Mem. Inst. Oswaldo Cruz, Rio de Janeiro, Vol. *86* (2): 229-232 apr./jun. 1991

REDESCRIPTION OF *NOMIMOSCOLEX PIRAEEBA* WOODLAND, 1934 (CESTODA, PROTEOCEPHALIDEA), FROM THE AMAZON CATFISHES, *BRACHYPLATYSTOMA* SPP. WITH PROPOSAL OF SYNONYMS AND INVALIDATION OF ENDORCHIINAE AND *ENDORCHIS*

A. ARANDAS REGO

Instituto Oswaldo Cruz, Departamento de Helmintologia, Caixa Postal 926, 20001 Rio de Janeiro, RJ, Brasil

The proteocephalid species Nomimoscolex piraeeba *Woodland, 1934,* N. dorad *(Woodland, 1935) and* Endorchis piraeeba *Woodland, 1934, from* Brachyplatystoma *spp., South American silurid fishes, are critically revised. It is concluded that they concern to one species,* N. piraeeba. *The Endorchiinae, a subfamily of Monticelliidae, and genus* Endorchis *are invalidated herein. The valid species of Endorchiinae, belonging to genus* Muzophorus, M. admonticellia *Woodland, 1934,* M. pirarara *Woodland, 1934 and* M. woodlandi *Rego, 1984, are transferred provisionally to Zygobothriinae.*

Key words: Proteocephalidea – *Nomimoscolex piraeeba* – *Brachyplatystoma* spp. – *Endorchis piraeeba* – *Nomimoscolex dorad* – Endorchiinae

Most of the proteocephalids from South American freshwater fishes collected in Amazon were described by Woodland, in a series of papers published during 1933-1935; this author established also the taxonomic principles of the Order Proteocephalidea. Notwithstanding, many of these descriptions are inadequate for identification of specimens. Aiming the elucidation of some doubts on the morphology of these species, a critical revision of the types of South American species, kept in the British Museum (Natural History), was undertaken. This confirmed the difficulties of improving original descriptions of Proteocephalidea using the type material. In order to solve the existing problems of identification, correct errors in the descriptions of Woodland, and to confirm the identification of hosts, it will be necessary to collect new material, from the same hostes and localities, as well.

Revision of the material, allowed me to redescribe *Nomimoscolex piraeeba* Woodland, 1934 (Zygobothriinae), parasite of *Brachyplatystoma* spp. (Siluriformes, Pimelodidae), reevaluate the taxonomic status of *N. dorad* (Woodland, 1935), *Endorchis piraeeba* Woodland, 1934, and of Endorchiinae, a subfamily of Monticelliidae.

MATERIALS AND METHODS

Besides the material from the BM (NH) studied herein, specimens from the Helminthological Collection of Oswaldo Cruz Institute (IOC) was also examined.

The specimens from the IOC Collection were preserved in Railliet & Henry solution. Strobila were stained by alcholic carmine of Langeron or haematoxylin of Delafield and mounted in mixture of Canada balsam and beechwood creosote. Some worms were included in parafin, sectioned and stained with haematoxylin-eosin. All measurements are in milimeters. Drawings were made with the aid of a camara lucida.

