Four New Lepocreadiid Digeneans (Trematoda) from Marine Fishes of Southern Japan and the Philippines

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Abstract

Four new species of lepocreadiid digeneans (Trematoda) are described from marine fishes of southern Japan and the Philippines. They are: *Neolepidapedoides ittoudai* sp. nov. from the intestine of *Sargocentron spinosissimum* (Holocentridae) of southern Japan, *Neolepidapedoides amamiensis* sp. nov. from the intestine of *Giganthias immaculatus* (Giganthiidae) of southern Japan, *Lepidapedoides miharahanadai* sp. nov. from the intestine of *Giganthias immaculatus* of southern Japan, and *Neolepocreadium ampahan* sp. nov. from the intestine of *Trachinotus blochii* (Carangidae) of the Philippines.

Key words: Digenea, Lepocreadiidae, new species, marine fish, Japan, Philippines.

Introduction

This paper deals with four new species of the family Lepocreadiidae (Trematoda, Digenea) from marine fishes of southern Japan and the Philippines. Host fishes were obtained from the local fish markets. The digeneans collected were washed in saline, fixed in 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). Measurements are given in millimeters unless otherwise stated, with the range followed by measurements of the holotype in parentheses.

*Neolepidapedoides ittoudai* sp. nov.

(Figs. 1–3)

Type host. *Sargocentron spinosissimum* (Holocentridae).

Site. Intestine.


Specimens. Holotype and 1 paratype, NSMT-Pl 2271.

Etymology. Specific name *ittoudai* is from the Japanese name of the host.

Description. Based on two specimens. Body slender, rounded at both ends, 4.28–4.43 (4.28) long by 0.78–0.83 (0.78) wide. Body width 18–19 (18)% of length. Tegument spinose. Oral sucker subterminal, 0.15 (0.15) × 0.16–0.17 (0.17), mouth opening apically; prepharynx 0.03 (0.03) long; pharynx 0.13 (0.13) × 0.14–0.16 (0.16); oesophagus 0.14–0.16 (0.16) long, bifurcating midway between suckers or slightly closer to acetabulum; caeca extending almost to posterior end of body. Acetabulum 0.23–0.25 (0.25) × 0.24–0.26 (0.24). Sucker ratio 1 : 1.44–1.55 (1.44). Forebody 16–18 (18)% of body length.

Testes almost rounded, tandem, intercaecal, separated; anterior testis 0.32–0.37 (0.37) × 0.37–0.40 (0.40); posterior testis 0.41–0.45 (0.45) × 0.42 (0.42). Posttesticular space 10–12 (10)% of body length. Vasa efferentia not joining each other. External seminal vesicle long tubular, sinuous, reaching near midlevel between posterior end of cirrus sac and ovary, surrounded by gland cells except proximal end. Cirrus sac clavi-
form, thick-walled, 0.35–0.39 (0.39) × 0.15–0.18 (0.15), straight or slightly arcuate, extending on left side of acetabulum to posterior to it; containing tubular, convoluted internal seminal vesicle; slender pars prostatica 0.12–0.14 (0.14) × 0.05–0.07 (0.07); cirrus 0.07–0.09 (0.09) long, its anterior half protruding into genital atrium. Genital atrium small. Genital pore enclosed in circular sphincter and gland cells, anterosinistral to acetabulum, just interior to left caecum.

Ovary ovoid, slightly dextral, 0.20–0.26 (0.26) × 0.26–0.28 (0.26), lying 62 (62)% of body length from anterior end of body, separated from anterior testis by about length of testis. Oviduct arising from near center of ovary, connecting short duct from seminal receptacle, branching Laurer’s canal, then running upward to receive common vitelline duct, entering Mehlis’
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gland. Mehlis’ gland immediately anterosinistral to ovary. Laurer’s canal running sinistrally, sinuous, opening on left body margin at mid- to post-ovarian level. Seminal receptacle ovoid, 0.20–0.25 (0.25) × 0.16–0.22 (0.16), posterosinistral to ovary. Uterus preovarian, with sphincter just before joining metraterm; metraterm slightly shorter than cirrus sac, enclosed in gland cells. Eggs thin-shelled, partially collapsed, 64–71 × 43–48 μm. Vitelline follicles extending from near posterior border of cirrus sac to posterior end of body, dorsal and ventral to caeca, confluent in posttesticular space. Excretory vesicle tubular, ending at level of intestinal bifurcation; pore terminal, surrounded by sphincter and gland cells.

