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Redescriptions of Mamaev's Two Digenean Trematodes *Diploproctia drepanei* (Lepocreadiidae) and *Beluesca plectorhynchi* (Cryptogonimidae)

Masaaki Machida

Department of Zoology, National Museum of Nature and Science
4–1–1 Amakubo, Tsukuba, Ibaraki 305–0005, Japan
E-mail: nrb23908@m.jccnet.jp

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Abstract Two digenean trematodes, *Diploproctia drepanei* (Lepocreadiidae) and *Beluesca plectorhynchi*, formerly *Pseudallacanthochasmus plectorhynchi* (Cryptogonimidae) were described by Mamaev (1970) from the drepanid fish *Drepane punctata* and the haemulid fish *Plectorhinchus cinctus*, respectively, in the Gulf of Tonkin. This paper is given to supplement his description based on newly obtained material: *Diploproctia drepanei* from *Drepane longimana* of the Philippines and *Beluesca plectorhynchi* from *Plectorhinchus gibbosus* of Japan.
Key words: Digenea, Lepocreadiidae, Cryptogonimidae, morphology, marine fish, Japan, Philippines.

Introduction

Two digenean trematodes, *Diploproctia drepanei* (Lepocreadiidae) and *Beluesca plectorhynchi*, formerly *Pseudallacanthochasmus plectorhynchi* (Cryptogonimidae) were described by Mamaev (1970) from the drepanid fish *Drepane punctata* and the haemulid fish *Plectorhinchus cinctus*, respectively, in the Gulf of Tonkin. This paper is given to supplement Mamaev's description based on newly obtained material. Fishes for study were obtained from the local fish markets. The digeneans collected were washed in saline, fixed in alcohol-formalin-acetic acid solution (AFA) under slight pressure, stained with Heidenhain's hematoxylin, cleared in creosote and mounted in Canada balsam. The specimens are deposited in the National Museum of Nature and Science, Tsukuba (NSMT), and the Meguro Parasitological Museum, Tokyo (MPM). Measurements are given in millimeters unless otherwise stated.

Family Lepocreadiidae

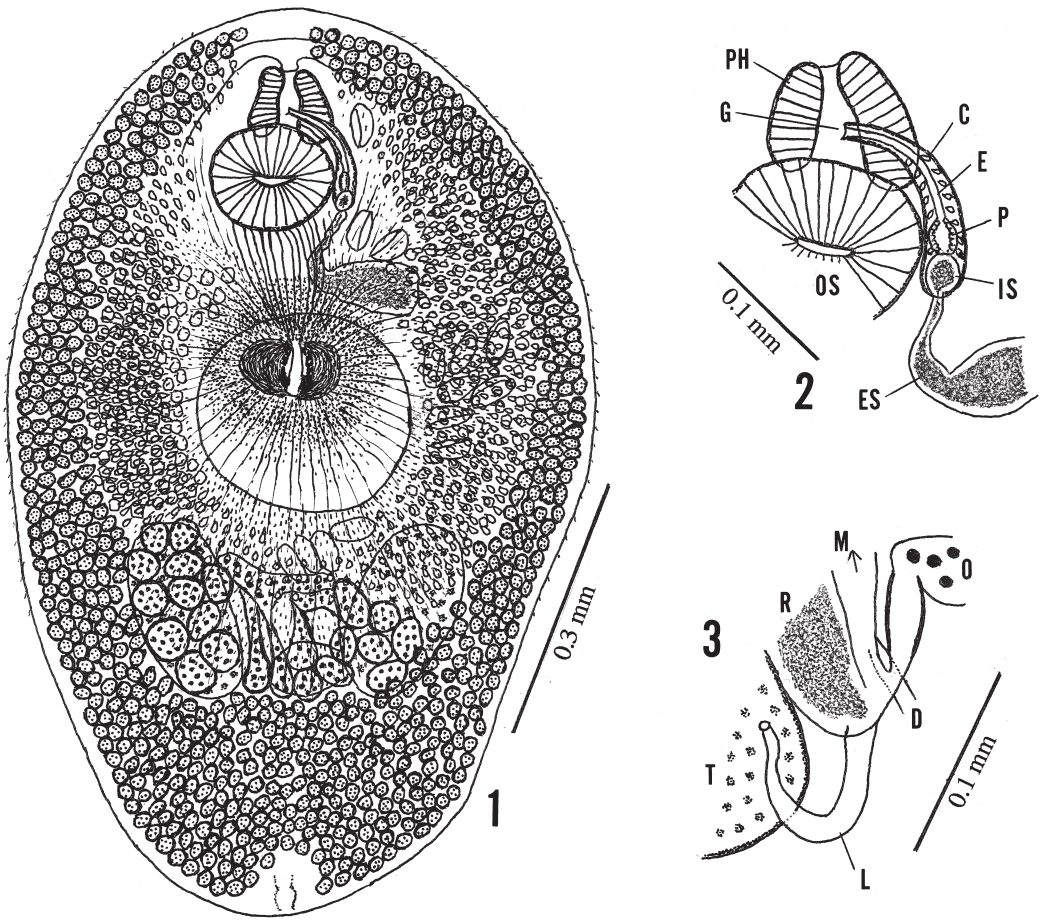
Diploproctia drepanei Mamaev, 1970

(Figs. 1–3)

