

**Trematodes of the Genus *Urorchis* (Digenea: Opecoelidae: Urorchiinae)
from Freshwater Fishes of Japan**

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Abstract

The subfamily Urorchiinae Yamaguti, 1958, is placed in the family Opecoelidae Ozaki, 1925. The diagnosis of the genus *Urorchis* Ozaki, 1927, is emended. From Japanese freshwater fishes, *U. goro* Ozaki, 1927, *U. acheilognathi* Yamaguti, 1934, *U. imba* Ishii, 1935, and an unidentified trematode of the genus are described and figured. Data on their hosts, geographical distribution and life cycles are provided.

Key words: digeneans, *Urorchis*, Opecoelidae, freshwater fishes, Japan

This paper, the fourth in a series on the digenetic trematodes of the Japanese freshwater fishes, deals with species of the genus *Urorchis* Ozaki, 1927 (Opecoelidae: Urorchiinae).

Materials and Methods

The materials and methods have been described in the first paper (Shimazu, 1988a). Some whole-mounts were stained with toluidine blue, and the excretory system was studied in some living specimens.

Subfamily Urorchiinae Yamaguti, 1958

Urorchiinae Yamaguti, 1958, p. 179 (type genus, *Urorchis* Ozaki, 1927).

Diagnosis. Opecoelidae. Body fusiform to plump. Intestinal ceca ending blindly, may or may not reach to posterior extremity of body. Ventral sucker sessile, in anterior half of body, with no appendages. Testes two, tandem or slightly diagonal. Cirrus pouch entire, claviform, more or less overlapping ventral sucker; seminal vesicle short, bipartite; pars prostatica small, accompanied by prostatic cells; cirrus protrusible. Genital atrium small. Genital pore ventral,

submedian to left, prececal. Ovary globular to trilobed, median or submedian, pretesticular or opposite anterior testis. Seminal receptacle present, canalicular. Laurer's canal present. Ootype complex preovarian. Uterus occupying all available space in hindbody. Eggs fully embryonated or not when laid. Vitelline follicles extending along ceca for whole or part of their length, sometimes entering prececal area, separate anteriorly. Excretory vesicle I-shaped, reaching to testicular region; flame cell formula $2[(2+2) + (2+2)] = 16$. Intestinal parasites of freshwater fishes.

Life cycle unknown.

Discussion. Ozaki (1927) considered his new genus, *Urorchis*, to be allied to the subfamily Philophthalminae Looss, 1899. Yamaguti (1934) placed it in the family Fellodistomidae Nicoll, 1913. Later he (1942) transferred it to the family Allocreadiidae Stossich, 1903, and he (1958) erected a new subfamily, Urorchiinae, with it as the type genus in the family. Skrjabin and Koval' (1957) assigned it to a new subfamily, Proctoecinae (Fellodistomidae). The Urorchiinae is excluded from both families because of a combination of the following features: the cirrus being ordinary, the genital atrium being *small and not* hermaphroditic, the genital pore being submedian to the left, the seminal receptacle being canalicular, the ootype complex being preovarian, the excretory vesicle being I-shaped, the flame cell

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formula being $2[(2+2)+(2+2)]=16$, and the miracidium being nonoculate. It seems more appropriate to include it in the family Opcoelidae Ozaki, 1925, though the uterine eggs are fully embryonated to miracidia in the type genus and this character has not previously been seen in the family. To receive it, the family diagnosis of the Opcoelidae has been emended (Shimazu, 1988b).

The subfamily consists of *Urorchis*, *Plagiocirrus* Van Cleave et Mueller, 1932, and *Pseudurorchis* Yamaguti, 1971 (Yamaguti, 1971). Japanese species belong to the genus *Urorchis*.

Genus *Urorchis* Ozaki, 1927

Urorchis Ozaki, 1927, p. 163 (type species, *U. goro* Ozaki, 1927).