Nomimoscolex piraeeba Woodland, 1934

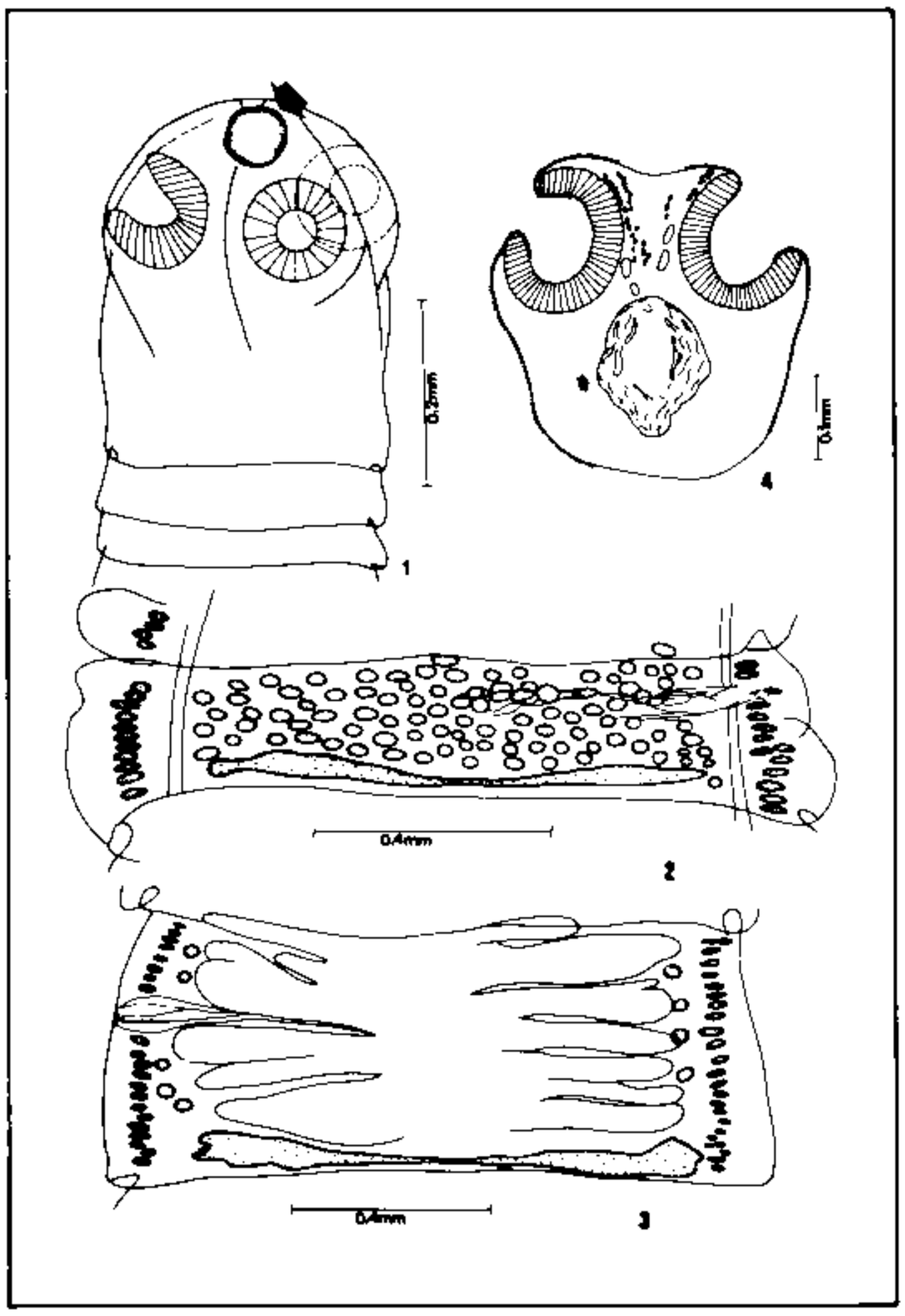
Synonyms: *Endorchis piraeeba* Woodland, 1934; *Myzophorus dorad* Woodland, 1935; *N. dorad* (Woodland, 1935) Freze 1965.

Hosts: *Brachyplatystoma filamentosum* (Licht.) and *B. flavicans* (Castelnau) (= *B. rousseauxii*).

Localities of collection: Parintins, Óbidos and Santarém, Amazon river, Amazon.

Research fellow of CNPq.

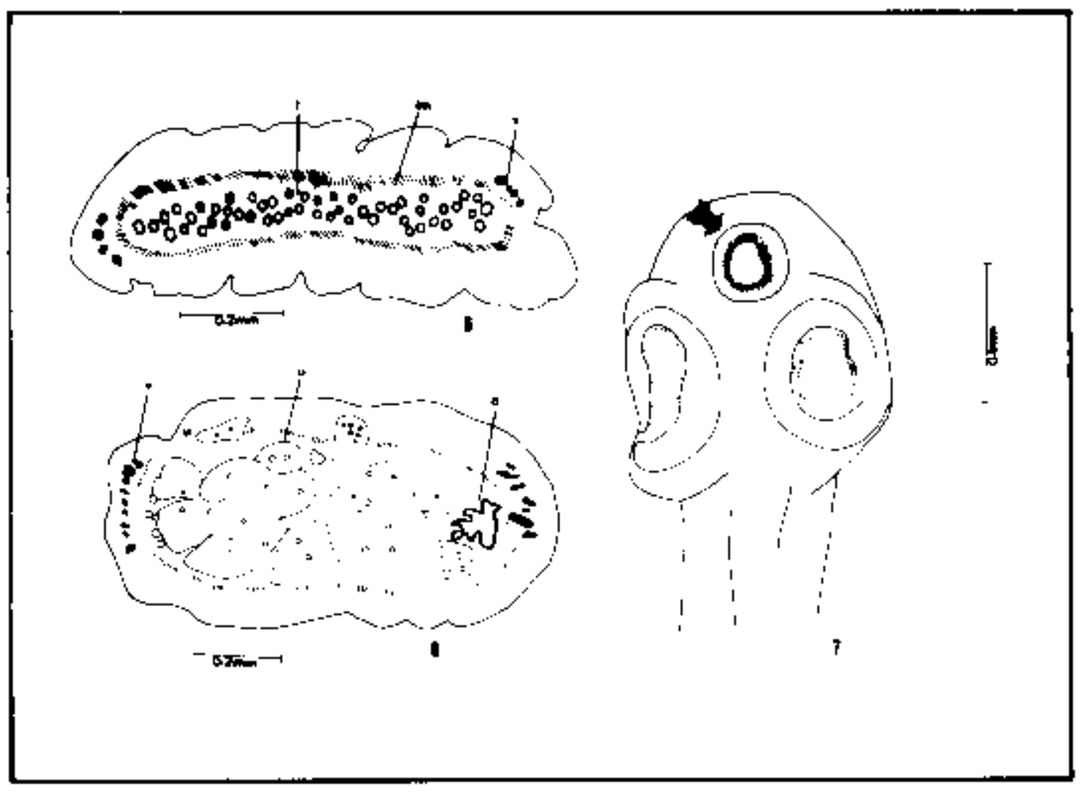
Received 2 October 1990.
Accepted 19 February 1991.



