RAFFLES BULLETIN OF ZOOLOGY 1990 **38**(1): 55-63

SILURODISCOIDES GUSSEV, 1961 (MONOGENEA: ANCYROCEPHALIDAE) FROM *PANGASIUS SUTCHI* FOWLER, 1931 (PANGASIIDAE) CULTURED IN PENINSULAR MALAYSIA.

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ABSTRACT. - Two species of *Silurodiscoides* Gussev, 1961 (Monogenea: Ancyrocephalidae) have been obtained from *Pangasius sutchi* Fowler, 1931 imported from Thailand and cultured in Peninsular Malaysia. They are *Silurodiscoides caecus* (Mizelle & Kritsky, 1969) Gussev, 1978 and *Silurodiscoides siamensis*, new species. A redescription of *S. caecus* is given. *Silurodiscoides caecus* was first described from an unidentified fish imported into the United States from Thailand. This study shows that the host species is probably *P. sutchi* or a related *Pangasius* species.

INTRODUCTION

The only known monogenean from *Pangasius* species is *Silurodiscoides pangasi* (Tripathi, 1957) Gussev, 1978 described from *Pangasius pangasius* in India. This species was first described as *Haplocleidus pangasi* by Tripathi (1957).

Two species of *Silurodiscoides* Gussev, 1961 were collected by the author from *Pangasius sutchi* Fowler, 1931 reared in two different farms in Puchong, Selangor (in 1979 and 1989) and a farm in Malacca (in 1986). One was identified as *Silurodiscoides caecus* (Mizelle & Kritsky, 1969) Gussev, 1978, while the other species is here described as new. *Silurodiscoides caecus* was first collected from an unidentified aquarium fish in the United States which was imported from Thailand and described as *Ancylodiscoides caecus* by Mizelle & Kritsky (1969). It was renamed *Silurodiscoides caecus* by Gussev (1978).

This paper presents a redescription of *S. caecus* and the description of the new *Silurodiscoides* species, here named *Silurodiscoides siamensis*, obtained from the gills of *Pangasius sutchi* imported from Thailand and cultured in Peninsular Malaysia. A redescription of *S. caecus* is necessary because of several observed differences between the present specimens of *S. caecus* and the type description.

MATERIALS AND METHODS

The fishes (both normal and albino varieties) were bought from farms in Selangor and Malacca, Peninsular Malaysia. The gills were removed and monogeneans dislodged by

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gently scrapping the gills with a bent needle. These were studied alive under a phase contrast microscope, and later fixed in ammonium-picrate-glycerine. The hard parts of these monogeneans were measured (in micrometer, μm) and drawn with the aid of a camera lucida using these ammonium-picrate-fixed preparations. The terminologies used were explained in Lim & Furtado (1986).

Specimens are deposited in the Zoological Reference Collection (ZRC), Department of Zoology, National University of Singapore; and the author's collection at the University of Malaya (UMP).

TAXONOMY

FAMILY ANCYROCEPHALIDAE BYCHOWSKY & NAGIBINA, 1978
SUBFAMILY ANCYLODISCOIDINAE GUSSEV, 1961

Silurodiscoides caecus (Mizelle & Kritsky, 1969) Gussev, 1978
(Figs. 1, 3).

Material. - Host: *Pangasius sutchi* Fowler, 1931. Localities: Puchong fish farms, Selangor (1979, normal variety; 1989, albino variety); Malacca fish farm (1986, normal variety). Number of parasites measured: 10. Number of fishes examined: 20. Specimens: UMP 164, host number MPP3 from Malacca fish farm.

Description. - Monogeneans of size 833(333-1000) x 149(124-183) with 4 granulated eyespots. 14 marginal hooks, length 11(10-12), all morphological similar except for hook 2 close to ventral anchors. Dorsal anchors with inner length 43(40-44), inner root 10(8-12), stumpy outer root and recurved point 12(12-14). Triangular patch ending in a spine, size 8(7-9) x 4(3-5). Ventral anchors with length 20(19-21), roots not well developed, recurved point 8(8-10) and broad fenestrated base. Dorsal bar broad v-shape, size 44(44-52) x 2(2-4); ventral bar flattened v-shape, length of one side 25(22-26).

