

**FOUR NEW SPECIES OF DACTYLOGYRIDS (MONOGENEA)
FROM *CIRRHINUS JULLIENI* SAUVAGE,
1878 (CYPRINIDAE) IN THAILAND**

S. Chinabut and L.H.S. Lim

ABSTRACT. - Three new species of *Dactylogyrus* Diesing, 1850, and one new species of *Thaparogyrus* Gussev, 1976, are described from *Cirrhinus jullieni* Sauvage, 1878 (Cyprinidae) of Thailand. They are *Dactylogyrus jullieni*, *D. bifidus*, *D. soikhaonensis* and *Thaparogyrus magnacleithrium*. This is the first time that *Thaparogyrus* is collected from this region and from *Cirrhinus*.

INTRODUCTION

Twelve monogenean species parasitising three *Cirrhinus* species (Syn. *Cirrhina*) had been previously reported from India and Vietnam. *Dactylogyrus mrigali* Gussev, 1976, *D. chauhanus* Gussev & Musselius, 1976, and *D. brevifurcatus* Kulkarni, 1970, were reported from *C. mrigala* (see Gussev, 1976 and Tripathi, 1957). *D. cirrhini* Jain, 1960, *D. crucitrabus* Gussev, 1976, and *D. anchoracanthus* Kulkarni, 1970, were found on *C. reba* (see Tripathi, 1975). Ha (1971) described *D. quangfami*, *D. molitorelli*, *D. uyeni*, *D. zoanyngi*, *D. babensis* and *D. bakanensis* from *C. molitorella*. The same five species of *Dactylogyrus* (except *D. uyeni*) reported by Ha (1971) were also reported from *C. molitorella* of Hainan Island (Lang, 1981).

Four species of *Cirrhinus* (*C. jullieni*, *C. lineatus*, *C. microlepis* and *C. marginipinnis*) (see Smith, 1945) have been recorded in Thailand, but only *C. jullieni* (known as Pla Soi Khao in Thailand) was examined for monogeneans. Four new species of monogeneans collected from *C. jullieni* are described in this paper.

MATERIAL AND METHODS

Fish samples were brought to the laboratory alive and kept in glass aquaria supplied with aeration. Gills were removed from the sacrificed host into petri dish containing clean water. The worms were gently scraped out from the gill filaments using bent needles. The monogeneans were removed on to clean slides with fine pipette in a drop of water and covered with cover slip.

S. Chinabut - National Inland Fisheries Institute, Bangkok 10900, Thailand. **L.H.S. Lim** - Institute for Advanced Studies, University of Malaya, 59100 Kuala Lumpur, Malaysia.

The four corners of the cover slip were sealed with nail varnish to prevent the cover slip from moving. Next ammonium picrate glycerine solution was added beneath the cover slip to fix and clear the monogeneans. The specimens were studied and drawings were done under a phase contrast microscope with the help of a drawing tube. The measurements are given in micrometers (μm .), the average is given followed by the range in parenthesis. In the descriptions, the position of the hooks follows that of Mizelle (1956).

The holotype specimens are kept in the helminthological collection at National Inland Fisheries Institute, Bangkok, Thailand, while the paratypes are deposited in the Institute for Advanced Studies (IPT), University of Malaya, Kuala Lumpur, Malaysia and in the Zoological Reference Collection (ZRC), Department of Zoology, National University of Singapore as well as in the National Inland Fisheries Institute, Bangkok (NIFI).

TAXONOMY

FAMILY DACTYLOGYRIDAE BYCHOWSKY, 1933

Dactylogyrus jullieni, new species

(Fig. 1)

Materials. - Host: *Cirrhinus jullieni*. Locality: Cho Praya River, Chainat Province, Thailand. No. of host examined: 5. No. of monogenean obtained : 15. No. of specimens measured: 10 specimens. Type specimens: Holotype (NIFI MONO 1990-010) and other paratypes in NIFI, 1 paratype (ZRC 1990. 11810) in ZRC and 1 paratype in IPT.