Diploproctia drepanei Mamaev, 1970: 172–173, fig. 19; Bray *et al.*, 1996: 354; Bray, 2005: 567, fig. 45.21.

Material. Four specimens from the intestine of *Drepane longimana* (Drepanidae), Puerto Princesa, Palawan, the Philippines, 18-XI-1988, NSMT-Pl 3601a, M. Machida leg.

Description. Based on four specimens. Body ovoid, 0.74–1.17 long by 0.60–0.71 wide; length/width 1.2–1.6. Tegument spinose from near anterior end to testicular level. Oral sucker 0.08–0.17 × 0.12–0.14; prepharynx up to 0.06 long; pharynx 0.08–0.10 × 0.07–0.12; caeca terminating blindly near posterior end of body. Acetabulum 0.20–0.24 × 0.20–0.24, orifice with thick lateral lamellar lips. Lips with radial muscle bundles in all directions. Anterior bundles pull the anterior end of the body toward the acetabulum, so that the oral sucker and pharynx are often



Figs. 1–3. *Diploproctia drepanei* Mamaev, 1970. — 1, entire worm, ventral view (NSMT-Pl 3601a). Anterior end of body is pulled toward acetabulum, so that oral sucker and pharynx are turned upside down; 2, terminal genitalia, ventral view; 3, ovarian complex, dorsal view. Abbreviations: C, cirrus sac; D, common vitelline duct; E, ejaculatory duct; ES, external seminal vesicle; G, genital pore; IS, internal seminal vesicle; L, Laurer's canal; M, Mehlis' gland; O, ovary; OS, oral sucker; P, pars prostatica; PH, pharynx; R, seminal receptacle; T, left testis.

turned upside down. Area around lips covered with numerous fine scale-like processes. Acetabulum surrounded by numerous small gland cells except anterior area. Sucker ratio 1 : 1.5–1.7. Forebody 43–47% of body length.

Testes ovoid, symmetrical, posterolateral to acetabulum; right testis 0.14–0.19 × 0.10–0.14; left testis 0.17–0.22 × 0.10–0.12. Posttesticular space 22–55% of body length. External seminal vesicle thin-walled saccular, 0.20–0.30 × 0.04–0.11, anterosinistral to acetabulum. Cirrus sac slender, 0.13–0.15 × 0.03, sinistral to oral sucker, including internal seminal vesicle 30–32 × 22–25 μm, pars prostatica 25–28 × 16–20 μm and ejaculatory duct. Genital pore near anterosinistral margin of body.

Ovary multilobate, ventral in testicular zone, 0.11–0.18 × 0.22–0.34 as a whole. Oviduct arising from midanterior edge of ovary, running backward, connecting anterodextral edge of seminal receptacle, then running forward, receiving common vitelline duct and entering Mehlis' gland. Seminal receptacle ovoid, 0.07–0.10 × 0.06–0.09, overlapping midposterior por-

tion of ovary dorsally. Laurer's canal opening dorsally in posterodextral corner of left testis. Uterus preovarian, passing sinistral to acetabulum. A small number of eggs in uterus. Partially collapsed eggs 51–54 × 30–31 μm. Vitelline follicles extending along lateral sides of body from oral sucker to posterior end of body, confluent in postovarian space; dorso-lateral follicles invading inward close to acetabulum. Excretory vesicle tubular, anterior extent not determined; pore terminal.

Remarks. Mamaev (1970) described this species as a new genus and species from *Drepane punctata* in the Gulf of Tonkin, characterized by the peculiar structure of the acetabulum, the structure of the cirrus sac and the position of the genital pore.