Vaginal opening ventral, midbody, posterior to copulatory organ, connected by short vaginal tube to large oval-shaped seminal receptacle which opens into a common area together with uterus and a trilobed structure. Ovary single, anterior to testis. Oviduct arises from anterior part of ovary, opens into trilobed structure. Within trilobed structure are ova and sperms suggesting that it is either a storage chamber for ripened eggs and sperms or the ootype. Uterine pore and copulatory tube probably share common sex atrium. Vitellaria co-extensive with intestines, confluencing at anterior, posterior and midbody. Vas deferens leaves anterior of testis crosses diagonally along dorsal to left side, loops round left intestinal limb to ventral side, dilates to form ovoid seminal vesicle. Ductus ejaculatorius leaves seminal vesicle to enter initial part of copulatory tube. Copulatory organ consists of tapering sigmoid tube, length 62(60-64), with spine-like structure near distal end, funnel-shaped initial, and grooved accessory piece with expanded distal part, length 41(40-44). Prostatic gland bulb-shape with duct which dilates slightly before entering initial part of copulatory tube. Egg spindle-shape with short processes at each end.

Remarks. - The hard parts of the present specimens of *S. caecus* are slightly smaller compared to those in the original description (see Mizelle & Kritsky, 1969).

There are also several discrepancies between the present redescription and the original description. According to the original description, eyespots are not present except for eyespots granules. This is probably just a matter of terminology, and the granulated eyespots are considered as eyespots here. Mizelle & Kritsky (1969) noted the presence of three or four subovate ovaries. In the present specimens, three subovate structures are also observed, but they are not the ovary as inferred by Mizelle & Kritsky (1969) but probably the ootype, or a storage chamber (as in capsalids) for ripened eggs and sperms (see Bychowsky, 1957). The single ovary is located posterior to these three subovate structures. This trilobed structure requires further elucidation. There is no mention in the original description of the uterus and egg.

Silurodiscoides siamensis, new species

(Figs. 2, 4)

Material. - Host: *Pangasius sutchi* Fowler, 1931. Localities: Malacca fish farm (1986, normal variety); Puchong fish farm, Selangor (1989, albino variety). Number of parasites measured: 10. Number of fishes examined: 20. Type specimens: Holotype (UMP 162, host number PS 25.2.86), paratypes (UMP 163, host number PS 25.2.86), paratype (ZRC 1990. 8824 – 8825 field number Pp 12, ZRC 1990. 8826 field number Pp 18); all from Malacca fish farm.

Description. - Monogeneans with 4 granulated eyespots. 14 marginal hooks, length 14(13-15), morphologically similar except for hook 2. Dorsal anchors with length 64(60-70), without roots, and recurved point 33(28-38). Large knee-shaped patches, size 30(24-36) x 14(12-20). Ventral anchors with inner length 23(22-24), outer length 21(20-22), inner root 8(8-10), outer root 3.5(2-4), broad fenestrated base and recurved point 13(12-14). Dorsal bar broad shallow v-shape, 8(8-10) x 40(36-44); ventral bar flattened out V-shape, length of one side 28(24-30).

Vaginal apparatus not observed in most specimens; in some, a small bulbous structure (probably seminal receptacle) could be seen opening into ootype. Three lightly sclerotised tubes, probably two vitelline ducts and one vaginal duct, enter ootype. Ootype opens into uterus. Single ovoid ovary anterior to single testis. Oviduct leaves anterior of ovary to ootype. Uterus sac-like; uterine opening ventral, midbody, below copulatory organ. Vitellaria co-extensive with intestines, confluencing at anterior, posterior and mid region. Vas deferens leaves anterior part of testis, crosses along dorsal side diagonally to left side, loops round left intestinal tract to ventral side, extends upwards forming thin, long blind seminal vesicle sac, ductus ejaculatorius leaves seminal vesicle to enter initial part of copulatory tube. In some cases the ductus ejaculatorius seems to empty into region around the initial part of the copulatory organ, which probably functions as a secondary storage chamber for sperms. Copulatory organ consists of slightly undulating tube, length 97(90-100), diameter 3(2-4), with lightly sclerotised funnel-like accessory piece length 120(110-134). Prostatic gland small, sited near initial part of copulatory organ, point of entry into copulatory tube not clear. Egg spindle-shape with long filaments at each end.

