, 7—15 (14–16), hook pair 5—16 (15–18). Cirrus 54 long, ring diameter 13 (12–15); accessory piece 32 (30–34) long. Testis 111–112 × 39–40; ovary 43–44 × 25–26.

REMARKS: *Cosmetocleithrum parvum* sp. n. most closely resembles *C. sobrinus* sp. n., from which it is distinguished by having a significantly smaller size, a smaller copulatory complex, and in the comparative morphology of the ventral and dorsal bars. The species name is from Latin (*parvus* = small).

Cosmetocleithrum rarum sp. n. (Figs. 76-81)

HOST: Cuiú-cuiú, *Oxydoras niger* (Valenciennes), Doradidae.

TYPE LOCALITY: Janauacá Lake near Manaus, Amazonas, Brazil (August 1982).

TYPE SPECIMEN: Holotype, INPA PA270-1.

DESCRIPTION (based on one specimen): Body fusiform; cephalic lobes well developed, two terminal, two bilateral. Single eyespot present; granules variable in size and shape; accessory granules absent. Pharynx subspherical; esophagus short. Peduncle short, broad; haptor hexagonal. Anchors similar, delicate; each with well-developed base, evenly curved point and shaft, well-developed roots. Ventral bar with posteromedial rotund projection; dorsal bar V-shaped, projections elongate. Hooks similar; each with finely tapered shaft and point, erect thumb, narrow shank; hook pair 1 subpeduncular; FH loop ¾ shank length. Gonads subovate; seminal vesicle conspicuous. Cirrus a coil of 2–3 rings, base small; accessory piece variable with ventral oblique groove. Vagina a funnel with small irregular protuberances in lumen of expanded portion.

MEASUREMENTS: Body 594 long, greatest width 115 in posterior trunk at level of testis. Pharyngeal diameter 34. Haptor 103 long, 108 wide. Ventral anchor 42, base width 24; dorsal anchor 38, base width 20. Ventral bar 37; dorsal bar 27. Hook (all pairs) 14–15. Cirrus 138 long, ring diameter 18; accessory piece 25 long. Testis 109 × 35; ovary 45 × 57.

REMARKS: The delicate anchors with evenly curved points and shafts distinguish this species from all others in the genus. Based on the morphology of the copulatory complex, it most closely resembles *C. bulbocirrus* sp. n., but *C. rarum* lacks the terminal inflation of the cirrus shaft. The specific name is from Latin (*rarum* = rare) and refers to the fact that it was found only once in several collections of the host from the Manaus area in Brazil.

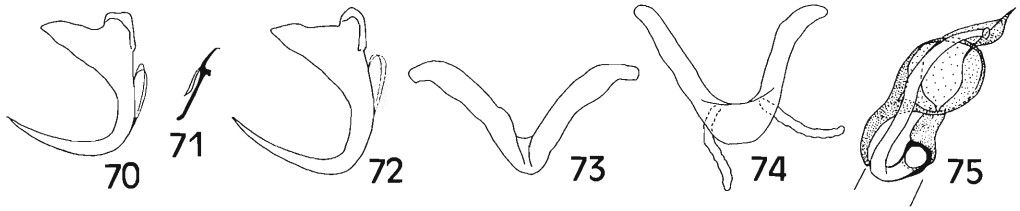
Cosmetocleithrum sobrinus sp. n. (Figs. 82-88)

HOST: Cuiú-cuiú, *Oxydoras niger* (Valenciennes), Doradidae.

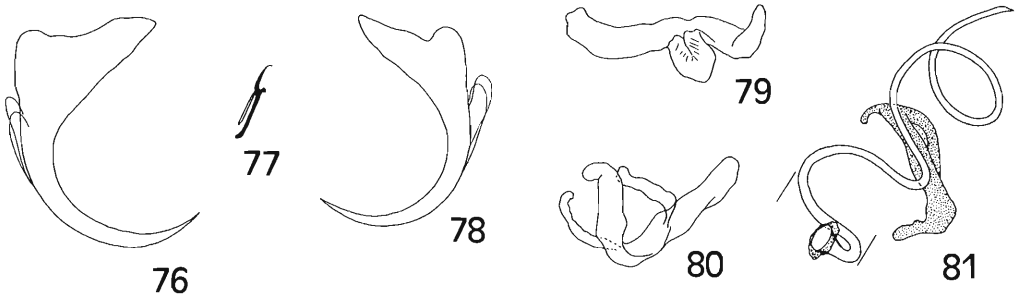
TYPE LOCALITY: Janauacá Lake near Manaus, Amazonas, Brazil (February 9, 1979; August 1982).

TYPE SPECIMENS: Holotype, INPA PA271-1; paratypes, INPA PA271-2, USNM 78776, HWML 22954.

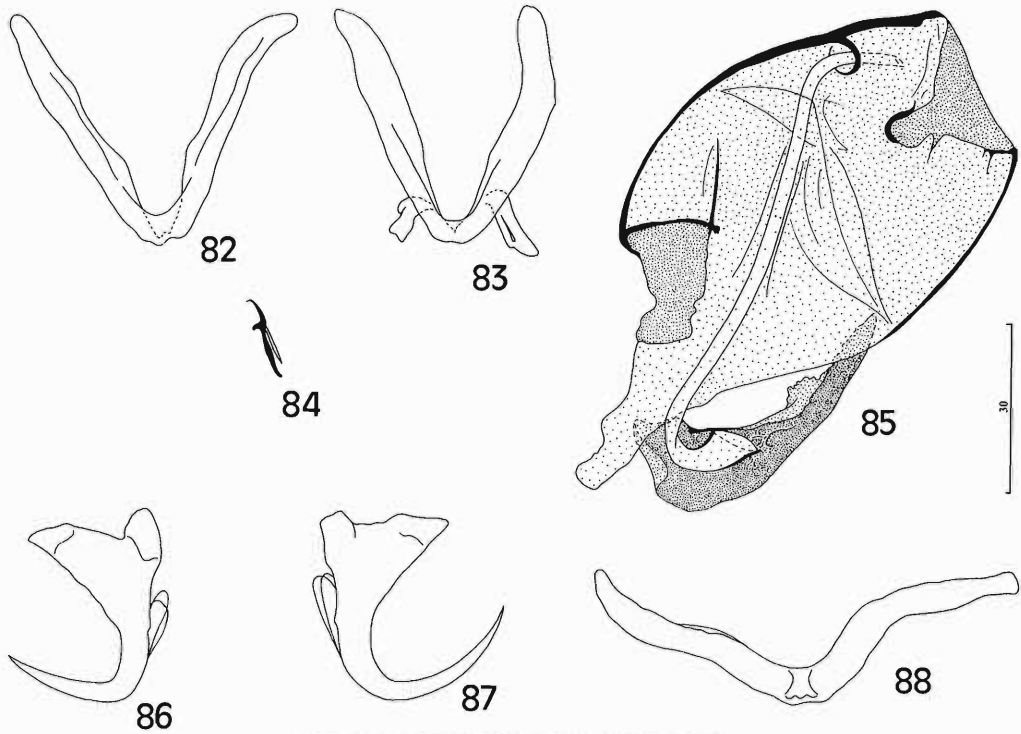
DESCRIPTION (based on 11 specimens): Body robust, fusiform; cephalic margin usually rounded or with two terminal, two bilateral lobes. Eyes 2, comprised of small spherical granules; accessory granules frequently absent, occasionally scattered in cephalic region. Pharynx subspherical; esophagus short. Peduncle broad, elongate; haptor bulbar. Ventral anchor with large deep root, broad superficial root, short straight shaft, slightly curved point; dorsal anchor with well-developed roots, short shaft, curved elongate point. Ventral bar broadly V-shaped, with ventral posterior fold along most of its length; dorsal bar V-shaped, projections short. Hooks similar;



Cosmetocleithrum parvum



Cosmetocleithrum rarum



Cosmetocleithrum sobrinus

Figures 70-88. Sclerotized parts of *Cosmetocleithrum* species. Figures 70-75. *Cosmetocleithrum parvum* sp. n. 70. Ventral anchor. 71. Hook. 72. Dorsal anchor. 73. Ventral bar. 74. Dorsal bar. 75. Copulatory complex. Figures 76-81. *Cosmetocleithrum rarum* sp. n. 76. Ventral anchor. 77. Hook. 78. Dorsal anchor. 79. Ventral bar. 80. Dorsal bar. 81. Copulatory complex. Figures 82-88. *Cosmetocleithrum sobrinus* sp. n. 82, 88. Ventral bars. 83. Dorsal bar. 84. Hook. 85. Copulatory complex. 86. Ventral anchor. 87. Dorsal anchor. All drawings are to the same scale (30 micrometers).

each with delicate point, straight tapered shaft, depressed thumb, shank swollen near midlength; FH loop ¾ shank length. Cirrus a conspicuously extended coil of about one ring, appearing as a straight tube with proximal and distal ends bent ventral; accessory piece large, globose, apparently hollow. Vagina a weakly sclerotized, irregular tube.

MEASUREMENTS: Body 1,088 (752–1,344) long, greatest width 264 (231–307) in anterior half. Pharyngeal diameter 95 (76–103). Haptor 94 (76–127) long, 129 (103–143) wide. Ventral anchor 34 (32–35), base width 23 (22–25); dorsal anchor 35 (33–37), base width 22 (21–23). Ventral bar 58 (45–75); dorsal bar 47 (39–53). Hook (all pairs) 17 (16–20). Cirrus 134 long; accessory piece 99 (82–122) long. Testis 121 × 86; ovary 115 (98–132) × 97 (67–127).