Diagnosis emend. Opcoelidae: Urorchiinae. Ceca and vitellaria may or may not reach posterior extremity of body, tending to shorten in extent. Cirrus short, straight. Ovary pretesticular. Uterine eggs fully embryonated.

Miracidia not oculate, bearing a pair of flame cells.

Discussion. Ozaki (1927) originally defined the ceca as simple and ending at the posterior level of the anterior testis and the vitellaria as surrounding the whole length of the ceca for the genus *Urorchis*. Wang (1983) proposed a new species, *U. hemibarbus*, in which both ceca and vitellaria extend almost to the posterior extremity of the body. (Wang described the genital pore as dextral, which needs confirmation.) There is a similar specimen with such ceca and vitellaria from Japan (see below). In other known species of the genus (three Japanese species presented in this paper; *U. macrovaum* Wang, 1983; *U. brachycaecum* Wang, 1983; and *U. saurogobii* Liu, 1987), neither the ceca nor the vitellaria enter the posttesticular region, and besides they tend to shorten in extent as seen in this paper. These differences in extent of the ceca and vitellaria do not seem to be of generic importance. Wang's species and the Japanese specimen should be retained in the genus. To accommodate them, therefore, the generic diagnosis has been

emended. They may have preserved the primitive types of the ceca and vitellaria judging from the above-mentioned tendency of these organs.

The genus is distributed in Japan (see this paper) and China (Wang, 1983; Wang, 1985; Wang *et al.*, 1985; Liu, 1987). The following are species known from Japan.

Urorchis goro Ozaki, 1927 (Figs. 1–8)

Urorchis goro Ozaki, 1927, pp. 160–163, figs. 5–7.

Material examined. 1) Lot 1. One gravid whole-mount (MPM Coll. No. 30022) of Ozaki (unidentified) from *Tridentiger obscurus* (Gobiidae) (other data not given).

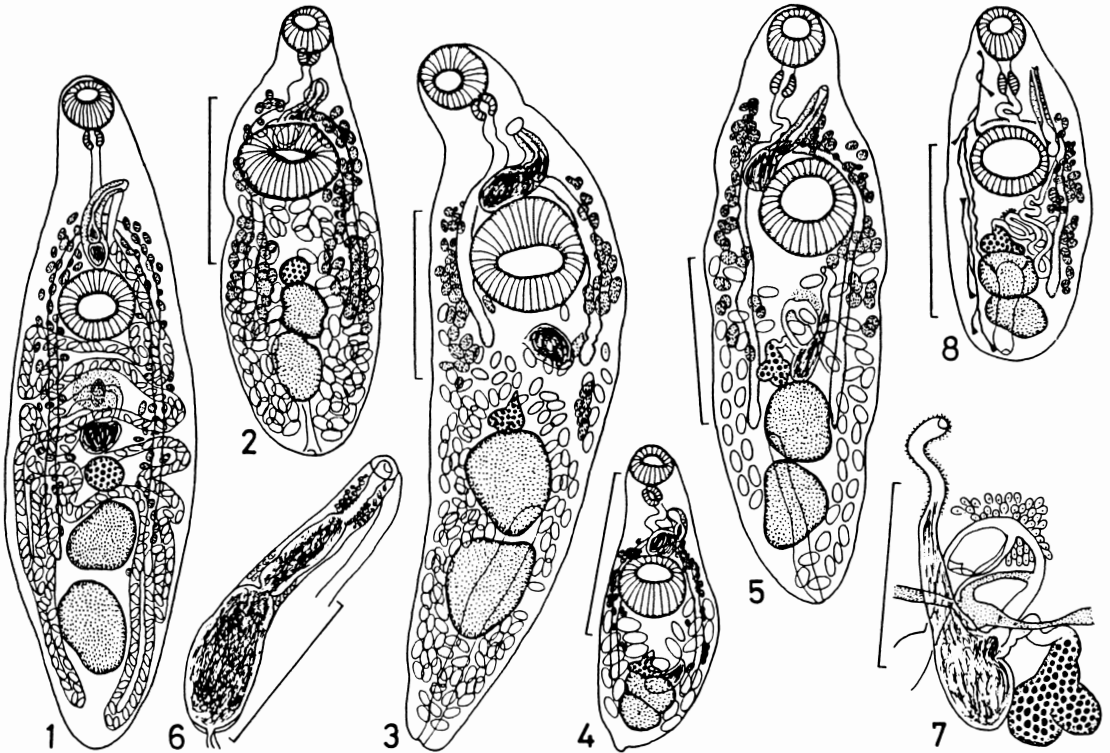
2) Lot 2. One gravid whole-mount (MPM Coll. No. 22628) of *U. goro* of Yamaguti (unpublished) from the intestine of *T. obscurus* from Tsuchiura, Ibaraki Prefecture, on April 16, 1929.