Remarks. Bray and Gibbons (1989) recognized ten species of Neolepidapedoides. Of them, two species possess vitelline follicles extending anteriorly near the posterior border of the cirrus sac, and an excretory vesicle reaching the intestinal bifurcation, they are: Neolepidapedoides hypoplectri (Nahhas and Cable, 1964) and Neolepidapedoides macrum (Overstreet, 1969). The present new species differs from N. hypoplectri in having a larger body and eggs, larger sucker ratio, and a different position of the genital pore. It differs from N. macrum in having a wider body and eggs, larger sucker ratio, and an external seminal vesicle surrounded by gland cells except the proximal end. In addition, the present species is distinguishable by possessing a mouth opening apically and a genital pore enclosed in the sphincter.

**Neolepidapedoides amamiensis** sp. nov.

(Figs. 4–6)

*Type host.* Giganthias immaculatus (Giganthiidae).

*Site.* Intestine.

*Type locality.* Koniya, Ohshima County, Kagoshima Pref., Japan, 9-III-1991.

*Specimens.* Holotype and 9 paratypes, NSMT-Pl 4157a.

*Etymology.* The specific name amamiensis is from the type locality, Amami Islands.

**Description.** Based on 10 specimens. Body linguiform, tapering slightly toward ends, 1.83–2.51 (1.83) long by 0.53–0.65 (0.58) wide. Body width 21–32 (32)% of length. Tentum spinose, sparse posteriorly. Eyespot pigments present. Oral sucker subterminal, 0.16–0.20 (0.16) × 0.19–0.26 (0.19); prepharynx 0.05–0.13 (0.12) long; pharynx 0.09–0.11 (0.10) × 0.09–0.12 (0.09); oesophagus 0.09–0.30 (0.10) long, bifurcating nearer acetabulum than oral sucker; caeca extending almost posterior end of body. Acetabulum 0.13–0.18 (0.13) × 0.14–0.19 (0.14). Sucker ratio 1:0.69–0.86 (0.77). Forebody 31–41 (34)% of body length.

Testes rounded to ovoid, tandem, intercaecal, contiguous; anterior testis 0.18–0.27 (0.18) × 0.20–0.32 (0.24); posterior testis 0.25–0.34 (0.26) × 0.21–0.32 (0.21). Posttesticular space 7–14 (8)% of body length. Vasa efferentia not joining each other. External seminal vesicle tubular, two or three transverse loops, extending near ovary, completely surrounded by gland cells. Cirrus sac claviform, straight or a little arcuate, 0.35–0.50 (0.37) × 0.14–0.21 (0.15), extending midway between acetabulum and ovary; containing oval internal seminal vesicle 0.06–0.15 (0.06) × 0.04–0.09 (0.07), pars prostatica 0.05–0.11 (0.06) × 0.05–0.10 (0.06), and cirrus 0.13–0.25 (0.20) long. Genital atrium small. Genital pore sinistral near antero- to midlateral border of acetabulum.

Ovary subglobular, slightly dextral, 0.11–0.18 (0.11) × 0.14–0.17 (0.15), in contact with or a little separated from anterior testis, lying 56–66 (59)% of body length from anterior end of body. Oviduct arising from near center of ovary, connecting short duct from seminal receptacle, giving off Laurer’s canal, receiving common vitelline duct, entering Mehlis’ gland. Laurer’s canal running downward, opening dorsally near left margin of anterior testis at its anterior to middle level. Mehlis’ gland sinistral to ovary. Seminal receptacle ovoid, 0.08–0.13 (0.09) × 0.11–0.29 (0.22), posterosinistral to ovary, slightly overlapping anterior testis. Uterus preovarian, with sphincter at junction with metraterm; metraterm
saccate, 0.18–0.30 (0.19) × 0.06–0.09 (0.06), enclosed in gland cells. Eggs thin-shelled, partially collapsed, 64–74 × 48–51 μm. Vitelline follicles extending from intestinal bifurcation to near posterior end of body; dorsal and ventral to caeca; confluent in forebody and posttesticular space. Excretory vesicle tubular, reaching to intestinal bifurcation; pore terminal, enclosed in sphincter and gland cells.