REMARKS: *Cosmetocleithrum sobrinus* sp. n. is closely related to *C. parvum* sp. n. and *C. confusus* sp. n. as indicated by the morphology of their accessory pieces. It is a larger worm than either species and can be further separated from them in the comparative morphology of the cirrus, anchors, bars, and hooks. The specific name is from Latin (*sobrinus* = a cousin) and refers to the relationships with the above named species.

Gussevia Kohn and Paperna, 1964

EMENDED DIAGNOSIS: Dactylogyridae, Ancyrocephalinae. Body divisible into cephalic region, trunk, peduncle and haptor. Tegument thin, smooth. Head organs, cephalic lobes present; cephalic glands unicellular, comprising bilateral groups posterolateral to pharynx. Eyes present, frequently dissociated. Mouth subterminal, midventral; pharynx muscular, glandular; esophagus present; intestinal caeca 2, confluent posterior to gonads. Gonads overlapping, intercaecal; testis dorsal to ovary. Vas deferens looping left intestinal caecum; seminal vesicle a dilation of vas deferens; prostatic reservoirs indistinct or apparently absent. Cirrus comprising a base from which a coiled tube arises; tube with less than one to several clockwise rings. Accessory piece distally ornate or complex. Common genital pore midventral near level of intestinal bifurcation. Oviduct short; uterus delicate, extending anteriorly along midline; seminal receptacle usually conspicuous immediately anterior to ovary; vagina sinistral, ventral, or usually dextral; vitellaria well developed, coextensive with intestinal caeca. Haptor developed into anterior and posterior lobes, armed with dorsal and ventral pairs of anchors, 14 hooks, and ventral and dorsal bars. Ventral anchors lying on posterior haptoral lobe, modified in shape, possessing a conspicuous anchor filament. Hook pairs 1, 2, 3, 4, 6, 7 similar, with slender shanks, lying on anterior haptoral lobe; pair 5 modified, usually elongate, delicate, associated with ventral anchors. Parasites of the gills of Neotropical cichlid fishes.

TYPE SPECIES AND HOST: *Gussevia spiralocirra* Kohn and Paperna, 1964 from *Pterophyllum scalare* (Lichtenstein) (=*P. eimekei* Ahl), Cichlidae.

OTHER SPECIES: *G. alii* (Molnar et al., 1974), *G. cichlasomatis* (Molnar et al., 1974), and *G. dobosi* (Molnar et al., 1974) combs. n. from *Cichlasoma bimaculatum* (Linnaeus); *G. obtusa* and *G. elephus* spp. n. from *Uaru amphiacanthoides* (Heckel); *G. longihaptor* (Mizelle and Kritsky, 1969) comb. n., *G. undulata, G. arilla,* and *G. tucunarense* spp. n. from *Cichla ocellaris* Bloch and Schneider; and *G. alioides, G. dispar,* and *G. disparoides* spp. n. from *Cichlasoma severum* (Heckel).

OTHER POSSIBLE INCLUSIONS: *Trinidactylus cichlasomatis* Hanek, Molnar, and Fernando, 1974 from *Cichlasoma bimaculatum* (Linnaeus).

REMARKS: Features which distinguish *Gussevia* from other genera in the *Urocleidoides* complex include the combined presence of (1) overlapping gonads, (2) a haptor with anterior and posterior lobes, (3) a modified ventral anchor with well-developed anchor filament, (4) a modified hook pair 5 usually delicate and lying on the posterior haptoral lobe with the ventral anchors, and (5) a cirrus coil with clockwise rings. All known species of *Gussevia* are parasitic on cichlid fishes, whereas *Urocleidoides* (as defined herein) species occur primarily on characoid hosts; *Vancleaveus* and *Cosmetocleithrum* species are found only on hosts of the Order Siluriformes.

Kohn and Paperna (1964) proposed *Gussevia* for ancyrocephaline species characterized primarily by having a dextral vagina, a cirrus with a long spiral (coiled) tube, and accessory piece attached to the distal end of the cirrus (not basally articulated). Designating their new species, *G. spiralocirra,* as the type species, they included *G. minuta* Kohn and Paperna, 1964, from the guppy (*Poecilia reticulata*) and two species described previously by Jain (1958) from India, *G. rhynchobdelli* (=*Urocleidus r.*) and *G. xenentodoni* (=*Urocleidus x.*). From their definition of the genus, their remarks, and the fact that *G. minuta*

(considered herein as a junior synonym of *Urocleidoides reticulatus* Mizelle and Price, 1964, type species of *Urocleidoides*) was included in their genus, it was obvious to Kritsky and Thatcher (1983) that the original authors had considered the configuration of *Gussevia* identical to that previously defined for *Urocleidoides* as emended by Mizelle et al. (1968). As a result, Kritsky and Thatcher (1983) considered the two genera synonymous, with *Urocleidoides* having priority; without comment, these authors transferred *G. spiralocirra* and *G. minuta* to this genus. *G. rhynchobdelli* and *G. xenentodoni* were excluded from *Urocleidoides* by Thatcher and Kritsky (1983), thus returning them provisionally to *Urocleidus*.

Mizelle and Kritsky (1969) proposed *Longihaptor* for what appeared as a unique species (*L. longihaptor*) from the gills of the aquarium fish *Cichla ocellaris*. The monotypic *Longihaptor* was characterized by having the ventral anchors situated on a conspicuous posterior haptoral lobe and adorned with a heavy anchor filament; modification of hook pair 5 was also considered a distinguishing character and the vagina was not observed in their specimens. These authors were concomitantly working with several *Urocleidoides* species, which enhanced the apparent distinction of the two genera. Collection of numerous species of Ancyrocephalinae for the present study, including *Gussevia spiralocirra* Kohn and Paperna, 1964 and other species from cichlids in South America, has shown that the group proposed by Mizelle and Kritsky (1969) is likely valid but that *Gussevia* has priority because its type species is clearly a member. Thus, *L. longihaptor* Mizelle and Kritsky, 1969 is transferred to *Gussevia* as a new combination. Based on comparison of type specimens, *Cleidodiscus bulbus* Rogers and Rawson, 1969, under study simultaneously with the work of Mizelle and Kritsky (1969), is considered a junior subjective synonym of *G. longihaptor* comb. n.

Our study of paratypes of *Urocleidoides alii, U. cichlasomatis,* and *U. dobosi,* all described by Molnar et al. (1974), confirms that these species are members of *Gussevia* as emended herein. Although paratypes of all three species are unstained and therefore unsuitable for study of internal features, they are clearly members of *Gussevia* based on the morphology and configuration of the haptor and its armament. Ventral anchors of all three species possess blunt points similar to those of *G. spiralocirra* Kohn and Paperna, 1964 and *G. alioides* sp. n. (Figs. 95, 119). Thus, the following new combinations are proposed: *G. alii* (Molnar et al., 1974) comb. n., *G. cichlasomatis* (Molnar et al., 1974) comb. n., *G. dobosi* (Molnar et al., 1974) comb. n.

In addition, *Trinidactylus cichlasomatis* Hanek, Molnar, and Fernando, 1974 is likely a member of *Gussevia*. Our study of two paratype specimens has revealed that at least one of them possesses two pairs of anchors. The dorsal "hooklike structures," described for this species and one of the characters used to establish the monotypic *Trinidactylus,* apparently represent the point and shaft of one pair of anchors whose bases are difficult to observe in the cleared and unstained paratypes. Because two pairs of anchors were definitely observed only in one paratype, we hesitate to formally transfer this species to *Gussevia*; examination of fresh material will probably be necessary to determine the valid generic placement of this species.

Gussevia spiralocirra
Kohn and Paperna, 1964
(Figs. 89-96)

