

MONOGENEANS FROM PANGASIIDAE (SILURIFORMES) IN SOUTHEAST ASIA: VI. *PANGASITREMA CAMILLAE* N. G., N. SP. (MONOGENEA, ANCYLODISCOIDIDAE), FROM *PANGASIUS POLYURANODON*

PARISELLE A.***, EUZET L.*** & LAMBERT A.****

Summary:

The examination of gill parasites from *Pangasius polyuranodon* Bleeker, 1852 (Siluriformes, Pangasiidae) in Indonesia revealed the presence of a new species of Monogenea, belonging to a new genus: *Pangasitrema camillae* n. g., n. sp. (Ancylodiscoïdidae). Among Ancylodiscoïdidae, the genus has several distinguishing features: the reduced size of the haptor, the morphology and size of gripi, the absence of a ventral transversal bar and of a cuneus associated with dorsal gripi.

KEY WORDS : Monogenea, Ancylodiscoïdidae, *Pangasitrema camillae* n. g., n. sp., freshwater fish, Siluriformes, Pangasiidae, *Pangasius polyuranodon*, Southeast Asia.

Résumé : MONOGENÈS DE PANGASIIDAE (SILURIFORMES) EN ASIE DU SUD-EST: VI. *PANGASITREMA CAMILLAE* N. G., N. SP. (MONOGENEA, ANCYLODISCOIDIDAE) CHEZ *PANGASIUS POLYURANODON*

L'examen des parasites branchiaux de *Pangasius polyuranodon* Bleeker, 1852 (Siluriformes, Pangasiidae) en Indonésie a révélé la présence d'une nouvelle espèce de Monogenea, appartenant à un nouveau genre *Pangasitrema camillae* n. g., n. sp. (Ancylodiscoïdidae). Parmi les Ancylodiscoïdidae, ce genre a des caractéristiques propres : la taille réduite du haptéur, la morphologie et la taille des gripi, l'absence d'une barre transversale ventrale et de cuneus associés aux gripi dorsaux.

MOTS CLÉS : Monogenea, Ancylodiscoïdidae, *Pangasitrema camillae* n. g., n. sp., poissons d'eau douce, Siluriformes, Pangasiidae, *Pangasius polyuranodon*, Asie du Sud-Est.

INTRODUCTION

Within the framework of an European Commission project on the biodiversity and aquaculture of Southeast Asian catfishes, the gills from pangasiid fishes (Siluriformes, Pangasiidae) were examined for monogeneans. This paper presents the description of a new species belonging to a new genus, *Pangasitrema camillae* n. g., n. sp. (Ancylodiscoïdidae), found on *Pangasius polyuranodon* Bleeker, 1852 (Siluriformes, Pangasiidae). This host species had been collected in Indonesia (Kalimantan, South part of Borneo Island), and had not been previously examined for parasites. The other monogeneans species belonging to *Thaparocleidus* Jain, 1952 found on *P. polyuranodon* will be described elsewhere. To date a total of 27 species of Monogenea (all belonging to

Thaparocleidus) have been described from the fifteen studied *Pangasius* species (*P. bocourti* Sauvage, 1880; *P. djambal* Bleeker, 1846; *P. gigas* Chevey, 1930; *P. humeralis* Roberts, 1989; *P. hypophthalmus* (Sauvage, 1878); *P. kinabatanganensis* Roberts & Vidthayanon, 1991; *P. kremphi* Roberts & Vidthayanon, 1991; *P. kunyit* Pouyaud, Teugels & Legendre, 1999; *P. lithostoma* Roberts, 1989; *P. mekongensis* Gustiano, Teugels & Pouyaud, 2003; *P. nasutus* (Bleeker, 1862); *P. nieuwenhuisii* (Popta, 1904); *P. pangasius* (Hamilton, 1822); *P. rheophilus* Pouyaud & Teugels, 2000 and *P. saba-bensis* Gustiano, Teugels & Pouyaud, 2003) from India, Bangladesh, Indonesia, Malaysia, Thailand and Vietnam (see Tripathi, 1957; Lim, 1990; Pariselle *et al.*, 2001a, 2001b, 2002a, 2002b and 2003).