3) Lot 3. One gravid whole-mount (MPM Coll. No. 22015) of *U. goro* of Yamaguti (unpublished) from the intestine of *Gnathopogon elongatus* (Cyprinidae) from Lake Suwa, Nagano Prefecture, on May 19, 1935.

4) Lot 4. Eleven immature and 56 whole-mounted and several serially-sectioned (10 μ m) gravid specimens (NSMT-P1 3605–3611) from the intestine of *Lefua echigonia* (Homalopteriidae) from Midori, Iiyama, Nagano Prefecture, from November 1982 to July 1989.

5) Lot 5. Two immature and 2 gravid whole-mounts (NSMT-P1 3612) from the intestine of *Rhinogobius brunneus* (Gobiidae) from Matsukawa, Matsumoto, Nagano Prefecture, on November 3, 1982.

Description. 1) From the original description and figures for *U. goro* by Ozaki (1927) with some slight alterations (Fig. 1). Body subcylindrical, slightly flattened dorsoventrally, broadest in middle, tapering gradually toward blunt posterior end and more slowly toward anterior, 2 (mean) (1.72–2.15, range) by 0.57 [sic] (0.45–0.57) in flattened whole-mounts. Oral sucker subterminal, 0.155 (0.13–0.165). Prepharynx very short, 0.02 long. Pharynx globular, about 0.07 in diameter. Esophagus



Figs. 1-8 *Urorchis goro*. 1: Adult worm, ventral view, redrawn from Ozaki (1927). 2: Adult worm (lot 2), ventral view. 3-5: Adult worms (lot 4), ventral view. 6: Male terminal genitalia in lot 4, ventral view. 7: Ovarian complex in lot 4, dorsal view. 8: Immature worm (lot 4), excretory system, ventral view. (Scale bars: 0.5 mm in Figs. 2-5 and 8; 0.2 mm in Figs. 6-7.)

fairly long, 0.16 long, bifurcating about midway between pharynx and ventral sucker; intestinal caeca extending along midlines between body margins and median line to posterior level of anterior testis. Ventral sucker spherical, 0.23 (0.205-0.265) in diameter, at anterior third of body; ratio of oral sucker to ventral about 2:3.

Testes globular or ovoid, somewhat irregular in shape, tandem, almost contiguous, in posterior third of body, 0.15-0.40 in diameter; post-testicular space as long as length of testis or half as long. Cirrus pouch curved, conical, in front of ventral sucker with its posterior end pressed against anterior margin of ventral sucker in flattened whole-mounts, 0.25-0.32 by 0.08-0.10; its wall made up of an internal annular layer and an external longitudinal layer of muscle fibers, both faintly developed. Seminal vesicle constricted in middle like the swimming

bladder of cyprinoid fishes, occupying posterior half of cirrus pouch. Pars prostatica not differentiated [distinct in fig. 6], containing many small prostatic secretory granules in its cavity; prostatic cells numerous, occupying anterior two-thirds of cirrus pouch, surrounding pars prostatica and ejaculatory duct. Genital atrium small. Genital pore ventral, [sinistral in figs. 5-6], a little prebifurcal, midway between median line and body margin. Ovary round, median, just pretesticular, 0.085-0.11 in diameter; oviduct starting from anterior end of ovary. Laurer's canal given off directly from seminal receptacle, short, opening dorsally at level of ootype. Ootype preovarian; Mehlis' gland diffusely scattered. Uterus running down to posterior end of body, describing two or three anteroposterior loops in posterior third of body on either side of testes, then turning forward and