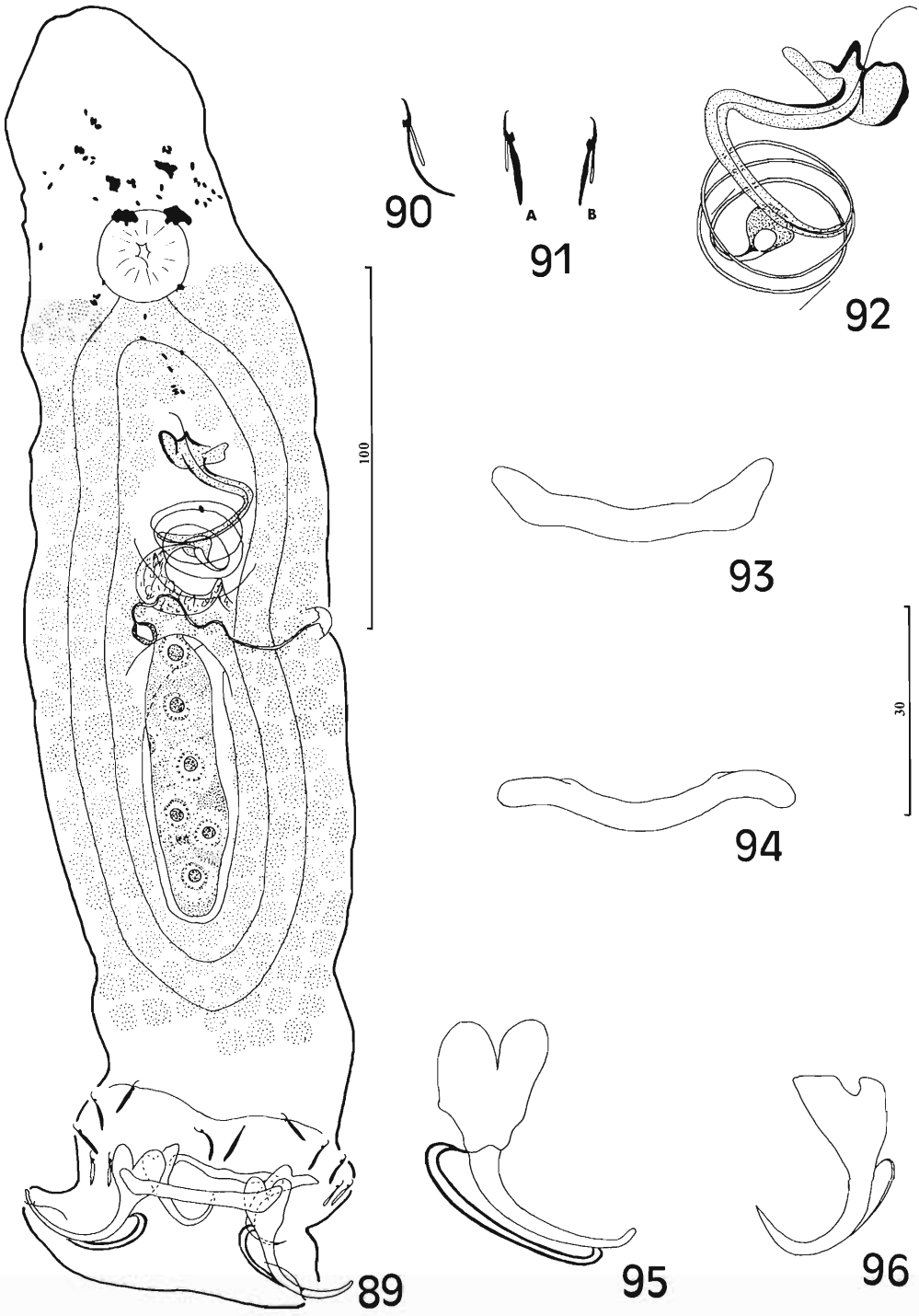
SYNONYMS: *Ancyrocephalus pterophylli* Lucký, 1970; *Urocleidoides spiralocirra* (Kohn and Paperna, 1964) Kritsky and Thatcher, 1983.

HOST: Cará bandeira, *Pterophyllum scalare* (Lichtenstein), Cichlidae.

LOCALITY: Rio Atacuari near its confluence with the Amazon River, East of Iquitos, Peru (March 1977).

SPECIMENS STUDIED: Vouchers, INPA PA272-1 to PA272-3, USNM 78778, HWML 22955; cotype (?), *Ancyrocephalus pterophylli* Lucký, 1970, USNM 78801.

REDESCRIPTION (based on 24 specimens, 20 measured): Body robust, fusiform; cephalic lobes poorly developed, usually two terminal, two bilateral. Four eyes, equidistant, members of posterior pair larger; eye granules dissociated, variable in size, generally ovate; accessory granules present in cephalic region and anterior trunk. Pharynx spherical; esophagus short. Peduncle broad; posterior haptoral lobe wide, poorly differentiated from anterior portion of haptor. Ventral anchor with equal, large roots; anchor point blunt, sharply recurved near termination. Dorsal anchor with large superficial root, evenly curved shaft and point. Ventral bar with enlarged ends, variable; dorsal bar rod-shaped, undulating. Hook pairs 1, 2, 3, 4, 6, 7 with enlarged thumb, slender or slightly inflated shank; hook pair 5 delicate



Figures 89-96. ***Gussevia spiralocirra*** **Kohn and Paperna, 1964. 89. Whole mount (ventral view). 90. Hook pair 5. 91A, B. Two forms of remaining hook pairs. 92. Copulatory complex. 93. Ventral bar. 94. Dorsal bar. 95. Ventral anchor. 96. Dorsal anchor. All figures are to the 30-micrometer scale except Figure 89 (100 micrometers).**

with well-developed thumb; FH loop ½ shank length. Gonads bacilliform; seminal vesicle lunate. Cirrus a coil of 3–4 rings, small base; accessory piece closely associated with terminal ring of cirrus, terminally ornate. Vagina sinistral, a tube opening into thick-walled "seminal receptacle."

MEASUREMENTS: Body 342 (264–416) long, greatest width 94 (68–143) in anterior or posterior trunk. Pharyngeal diameter 21 (18–26). Haptor 59 (54–64) long, 91 (88–94) wide. Ventral anchor 35 (31–39), base width 17–18; dorsal anchor 23 (17–27), base width 12 (10–14). Ventral bar 38 (27–44); dorsal bar 36 (27–42). Hook pairs 1, 2, 3, 4, 6, 7—13 (12–14); hook pair 5—17 (15–18). Cirrus 233 long, ring diameter 21 (17–25); accessory piece 36 (31–42) long. Testis 50–51 × 17–18; ovary 48 (35–56) × 19 (12–29).

REMARKS: *Gussevia spiralocirra* is the type species of the genus. Our specimens were morphometrically variable, with two semidistinct forms being present. In most specimens, the shanks of hooks 1, 2, 3, 4, 6, and 7 are slightly inflated (Fig. 91A), whereas those in other specimens possessed slender shanks (Fig. 91B). Although measurements of both forms overlapped, those of specimens with slender hook shanks tended to occupy the smaller values of the ranges for anchors and bars. All of our specimens possessed a sinistral vagina, whereas Kohn and Paperna (1964) report it as dextral in their specimens. We were not able to examine type specimens of this species; however, based on the comparison of our specimens with drawings provided by these authors, we consider our collection to be conspecific with this species. Verification of the position of the vagina will depend on study of the type material deposited in the Museum of the Oswaldo Cruz Institute, Brazil.

Our examination of one cotype(?) of *Ancyrocephalus pterophylli* Lucký, 1970 has shown this species to be conspecific with our collection. The cotype is unstained and verification of the features of the internal organs was not possible. However, the shapes of the sclerotized structures of the haptor and copulatory complex fall within variation observed in our series. Thus, *A. pterophylli* is considered a junior subjective synonym of *Gussevia spiralocirra.*

Gussevia spiralocirra is closely related to *G. alii* (Molnar et al., 1974) comb. n., *G. alioides* sp. n., *G. cichlasomatis* (Molnar et al., 1974) comb. n., and *G. dobosi* (Molnar et al., 1974) comb. n. based on the comparative morphology of the haptoral armament and copulatory complex. These species are easily differentiated by the number of rings in the cirral coil, the position of the vagina, and the morphology of the accessory piece.

Gussevia elephus sp. n. (Figs. 97-104)

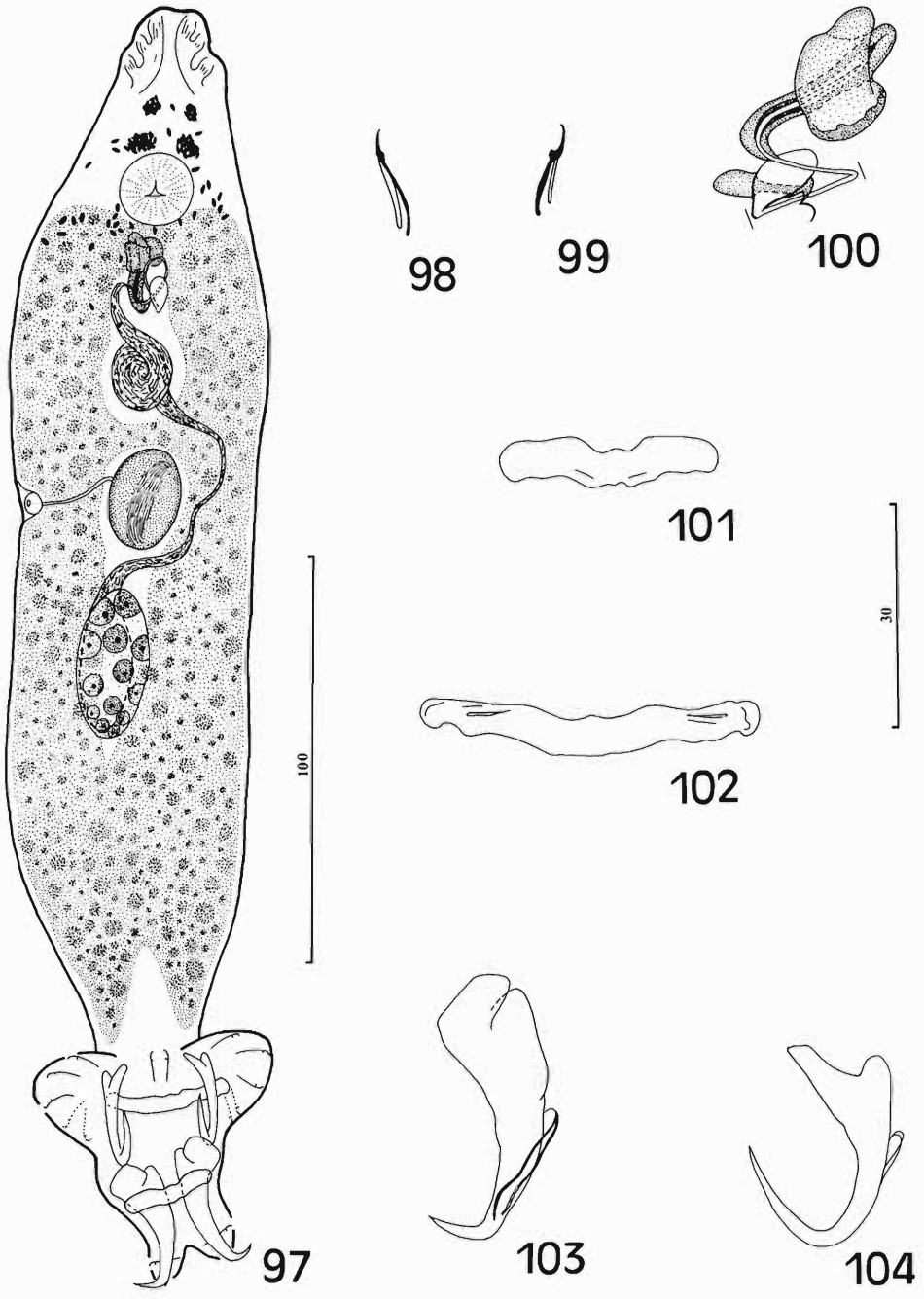
HOST: Cará bararuá, *Uaru amphiacanthoides* (Heckel), Cichlidae.