Nomimoscolex piraeeba Woodland, 1934. Fig. 1: scolex. Apical organ (arrow). Fig. 2: mature segment. Fig. 3: gravid segment. Fig. 4: section of scolex. Apical organ (arrow).

Material deposited in BM (NH) numbers, 1954.23.139-145 (*N. dorad*); 1964-12.15.111-122 (*N. piraeeba*) and 1964.12.15.65-70 (*E. piraeeba*) and Col. IOC, numbers, 32727a-b, 32728, 32729a-b and 32730a-d.

Redescription – Strobila 98 long, 2,5 wide to 134 long, 1,7 wide. Small strobila were also found, with 19,6 long, 1,47 wide. All strobila with numerous segments, short, slightly craspedots. Rounded scolex, somewhat broader than the neck, of variable dimensions, 0,386 long, 0,450 wide to 0,660 long, 0,550 wide. Suckers of acetabular type, muscular, located in funnel-shaped or triangular portions of scolex, 0,200 – 0,220 wide. Minute spines in borders of suckers and some parts of scolex. Scolex with an apical organ of glandular nature, with "os terminale" opening on its apex (Figs 1, 4, 7). Segments generally broader than long with variable dimensions; the mature segments, 0,292 long, 2,45 wide to 0,460 long, 1,46 wide; the gravid segments, 0,882 long, 2,25 wide. Gravid segments somewhat longer than broad. Genital pores irregulary alternated, opening laterally. Cirrus pouch small, elongated, with 0,315 long, 0,175 wide to 0,500 long, 0,160 wide. About 100 testes, grouped. Ovary, thin, at base of segments. Vitellaria with few follicles. Uterus with few outgrowths. Eggs, 0,026 – 0,028 diameter. Gonads situated in medullar parenchyma; vitellarian follicles in lateral cortical parenchyma. Ovary and uterus project small portions across fibers of longitudinal muscles, reaching cortex. Cuticle very thick and the longitudinal musculature are well developed and regular (Figs 5, 6).



Nomimoscolex piraeeba Woodland, 1934. Figs 5 e 6: section of segments – t = testes; v = vitellaria; lm = longitudinal muscles; o = ovary; u = uterus. *Endorchis piraeeba* apud Woodland, 1934. Fig. 7: scolex. Apical organ (arrow).

REMARKS

Analysis of some of these characters carry on to the following considerations. The lenght of the strobila is compatible in all three species and all have numerous segments. *E. piraeeba* differs in the shape of segments, because it was described as having segments longer than wide. We believe that this difference is related to the process of strobila distention caused by the strong longitudinal musculature. The secondary transverse grooves, described by Woodland (1934b) in *E. piraeeba* and *N. piraeeba* can be explained as due to the extreme contraction of the strobila. Nevertheless, some samples of *E. piraeeba* from the BM (NH), with nature segments wider than long were found. The scolices are also similar and it is remarkable the presence of a glandular apical organ in the three species described by Woodland (1934a, b; 1935). The presence of minute spines in the suckers is another important character. Wood-

land (1935) did not mention spines in the suckers of *N. dorad*, but they may not be visible in some specimens, since I have found these spines in a cotype from BM (NH).

Concerning the triangular-shaped suckers of *E. piraeeba*, as described by Woodland (1934b), I believe that it is an error; certainly it is due to a twisting of the scolex. In other scolex of the same species, triangular-shaped suckers were not found. This character evidently can not have the generic value atributed by that author.

It was observed that the longitudinal musculature of segments has equal development in the three species. Finally, Woodland (1934b) described in *E. piraeeba* the ovary situated mostly in the medulla, but with some conspicuous projections intruding between the muscle fibers, reaching the dorsal cortex. The re-examination of the type material has confirmed that parts of ovary can really reach the cortex. Note that in *N. dorad*, as described by Woodland (1935), "The ovary is massive and shows little or no trace of dorsal projections". However, I consider this character of minor importance and no significant for the definition of sub-family, as atributed by Woodland (1934b), since we have found the same character in other species of monticelliids. In conclusion: *E. piraeeba* Woodland, 1934 and *N. dorad* (Woodland, 1935) are synonyms of *N. piraeeba* Woodland, 1934.

