

Neoplagioporus zacconis (Trematoda: Opecoelidae) from the intestine of the pale chub, *Zacco platypus*, in Korea

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Abstract: *Neoplagioporus zacconis* (Yamaguti, 1934) (Trematoda: Opecoelidae) was found from the intestine of the pale chub, *Zacco platypus*, for the first time in Korea. The worms were characterized morphologically by oval body shape, bipartited seminal vesicle, sinistrally located genital pore, and lobed ovary, and distinguished from the two other species of *Neoplagioporus* by body shape and distribution of vitelline follicles. The morphological characteristics, except the ovary, well corresponded to those of the previous descriptions. The morphological difference of the ovary was considered as a character of geographical phenotypic variation.

Key words: *Neoplagioporus zacconis*, *Zacco platypus*, digenetic trematode, Opecoelidae

There have been a few studies on the digenetic trematodes utilizing freshwater fish as their definitive hosts in Korea (Park, 1938 & 1939; Kim and Rim, 1995). Furthermore, adult digeneans from pale chub, *Zacco platypus*, have not been reported yet in Korea. In this study, we reported one digenetic trematode, *Neoplagioporus zacconis*, from the alimentary canal of the pale chub for the first time in Korea.

Pale chubs were collected from several localities during the period from 1992 through 1997. Living worms were fixed in hot AFA (ethanol-formalin-acetic acid), stored in 70% ethanol, and stained with acetocarmine in the routine preparation of whole mounts. Specimens were measured with an ocular micro-

meter, and were drawn with the aid of a camera lucida. Measurements, unless otherwise stated, are in millimeters.

Neoplagioporus zacconis (Yamaguti, 1934)
Synonym: *Caudotestis zacconis* Yamaguti, 1934

Plagioporus (Caudotestis) zacconis Yamaguti, 1958

The description is based on 5 mature specimens. Each value is the mean with the range in parentheses. Body elongated oval, 1.63 (1.45-1.84) long by 0.82 (0.65-0.94) in maximum width. Tegument smooth. Oral sucker subterminal, 0.22 (0.19-0.28) long by 0.24 (0.20-0.32) wide. Ventral sucker pre-equatorial, 0.35 (0.27-0.41) long by 0.35 (0.28-0.40) wide. Ratio of mean diameters of oral and ventral suckers 1:1.54 (1:1.35-1.65). Prepharynx short. Pharynx well developed, 0.12 (0.10-0.15) in both length and width. Intestinal caeca simple, extending to the level of the posterior border of posterior testis.

Testes tandem, in posterior intercaecal

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region, irregular in shape; anterior testis 0.19 (0.10-0.23) long by 0.22 (0.13-0.30) wide; posterior testis 0.23 (0.16-0.29) long by 0.24 (0.14-0.31) wide. Cirrus sac elongated clavi form, overlapping dorsally anterior margin of ventral sucker. Seminal vesicle bipartite by a constriction; twisted, large proximal region and oval, small distal region. Pars prostatica tubular, surrounded by well developed prostatic cells. Ejaculatory duct short, joining metraterm to form shallow genital atrium. Genital pore ventral, sinistral, at level of pharynx.

Ovary deeply bilobed or trilobed, pretesti-

cular or at right of anterior testis, 0.15 (0.09-0.18) long by 0.13 (0.09-0.16) wide. Seminal receptacle dorsal, round or oval, just left to ovary or overlapping anterior testis, 0.11 (0.07-0.14) long by 0.12 (0.08-0.18) wide. Oviduct passing antero-laterally from ovary, receiving duct from seminal receptacle and common vitelline duct before passing into Mehlis' gland. Laurer's canal passing transversely to left, opening dorsally. Ootype complex anterior to seminal receptacle. Vitelline follicles extending from posterior or lateral margin of pharynx to posterior border of posterior testis, embracing caeca, absent