TYPE LOCALITY: Rio Negro near Manaus, Amazonas, Brazil (June 27, 1983).

TYPE SPECIMENS: Holotype, INPA PA273-1; paratypes, USNM 78779, HWML 22956.

DESCRIPTION (based on one immature and six adult specimens, adults measured): Body foliform, robust; cephalic margin narrow, with two terminal and two bilateral cephalic lobes poorly developed. Eyes 4; members of posterior pair larger, slightly closer together than members of anterior pair; eye granules elongate ovate; accessory granules present in cephalic and anterior trunk regions. Pharynx spherical; gut obscured by dense vitellaria. Peduncle tapered; haptor (ventral view) shaped like the head of an African elephant, posterior lobe narrow. Ventral anchor with superficial root depressed on deep root, shaft expanded, point straight and aculeate; dorsal anchor with well-developed roots, curved shaft, elongate point. Ventral bar with medial anterior depression; dorsal bar rod-shaped with slight terminal enlargements. Hook pairs 1, 2, 3, 4, 6, 7 similar, with delicate point, conspicuous thumb, slightly enlarged shank; hook pair 5 delicate; FH loop ¾ shank length. Gonads subovate; seminal vesicle coiled posterior to cirrus base. Cirrus a coil of about 1½ rings, enlarged base; accessory piece enclosing distal ½-ring of coil, with flabellate termination. Vagina dextral, a short delicate tube connecting with large medial seminal receptacle showing local regions of spermatozoa.

MEASUREMENTS: Body 419 (317–529), greatest width 98 (65–123) in anterior or posterior trunk. Pharyngeal diameter 23 (20–26). Haptor 71 (64–81) long, 66 (53–93) wide. Ventral anchor 33 (32–34), base width 13 (12–14); dorsal anchor 27 (25–28), base width 14 (12–15). Ventral bar 27 (24–29), dorsal bar 38 (33–42). Hook pairs 1, 2, 3, 4, 6, 7—13–14; hook pair 5—15 (14–16). Cirrus 60 long, ring diameter 19 (16–24); accessory piece 23 (22–25) long. Testis 38–39 × 20–21; ovary 39 (32–43) × 24 (23–26).



Figures 97-104. ***Gussevia elephus*** **sp. n. 97. Ventral view of holotype. 98. Hook pair 5. 99. Remaining hook pairs. 100. Copulatory complex. 101. Ventral bar. 102. Dorsal bar. 103. Ventral anchor. 104. Dorsal anchor. All figures are to the same scale (30 micrometers) except the whole-mount drawing (100 micrometers).**

REMARKS: This species is most closely related to *G. obtusa* and *G. dispar* spp. n. They are easily distinguished by the comparative morphology of the haptoral armament, copulatory complex, and vagina. The haptor, shaped as the head of an African elephant, distinguishes this species from all others in the genus and is the characteristic from which the specific name is derived (Latin, *eleph/o* = elephant).

Gussevia obtusa sp. n. (Figs. 105–112)

HOST: Cará bararuá, *Uaru amphiacanthoides* (Heckel), Cichlidae.

TYPE LOCALITY: Rio Negro near Manaus, Amazonas, Brazil (June 27, 1983).

TYPE SPECIMENS: Holotype, INPA PA274-1; paratypes, USNM 78780, HWML 22957.

DESCRIPTION (based on five specimens): Body fusiform; cephalic lobes poorly developed, usually two terminal, two bilateral. Four eyes, usually compact; members of posterior pair larger, closer together than members of anterior pair; eye granules small, ovate; accessory granules infrequent in cephalic and anterior trunk regions. Pharynx spherical; esophagus moderately long. Peduncle moderate; haptor deeply incised bilaterally forming well-developed anterior and posterior lobes. Ventral anchor with appressed roots, evenly curved shaft and point; tip of point bent, blunt. Dorsal anchor with well-developed roots, curved shaft, elongate point. Ventral bar with enlarged ends, medial swelling; dorsal bar rod-shaped, with tapered ends. Hook pairs 1, 2, 3, 4, 6, 7 with delicate point, enlarged thumb, slender shank; pair 5 delicate; FH loop ¾ shank length. Gonads elongate; seminal vesicle pyriform. Cirrus a coil of 2–3 rings; accessory piece closely associated with terminal cirral ring, distal portion flabellate, clavate. Vagina dextral, comprising a terminal bulbous structure, moderately elongate tube opening into conspicuous seminal receptacle with local regions of spermatozoa.

MEASUREMENTS: Body 349 (288–393) long, greatest width 72 (59–86) usually in posterior trunk. Pharyngeal diameter 16 (15–17). Haptor 67 (51–79) long, 68 (62–77) wide. Ventral anchor 35 (34–37), base width 11–12; dorsal anchor 24–25, base width 12–13. Ventral bar 27 (23–29); dorsal bar 32 (30–34). Hook pairs 1, 2, 3, 4, 6, 7—14 (13–15); hook pair 5—18–19. Cirrus 112 long, ring diameter 19 (15–21); accessory piece 21 (19–24) long. Ovary 46 (39–52) × 14 (13–15).

REMARKS: *Gussevia obtusa* most closely resembles *G. disparoides* sp. n. as shown by the comparative morphology of the bases of the anchors and of the copulatory complex. These species are distinguished by the presence of a smooth origin of the ventral anchor shaft from the base in *G. obtusa* (shaft with distinct proximal bend in *G. disparoides*), small terminal enlargements of the ventral bar in *G. obtusa,* and the comparative morphology of the distal portion of the vagina. The specific name from Latin (*obtus* = blunt) refers to the tip of the ventral anchor point.

Gussevia alioides sp. n. (Figs. 113–120)

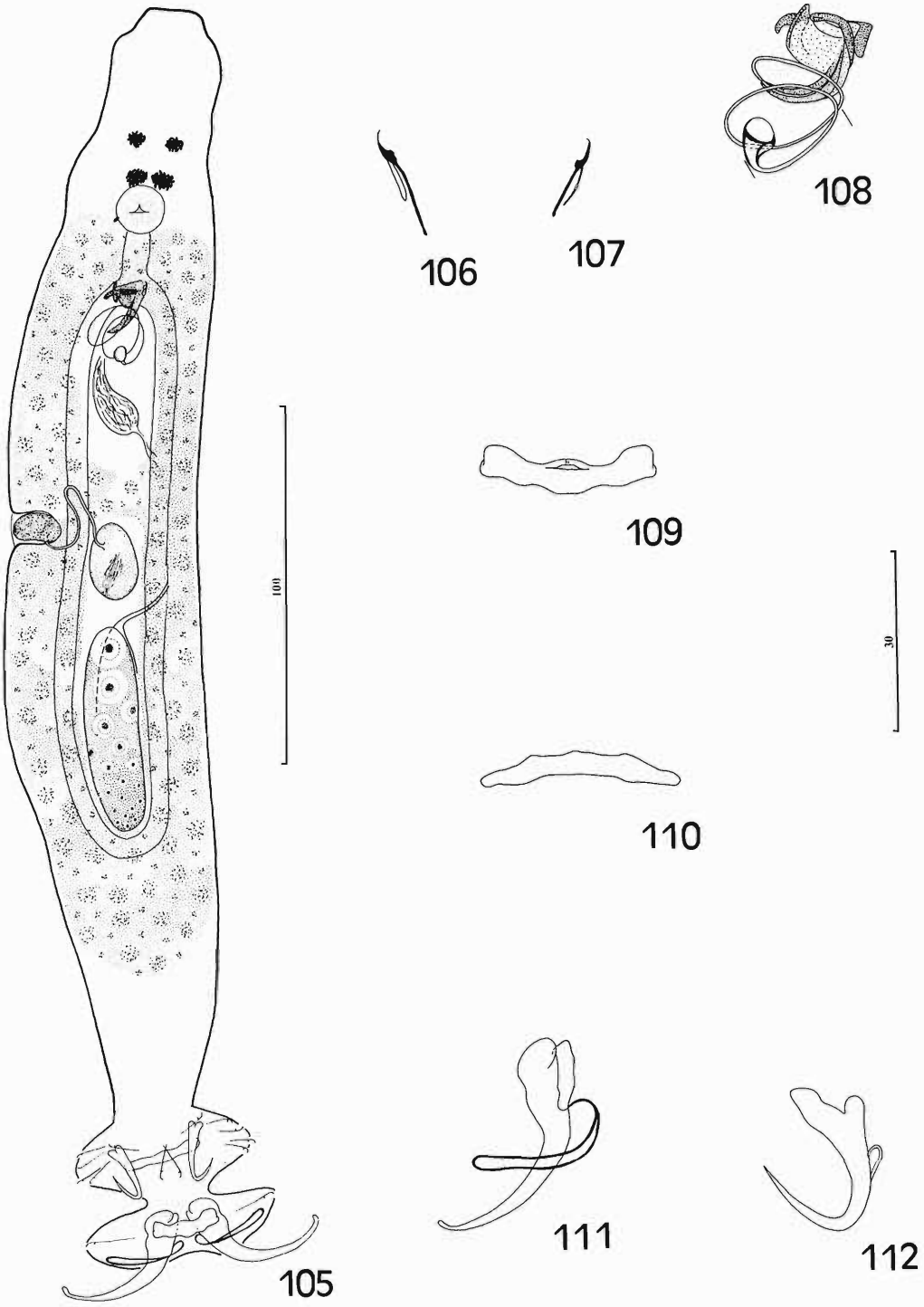
HOST: Cará roxo, *Cichlasoma severum* (Heckel), Cichlidae.