MATERIALS AND METHODS

Fish, caught by hook and line, were bought in fish markets or directly from fishermen in Indonesia (Kalimantan, South part of Borneo Island). The fish were dissected as soon as possible, and the left branchial arches were frozen in liquid nitrogen, until examination. To verify the specific identity of host fishes, the carcasses were numbered, fixed and preserved in formalin. In the laboratory, the gills were thawed and the monogeneans were detached from the

* IRD (ex ORSTOM), Catfish Asia Project, Instalasi Penelitian Perikanan Air Tawar, Jalan Ragunan-Pasar Minggu, P.O. Box 7220/jkspm, Jakarta 12540, Indonesia.

** GAMET, BP 5095, 34033 Montpellier Cedex 1, France.

*** Station Méditerranéenne de l'Environnement Littoral, 1, quai de la Daurade, 34200 Sète, France.

**** Laboratoire Génome, Populations, Interactions, Adaptations; UMR 5171, cc 92, Université Montpellier II, Sciences et Techniques du Languedoc, Place Eugène Bataillon, 34095 Montpellier, Cedex 5, France.

Correspondence: A. Lambert. E-mail: lambert@univ-montp2.fr

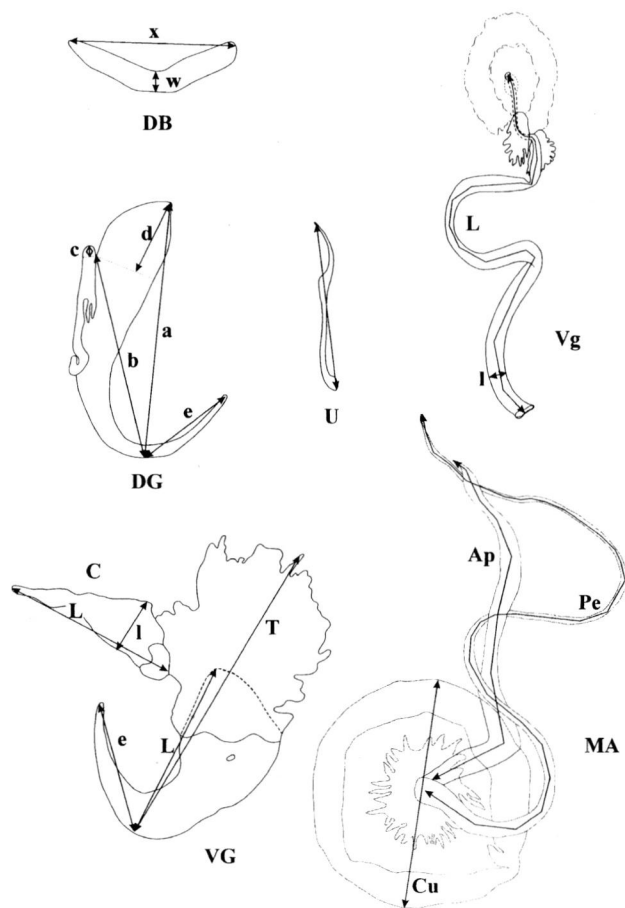


Fig. 1. – Measurements used in this study.

DB = dorsal transverse bar; x = total length; w = width in the middle.
 DG = dorsal gripus; a, b, c, d and e = standard measurements.
 U = total length of the uncinuli.
 Vg = vagina; L = total length; l = maximum width.
 C = cuneus; L = length; l = largest width.
 VG = ventral gripus; T = total length including fibrous parts; L = total length; e = standard measurements of the point.
 MA = male apparatus; Pe = total length of the penis; Ap = length of the accessory piece; Cu = cupule like structure maximum diameter.

gill using a strong water current. The worms were then transferred individually to a slide with a mounted needle into a drop of ammonium picrate-glycerine (mixture described by Malmberg (1957)). The preparation was then covered with a round cover slip and sealed with Glyceel (GURR-BDH Chemicals Ltd.). From these preparations, drawings were made of the sclerotised pieces of the haptor and of the copulatory complex using a camera lucida. Measurements, made with a digitiser, in micrometers, and presented as the mean \pm standard deviation followed by the range in parentheses, are those proposed by Gussev (1962) (Fig. 1). The method of numbering of the haptoral pieces is that adopted at ICOPA IV (Euzet & Prost, 1981). Terminology is that of Pariselle and Euzet (1995) and N'Douba *et al.* (1999).

DESCRIPTION

PANGASITREMA N. G., N. SP.