Etymology. - This species is named *Silurodiscoides siamensis* because of the origin of the host species in Siam or Thailand.

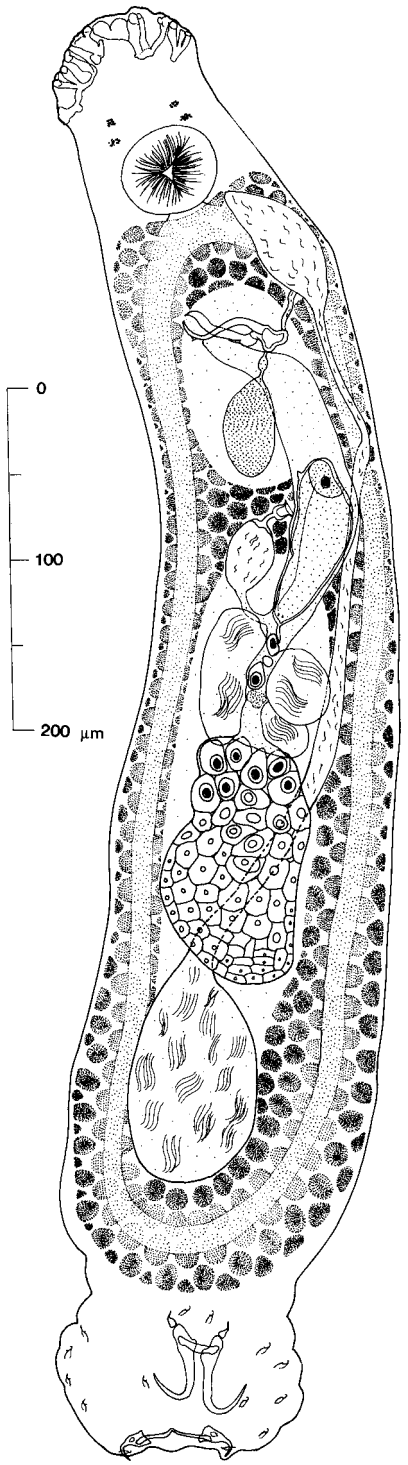

Fig. 1. Composite illustration of *Silurodiscoides caecus* (Mizelle & Kritsky, 1969) Gussev, 1978.