TYPE LOCALITY: Rio Solimões, near Marchantaria Island, Manaus, Amazonas, Brazil (January 2, 1984).

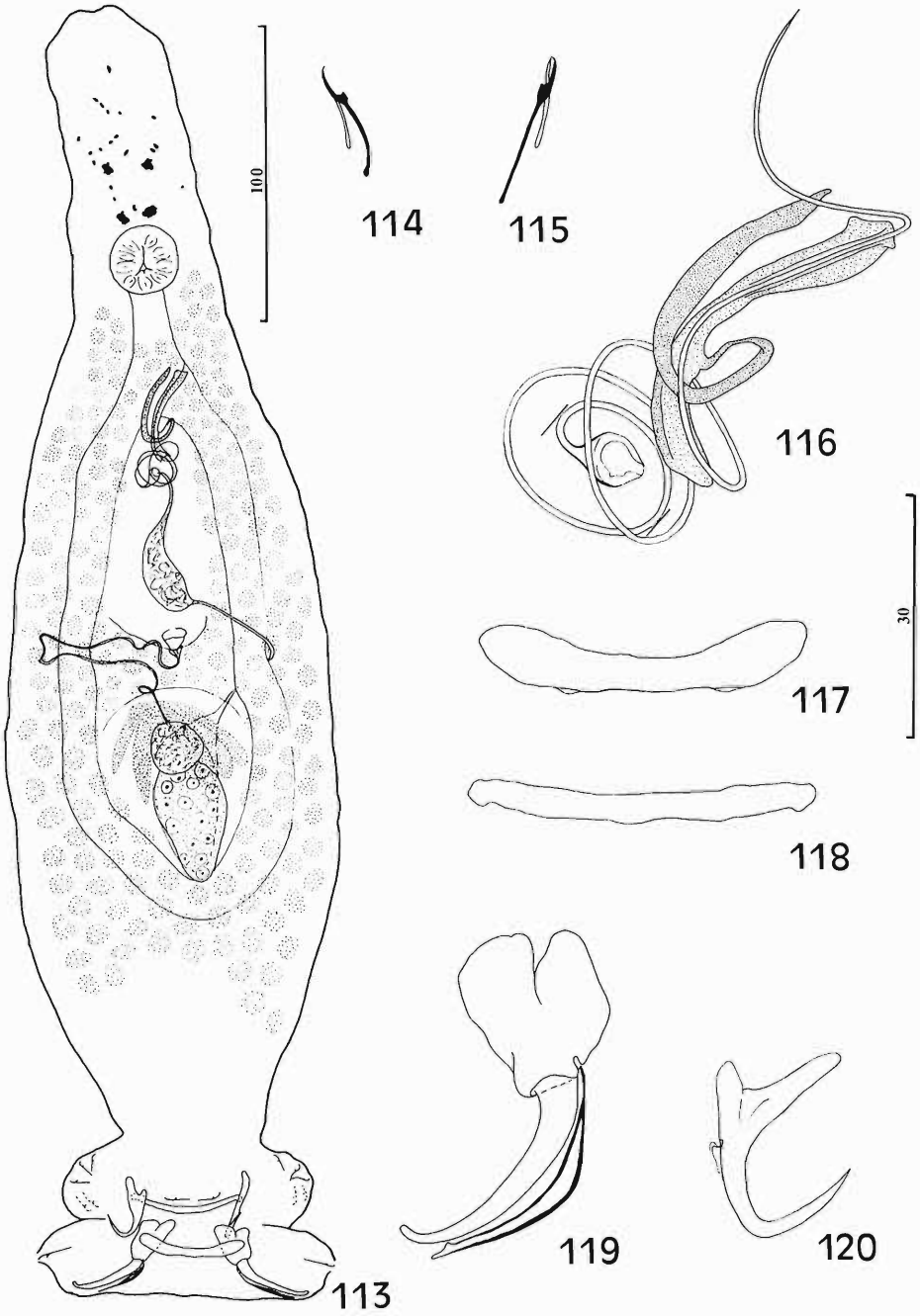
TYPE SPECIMENS: Holotype, INPA PA275-1; paratypes, INPA PA275-2, USNM 78781, HWML 22958.

DESCRIPTION (based on 19 specimens): Body robust, with narrow anterior trunk and cephalic regions; cephalic lobes poorly developed, usually two terminal, two bilateral. Eyes 4, subequal; members of posterior pair closer together; eye granules ovate, large; accessory granules scattered in cephalic area. Pharynx spherical; esophagus moderately long. Peduncle broad; posterior haptoral lobe well developed, large. Ventral anchor with large base, evenly curved shaft and point, tip of point recurved and blunt. Dorsal anchor with well-developed roots, slightly bent shaft, elongate point. Ventral bar with enlarged ends; dorsal bar usually straight, rod-shaped, with slightly enlarged ends. Hook pairs 1, 2, 3, 4, 6, 7 with delicate point, large thumb, slender shank having slight basal enlargement; hook pair 5 delicate, with large thumb; FH loop ½–¾ shank length. Gonads pyriform; seminal vesicle a conspicuous dilation of vas deferens. Cirrus a coil of 4–5 rings; accessory piece closely associated with distal cirral ring, with elongate projection arising near midlength. Vagina midventral, with dextral loop of tube lying ventral to right intestinal caecum. Egg ovate to subspherical, with short irregular proximal filament.

MEASUREMENTS: Body 381 (321–441), greatest width 101 (85–126) in posterior half. Pharyngeal diameter 21 (19–23). Haptor 65 (58–77) long, 93



Figures 105-112. ***Gussevia obtusa*** **sp. n. 105. Holotype (ventral view). 106. Hook pair 5. 107. Hook of remaining pairs. 108. Copulatory complex. 109. Ventral bar. 110. Dorsal bar. 111. Ventral anchor. 112. Dorsal anchor. All figures are to the same scale (30 micrometers) except Figure 105 (100 micrometers).**



Figures 113–120. ***Gussevia alioides*** **sp. n. 113. Ventral view of holotype. 114. Hook of pairs 1, 2, 3, 4, 6, 7. 115. Hook pair 5. 116. Copulatory complex. 117. Ventral bar. 118. Dorsal bar. 119. Ventral anchor. 120. Dorsal anchor. All are drawn to the same scale (30 micrometers) except Figure 113 (100 micrometers).**

(80–101) wide. Ventral anchor 39 (33–42), base width 12 (10–18); dorsal anchor 25 (23–26), base width 15 (12–17). Ventral bar 37 (27–45); dorsal bar 39 (27–43). Hook pairs 1, 2, 3, 4, 6, 7—14 (13–15); hook pair 5—20 (19–21). Cirrus 253 long, ring diameter 19 (17–21); accessory piece 39 (34–44) long. Testis 44 (30–60) × 24 (20–27); ovary 44 (38–53) × 19 (18–21). Egg 77 × 66.

REMARKS: *Gussevia alioides* sp. n. is the only described species in the genus having a midventral vaginal opening with a dextral loop of the vaginal tube. It is closest to *G. alii* (Molnar et al., 1974) as shown by the morphology of the haptoral armament and copulatory complex. The vagina in *G. alii* is dextroventral. The specific name refers to the relationship of these species.

Gussevia tucunarense sp. n. (Figs. 121-128)

HOST: Tucunaré, *Cichla ocellaris* Bloch and Schneider, Cichlidae.

TYPE LOCALITY: Rio Negro near Manaus, Amazonas, Brazil (June 12, 1978; June 27, 1983; December 1983).

TYPE SPECIMENS: Holotype, INPA PA276-1; paratypes, INPA PA276-2 to PA276-5, USNM 78782, HWML 22959.

