MONOGENEANS FROM PANGASIIDAE (SILURIFORMES) IN SOUTHEAST ASIA: IX. TWO NEW SPECIES OF *THAPAROCLEIDUS* JAIN, 1952 (ANCYLODISCOIDIDAE) FROM *PANGASIUS MAHAKAMENSIS*

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Summary:

The examination of gill parasites from *P. mahakamensis* Pouyaud, Gustiano & Teugels, 2002 (Siluriformes, Pangasiidae) in Southeast Asia revealed the presence of three species of Monogenea. One (*Thaparocleidus caecus* (Mizelle & Kritsky, 1969)) had been previously described. The other two, belonging to *Thaparocleidus* Jain, 1952 (Monogenea, Ancylodiscoididae) as defined by Lim (1996) and Lim *et al.* (2001), are considered new species: *T. pouyaudi* n. sp. and *T. teugelsi* n. sp.

KEY WORDS : Monogenea, Ancylodiscoididae, *Thaparocleidus pouyaudi* n. sp., *Thaparocleidus teugelsi* n. sp., freshwater fish, Siluriformes, Pangasiidae, *Pangasius mahakamensis*, Southeast Asia.

Résumé : MONOGÈNES DE PANGASIIDAE (SILURIFORMES) EN ASIE DU SUD-EST : IX. DEUX ESPÈCES NOUVELLES DE *THAPAROCLEIDUS* JAIN, 1952 (ANCYLODISCOIDIDAE) CHEZ *PANGASIUS MAHAKAMENSIS*

L'examen des parasites branchiaux de Pangasius mahakamensis *Pouyaud, Gustiano & Teugels, 2002 (*Siluriformes, Pangasiidae*) a révélé la présence de trois espèces de Monogenea. Une (*Thaparocleidus caecus *(Mizelle & Kritsky, 1969) a déjà été décrite. Les deux autres, appartenant au genre* Thaparocleidus *Jain, 1952 (Ancylodiscoididae) tel que défini par Lim (1996) et Lim* et al. *(2001), sont considérées comme nouvelles :* T. pouyaudi *n. sp. et* T. teugelsi *n. sp.*

MOTS CLÉS : *Monogenea, Ancylodiscoididae,* Thaparocleidus pouyaudi *n. sp.,* Thaparocleidus teugelsi *n. sp., poisson d'eau douce, Siluriformes, Pangasiidae,* Pangasius mahakamensis, *Asie du Sud-Est.*

INTRODUCTION

Within the framework of an European Commission project on the biodiversity and culture of Southeast Asian catfishes, the gills from pangasiid fishes (Siluriformes, Pangasiidae) were examined for monogeneans. This paper presents the descriptions of two new species of *Thaparocleidus* Jain, 1952 (Monogenea, Ancylodiscoididae) found on *P. mahakamensis* Pouyaud, Gustiano & Teugels, 2002. This endemic fish species had not been previously examined for parasites. To date, 38 species of Monogenea (37 *Thaparocleidus* and one *Pagasitrema* Pariselle, Euzet & Lambert 2004) have been described from seventeen *Pangasius* species (*P. bocourti* Sauvage, 1880; *P. djambal* Bleeker, 1846; *P. elongatus* Pouyaud, Gustiano & Teugels, 2002; *P. gigas* Chevey, 1930; *P. humeralis* Roberts, 1989; *P. hypophthalmus* (Sauvage, 1878); *P. kinabatanganensis* Roberts & Vidthayanon, 1991; *P. krempfi* 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. polyuranodon* Bleeker, 1852; *P. rheophilus* Pouyaud & Teugels, 2000 and *P. sabahensis* Gustiano, Teugels & Pouyaud, 2003) from India, Bangladesh, Indonesia, Malaysia, Thailand and Vietnam (see Tripathi, 1957; Lim, 1990; Pariselle *et al.* 2001a, b, 2002a, b, 2003, 2004a, b and 2005).