Diagnosis: Ancylo-discoididae. Three pairs of head glands. Rare ocellar granulae. Haptor with two pairs of gripi. Ventral gripus, morphologically original, with cuneus. Ventral transverse bar absent. Dorsal gripus with dorsal transverse bar. Fourteen uncinuli. Vas deferens arising from anterior region of testis, looping left intestinal branch, ascending, forming anterior blind saccular vesicle. Copulatory organ with penis, accessory piece. Ovary anterior to testis. Medioventral vaginal opening. Tubular sclerotised vagina. Eggs ovoid. Parasites of pangasiid fishes.

Comments

This new genus is easily distinguished from all others described from catfish hosts in having no ventral transverse bar, a medioventral vaginal opening, a very special ventral gripus morphology, cuneus associated with ventral gripus (not with dorsal ones as the case in *Thaparocleidus* Jain, 1952, the only other genus of monogeneans described on pangasiid fishes).

Pangasitrema n. g. is named after the host family (Pangasiidae).

PANGASITREMA CAMILLAE N. G., N. SP.

(Figs 2, 3)

Type host: *Pangasius polyuranodon* Bleeker, 1852.

Site: gills.

Type locality¹: Barito River at Banjarmasin (Central Kalimantan Province, Borneo Island, Indonesia).

Material studied: 18 individuals fixed and mounted in Malmberg solution.

Type-material: holotype deposited at the Muséum National d'Histoire Naturelle (Paris): 21 HG Tg 140. Paratypes deposited at the Muséum National d'Histoire Naturelle (Paris): 21 HG Tg 141 & Tg 142.

Adults $3,035 \pm 652.5$ (1,434-3,980) long, 348 ± 38.3 (253-436) wide at level of penis. Pharynx 156 ± 15.4 (127-189) wide. Dorsal gripus with blade bent at distal third, poorly marked guard: a = 29 ± 1 (27-32), b = 23 ± 1.2 (21-27), c = 1 ± 0.2 (1-2), d = 8 ± 0.7 (7-9), e = 13 ± 0.8 (12-15), no cuneus. Open V-shaped dorsal transverse bar²: x = 20 ± 1.2 (17-22), w = 3 ± 0.4 (2-4). Strong ventral gripus with irregular, fibrous parts, each apparently serving as attachment of muscles associated with these gripi, very small aperture: T = 34 ± 3.8 (25-42), L = 22 ± 0.7 (21-24), e = 14 ± 0.9 (12-15). Ventral

¹ See Conclusion.

² One specimen seems to have no dorsal transverse bar, while the haptor and other sclerotised pieces are in good condition.

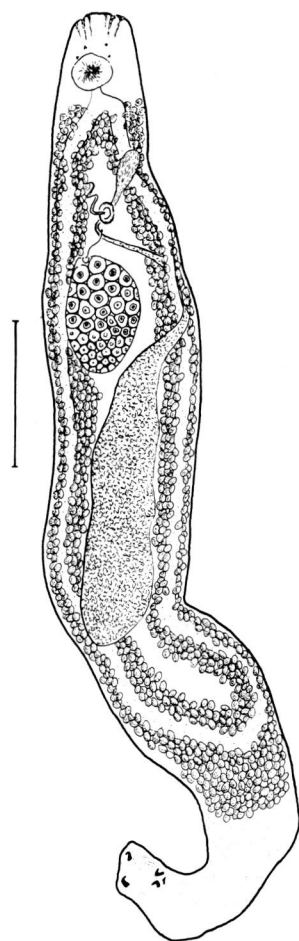


Fig. 2. – *Pangasitrema camillae*. n. g., n. sp. Habitus, ventral view. Bar = 0,5 mm.

cuneus: $L = 21 \pm 1.3$ (19-23), $l = 5 \pm 0.7$ (4-7). Thin uncinuli II = 15 ± 0.9 (14-18), uncinuli I, III-VII = 16 ± 2.7 (10-20). Long, sinuous penis (1.5 to 2 turns) winded round the accessory piece, with poorly developed basal bulb, directly attached on cupule like-structure (Cu = 88 ± 6.6 (76-98)), no heel: Pe = 282 ± 7.7 (264-298). Long accessory piece linked to cupule-like structure near the penis attachment: Ap = 113 ± 6.5 (99-125). Long, sinuous vagina, with "glands" associated with extremity opposite to opening: L = 156 ± 8.9 (142-168), $l = 5 \pm 0.6$ (4-7). Egg ovoid, $140 \times 57.5 \mu\text{m}$ *in utero*.