Remarks. The present new species is most like *Neolepidapedoides trachinoti* (Siddiqi and Cable, 1960). Both differ from all other species of *Neolepidapedoides* by possessing vitelline follicles that intrude into the forebody. The present species differs from *N. trachinoti* by having an excretory vesicle which extends to the intestinal bifurcation as compared with the posterior margin of the anterior testis, smaller sucker ratio (1 : 0.69 to 0.86 as compared with 1 : 1), larger eggs (64 to 74 by 48 to 51 μm as compared with...
39 to 50 by 25 to 35μm) and vitelline follicles being confluent at the level of the intestinal bifurcation.

**Lepidapedoides miharahanadai** sp. nov.  
(Figs. 7–9)

*Type host.* *Giganthias immaculatus* (Giganthiidae).  
*Site.* Intestine.

*Type locality.* Koniya, Ohshima County, Kagoshima Pref., Japan, 9-III-1991.  
*Specimens.* Holotype and 10 paratypes, NSMT-PI 4157b.

*Etymology.* The specific name *miharahanadai* is from the Japanese name of the host.  
*Description.* Based on 11 specimens. Body linguiform with rounded ends, 1.96–2.72 (1.96) long by 0.51–0.65 (0.51) wide. Body width 19–33 (26)% of length. Tegument spinose. Eye-
spot pigments present. Oral sucker subterminal, 0.15–0.21 (0.15)×0.21–0.25 (0.21); prepharynx 0.04–0.10 (0.05) long; pharynx well-developed, 0.10–0.13 (0.11)×0.13–0.17 (0.13); oesophagus 0.10–0.30 (0.11) long, bifurcating slightly nearer acetabulum than oral sucker; caeca extending almost posterior end of body. Acetabulum 0.15–0.18 (0.15)×0.15–0.19 (0.16). Sucker ratio 1 : 0.70–0.79 (0.76). Forebody 30–38 (33)% of body length.

Testes rounded to ovoid, tandem, intercaecal, contiguous; anterior testis 0.17–0.24 (0.20)×0.22–0.28 (0.23); posterior testis 0.20–0.28 (0.23)×0.23–0.28 (0.23). Posttesticular space 12–17 (13)% of body length. Vasa efferentia not joining each other. External seminal vesicle tubular, sinuous, surrounded by gland cell mass which is delimited by membranous sac, extending to near ovary. Cirrus sac claviform, straight or slightly arcuate, more or less thick-walled, 0.24–0.48 (0.32)×0.13–0.20 (0.15), extending midway between acetabulum and ovary; containing oval internal seminal vesicle 0.07–0.16 (0.11)×0.07–0.14 (0.10), flask-shaped pars prostatica 0.08–0.22 (0.09)×0.07–0.18 (0.08) and cirrus. Cirrus often everted out of genital pore. Pars prostatica stretching to 0.50 long when the cirrus is everted. Genital atrium small. Genital pore sinistral near antero- to midlateral border of acetabulum.

Ovary globular, slightly dextral, 0.10–0.13 (0.10)×0.11–0.15 (0.12), a little separated from or in contact with anterior testis, lying 53–64 (62)% of body length from anterior end of body. Oviduct arising from anterior to middle portion of ovary, running to the left, receiving short duct from seminal receptacle at the same point branching Laurer’s canal, running upward to connect common vitelline duct, entering Mehlis’ gland. Laurer’s canal opening dorsally on left margin of anterior testis at its anterior to middle level. Mehlis’ gland sinistral to ovary. Seminal receptacle 0.10–0.19 (0.18)×0.13–0.29 (0.13), posterosinistral to ovary, partially overlapping anterior testis. Uterus preovarian, with sphincter at junction with metraterm; metraterm saccate, enclosed in gland cells, 0.27–0.39 (0.28)×0.10–0.14 (0.12), along left side of cirrus sac. Eggs thin-shelled, partially collapsed, 68–74×41–46 μm. Vitelline follicles extending from oesophageal level to posterior end of body. Excretory vesicle tubular, terminating near intestinal bifurcation; pore terminal, enclosed in sphincter and gland cells.