Description. - Body 347 (270-410) long, 92 (80-100) wide. Anchors: inner length 30 (28-31), outer length 32 (25-34), inner root 5 (4-6), inconspicuous outer root, and recurved point 10 (10-12). One short stout dorsal bar, size 9 (8-9) X 4 (4-5). 14 marginal hooks with distinct handle and thin pivot. Two types of hooks: pair nos. 1 and 2 smaller, total length 10-12; others larger, total length 18 (16-22). Two needles present. Copulatory organ consists of coiled tube and lightly sclerotized accessory piece. Vaginal tube coiled.

Etymology. - This species is named after its host.

Remarks. - This new species have anchors with gently recurving shafts and points, and inconspicuous outer roots. The copulatory organ is similar to that of *D. quangfami* Ha, 1971, from *Cirrhina molitorella* of North Vietnam and *D. flagellatus* Lang, 1981, from *Osteochilus vittatus* of Hainan island. However, the present species differs from the two mentioned species in the structures of dorsal bar, vaginal armament and marginal hooks.

Dactylogyrus soikhaonensis, new species

(Fig. 2)

Materials. - Host: *Cirrhinus jullieni*. Locality: Cho Praya River, Chainat Province, Thailand. No. of host examined: 5. No. of monogenean obtained: 8. No. of specimens measured: 8. Type specimens: Holotype (NIFI MONO 1990-011), 1 paratype (ZRC 1990. 11821), 1 paratype (IPT), 5 paratypes (NIFI).

Description. - Body 410 (384-440) long, 120 (104-144) wide. Anchors falcatoïd-type with roots on same level, inner length 30 (29-31), outer length 44 (43-45), short point, outer root 4 (3-5) and inner root 5 (4-5). One bone-shaped dorsal bar, size 2 (2-4) X 17 (16-18). Ventral bar not found. Two needles present. 14 marginal hooks, 15 (14-19) long. Copulatory tube coiled, accessory piece with grooved distal part, 19 (16-24) long. Vaginal tube 78 (76-80) long.

Etymology. - This species is named after the Thai name of the host.

Remarks. - The anchors of the present species belong to the anchor-types found in *D. anchoracanthus* Kulkarni, 1970, *D. chauhanus* Gussev & Musselius, 1976, and *Dogielius catlarius* Gussev, 1976, however in all the abovementioned species including the present species the anchors are structurally different. The present species is different from *D. chauhanus* from *Cirrhina mrigala* in the shape of marginal hooks. The copulatory organ of this species is also similar to that *D. jullieni*, new species but the shape of anchors and connective bar are different in the two species. The vaginal tube of the present species is similar to that of *D. jullieni*, new species although less coiled.

***Dactylogyrus bifidus*, new species**

(Fig. 3)

Materials. - Host: *Cirrhinus jullieni*. Locality: Cho Praya River, Chainat Province, Thailand. No. of host examined: 5. No. of monogeneans obtained: 3. No. of specimens measured: 3. Type specimens: Holotype (NIFI MONO 1990-012), 1 paratype (ZRC 1990. 11822), and 1 paratype (IPT).

Description. - Anchors: inner length 33 (32-34), outer length 28 (27-29), inner root 14 (14-15), with outer roots bent inwards, gently recurving point 18 (17-18). One bone-shaped dorsal bar, size 3(2-3) X 12(10-12). Marginal hooks 14-18 long. Copulatory tube short, tapering 20 (19-20) long, accessory piece fork-like. Vaginal tube short.

Etymology. - This species is named *Dactylogyrus bifidus*, new species because of the fork-shaped accessory piece of the copulatory organ.