Comments

A question remains about this new species (and genus) as the haptoral development was not observed: are the pieces associated with the ventral gripus a true cuneus or the vestiges of the ventral transverse bar?

The species is named for Camille Pariselle who helped us in the morphological description and drawing of type material during a teaching practice.

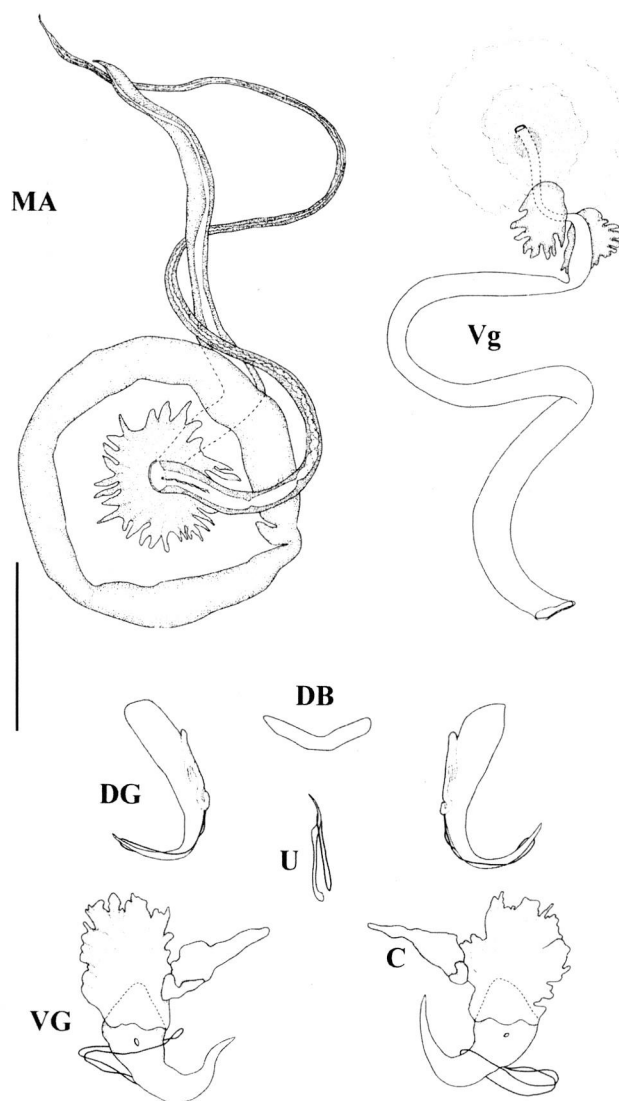


Fig. 3. – *Pangasitrema camillae* n. g., n. sp. C = cuneus; DB = dorsal transverse bar; DG = dorsal gripus; MA = male apparatus; VG = ventral gripus; Vg = vagina; U = uncinuli. Bar = 30 μm .

CONCLUSIONS

Of 988 monogeneans recovered from seven *P. polyuranodon* in Southeast Asia, only 18 are specimens of *Pangasitrema*, the other 970 belong to several species of *Thaparocleidus*. *P. camillae* n. g., n. sp. was found in small numbers on the host (0 to 8 per host), firmly attached together at the extremity of one or two gill filaments only. A comparable mode of strong attachment at the end part of a gill filament exists in some monogenean parasites of African characids (Teleostei). It was observed for species of *Characidotrema* Paperna, 1969, particularly in *C. elongata* Paperna & Thurston, 1968 a gill parasite

of *Brycinus nurse* (Rüppel, 1832) (personal observation: L. Euzet)

One specimen of a very similar worm was found on the gills of *Pangasius macronema* Bleeker, 1951 from cage culture at Chau Doc (Mekong Delta, Vietnam). As the measurements of the sclerotised parts are always smaller (eg. penis 199 vs 282 µm; length of vagina 108 vs 156 µm; dorsal gripus a 22 vs 29 µm; ventral gripus L 18 vs 22 µm; etc.) nothing could be concluded concerning its identity or if it represents a lateral transfer from *P. polyuranodon* which was also present in the cages. The present species increases the number of monogenean species described on 16 species of pangasiids hosts (*P. bocourti*, *P. djambal*, *P. gigas*, *P. humeralis*, *P. hypophthalmus*, *P. kinabatanganensis*, *P. krempfi*, *P. kunyit*, *P. lithostoma*, *P. mekongensis*, *P. nasutus*, *P. nieuwenhuisii*, *P. pangasius*, *P. polyuranodon*, *P. rheophilus* and *P. sababensis*) to 28.