Remarks. The genus Lepidapedoides is most closely related to Neolepidapedoides, differing by possessing gland cells around the external seminal vesicle delimited by membrane as compared with those scattered in parenchyma (Bray, 2005).

The present new species was found with the above-mentioned N. amamiensis from the same host individual and resembles it, but differs from it by having an external seminal vesicle which is surrounded by gland cells enclosed in a membranous sac and a larger pharynx and metraterm. The membranous sac is sometimes not clear.

There are three species of Lepidapedoides that possess vitelline follicles and an excretory vesicle extending to the intestinal bifurcation; they are Lepidapedoides dollfusi (Durio and Manter, 1968), Lepidapedoides manteri (Hafeezullah, 1970) and Lepidapedoides angustus Bray, Cribb and Barker, 1996. Bray et al. (1996) redescribed L. dollfusi. The present new species differs from all three by having a larger pharynx, tandem testes, a cirrus sac which extends midway between the acetabulum and ovary, and a shorter posttesticular space. It further differs from L. dollfusi in body shape and egg size; from L. manteri in sucker ratio and position of the genital pore; and from L. angustus in sucker ratio and egg size.

Neolepocreadium ampahan sp. nov. (Figs. 10–12)

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Etymology. Specific name ampahan is from the Philippine local name of the host.

Description. Based on 20 specimens. Body elongated, tapering anteriorly and rounded posteriorly, 2.14–3.96 (3.96) long by 0.50–0.72 (0.56) wide at ovarian level. Tegument spinose, sparse posteriorly. Eyespot pigments scattered in pharyngeal-oesophageal region and numerous gland cells without granules also scattered in forebody. Oral sucker subterminal, sometimes nearly funnel-shaped, 0.09–0.12 (0.11) × 0.07–0.14 (0.12); prepharynx unrecognizable; pharynx 0.05–0.08 (0.06) × 0.05–0.08 (0.07); oesophagus 0.07–0.19 (0.19) long, bifurcating midway between suckers; caeca extending near posterior end of body. Acetabulum 0.14–0.20 (0.20) × 0.16–0.23 (0.21). Sucker ratio 1:1.48–2.23 (1.69). Forebody

Figs. 10–12. Neolepocreadium ampahan sp. nov. — 10, Entire worm, ventral view (holotype, NSMT-Pl 3546); 11, terminal genitalia, ventral view; 12, ovarian complex, dorsal view. Abbreviations: A, acetabulum; CS, cirrus sac; E, egg; ES, external seminal vesicle; G, genital pore; GC, crescent-shaped gland cells; IS, internal seminal vesicle; L, Laurer’s canal; M, metraterm; MG, Mehlis’ gland; O, ovary; P, pars prostatica; R, seminal receptacle; V, common vitelline duct.

NSMT-Pl 3546.
12–27 (20)% of body length.

Testes globular, tandem, separated, approximately in middle third of hindbody; anterior testis 0.23–0.36 (0.35) × 0.29–0.43 (0.34); posterior testis 0.24–0.42 (0.37) × 0.28–0.43 (0.34). Posttesticular space 25–43 (30)% of body length. Vasa efferentia not joining each other. External seminal vesicle swollen tubular, winding, 0.32–0.91 (0.68) × 0.06–0.14 (0.13), extending anterior 1/3 between acetabulum and ovary. No gland cells surrounding external seminal vesicle. Cirrus connected with pars prostatica by short canal, each of the cells opening into genital atrium. Genital pore anterior to acetabulum.

Remarks. Two other species of Neolepocreadium have been described, both from fishes of the genus Trachinotus: Neolepocreadium caballeroi Thomas, 1960 (type species) from T. goreensis and T. glancus of Ghana and Neolepocreadium trachinoti Madhavi, Narasimhulu and Shameem, 1986 from T. blochii of the Bay of Bengal, India. The present new species is very similar to N. caballeroi, differing in having a distinctive pars prostatica and a thin cirrus without muscular wall. The most distinctive feature of the present species is the genital atrium provided anteriorly with crescent-shaped gland cells. These gland cells have not been described for the two other species of Neolepocreadium.

References


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