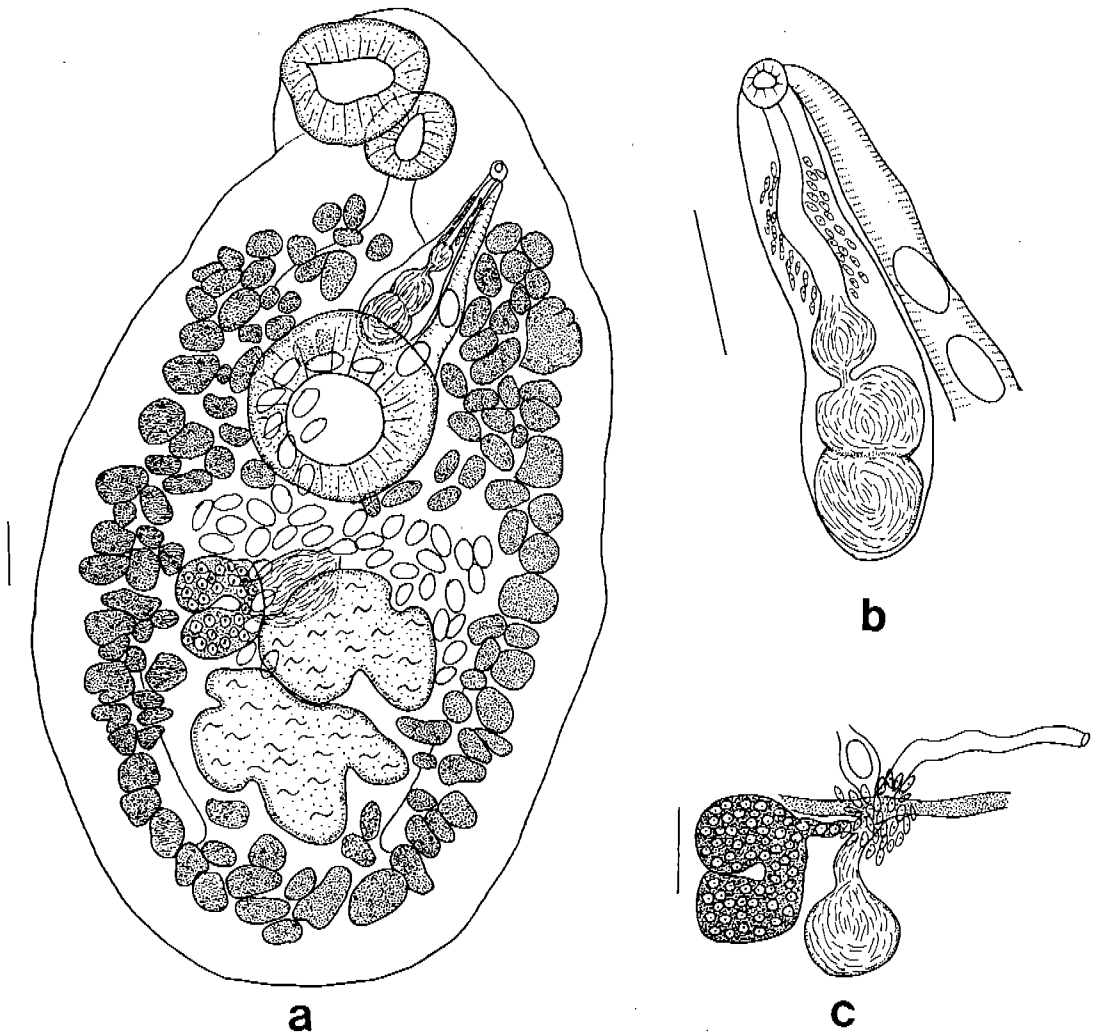


Fig. 1. *Neoplagioporus zacconis* (Yamaguti, 1934) from the intestine of *Zacco platypus*. (a) Whole mount, ventral view; (b) Cirrus sac and metraterm; (c) Female proximal genitalia. Bar = 0.1 mm.

Table 1. Dimensions^{a)} of *Neoplagioporus zacconis* from the intestine of *Zacco platypus* in Korea and comparison with those of previous reports