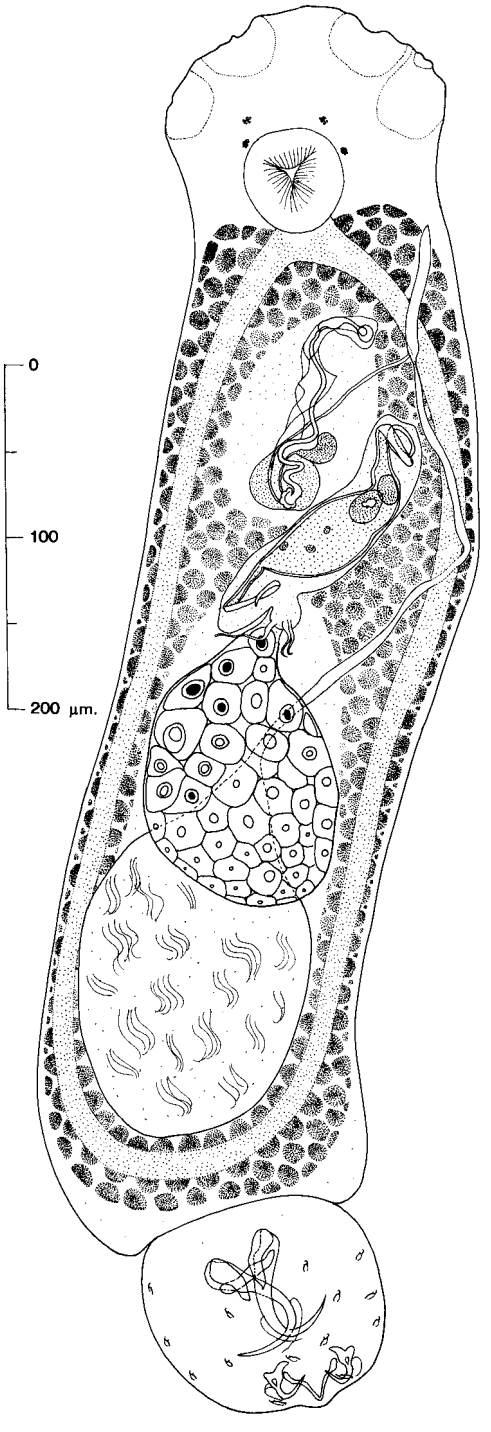

Fig. 2. Composite illustration of *Silurodiscoides siamensis*, new species.

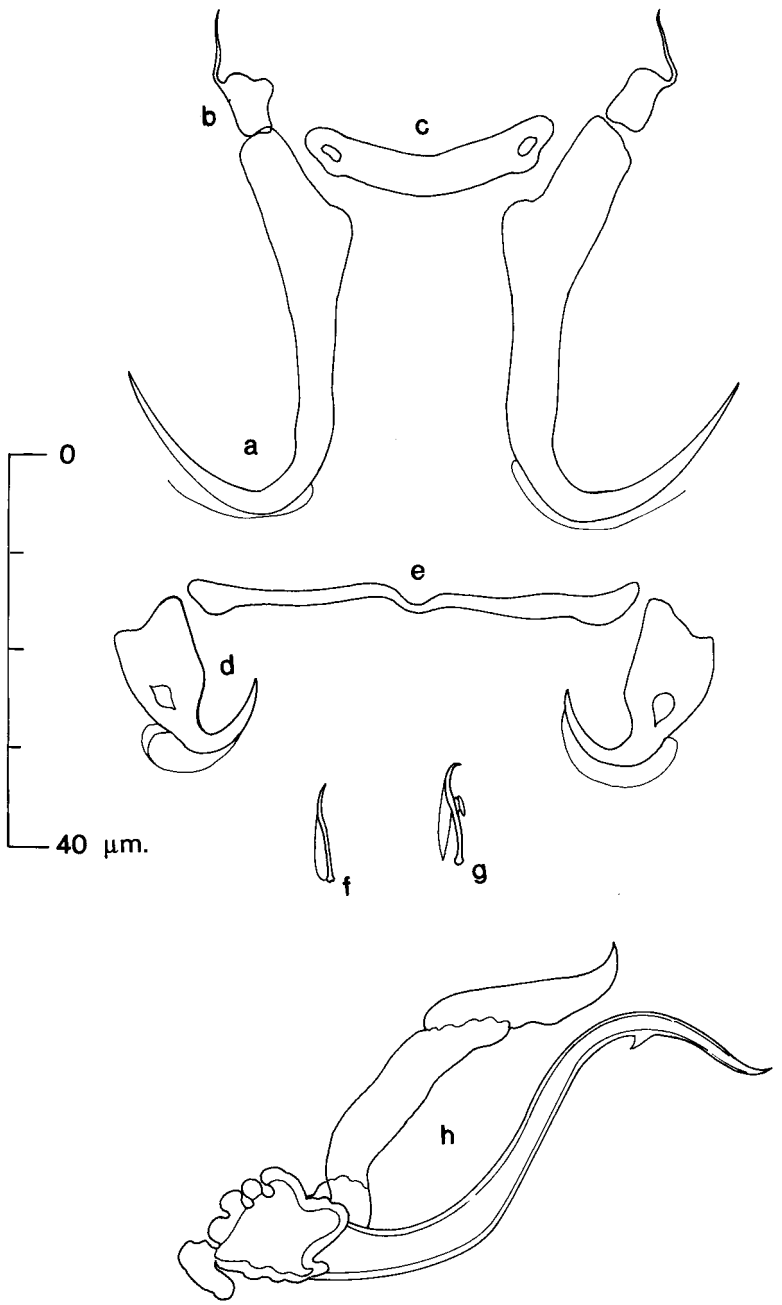

Fig. 3. Hard parts of *Silurodiscoides caecus* (Mizelle & Kritsky, 1969) Gussev, 1978. a, dorsal anchor, b, patch; dorsal bar, d, ventral anchor; e, ventral bar; f, second marginal hook, g, marginal hook; h, copulatory organ.