filling up space behind ventral sucker, or middle third of body; metraterm running alongside cirrus pouch to genital atrium. Eggs fairly large, light yellow, elliptical, 0.063–0.072 by 0.038–0.042, lying in a row in uterus; egg shell thin, bearing a small knoblike projection at antiopecular pole. Vitelline follicles surrounding whole length of ceca. Excretory vesicle tubular, extending forward as far as midlevel of anterior testis; excretory pore terminal.

Lots 1–3 were similar to the above description. Eggs were fully embryonated. In lot 1, eggs measured 72–76 by 34–38 μm , but neither Laurer's canal nor the excretory vesicle could be worked out. Fig. 2 shows lot 2, in which the ventral sucker was larger, with the sucker width ratio of 1:2.03. In lots 2 and 3, the vitellaria only slightly entered the prececal area. Laurer's canal in lot 3 extended forward to open dorsally a little behind the ventral sucker.

2) From lots 4–5, 10 gravid whole-mounts of lot 4 measured (Figs. 3–8). Body 0.95–2.37 by 0.33–0.67; forebody 0.43–0.63, 30–45% of total body length; no eyespots seen even in smaller immature worms. Oral sucker 0.11–0.20 by 0.12–0.21. Prepharynx short. Pharynx globular, 0.06–0.08 in diameter. Esophagus undulating or straight, 0.12–0.20 long, bifurcating in front of ventral sucker; ceca ending at various levels from behind ventral sucker to between two testes. Ventral sucker 0.19–0.33 by 0.20–0.38; sucker width ratio 1: 1.56–1.79.

Testes entire or slightly indented, usually longitudinally elongated, in middle third of hindbody, 0.12–0.40 by 0.12–0.28. Cirrus pouch extending to midlevel of ventral sucker, 0.16–0.35 by 0.06–0.09; seminal vesicle short, straight, distinctly bipartite, posterior part elliptical, anterior pear-shaped; pars prostatica small, accompanied by prostatic cells; cirrus short, protrusible. Genital atrium small, shallow. Genital pore located at midlevel of esophagus or slightly anterior to it. Ovary globular to 2- to 3-lobed, dextrosubmedian, 0.09–0.13 by 0.10–0.13. Seminal receptacle canalicular, almost median, opposite or anterior to ovary, 0.08–0.16 by 0.07–0.08. Laurer's canal extending anteriorly, straight or recurved, opening dorsally behind

ventral sucker. Ootype complex preovarian. Uterus enlarging its extent according to growth of worms, after coiling pretesticularly, describing a loop descending gradually toward posterior end of body on left side of testes, then a similar loop on right side, and finally coming to fill all available space in hindbody, but not invading intertesticular space; metraterm well developed, possibly extending to behind ventral sucker. Eggs thin-shelled, fully embryonated in distal coils of uterus, gradually increasing in size according to stage of development of embryos in them, fully-embryonated eggs 70–84 by 30–42 μm in balsam (75–92 by 40–45 μm in life); miracidia having a pair of flame cells and no eyespots. Vitelline follicles rather sparse, surrounding whole ceca or almost so, extending forward to midlevel of esophagus, separated there. Excretory vesicle I-shaped, reaching to midlevel of anterior testis; flame cell formula $2[(2+2)+(2+2)]=16$; excretory pore terminal.

Discussion. Ozaki (1927) described a new genus and species, *Urorchis goro*, from the intestine of *T. obscurus* from Kasumigaura, Ibaraki Prefecture, and a swamp near Sendai, Miyagi Prefecture. He deposited the holotype (No. P. 260) in the collection of the Zoological Institute, Science Faculty, Imperial University, Tokyo. I have been unable to trace it. Most presumably, it has already been lost. Lot 1 is likely to be part of the type series.