DESCRIPTION (based on 28 specimens; 20 measured): Body fusiform; cephalic margin rounded or with poorly developed lobes, usually two terminal, two bilateral. Eyes 4, frequently dissociated, subequal, equidistant; eye granules large, subspherical; accessory granules present in cephalic and anterior trunk regions. Pharynx spherical; esophagus apparently short; gut obscured by dense vitellaria. Peduncle broad, posterior haptoral lobe reduced. Ventral anchor with truncate superficial root, well-developed deep root, angular bends at junctions of base and shaft and shaft and point; point tip obtuse, slightly recurved. Dorsal anchor with elongate superficial root, short deep root, bent shaft, elongate point. Ventral bar with slightly enlarged ends, anteromedial indented plate; dorsal bar rod-shaped with slightly enlarged terminations. Hook pairs 1, 2, 3, 4, 6, 7 with delicate point, erect thumb, slender shank; hook pair 5 delicate; FH loop extending to near proximal end of shank. Gonads elongate; seminal vesicle inconspicuous. Cirrus a coil of about 1½ rings, base with fleshy projection apparently following proximal ⅓ coil; accessory piece flabellate, enclosing terminal portion of cirral tube. Vagina dextral, with sinuous tube.

MEASUREMENTS: Body 292 (219–416), greatest width 66 (48–84) near midlength. Pharyngeal diameter 18 (15–21). Haptor 52 (32–72) long, 55 (43–74) wide. Ventral anchor 25 (23–27), base width 12 (11–13); dorsal anchor 26 (23–28), base width 10 (9–11). Ventral bar 20 (17–24); dorsal bar 28 (19–32). Hook pairs 1, 2, 3, 4, 6, 7—11 (10–12); hook pair 5—14–15. Cirrus 63 long, ring diameter 19 (14–30); accessory piece 27 (17–37) long. Testis 33 (27–39) × 17 (13–20); ovary 41 (31–52) × 17 (13–19).

REMARKS: Based on the morphology of the ventral anchor, *G. tucunarense* sp. n. is closely related to *G. longihaptor* (Mizelle and Kritsky, 1969) comb. n., *G. arilla* sp. n., and *G. undulata* sp. n., all from *Cichla ocellaris*. Structures which best distinguish these species include the vagina, copulatory complex, and ventral anchor shafts and points. The species name is derived from the local name of the fish host, tucunaré.

Gussevia longihaptor (Mizelle and Kritsky, 1969) comb. n. (Figs. 129-136)

SYNONYMS: *Cleidodiscus bulbus* Rogers and Rawson, 1969; *Longihaptor longihaptor* Mizelle and Kritsky, 1969.

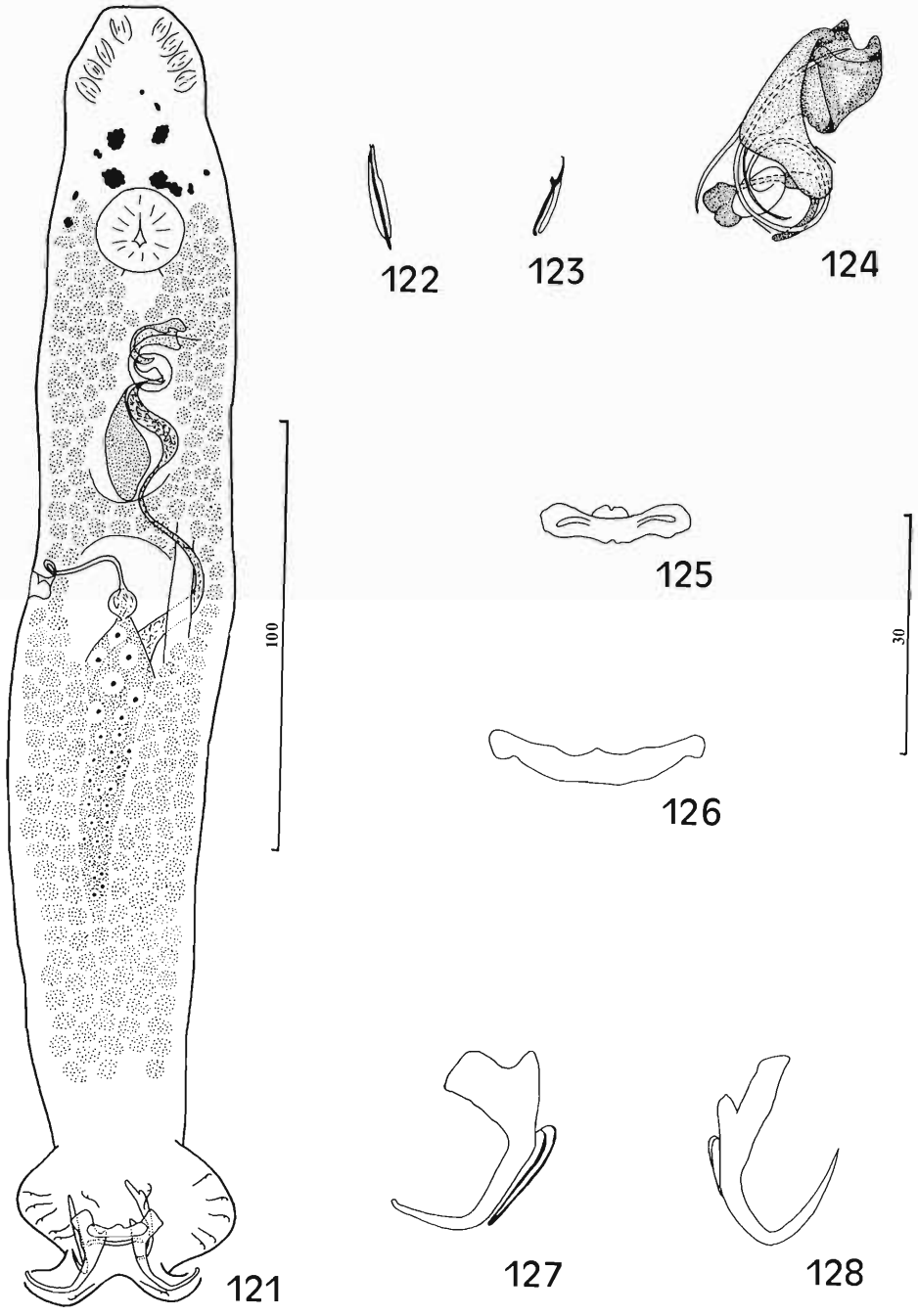
HOST: Tucunaré, *Cichla ocellaris* Bloch and Schneider, Cichlidae.

TYPE LOCALITY: Amazon River Basin, Brazil (Mizelle and Kritsky, 1969).

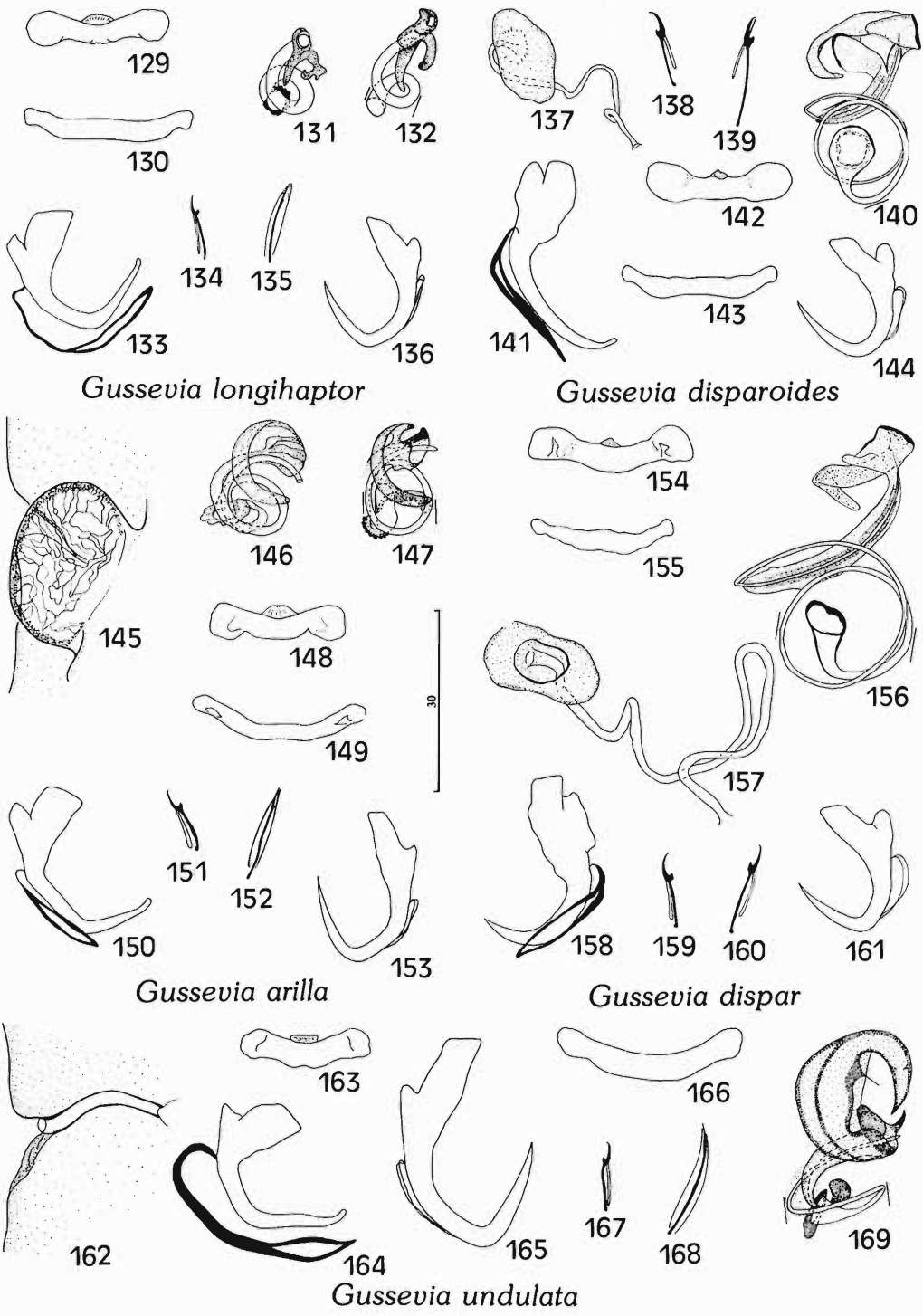
PRESENT LOCALITY: Rio Negro near Manaus, Amazonas, Brazil (June 27, 1983).