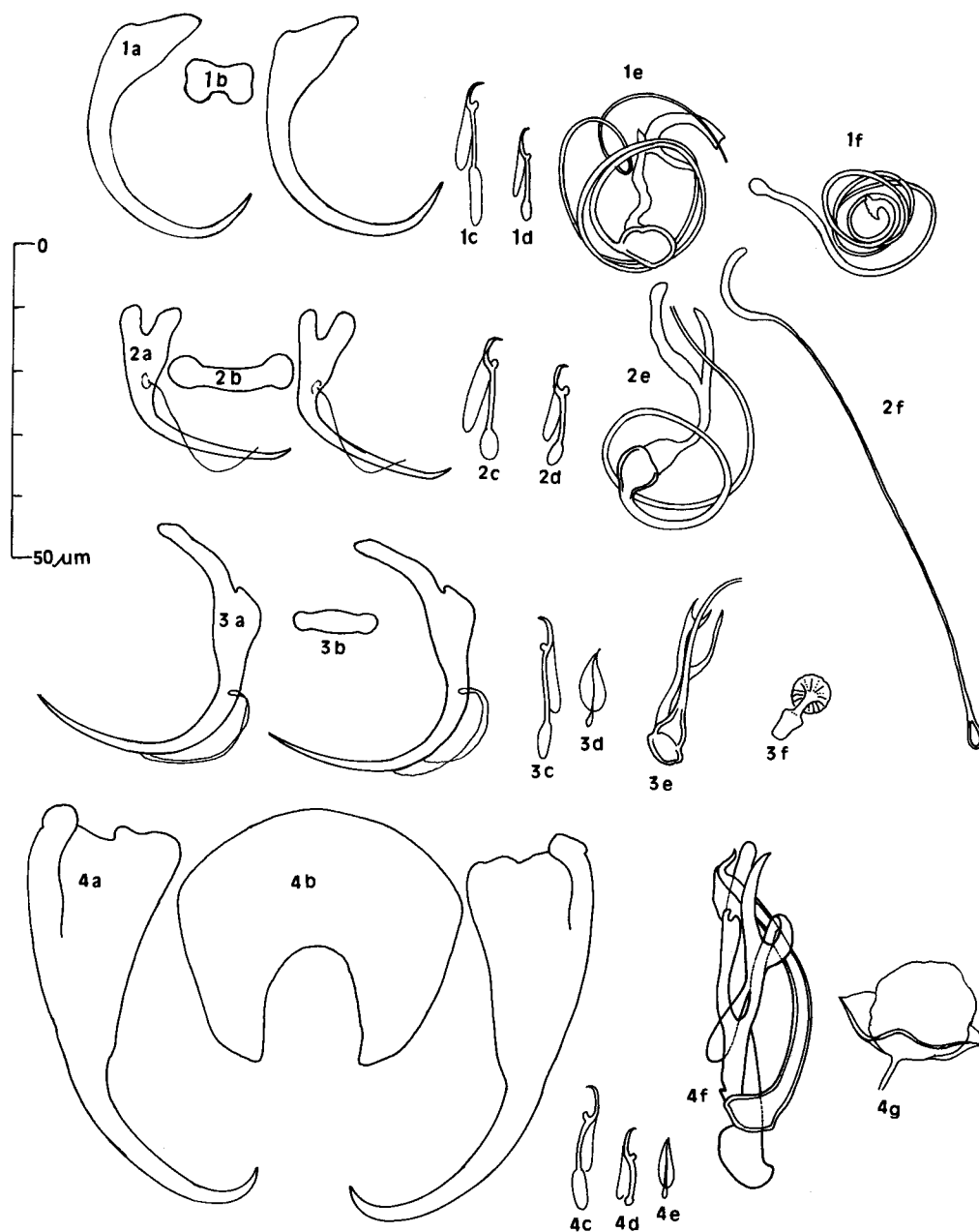
Remarks. - This species is similar to *D. furcatus* Lang, 1981, from *O. vittatus* (Hainan Island), except that the marginal hooks and the anchors of the present species are smaller.

***Thaparogyrus magnacleithrium*, new species**

(Fig.4)

Materials. - Host: *Cirrhinus jullieni*. Locality: Cho Praya River, Chainat Province, Thailand. No. of host examined: 5. No. of monogeneans obtained: 20. No. of specimens measured: 20 specimens. Type specimens: Holotype (NIFI MONO 1990-013), 1 paratype (ZRC 1990. 11820), and 1 paratype (IPT).