	Yamaguti (1934)	Shimazu (1990)	Present study (1998)
Body	1.38-1.63 × 0.625-0.875	1.46-3.08 × 0.87-1.50	1.45-1.84 × 0.65-0.94
Oral sucker (Os)	0.18-0.20 in diameter	0.20-0.24 × 0.22-0.29	0.19-0.28 × 0.20-0.32
Ventral sucker (Vs)	0.30-0.31 × 0.35	0.29-0.45 × 0.31-0.45	0.27-0.41 × 0.28-0.40
Ratio of Os:Vs	1:1.71	1:1.44-1.62	1:1.35-1.65
Pharynx	0.09-0.10 × 0.088-0.11	0.12-0.14 × 0.10-0.16	0.10-0.15 × 0.10-0.15
Anterior testis	0.26 × 0.30	0.16-0.53 (L) by	0.10-0.23 × 0.13-0.30
Posterior testis	0.21 × 0.31	0.22-0.51 (W)	0.16-0.29 × 0.14-0.31
Ovary	0.16 × 0.25	0.16-0.27 × 0.24-0.40	0.09-0.18 × 0.09-0.16
Seminal receptacle	—	0.12-0.20 × 0.11-0.16	0.07-0.14 × 0.08-0.18
Eggs (μm)	72-81 × 39-42	63-80 × 38-44	65-75 × 37-41
Host	<i>Zacco temmincki</i>	<i>Zacco platypus</i>	<i>Zacco platypus</i>
Geographic location	Japan	Japan	Korea

^{a)}Length × width; Unit is mm except for eggs.

from peripheral fields of body. Anterior portion of left vitelline follicles being obstructed by cirrus sac. Uterus extending to posterior border of anterior testis. Eggs oval; 71 μm (65-75 μm) long by 40 μm (37-41 μm) wide.

Host: *Zacco platypus*

Locality: Pochon, Kyonggi-do (July 14, 1992); Chongpyong, Kyonggi-do (Oct. 1, 1992); Yangsan, Kyongsangnam-do (April 9, 1997; Oct. 11, 1997)

Location in host: Intestine

Specimens deposition: PKNU (Pukyong National University) Helminth Collection

The genus *Neoplagioporus* was newly proposed by Shimazu (1990) to accommodate three species, *N. zacconis* (Yamaguti, 1934), *N. ayu* (Takahashi, 1928) and *N. elongatus* (Goto et Ozaki, 1930). He distinguished it from other genera of the subfamily Plagioporinae by a distinctly bipartite seminal vesicle, submedian sinistrally situated genital pore, trilobated or bilobated ovary, and extensively distributed vitelline follicles. The closely related genera - *Podocotyle*, *Plagioporus* and *Caudotestes* - are distinguished from *Neoplagioporus* by above-mentioned characters. Therefore, we accepted the new genus *Neoplagioporus* proposed by Shimazu (1990).

The morphological characteristics of the present specimens well corresponded to those

of the genus *Neoplagioporus*. In species level, however, the present specimens were different in the ovary shape from that described by Yamaguti (1934) and Shimazu (1990). The shape of the ovary was not trilobated but bilobated except one specimen among examined 10 specimens, and the direction of splitting of the ovary was the lateral face of it not the posterior. The other characteristics of the present specimens well coincided with those of *N. zacconis* (Table 1). Therefore, we considered the difference of the ovary shape as a character of geographical phenotypic variation, and proposed that the character state "bilobed or trilobed ovary" should be included in the description of *N. zacconis*.

The recorded hosts of *N. zacconis* are *Zacco temmincki*, *Z. platypus*, *Oncorhynchus masou* in Japan (Yamaguti, 1934 & 1942; Shimazu, 1990), and *Opsariichthys bidens* in China (Wang et al., 1985). In Korea, *Z. platypus* is a definitive host for *N. zacconis*.

Neoplagioporus zacconis differs from the other two species - *N. ayu* and *N. elongatus* - by having broader oval body shape and the confined distribution of vitelline follicles which are absent from the peripheral region of the body.

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=초록=

한국산 피라미 장에 기생하는 흡충류 *Neoplagioporus zacconis*
(Trematoda: Opecoelidae)

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피라미 (*Zacco platypus*)의 장으로부터 흡충류에 속하는 *Neoplagioporus zacconis* (Yamaguti, 1934) 1종을 한국에서는 처음으로 발견하여 기재하였다. 본 연구에서 발견된 총체는 난소의 형태를 제외한 다른 형태학적 특징들은 기존에 기재되어 있는 특징들과 잘 일치하였다. 난소 형태의 차이는 지리학적 표현형의 변이로 여겨졌다. *Neoplagioporus*속에 대한 속명을 신편평흡충속으로 제안한다.

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