The following notes are given to supplement the description of this species. 1) Mamaev (1970) said of his specimens that the caeca terminating with fine tubes and opening through separate ani near the posterior margin of the body. In my specimens, however, no evidence of ani is found. 2) Mamaev (1970) described that his specimens had a thin flask-shaped cirrus sac extending from the anterosinistral edge of the body to the anterior border of the acetabulum. The cirrus sac was mostly occupied by a large internal seminal vesicle. No external seminal vesicle existed. In my specimens, however, a slender cirrus sac lies sinistral to the oral sucker, containing internal seminal vesicle, pars prostatica and ejaculatory duct. A thin-walled saccular external seminal vesicle is observed anterosinistral to the acetabulum. 3) Based on Mamaev's (1970) description and illustration, Bray *et al.* (1996) stated this species to possess a complete scoop, and Bray (2005, fig. 45.21) illustrated a sharply outlined U-shaped scoop. Mamaev (1970) did not describe and illustrate such a scoop. An U-shaped bold line with some branches outward illustrated by Mamaev (1970, fig. 19) was not a scoop, but a route of the vitelline ducts. The right and left vitelline ducts each begin at the pharyngeal level, pass downward near the lateral sides of the acetabulum and join both ducts at the preovarian level. In Mamaev's specimens, the oral sucker and acetabulum were surrounded by a ring of gland cells. In my specimens, the acetabulum is enclosed with gland cells anterolaterally, laterally and posteriorly. The scoop usually contains gland cells around the margins (Bray *et al.*, 1996). Having no scoops in my specimens, the gland cells in this species do not appear to be concerned with forming a scoop. Thus, this species is closely related to *Pseudolepocreadioides symmetrorchis* Hafeezullah, 1970 from *Drepane punctata* in the Indian Ocean except for the acetabulum with lamellar lips (Madhavi *et al.*, 1986, fig. 5).

Family Cryptogonimidae

Beluesca plectorhynchi (Mamaev, 1970)

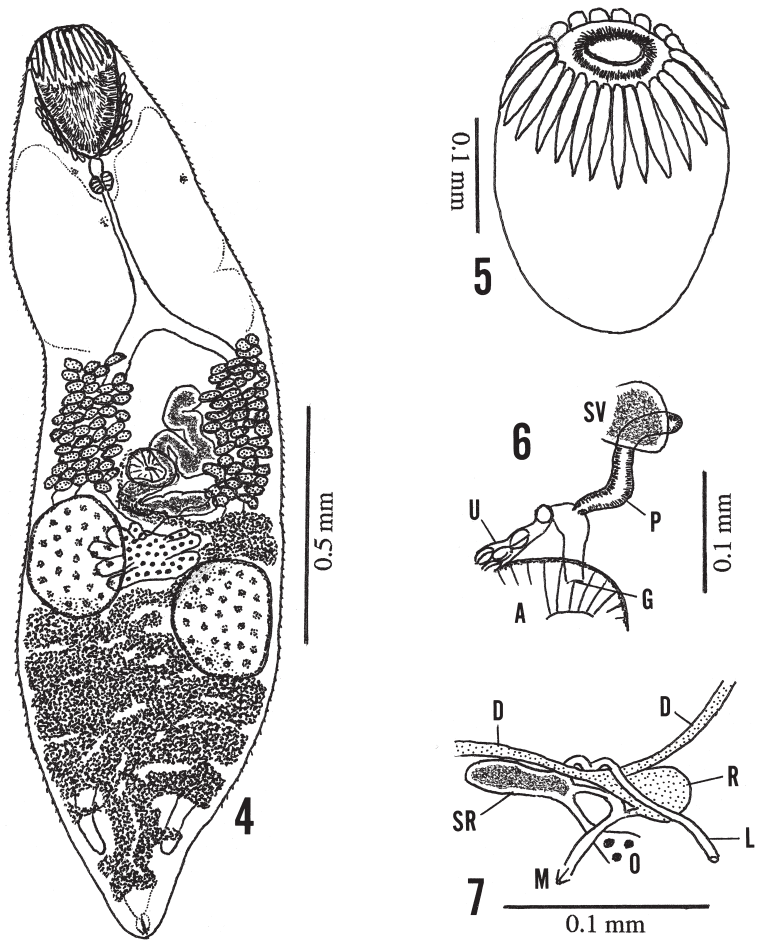
(Figs. 4–7)

Pseudallacanthochasmus plectorhynchi Mamaev, 1970: 174–175, fig. 20.

Beluesca plectorhyncha [*sic*]: Miller and Cribb, 2007: 56–57.

Material. Forty specimens from the pyloric caeca and intestine of *Plectorhinchus gibbosus* (Haemulidae), Nago, Okinawa Pref., Japan, 27-II-2009, MPM Coll. No. 20649 and 2-III-2009, MPM Coll. No. 20653, M. Machida leg.