SPECIMENS STUDIED: Vouchers, INPA PA277-1, USNM 78783, HWML 22960; three paratypes, *Longihaptor longihaptor* Mizelle and Kritsky, 1969, USNM 71000; paratype, *Cleidodiscus bulbus* Rogers and Rawson, 1969, USNM 71363.

REDESCRIPTION (based on three specimens): Body robust, fusiform; cephalic margin rounded or with two terminal, two bilateral cephalic lobes. Eyes 4, equidistant; members of posterior pair larger than those of anterior pair; eye granules variable in size and shape; accessory granules rare in cephalic area. Pharynx spherical; esophagus short to nonexistent. Peduncle tapered posteriorly, broad; haptoral lobe well developed. Ventral anchor with large superficial root, conspicuous deep root, short shaft, tip of point obtuse. Dorsal anchor with elongate superficial root, short deep root, curved shaft, acute point. Ventral bar with enlarged ends, small anteromedial plate; dorsal bar rod-shaped with slight terminal



Figures 121-128. ***Gussevia tucunarense*** **sp. n. 121. Holotype, ventral view. 122. Hook pair 5. 123. Hook of remaining pairs. 124. Copulatory complex. 125. Ventral bar. 126. Dorsal bar. 127. Ventral anchor. 128. Dorsal anchor. Figures are drawn to the same scale (30 micrometers) except Figure 121 (100 micrometers).**



Figures 129-169. Sclerotized structures of *Gussevia* spp. Figures 129-136. *Gussevia longihaptor* (Mizelle and Kritsky, 1969) comb. n. 129. Ventral bar. 130. Dorsal bar. 131, 132. Copulatory complexes. 133. Ventral anchor. 134. Hook of pairs 1, 2, 3, 4, 6, 7. 135. Hook pair 5. 136. Dorsal anchor. Figures 137-144. *Gussevia disparoides* sp. n. 137. Vagina. 138. Hook of pairs 1, 2, 3, 4, 6, 7. 139. Hook pair 5. 140. Copulatory complex.

enlargements. Hook pairs 1, 2, 3, 4, 6, 7 with erect thumb, delicate point and shaft, slender shank; hook pair 5 with poorly developed thumb, slender shank; FH loop $^{9}/_{10}$ shank length. Gonads elongate; seminal vesicle indistinct. Cirrus a coil of about 1½ rings, small base, tube dilated; accessory piece with short proximal portion giving rise to two terminal branches. Vagina not observed, apparently unsclerotized.

MEASUREMENTS: Body 414 (373–439) long, greatest width 84 (49–106) near midlength. Pharyngeal diameter 35 (21–40). Haptor 51 (49–52) long, 63 (43–76) wide. Ventral anchor 22–23, base width 12–13; dorsal anchor 21–22, base width 11–12. Ventral bar 21 (19–23); dorsal bar 28 (27–29). Hook pairs 1, 2, 3, 4, 6, 7—11–12; hook pair 5—15–16. Cirrus 33 long, ring diameter 10 (9–11); accessory piece 12 (9–14) long. Testis 49–50 × 8–9; ovary 70 (62–78) × 14 (13–16).

REMARKS: This species was originally described as *Longihaptor longihaptor* by Mizelle and Kritsky (1969) from the gills of *Cichla ocellaris,* an aquarium fish in the United States. Examination of three paratype specimens of *L. longihaptor* and comparison of these specimens with ours confirms their conspecificity. Major differences in the depictions of the copulatory complex are due to the fact that Mizelle and Kritsky (1969) drew a specimen that had been severely flattened with the cirrus lying in lateral view. Nonetheless, these authors do depict an expanded cirrus tube with about 1½ coils. Similarly, examination of the paratype of *Cleidodiscus bulbus* described by Rogers and Rawson (1969 publication date: Aug. 21, 1969) confirmed that this species is conspecific with *L. longihaptor* (publication date: Apr. 16, 1969), and it is relegated to junior subjective synonomy because of a later publication date.

Gussevia disparoides sp. n. (Figs. 137–144)

HOST: Cará roxo, *Cichlasoma severum* (Heckel), Cichlidae.

TYPE LOCALITY: Rio Solimões near Marchantaria Island, Manaus, Amazonas, Brazil (January 2, 1984).

TYPE SPECIMENS: Holotype, INPA PA278-1; paratypes, INPA PA278-2, USNM 78784, HWML 22961.

DESCRIPTION (based on 11 specimens): Body fusiform, stout; cephalic margin rounded or with two terminal, two bilateral cephalic lobes. Eyes 4; members of posterior pair larger, closer together than members of anterior pair; eye granules subovate, variable in size; accessory granules few in cephalic region. Pharynx subovate; esophagus short to nonexistent. Peduncle broad, tapered posteriorly; posterior haptoral lobe with divergent arms. Ventral anchor with appressed roots, proximal bend of shaft, obtuse point; dorsal anchor with well-developed roots, short shaft, elongate point. Ventral bar with enlarged ends and short, acute anteromedial projection. Dorsal bar rod-shaped, with slightly enlarged ends. Hook pairs 1, 2, 3, 4, 6, 7 with curved shaft and point, erect thumb, slender shank; hook pair 5 similar except for elongate shank; FH loop ½–¾ shank length. Gonads small, bacilliform; seminal vesicle pyriform. Cirrus a coil of about 2½ rings; accessory piece closely associated with distal ring of cirrus, with terminal lamellar projections. Vagina dextral with terminal fleshy funnel and winding tube.

MEASUREMENTS: Body 352 (303–405), greatest width 80 (62–101) near midlength. Pharyngeal diameter 17 (16–18). Haptor 56 (51–60) long, 69 (63–73) wide. Ventral anchor 32 (29–34), base width 11 (9–12); dorsal anchor 21 (20–23), base width 11 (10–12). Ventral bar 26 (22–28), dorsal bar 27 (23–31). Hook pairs 1, 2, 3, 4, 6, 7—13 (12–14); hook pair 5—18 (16–19). Cirrus 122 long, ring diameter 18 (17–20); accessory piece 25 (21–38) long. Testis 30 (25–35) × 13 (10–16); ovary 40 (38–42) × 15 (14–17).

REMARKS: *Gussevia disparoides* sp. n. is closest to *G. dispar* sp. n., also from *Cichlasoma severum.* They are easily distinguished by the mor-

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141. Ventral anchor. 142. Ventral bar. 143. Dorsal bar. 144. Dorsal anchor. Figures 145–153. *Gussevia arilla* sp. n. 145. Vagina. 146, 147. Copulatory complexes. 148. Ventral bar. 149. Dorsal bar. 150. Ventral anchor. 151. Hook of pairs 1, 2, 3, 4, 6, 7. 152. Hook pair 5. 153. Dorsal anchor. Figures 154–161. *Gussevia dispar* sp. n. 154. Ventral bar. 155. Dorsal bar. 156. Copulatory complex. 157. Vagina. 158. Ventral anchor. 159. Hook of pairs 1, 2, 3, 4, 6, 7. 160. Hook pair 5. 161. Dorsal anchor. Figures 162–169. *Gussevia undulata* sp. n. 162. Vagina. 163. Ventral bar. 164. Ventral anchor. 165. Dorsal anchor. 166. Dorsal bar. 167. Hook of pairs 1, 2, 3, 4, 6, 7. 168. Hook pair 5. 169. Copulatory complex. All figures are given to the same scale (30 micrometers).

phology of the ventral anchor (anchor point acute in *G. dispar*; obtuse in *G. disparoides*). The specific name reflects the apparent close relationship of these species.

Gussevia arilla sp. n. (Figs. 145–153)

HOST: Tucunaré, *Cichla ocellaris* Bloch and Schneider, Cichlidae.

TYPE LOCALITY: Rio Negro near Manaus, Amazonas, Brazil (June 27, 1983).

TYPE SPECIMENS: Holotype, INPA PA279-1; paratypes, USNM 78785, HWML 22962.

DESCRIPTION (based on seven specimens): Body robust, tapered at both extremities; cephalic lobes poorly developed, two terminal, two bilateral. Eyes 4, equidistant; members of posterior pair larger or subequal in size to members of anterior pair; eye granules variable in size, subovate; accessory granules usually present in cephalic region. Pharynx spherical; posterior haptoral lobe with divergent arms. Ventral anchor with large truncate superficial root, well-developed deep root, straight shaft with proximal angular origin, straight point with obtuse tip. Dorsal anchor with elongate superficial root, small deep root, bent shaft, elongate point. Ventral bar with enlarged terminations, anteromedial flap with small indentation. Dorsal bar rod-shaped. Hook pairs 1, 2, 3, 4, 6, 7 with erect thumb, delicate point and shaft, shank with slight variation in diameter; hook pair 5 elongate, delicate, with poorly developed thumb; FH loop $^{9}/_{10}$ shank length. Gonads short, bacilliform; seminal vesicle indistinct. Cirrus a coil of 1½ rings, base articulated to accessory piece. Accessory piece complex with proximal arm flared distally into a sheath wrapped around termination of cirral tube. Vagina dextral, with fleshy lobe ventral to lateral opening (Fig. 145); lobe with internal ridges imparting a cerebral appearance.