MATERIALS AND METHODS

Fish, caught by hook and line, were bought in fish markets or directly from fishermen in Indonesia (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 gill using a strong water current. The worms were then transferred individually into a drop of ammonium picrate-glycerine (mixture described by Malmberg (1957)) on a slide with a mounted needle. The preparation was then covered with a round cover slip and sealed with Glyceel (GURR-BDH Chemicals Ltd.). From these preparations, drawings

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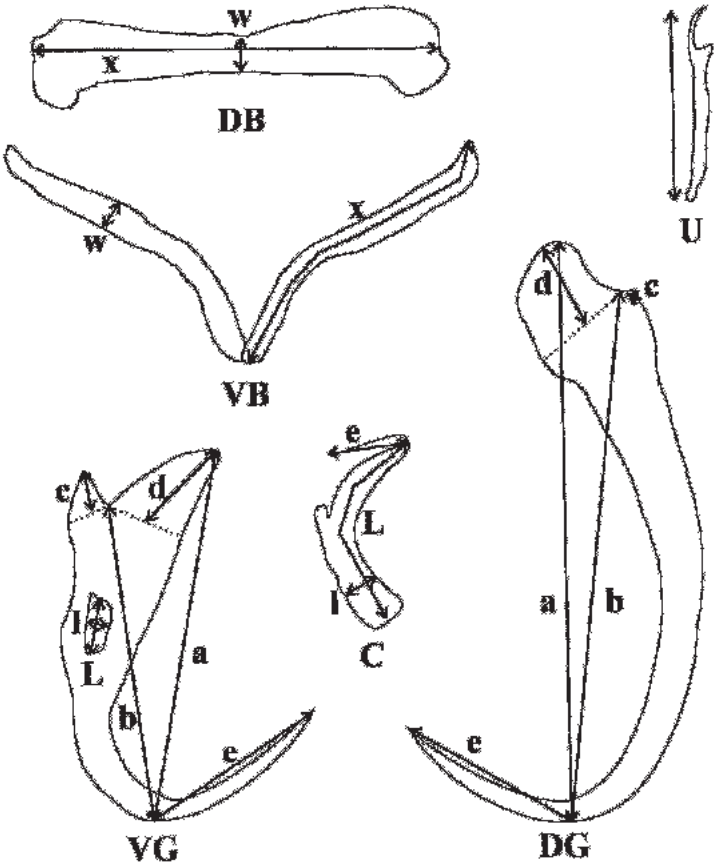

Fig. 1. – Measurements used in this study.
C = cuneus: L = length; l = largest width; e = extension length.
DB = dorsal transverse bar: x = total length; w = width in the middle.
DG = dorsal gripus: a, b, c, d and e = standard measurements.
MA = male apparatus: Pe = total length of the penis; Ap = length of the accessory piece; He = length of the heel.
U = total length of the uncinuli.
VB = ventral transverse bar: x = length of one branch; w = largest width.
VG = ventral gripus: a, b, c, d and e = standard measurements; L and l = length and width of gripus aperture.

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 ± 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). Terminologies are that of Pariselle and Euzet (1995) and N'Douba *et al.* (1999).

RESULTS

Three species of gill Monogenea were recovered in Southeast Asia from *Pangasius mahakamensis* (Siluriformes, Pangasiidae). One had been previously described (*T. caecus* (Mizelle & Kritsky, 1969), see "Conclusions" below). The remaining two species are considered new (see descriptions below), and their anatomy (soft and hard parts) complies with that of *Thaparocleidus* Jain, 1952 (Monogenea, Ancylodiscoididae) as defined by Lim (1996) and Lim *et al.* (2001).