Description. Based on 15 specimens. Body elongated, 1.53–2.14 long by 0.53–0.73 wide, rounded anteriorly and taperin posteriorly; length/width 2.3–3.8. Tegument spinose. Eyespots usually at oesophageal level. Dermal glands scattered all over. Oral sucker barrel-shaped, 0.25–0.32 × 0.19–0.25, mouth opening small, apically. Oral spines 22–24 in number, large, lanceolate, 97–107 × 15–17 μm. Cephalic glands surrounding oral sucker. Prepharynx 0.03–0.12 long; pharynx 45–95 × 33–70 μm; oesophagus 0.07–0.27 long, bifurcating approximately midway between suckers; caeca extending almost to posterior end of body. Acetabulum 0.09–0.13 × 0.11–0.15, embedded in ventrogenital sac. Sucker ratio 1 : 0.4–0.7. Forebody 41–53% of body length.



Figs. 4–7. *Beluesca plectorhynchi* (Mamaev, 1970). — 4, entire worm, dorsal view (MPM Coll. No. 20653); 5, oral sucker showing mouth and oral spines, ventral view; 6, terminal genitalia, dorsal view; 7, ovarian complex, dorsal view. Abbreviations: A, acetabulum; D, vitelline duct; G, genital pore; L, Laurer's canal; M, Mehlis' gland; O, ovary; P, pars prostatica; R, vitelline reservoir; SR, seminal receptacle; SV, seminal vesicle; U, uterus.

Testes ovoid or longitudinally elongate, symmetrical or slightly diagonal, a short distance posterior to acetabulum, in anterior half of hindbody; right testis 0.24–0.35 × 0.15–0.28; left testis 0.20–0.38 × 0.15–0.24. Posttesticular space 26–34% of body length. Seminal vesicle long voluminous tubular, convoluted, beginning at preovarian level, running forward to anterior to acetabulum, then backward to connect pars prostatica. Pars prostatica a slender tube, 0.08–0.13 × 0.01–0.03, joining metraterm to form short genital atrium. Genital pore median, near opening of ventrogenital sac.

Ovary ovoid or nearly oblong with deeply transverse incisions, 0.10–0.18 × 0.19–0.34, ventral in testicular zone. Oviduct arising from forward portion of ovary, connecting edge of seminal receptacle, receiving common vitelline duct, entering Mehlis' gland. Laurer's canal originating from the same point where oviduct connects with seminal receptacle, opening middorsally at pre- to postovarian level. Seminal receptacle very small, ovoid, 40–80 × 25–28 μm, overlapping forward portion of ovary dorsally. Uterus filling

most of postovarian spaces, passing along lateral or dorsal to acetabulum, connecting short metraterm immediately anterior to acetabulum. Proximal end of uterus filled with sperm. Eggs 18–21 × 10–12 μm. Vitelline follicles in two lateral groups, extending from some distance posterior to intestinal bifurcation to a level midway between acetabulum and testes. Excretory vesicle Y-shaped, bifurcating in ovarian zone, arms reaching oral sucker; pore terminal, with sphincter.

Remarks. Mamaev (1970) originally described this species under the name of *Pseudallacanthochasmus plectorhynchi* from *Plectorhinchus cinctus* in the Gulf of Tonkin. Judging from his distorted illustrations, his specimens seem to be in poor condition.

Miller and Cribb (2007) described two new species of cryptogonimid digeneans from *Plectorhinchus gibbosus* off the Great Barrier Reef, erecting a new genus *Beluesca* for the two species, *B. littlewoodi* (type species) and *B. longicolla.* They distinguished between the two species in that vitelline follicles of *B. littlewoodi* extend posterior to the acetabulum, whereas those of *B. longicolla* do not extend beyond the acetabulum. At that time, they transferred *Pseudallacanthochasmus plectorhynchi* to the genus *Beluesca* as *B. plectorhynchi.* They compared *B. plectorhynchi* with their species, but it was not accurate because Mamaev's description was insufficient.

I redescribed here *B. plectorhynchi* based on newly obtained specimens from *Plectorhinchus gibbosus* of Japan. This species is more like *B. littlewoodi* than *B. longicolla* in vitelline follicles extending posterior to the acetabulum, but differs from *B. littlewoodi* by having barrel-shaped oral sucker as compared with funnel-shaped oral sucker; lanceolate oral spines as compared with fishhook-like oral spines; ovary with deeply transverse incisions as compared with ovary lobated deeply; very small ovoid seminal receptacle which overlaps the forward portion of the ovary as compared with tuburosaccular seminal receptacle which locates posterior to the ovary and may extend well posterior to the testes; and excretory vesicle extending to the oral sucker as compared with excretory vesicle reaching anterior to the pharynx.

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