ACKNOWLEDGEMENTS

This work was part of a project on the characterisation, utilisation and maintenance of biological diversity in relation to the diversification and sustainability of catfish culture in Southeast Asia supported by a European Commission (grant IC18-CT96-0043).

Drawings by Dr. N. Le Brun.

REFERENCES

- EUZET L. & PROST M. Report of the meeting on Monogenea: problems of systematics, biology and ecology, *in*: Review of advances in parasitology, Slusarski W. (ed.), PWN Polish Scientific Publishers, Warsaw, 1981, 1003-1004.
- GUSSEV A.V. *In*: Key to parasites of freshwater fish of the USSR, Bychovskaya-Pavlovskaya I.E. *et al.* (eds). *Academiya Nauk SSSR, Moscow-Leningrad, 1962*, 919 pp. (In Russian: English translation IPST, Ser. No. 1136, Jerusalem, 1964).
- LIM L.H.S. *Silurodiscoides* Gussev, 1961 (Monogenea: Ancyrocephalidae) from *Pangasius sutchi* Fowler, 1931 (Pangasiidae) cultured in Peninsular Malaysia. *Raffles Bulletin of Zoology*, 1990, 38, 55-63.
- MALMBERG G. On the occurrence of *Gyrodactylus* on Swedish fishes. *Skrifter utgivna av Södra Sveriges Fiskeriförening*, (1956), 1957, pp. 19-76 (In Swedish, with description of species and a summary in English).
- N'DOUBA V., LAMBERT A. & EUZET L. Gill parasites of the genus *Quadriacanthus* Paperna, 1961 from *Heterobranchius longifilis* and *H. isopterus* with description of seven new species from Côte d'Ivoire, West Africa. *Systematic Parasitology*, 1999, 44, 105-118.
- PARISELLE A. & EUZET L. Gill parasites of the genus *Ciclidogyrus* Paperna, 1960 (Monogenea, Ancyrocephalidae) from *Tilapia guineensis* (Bleeker, 1862), with descriptions of six new species. *Systematic Parasitology*, 1995, 30, 187-198.
- PARISELLE A., LIM L.H.S. & LAMBERT A. Monogeneans from Pangasiidae (Siluriformes) in Southeast Asia: I. Five new species of *Thaparocleidus* Jain, 1952 (Ancylo-discoidinae) from *Pangasius pangasius*, *P. kinabatanganensis*, *P. rheophilus* and *P. nieuwenhuisii*. *Parasite*, 2001a, 8, 127-135.
- PARISELLE A., LIM L.H.S. & LAMBERT A. Monogeneans from Pangasiidae (Siluriformes) in Southeast Asia: II. Four new species of *Thaparocleidus* Jain, 1952 (Ancylo-discoidinae) from *Pangasius humeralis*. *Parasite*, 2001b, 8, 317-324.
- PARISELLE A., LIM L.H.S. & LAMBERT A. Monogeneans from Pangasiidae (Siluriformes) in Southeast Asia: III. Five new species of *Thaparocleidus* Jain, 1952 (Ancylo-discoididae) from *Pangasius bocourti*, *P. djambal* and *P. hypophthalmus*. *Parasite*, 2002a, 9, 207-217.
- PARISELLE A., LIM L.H.S. & LAMBERT A. Monogeneans from Pangasiidae (Siluriformes) in Southeast Asia: IV. Five new species of *Thaparocleidus* Jain, 1952 (Ancylo-discoididae) from *Pangasius krempfi*, *P. kunyit*, *P. mekongensis* and *P. sababensis*. *Parasite*, 2002b, 9, 315-324.
- PARISELLE A., LIM L.H.S. & LAMBERT A. Monogeneans from Pangasiidae (Siluriformes) in Southeast Asia: V. Five new species of *Thaparocleidus* Jain, 1952 (Ancylo-discoididae) from *Pangasius nasutus*. *Parasite*, 2003, 10, 317-323.
- TRIPATHI Y.R. Monogenetic trematodes from fishes in India. *Indian Journal of Helminthology*, 1957, 9, 1-149.

Reçu le 1^{er} octobre 2003
 Accepté le 3 mars 2004