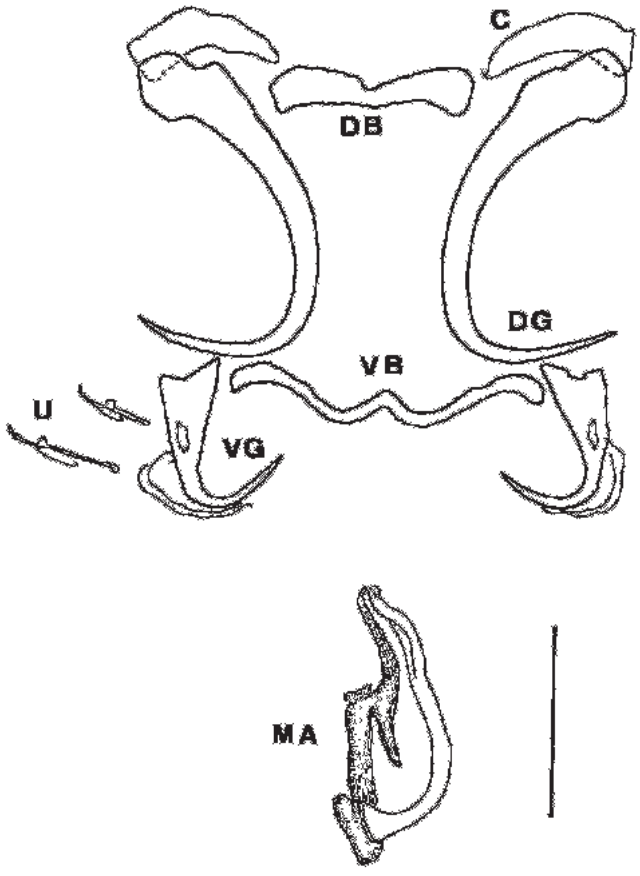

Fig. 2. – *Thaparocleidus pouyaudi* n. sp. C = cuneus; DB = dorsal transverse bar; DG = dorsal gripus; MA = male apparatus; VB = ventral transverse bar; VG = ventral gripus; U = uncinuli. Bar = 30 µm.

DESCRIPTIONS

THAPAROCLEIDUS POUYAUDI N. SP. (Fig. 2)

Type host: *Pangasius mahakamensis* Pouyaud, Gustiano & Teugels, 2002.

Site: gills.

Type locality: Mahakam River at Samarinda (East Kalimantan Province, Borneo Island, Indonesia).

Material studied: 30 individuals fixed and mounted in Malmberg solution.

Type material: holotype deposited at the Muséum National d'Histoire Naturelle (Paris): n° 254 HG, Ti 140. Paratype deposited at the Muséum National d'Histoire Naturelle (Paris): n° 254 HG, Ti 140 bis.

Adults: 684 ± 87.6 (531-830) long, 88 ± 14.9 (63-116) wide at the level of the penis. Pharynx: 45 ± 4.6 (36-53) wide. Dorsal gripus with blade bent at distal quarter: a = 51 ± 1.6 (47-55), b = 47 ± 1.6 (43-50), c = 1 ± 0.2 (0.4-2), d = 8 ± 0.7 (6-10), e = 19 ± 1.2 (16-22). Curved cuneus with very short extension: L = 22 ± 1.1 (19-24), l = 6 ± 0.5 (5-7), e = 1 ± 1 (0.1-4). Straight dorsal transverse bar with rounded extremities: x = 28 ± 1.3 (25-30), w = 3 ± 0.5 (3-5). Ventral gripus with marked aperture and guard: a = 23 ± 0.7 (22-24), b = 20 ± 0.8 (18-22), c = 2 ± 0.4 (2-3), d = 6 ± 0.6 (5-8), e = 12 ± 0.6 (11-13), L = 4 ± 0.5 (3-6), l = 2 ± 0.2 (1-2). V-shaped ventral transverse bar: x = 25 ± 1.2 (22-28), w = 3 ± 0.4 (2-4). Uncinuli II = 16 ± 0.8 (13-18), uncinuli I and III to VII = 16 ± 2.5 (9-19). J-shaped penis: Pe = 49 ± 1.9 (46-52), heel: He = 3 ± 0.4 (2-3). Slightly sinuous accessory piece with posterior extention at the middle: Ap = 31 ± 1.3 (29-34). No visible vagina.