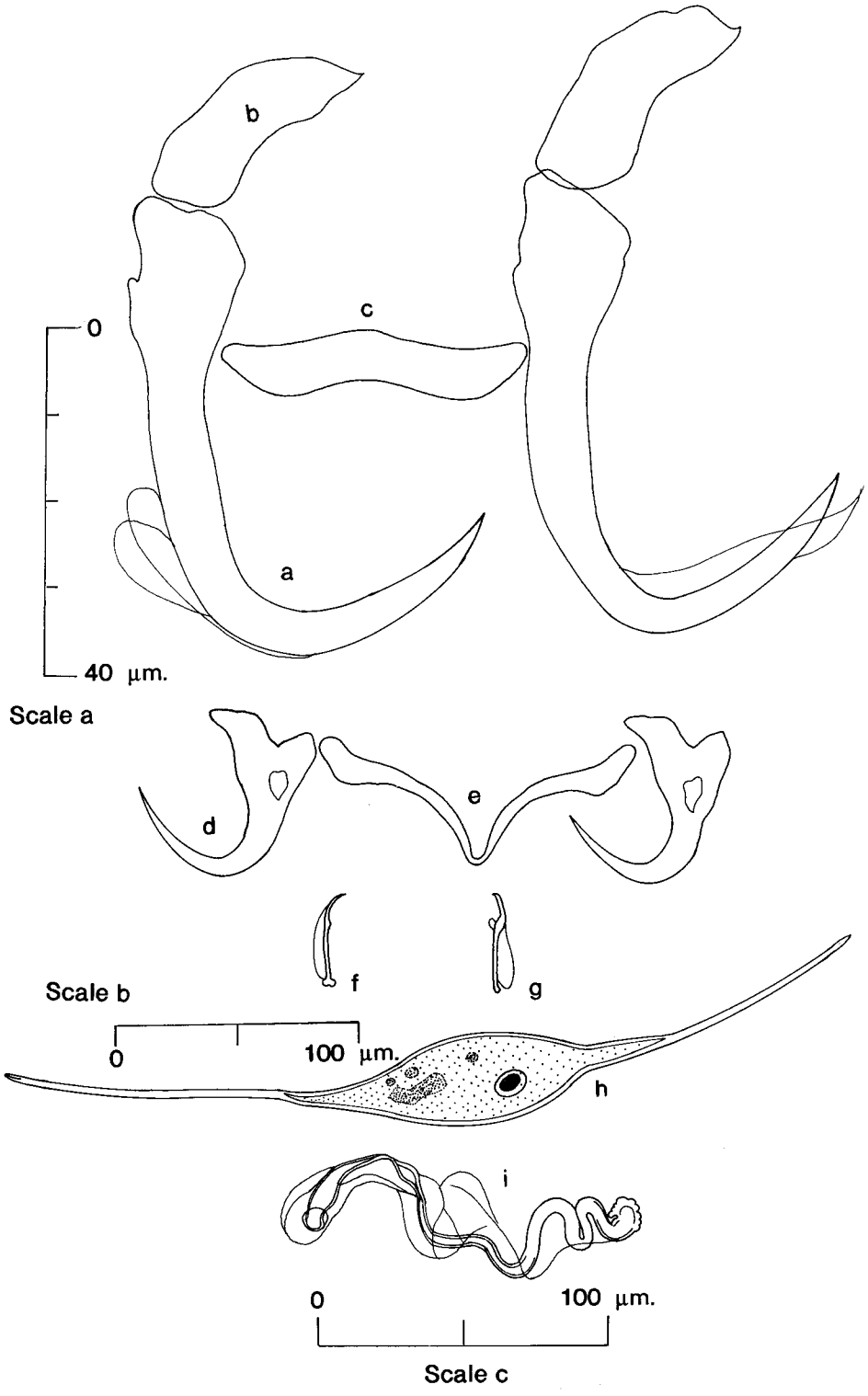

Fig. 4. Hard parts of Silurodiscoides siamensis, new species. a, dorsal anchor; b, patch; c, dorsal bar; d, ventral anchor, e, ventral bar, f, second marginal hook; g, marginal hook; h, egg; i, copulatory organ.