All the specimens but lot 2 examined here resemble Ozaki's original description for *U. goro* though different in shape of the ovary and extent of Laurer's canal. These differences are slight and insufficient to create a new species for them. They are all identified as *U. goro*. Lot 2 with a larger ventral sucker is provisionally referred to this species. It is evident from lots 4 and 5 that the ovary is variable in shape (spherical, bilobed or trilobed) and the ceca and vitellaria tend to shorten in extent.

The species has been recorded from *Tridentiger obscurus* of Miyagi and Ibaraki Prefectures, and *Gnathopogon elongatus*, *Lefua echigonia* and *Rhinogobius brunneus* of Nagano Prefecture, Japan (Ozaki, 1927; this paper); and from *Hemibarbus maculatus* (Cyprinidae) of

Fujian, China (Wang *et al.*, 1985). Its life cycle is unknown. Miracidia can hatch immediately after eggs are laid.

Urorchis acheilognathi Yamaguti, 1934
(Figs. 9–15)

Urorchis acheilognathi Yamaguti, 1934, pp. 415–417, figs. 81–82.

Material examined. 1) Lot 1. Type series of *U. acheilognathi* of Yamaguti (1934): 2 immature and 22 gravid whole-mounts (holotype and paratypes, MPM Coll. No. 22629) from the intestine of *Acheilognathus intermedia* [= *A. lanceolatus*] (Cyprinidae) (type host) from Lake Ogura, Kyoto Prefecture, on May [3 and 31], 1932; and 2 gravid whole-mounts (paratypes, MPM Coll. No. 22630) from the intestine of *A. cyanostigma* from [Lake Kohata, Kyoto Prefecture, on May 14, 1928].

2) Lot 2. One gravid whole-mount (MPM Coll. No. 22626) of *Urorchis* of Yamaguti (unpublished) from the intestine of *Gnathopogon caerulescens* (Cyprinidae) from Lake Biwa, Shiga Prefecture, on July 9, 1927.

3) Lot 3. One gravid whole-mount (MPM Coll. No. 22014) of *U. goro* of Yamaguti (unpublished) from the intestine of *G. caerulescens* from Lake Biwa on May 26, 1936.

4) Lot 4. One gravid whole-mount (MPM Coll. No. 22627) of *Urorchis*, probably one of the three specimens of *U. acheilognathi* of Yamaguti (1942) from near Kyoto, from the intestine of “experimental” *Pseudorasbora parva* (Cyprinidae) on June 22, 1937. (The word “experimental” suggests that lot 4 was obtained from the fish which he used for some other experiments.)

5) Lot 5. Two immature and 60 gravid whole-mounts (NSMT-P1 3618–3622) from the intestine of *A. lanceolatus* from Lake Kizaki, Nagano Prefecture, from October 1980 to May 1981.

6) Lot 6. Two immature and 11 gravid whole-mount (NSMT-P1 3614–3615) from the intestine of *P. parva* from Lake Kizaki on August 28, 1981, and July 5, 1983.

7) Lot 7. Eight gravid whole-mounts (NSMT-P1 3617) from the intestine of *Moroco steindachneri* (Cyprinidae) from Lake Kizaki on September 21, 1979.