Description. - Body 620 (600-640) long, 132 (104-160) wide. Anchors stout, inner length 51 (46-58), outer length 60 (52-70), recurved point 5 (4-6). One large arch-shaped connective bar, size 32 (30-34) X 38 (36-40). 14 marginal hooks with distinct handle, 16 (14-18) long. Two needles present. Copulatory tube 31 (28-34) long with accessory piece of several interlocking pieces 42 (40-44) long. Vaginal opening sclerotised with short vaginal tube.



Figs. 1-4. 1. Illustrations of hard parts of haptor, copulatory organs and vaginal tube of *Dactylogyrus jullieni*, new species a, anchors; b, dorsal bar; c & d, marginal hooks; e, copulatory organ; f, vaginal tube. 2. Illustrations of hard parts of haptor, copulatory organ and vaginal tube of *Dactylogyrus soikhaonensis*, new species a, anchors; b, dorsal bar; c & d, marginal hooks; e, copulatory organ; f, vaginal tube. 3. Illustrations of hard parts of haptor, copulatory organ and vaginal tube of *Dactylogyrus bifidus*, new species a, anchors; b, dorsal bar; c, marginal hooks; d, needle; e, copulatory organ; f, vaginal tube. 4. Illustrations of hard parts of haptor, copulatory organ and vaginal tube of *Thaparogyrus magnacleithrium*, new species a, anchors; b, dorsal bar; c & d, marginal hooks; e, needle; f, copulatory organ; g, vaginal tube.

Etymology. - This species is named *Thaparogyrus magnacleithrium*, because of the huge arch-shaped connective bar.

Remarks. - This present species is very similar to *Thaparogyrus lucknowius* Gussev 1976 from *Labeo bast* in the overall structures of all the hard parts, but the length of anchor of present species are twice the size of that in *T. lucknowius*. The copulatory organ of the present species is similar to that found in *T. lucknowius*. The marginal hooks of *T. lucknowius* and the present species are about the same size except that the handle is shorter in the present species. This species differs from *T. lucknowius* in having a big arch-shaped bar. This species is the second *Thaparogyrus* species to be described and the first for this host genus.

DISCUSSION

All the three *Dactylogyrus* species found on *C. jullieni* possess only one bar and have similar type of marginal hooks except that in *D. jullieni*, new species there is one pair of larval-type hooks.

Thaparogyrus Gussev, 1976, was first described from *L. bast* in India and the only species described so far is the type species *T. lucknowius*. *T. magnacleithrium*, new species is thus the second species to be described for this genus as well as being the first for the Sunda region.

Acknowledgements. - The authors would like to thank IDRC for supporting this project, Dr. K. Tonguthai, Head of Fish Health Section for her help in collecting the specimens and also Mr. Somwang Phimolboot, Head of Chainat Fishery Station for his hospitality and the use of the facilities at the Fishery Station.

LITERATURE CITED

- Gussev, A.V., 1976. Freshwater Indian Monogeneoidea. Principles of systematics analyses of the world fauna and their evolution. *Ind. J. Helm*, **25&26**: 241p.
- Ha, K., 1971. New species of Monogeneans from freshwater fishes of North Vietnam. Pt. 2. *Parasitologiya*, **5(5)**: 425-440 (in Russian).
- Kulkarni, T., 1970. Studies on the monogenetic trematodes of fishes found in Hyderabad, Andhra Pradesh (India). Part III. *Riv. Parasitol*, **31(1)**: 15-28.
- Lang, S., 1981. Monogenetic fauna of freshwater fishes of Hainan Island. *Acta Zoologica Sinica*, **27(1)**: 75-86.
- Lim, L.H.S., 1990. Freshwater monogeneans of Peninsular Malaysia. *Asian Fisheries Science*, **31**: 75-285.
- Smith, H.M., 1945. *The Freshwater Fishes of Siam, or Thailand*. Reprinted by T.F.H. Publications, Inc., Jersey City, N.J. 622 pp.
- Tripathi, Y.R., 1957. Monogenetic trematodes from fishes of India. *Ind. J. Helm*, **9**: 1-149.