Comments

T. pouyaudi n. sp. belongs to the group characterised by the presence of mid-sized (between 15 and 25 µm long) curved cuneus without a bubbled protuberance on the convex side and a very short extension (less than 5 µm). This group consist of five species, three (*T. brevicochleus* Pariselle, Lim & Lambert, 2001, *T. levangi* Pariselle, Lim & Lambert, 2004; and *T. slembroucki* Pariselle, Lim & Lambert, 2004) have a cupule-like structure associated with the penis (absent in *T. pouyaudi*); one has an extremely long and thin penis (*T. euzeti* Pariselle, Lim & Lambert, 2002); and one (*T. meburus* Pariselle, Lim & Lambert, 2002) has a visible vagina (*vs.* not visible) and a different shape of penis and accessory piece.

The name *Thaparocleidus pouyaudi* n. sp. is proposed for Dr Laurent Pouyaud from IRD (ex-ORSTOM) who described the new endemic host species and helped in collecting the fish samples.

THAPAROCLEIDUS TEUGELSI N. SP. (Fig. 3)

Type host: *Pangasius mahakamensis* Pouyaud, Gustiano & Teugels, 2002.

Site: gills.

Type locality: Mahakam River at Samarinda (East Kalimantan Province, Borneo Island, Indonesia).

Material studied: 30 individuals fixed and mounted in Malmberg solution.

Type material: holotype deposited at the Muséum National d'Histoire Naturelle (Paris): n° 255 HG, Ti 141. Paratype deposited at the Muséum National d'Histoire Naturelle (Paris): n° 255 HG, Ti 141 bis.

Adults: 659 ± 82.4 (512-793) long, 96 ± 16.1 (57-140) wide at the level of the penis. Pharynx: 49 ± 7.3 (38-71) wide. Dorsal gripus with blade bent at distal quarter and marked guard: a = 48 ± 1.3 (45-52), b = 44 ± 1.2 (41-47), c = 2 ± 0.4 (1-3), d = 7 ± 0.7 (6-9), e = 13 ± 1.2 (10-16). Large and curved cuneus with thin extension (sometimes not visible, see measurements) and a marked protuberance on the convex side: L = 28 ± 1 (25-30), l = 6 ± 0.4 (5-7), e = 3 ± 2 (0-7). Straight dorsal transverse bar: x = 38 ± 1.3 (35-41), w = 4 ±