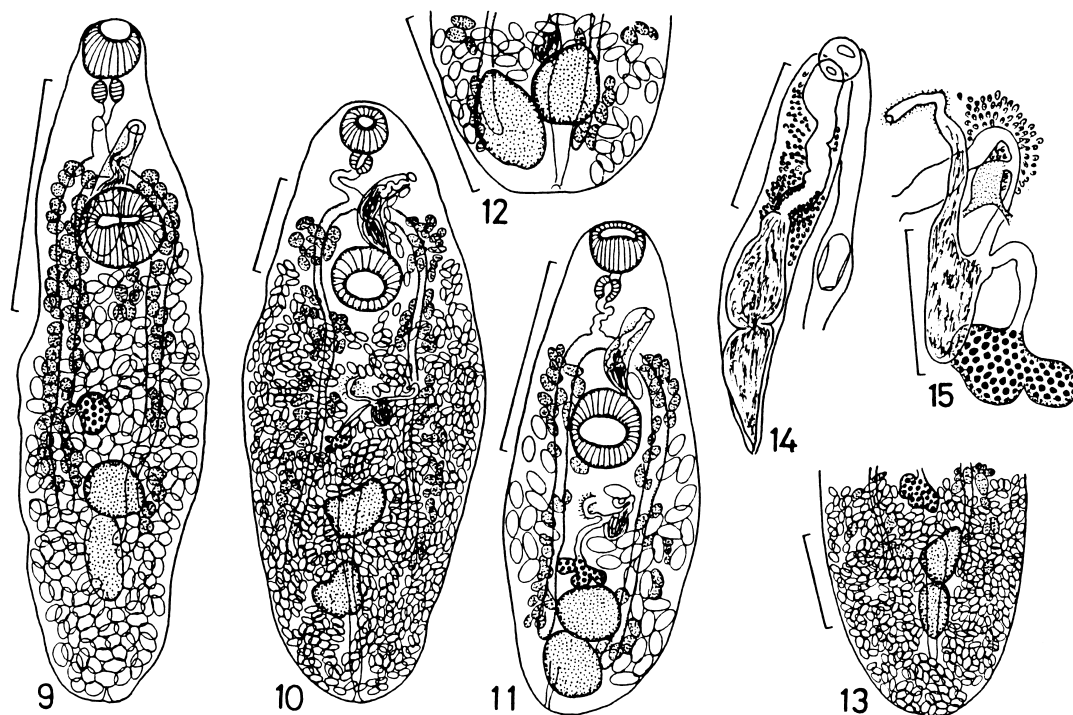
8) Lot 8. One gravid whole-mount (NSMT-P1 3613) from the intestine of *Sarcocheilichthys variegatus microoculus* (Cyprinidae) from Lake Kizaki on July 18, 1981.

9) Lot 9. Three gravid whole-mounts (NSMT-P1 3616) from the intestine of the “Kizaki-masu” salmon (*Oncorhynchus masou macrostomus?*) (Salmonidae) from Lake Kizaki on September 27, 1977.

Description. 1) For the original description and figures for *U. acheilognathi*, see Yamaguti (1934).

From lot 1, 10 gravid whole-mounts measured (Fig. 9). Body oblong to ovate, 1.03–1.82 by 0.40–0.79; forebody 0.35–0.59 long, 26–35% of total body length. Oral sucker subterminal, 0.11–0.16 by 0.12–0.18. Prepharynx short. Pharynx 0.05–0.07 by 0.07–0.09. Esophagus straight or sinuous, 0.05–0.08 long, bifurcating about midway between pharynx and ventral sucker; intestinal ceca extending to testicular zone (at the most to midlevel of posterior testis). Ventral sucker 0.16–0.24 by 0.16–0.25; sucker width ratio 1: 1.21–1.60.

Testes almost entire, median, tandem, contiguous or separated by uterus, 0.11–0.24 by 0.08–0.24, in third quarter of hindbody. Cirrus pouch club-shaped, sometimes extending a little farther backward than ventral sucker, 0.24–0.45 by 0.05–0.19. Seminal vesicle bipartite, posterior part elliptical, anterior pyriform, curved or not anteriorly; pars prostatica small, accompanied by prostatic cells; cirrus rather long, winding, protrusible. Genital atrium shallow. Genital pore at midlevel of esophagus or anterior to it. Ovary globular or cordiform, dextrosubmedian or median, pretesticular, 0.08–0.14 by 0.09–0.14. Seminal receptacle canalicular, retort-shaped, 0.12–0.16 by 0.06–0.08, median, anterior to or side by side with ovary. Laurer’s canal not worked out. Ootype complex preovarian. Uterus occupying all available space of hindbody in fully-gravid specimens. Eggs numerous, elliptical, thin-shelled, fully embryonic.