MEASUREMENTS: Body 248 (199–305), greatest width 79 (57–93) near midlength. Pharyngeal diameter 20 (14–23). Haptor 48 (41–62) long, 66 (61–72) wide. Ventral anchor 26 (25–27), base width 12 (10–14); dorsal anchor 26 (24–27), base width 11 (9–13). Ventral bar 22 (20–23); dorsal bar 28 (27–29). Hook pairs 1, 2, 3, 4, 6, 7—11–12; hook pair 5—15–16. Cirrus 83 long, ring diameter 12 (11–14); accessory piece 15 (14–16) long. Ovary 44–45 × 21–22.

REMARKS: *G. arilla* sp. n. is easily distinguished from all other known species in the genus by the characteristic fleshy lobe ventral to the dextral opening of the vagina. Based on haptoral morphology, it most closely resembles *G. tucunarense* sp. n. The specific name is from Neolatin (*arilla* = a wrapper) and refers to the complex structure of the terminal portion of the accessory piece.

Gussevia dispar sp. n. (Figs. 154–161)

HOST: Cará roxo, *Cichlasoma severum* (Heckel), Cichlidae.

TYPE LOCALITY: Rio Solimões near Marchantaria Island, Manaus, Amazonas, Brazil (January 2, 1984).

TYPE SPECIMENS: Holotype, INPA PA280-1; paratypes, USNM 78786, HWML 22963.

DESCRIPTION (based on six specimens): Body fusiform, gently tapered posteriorly; cephalic lobes poorly developed, two terminal, two bilateral. Eyes 4, subequal; members of posterior pair slightly closer together than members of anterior pair; eye granules variable in size, subovate to bacilliform; accessory granules present in cephalic and anterior trunk regions. Pharynx spherical, esophagus moderately elongate. Peduncle narrow, elongate; haptor with small posterior lobe. Ventral anchor with truncate superficial root, knoblike deep root, short shaft, curved and acute anchor point. Dorsal anchor with elongate superficial root, small deep root, bent shaft, elongate point. Ventral bar with enlarged terminations, small anteromedial triangular projection. Dorsal bar rod-shaped with slightly enlarged terminations. Hook pairs 1, 2, 3, 4, 6, 7 with curved shaft and point, erect thumb, slender shank; hook pair 5 similar, with longer shank and small proximal enlargement; FH loop ¾ shank length. Gonads elongate; seminal vesicle stout, fusiform. Cirrus a coil of about 2½ rings; accessory piece with well-developed proximal arm flaring distally with folded lamellar projection. Vagina dextral, with terminal fleshy funnel, winding delicate tube. Egg ovate, with short anterior filament and posterior pointed elevation.

MEASUREMENTS: Body 540 (500–587), greatest width 85 (82–88) in anterior half near midlength. Pharyngeal diameter 24 (23–26). Haptor 61 (54–66) long, 73 (66–77) wide. Ventral anchor 29 (28–30), base width 12 (10–13); dorsal anchor 21 (20–22), base width 11–12. Ventral bar 28–29, dorsal bar 25 (24–26). Hook pairs 1, 2, 3, 4, 6, 7—13–14; hook pair 5—16–17. Cirrus 166

long, ring diameter 25 (23–26); accessory piece 41 (37–44) long. Ovary 97–98 × 13–14. Egg 87–88 × 39–40 wide.

REMARKS: Based on the structure of the vagina, bars, copulatory complex, hooks and dorsal anchor, this species most closely resembles *G. disparoides* sp. n. They are easily distinguished by the morphology of the ventral anchors and relative body shapes. The species name is from Latin (*dispar* = different) and refers to the unique ventral anchor.

Gussevia undulata sp. n. (Figs. 162-169)

HOST: Tucunaré, *Cichla ocellaris* Bloch and Schneider, Cichlidae.

TYPE LOCALITY: Rio Negro near Manaus, Amazonas, Brazil (June 27, 1983); also collected from the same host purchased at the Manaus Fish Market (December 1983).

TYPE SPECIMENS: Holotype, INPA PA281-1; paratypes, INPA PA281-2, USNM 78787 and 78788, HWML 22964.

DESCRIPTION (based on eight specimens): Body fusiform, tapered gently posteriorly; cephalic margin rounded or with two terminal, two bilateral cephalic lobes poorly developed. Four eyes, equidistant; members of posterior pair larger than those of anterior pair; eye granules elongate ovate to bacilliform; accessory granules present in cephalic and anterior trunk regions. Pharynx subspherical; esophagus short. Peduncle short, broad; haptoral lobe with divergent elongate arms. Ventral anchor with large truncate superficial root, small deep root, straight shaft originating at an angle from anchor base, undulating point with obtuse tip. Dorsal anchor with large superficial root, small deep root, curved shaft, sharply recurved elongate point. Ventral bar small, with slightly enlarged ends and anteromedial truncate process. Dorsal bar rod-shaped, with slightly enlarged terminations. Hook pairs 1, 2, 3, 4, 6, 7 with delicate point and shaft, erect thumb, slender shank; hook pair 5 apparently lacking thumb; FH loop nearly equals shank length. Gonads fusiform; seminal vesicle large. Cirrus a coil of about 1½ rings; base with lateral flange. Accessory piece with short proximal arm from which complex terminal branch arises, accessory piece flared distally. Vagina dextral, a short tube; posterior surface sclerotization present at vaginal opening.

MEASUREMENTS: Body 420 (366–526), greatest width 84 (71–111) near midlength. Pharyngeal diameter 23 (17–27). Haptor 74 (67–81) long, 77 (70–82) wide. Ventral anchor 24 (22–26), base width 13 (12–15); dorsal anchor 34 (31–39), base width 15 (12–18). Ventral bar 24 (21–25); dorsal bar 31 (30–33). Hook pairs 1, 2, 3, 4, 6, 7—12–13; hook pair 5—17 (15–19). Cirrus 58 long, ring diameter 21 (17–27); accessory piece 31 (29–33) long. Testis 46 (39–53) × 19 (17–22); ovary 30 (18–41) × 17 (16–18).

REMARKS: *Gussevia undulata* sp. n. is most closely related to *G. longihaptor* (Mizelle and Kritsky, 1969) as shown by the comparative morphology of the ventral anchor, hooks, and bars. *Gussevia undulata* is separated from this species by having (1) an undulating ventral anchor point, (2) a complex accessory piece of the copulatory complex, (3) a slender cirral tube (expanded in *G. longihaptor*), and (4) a sclerotized vagina. The specific name, from Latin (*undulata* = wavy), refers to the shape of the ventral anchor point.

Discussion

Although Kritsky and Thatcher (1983) listed 30 described species belonging to *Urocleidoides* sensu Mizelle et al. (1968), the present revision does not consider the generic status of 22 of them. This remaining group of species is undoubtedly polyphyletic. However, its members are morphologically redundant with regard to the haptoral and copulatory sclerites, and most available specimens (mostly types) of the species are unstained and cleared, which precludes the study of their internal organ systems. It was not possible to assign at the generic level even those for which the internal organ systems are known because general organizational patterns could not be determined. Therefore, with regard to the present revision, we consider the following species incertae sedis: *Urocleidoides affinis* Mizelle, Kritsky, and Crane, 1968, *U. amazonensis* Mizelle and Kritsky, 1969, *U. carapus* Mizelle, Kritsky, and Crane, 1968, *U. catus* Mizelle and Kritsky, 1969, *U. chavarriai* (Price, 1938) Molnar, Hanek, and Fernando, 1974, *U. corydori* Molnar, Hanek, and Fernando, 1974, *U. costaricensis* (Price and Bussing, 1967) Kritsky and Leiby, 1972, *U. gymnotus* Mizelle, Kritsky, and Crane, 1968, *U. heteroancistrium* (Price and Bussing, 1968) Kritsky and Leiby, 1972, *U. kabatai* Molnar, Hanek, and Fernando, 1974, *U. lebedevi* Kritsky and Thatcher, 1976, *U. mamaevi* Kritsky and Thatcher, 1976, *U. margolisi* Molnar,

Hanek, and Fernando, 1974, *U. megorchis* Mizelle and Kritsky, 1969, *U. microstomus* Mizelle, Kritsky, and Crane, 1968, *U. robustus* Mizelle and Kritsky, 1969, *U. stictus* Mizelle, Kritsky, and Crane, 1968, *U. strombicirrus* (Price and Bussing, 1967) Kritsky and Thatcher, 1974, *U. travassosi* (Price, 1938) Molnar, Hanek, and Fernando, 1974, *U. trinidadensis* Molnar, Hanek, and Fernando, 1974, *U. variabilis* Mizelle and Kritsky, 1969, and *U. virescens* Mizelle, Kritsky, and Crane, 1968.

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(Wed.)	12 Feb.	Naval Medical Research Institute, Bethesda, MD (*with* Food and Drug Administration)
(Wed.)	19 Mar.	Walter Reed Army Institute of Research, Washington, D.C. (*with* Armed Forces Institute of Pathology)
(Wed.)	16 Apr.	Johns Hopkins University, Baltimore, MD
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