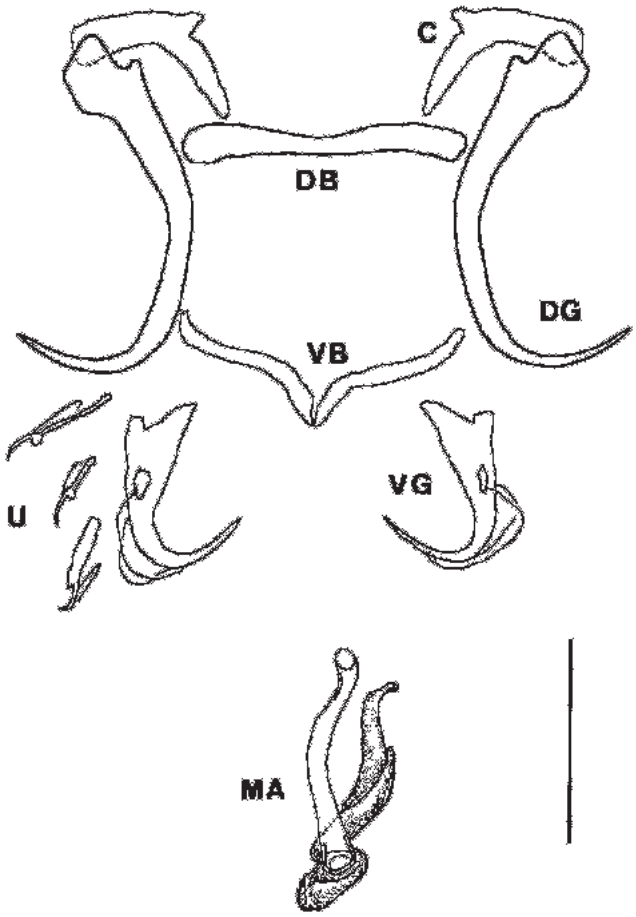

Fig. 3. – *Thaparocleidus teugelsi* n. sp. C = cuneus; DB = dorsal transverse bar; DG = dorsal gripus; MA = male apparatus; VB = ventral transverse bar; VG = ventral gripus; U = uncinuli. Bar = 30 µm.

0.4 (3-5). Ventral gripus with marked aperture and guard: a = 24 ± 0.6 (23-25), b = 20 ± 0.6 (19-21), c = 2 ± 0.3 (1-3), d = 7 ± 0.6 (5-8), e = 12 ± 0.8 (10-14), L = 5 ± 0.5 (3-6), l = 2 ± 0.3 (1-3). V-shaped ventral transverse bar: x = 25 ± 1 (22-26), w = 3 ± 0.4 (2-4). Uncinuli II = 17 ± 0.7 (14-18), uncinuli I and III to VII = 16 ± 2.4 (9-20). Large and short S-shaped penis, with a poorly marked basal bulb, a sub-terminal opening, and a well developed heel: Pe = 33 ± 1.2 (31-35), He = 4 ± 1.2 (2-6). S-shaped accessory piece made up of two simple parts, the proximal one attached to the basal bulb of the penis: Ap = 30 ± 2 (26-38). No visible vagina.

Comments

T. teugelsi n. sp. belongs to the group characterised by the presence of a well marked bubbled protuberance on the convex side of the cuneus. This new species is easily distinguishable from *T. chandpuri* Pariselle, Lim & Lambert, 2001; *T. sabanensis* Pariselle, Lim & Lambert, 2001; *T. redebensis* Pariselle, Lim & Lambert, 2001; *T. phuongi* Pariselle, Lim & Lambert, 2002; *T. infundibulus* Pariselle, Lim & Lambert, 2005; *T. caestus* Pariselle, Lim & Lambert, 2004 and *T. crassipenis* Pariselle, Lim & Lambert, 2004 in having a large penis with an oval sub-terminal opening. *T. teugelsi* n. sp. is close to *T. sudartoi* Pariselle, Lim & Lambert, 2005 but differs by the shape and size of the penis [S-shaped and 33 µm (*T. teugelsi*), *vs.* curved and 42 µm (*T. sudartoi*)], and the shape of the cuneus protuberance (more marked in *T. teugelsi* n. sp.).

The name *Thaparocleidus teugelsi* n. sp. is proposed for our late lamented colleague Pr Guy G. Teugels from MRAC (Tervuren) who describe the new endemic host species.

CONCLUSIONS

The presence of *T. caecus* on *P. mahakamensis* may be the result of a lateral transfer of this parasite between *P. hypophthalmus* (introduced for culture purpose in the Mahakam River) and the local *P. mahakamensis*, as these two host species are not phylogenetically related (see Pouyaud *et al.*, 2000 and comments in Pariselle *et al.*, 2002a). Furthermore, only eleven *T. caecus* were recovered among more than 200 worms collected from *P. mahakamensis*.

The present two new species bring the number of monogenean species described on 18 species of pangasiids (*P. bocourti*, *P. djambal*, *P. elongatus*, *P. gigas*, *P. humeralis*, *P. hypophthalmus*, *P. kinabatanganensis*, *P. krempfi*, *P. kunyit*, *P. lithostoma, P. mahakamensis*, *P. mekongensis*, *P. nasutus, P. nieuwenhuisii*, *P. pangasius*, *P. polyuranodon, P. rheophilus* and *P. sabahensis*) to 40.

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