Figs. 9–15 *Urorchis acheilognathi*. 9. Adult worm, holotype (lot 1), ventral view. 10–13: Adult worms (lot 5), ventral view. 14: Male terminal genitalia in lot 5, ventral view. 15: Ovarian complex in lot 5, dorsal view. (Scale bars: 0.5 mm in Figs. 9–13; 0.2 mm in Figs. 14–15.)

nated, 50–76 by 32–44 μm (collapsed). Vitelline follicles surrounding ceca, beginning at bifurcal level, ending usually a short distance in front of cecal termination, separate anteriorly. Excretory vesicle I-shaped, extending almost to anterior border of anterior testis; excretory pore terminal.

Lots 2 and 3 were similar to lot 1.

2) Lot 4 agreed well with Yamaguti's (1942) description for the three specimens from *P. parva*. According to him, the seminal vesicle is constricted at about the middle, the excretory vesicle is tubular, and the flame cell formula is $(3+3)\times 2=12$. This formula is very questionable (see that in *U. goro* in this paper).

3) From lots 5–9, 10 gravid whole-mounts of lot 5 measured (Figs. 10–15). Body 0.95–3.16 by 0.51–1.30; forebody 0.47–1.00, 31–60% of total body length. Oral sucker 0.13–0.25 by 0.15–0.26. Pharynx 0.06–0.12 by 0.07–0.12. Esophagus undulating, 0.09–0.32 long, bifurcating midway between two suckers; ceca ex-

tending to midlevel between two testes. Ventral sucker 0.21–0.35 by 0.20–0.40; sucker width ratio 1: 1.31–1.60. Testes globular or slightly irregularly indented, large or small, usually tandem, rarely oblique, contiguous or separated by uterus, 0.16–0.31 by 0.12–0.34. Cirrus pouch extending to midlevel of ventral sucker, 0.24–0.51 by 0.04–0.12; seminal vesicle divided; pars prostatica small; cirrus fairly long. Ovary globular or 2- to 3-lobed, 0.08–0.27 by 0.09–0.20. Seminal receptacle 0.10–0.14 by 0.05–0.08. Laurer's canal extending anteriorly or anterolaterally, fairly long, sinuate or not. Eggs 70–90 by 38–46 μm in balsam (72–79 by 37–42 μm in life in lot 9); egg shell thin, asymmetric longitudinally. Vitelline follicles rather thin. Other features similar to those of lots 1–4.

Discussion. This species differs from *U. goro* in having a broader body, longer ceca reaching to the midlevel between the two testes, a smaller sucker width ratio, smaller testes sometimes

separated by the uterus, a longer cirrus, more thinly distributed vitellaria and a longer excretory vesicle reaching to the anterior border of the anterior testis.

The species has been recorded from the Kizaki-masu salmon, *Moroco steindachneri* and *Sarcocheilichthys variegatus microoculus* of Nagano Prefecture, *Acheilognathus lanceolatus* and *Pseudorasbora parva* of Nagano and Kyoto Prefectures, *Gnathopogon caerulescens* of Shiga Prefecture, and *A. cyanostigma* of Kyoto Prefecture, Japan (Yamaguti, 1934, 1942; this paper); and from *Hemibarbus maculatus* of Fujian, China (Wang *et al.*, 1985). Its life cycle is unknown.

Urorchis imba Ishii, 1935
(Fig. 16)

Urorchis imba Ishii, 1935, pp. 537–548, figs. 1–2.

This species has been known only from the original description and figures for it by Ishii (1935). He described it from the intestine of *Pseudorasbora parva* from Imbanuma and Teganuma lakes, Chiba Prefecture. The type material has not been located.