Remarks. - This species is different from *S. caecus* and *S. pangasi* in having a long undulating copulatory tube compared to tapering sigmoid and curved tubes of the other two species. The knee-shaped patches of the present species are similar to that in *S. pangasi* but different from the triangular patches in *S. caecus*. The outer roots of the dorsal anchors in the present species are not as pronounced as those in *S. caecus*. There are no roots on the ventral anchors of *S. caecus*, while in the present species, the roots are developed. The seminal vesicle of the present species is thin and long as in *S. pangasi*, while in *S. caecus*, it is ovoid. Unlike *S. caecus* where the uterine pore and copulatory organ open into a common atrium; in the present species, the openings are separate. The eggs of the present species have two very long processes or filaments, while the eggs of *S. caecus* have short filaments. According to Bychowsky (1957), a number of ducts open into the ootype, viz., vitelline duct, vaginal duct and genito-intestinal duct. It is difficult at this stage to determine what the three ducts are. More studies are required before the origins and functions of the three ducts can be elucidated.

DISCUSSION

There are now three species of *Silurodiscoides* attributed to *Pangasius* species in the Oriental Region; *S. caecus* and *S. siamensis*, new species, from *P. sutchi* (Thailand), and *S. pangasi* from *P. pangasius* (India). There are four species of *Pangasius* Valenciennes, 1840 known from Peninsular Malaysia (Kottelat, 1989, under *Pangasius* and *Pangasianodon*), but until now, none of them have been examined (see Lim, in press). *Pangasius sutchi*, a cultured species, is the only species examined thus far in Peninsular Malaysia. This species is not native to Peninsular Malaysia but imported from Thailand and cultured in ponds.

Silurodiscoides caecus and *S. siamensis*, new species, were also found on *P. sutchi* in a recent survey conducted on Thai *Pangasius* species (unpublished data). This suggests that *P. sutchi* has been imported into Peninsular Malaysia without any quarantine measures.

Acknowledgements. - This work was done in the Department of Zoology, University of Malaya, Kuala Lumpur. I would like to thank Mr. Liew K. S. for his help in collecting the parasites.

LITERATURE CITED

Bychowsky, B. E., 1957. *Monogenetic trematodes, their systematics and phylogeny*. (English translation by P. C. Oustinoff and W. J. Hargis, Jr., Eds.). Graphic Arts Press, Washington, D. C. 1961, 627 pp.

Gussev, A. V., 1978. Monogenoidea of freshwater fishes. Principles of systematics, analysis of world fauna and its evolution. *Parazitol. Sb.*, **38**: 96-198. (In Russian.)

Kottelat, M., 1989. Zoogeography of the fishes from Indochinese inland waters with an annotated check-list. Bull. Zool. Mus., *Univ. Amsterdam*, **12**(1): 1-55.

Lim, L. H. S., & J. I Furtado, 1986. Five new species of ancylodiscoidins (Monogenea: Ancylodiscoidinae) from *Notopterus chitala* (Hamilton) and *Notopterus notopterus* (Pallas) in Peninsular Malaysia. *Folia Parasitologica*, **33**: 315-325.

Lim, L. H. S., in press. Freshwater monogeneans of Peninsular Malaysia. *Asian Fish. J.*

Mizelle, J. & D. C. Kritsky, 1969. Studies on monogenetic trematodes. XXXIX. Exotic species of monopisthocotylea with the proposal of *Archidiplectanum* gen. n. and *Longihaptor* gen. n. *Amer. Midl. Nat.*, **81**(2): 370-386.

Tripathi Y. R., 1957. Monogenetic trematodes from fishes of India. *Indian J. Helminthology*, **9**: 1-149.