The Endorchiinae is represented by two genera: *Endorchis* Woodland, 1934 and *Myzophorus* Woodland, 1934. *Endorchis piraeeba* is a junior synonym of *N. piraeeba;* the other species of the genus, *E. mandube* Woodland, 1935 is a synonym of *Gibsoniela mandube* (Woodland, 1935) as noted by Chambrier (1990) and by Rego (1984). The species of *Myzophorus, M. admonticellia* Woodland, 1934 from *Pinirampus* sp., *M. pirarara* Woodland, 1934 from *Phractocephalus hemiliopterus* and *M. woodlandi* Rego, 1984 from *P. hemiliopterus*, all from the Amazon, must be placed in another monticelliid subfamily.

The validity of *Myzophorus* is controversial because of its incomplete definition by Woodland (1934a), although accepted by Wardle & McLeod (1952), Yamaguti (1959) and Freze (1965). The last author diagnosed the genus as follows: metascolex present of absent. Suckers round, not armed. Longitudinal muscles divided in two parts, apart by parenchymatous tissue. Ovary medullar, but it can emit small projections in dorsal cortex. Medullary uterus, but some of its diverticula can enter the cortex ventral. Vitellaria lateral, crescent shaped. The present author could not observe such a division of longitudinal musculature as reported by Woodland (1934a). It seems that this character has no practical value to the taxonomy of the group. Also Woodland (1934a) "admited that it appears absurd to allow the presence or absence of a few scattered muscle fibers to determine the family position of a worm. . .".

Endorchiinae was also imperfectly diagnosed by Woodland (1934b): "Proteocephalina in which the testes are medullary, while the vitellaria, a large part of ovary and (probably) the uterus are cortical. The vitellaria are dispersed and lateral in position". Note that the problem of position of uterus has never been solved.

Endorchiinae Woodland, 1934 and genus *Endorchis* Woodland, 1934 must be invalidated in order to clarify the classification of monticelliids. The species of *Myzophorus* are placed in the subfamily Zygobothriinae, which is redefined below in order to include species in which the ovary is partially projected into the cortex.

Zygobothriinae — Scolex unarmed. Suckers variable in shape. Metascolex present or absent. Secondary folds may be present on the strobila. Genitalia medullar, but in some species outgrowths of uterus or parts of ovary invade the cortex. Vitellaria cortical, generally in two bands, dorsal and ventral.

ACKNOWLEDGEMENTS

To Dr David Gibson, Head of Parasitic Worms Section, British Museum (Natural History) for the loan of the co-types of Woodland.

REFERENCES

CHAMBRIER, A. de, 1990. Redescription de *Proteocephalus paraguayensis* (Rudin, 1917) (Cestoda: Proteocephalidae) parasite de *Hydrodynastes gigas* (Dum., Bibr. & Dum., 1854) du Paraguay. *System. Parasit., 16:* 85-97.

FREZE, V. I., 1965. Principles of Cestodology In K. I. Skrjabin, Vol. 5. *Proteocephala. Cestodes of*

fishes, amphibians and reptiles. Moscow: Izdatelstvo. Nauk. 538 p. English version. Israel Program of Scientific translations.

REGO, A. A., 1984. Proteocephalidea from Amazonian freshwater fishes: new systematic arrangement for the species described by Woodland as *Anthobothrium* (Tetraphyllidea). *Acta Amazonica 14:* 86-94.

WARDLE, R. A. & McLEOD, J. A., 1952. *The Zoology of Tapeworms.* The University of Minnesota press. Ed. Minneapolis. 780 p.

WOODLAND, W. N. F., 1934a. On the Amphlaphorchidinae, a new subfamily of Proteocephalid cestodes and *Myzophorus admonticellia* gen. n., sp. n., parasitic in *Pinirampus* spp. from the Amazon. *Parasitology, 26:* 141-149.

WOODLAND, W. N. F., 1934b. On some remarkable new cestodes from the Amazon siluroid fish, *Brachyplatystoma filamentosum* (Lichtenstein). *Parasitology, 26:* 268-277.

WOODLAND, W. N. F., 1935. Additional cestodes from the Amazon Siluroids Pirarara, Dórad and Sudobim. *Proc. Zool. Soc. London.,* part IV: 851-864.

YAMAGUTI, S., 1959. Systema Helminthum, 2, *The Cestodes of Vertebrates.* 1-626, 769-860. Intersc. Publish Inc. New York.