Description. From the original description and figures for *U. imba* by Ishii (1935) with some slight alterations (Fig. 16). Body subcylindrical, lightly flattened dorsoventrally, broadest in posterior third, 1.64–1.83 by 0.59–0.60 (0.48–0.52 at level of ventral sucker). Oral sucker terminal, 0.16–0.18 in diameter. [Pharynx present in fig. 1.] Esophagus 0.11–0.17 by 0.032–0.039, bifurcating about midway between pharynx and ventral sucker; intestinal ceca running along midlines between body margins and median line to midlevel of posterior testis. Ventral sucker spherical, 0.22–0.24 in diameter, located at anterior end of middle third of body.

Testes almost contiguous, tandem, in posterior third of body, multilobed, somewhat irregular in shape; anterior one 0.189–0.191 by 0.175–0.207, posterior 0.143–0.223 by 0.191–0.270. Cirrus pouch straight, conical, in front of ventral sucker in flattened whole-

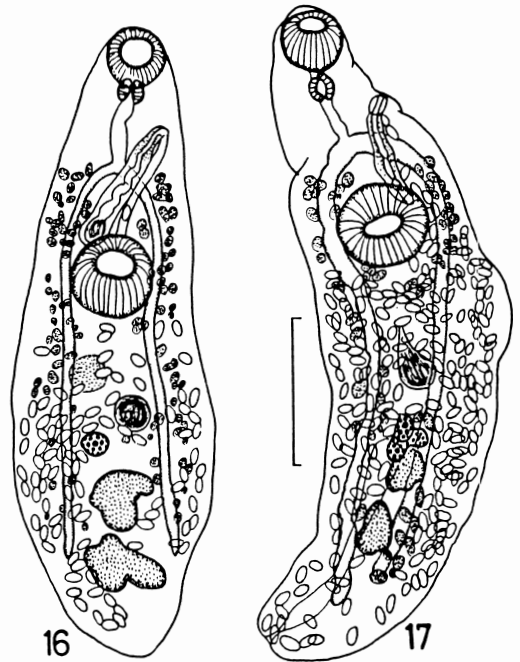


Fig. 16 *Urorchis imba*, adult worm, holotype, ventral view, redrawn from Ishii (1935).

Fig. 17 *Urorchis* sp., adult worm, ventral view. (Scale bar: 0.5 mm in Fig. 17.)

mounts, 0.318 by 0.048–0.056; seminal vesicle occupying posterior part of cirrus pouch; ejaculatory duct winding, ending in a cirrus; pars prostatica not differentiated, containing many small prostatic secretory granules in its lumen; prostatic cells numerous, in anterior third of cirrus pouch. Genital atrium small. Genital pore [sinistral in fig. 1], ventral, a little prebifurcal, midway between median line and body margin. Ovary a little to right of median line, pretesticular, nearly round, 0.072–0.095 in diameter; oviduct starting from anterior end of ovary, joining seminal receptacle after a short course forward, then receiving vitelline duct and forming an ootype. [Seminal receptacle spherical, antero-sinistral to ovary in fig. 1.] Mehlis' gland diffusely scattered around ootype, preovarian. Uterus running down to posterior end of body and winding on to genital pore. Eggs elliptical, lying in a row in uterus, 0.066–0.075 by 0.028–0.033, with a very thin shell. [Vitelline follicles thin, extending along ceca from bifurcal

level to midlevel between two testes in fig. 1.]

Discussion. Ishii (1935) did not describe the male terminal genitalia in detail. His figure (fig. 2) suggests that the seminal vesicle is spherical and the ejaculatory duct or cirrus is fairly long and winding. He said nothing of development of eggs in the uterus and the excretory vesicle. According to him, the species differs from *U. goro* in the body being broadest in the posterior part, the testes being multilobed, the ejaculatory duct winding more, the ovary, seminal receptacle and Mehlis' gland being submedian, and in measurements. He did not compare it with *U. acheilognathi* for some unknown reason. It seems to me that it more closely resembles the latter as seen in this paper in general morphology and host. It is, however, provisionally maintained as a valid species pending further studies of the type material and specimens from its type host at its type locality.

The species has been recorded from *Pseudorasbora parva* of Chiba Prefecture, Japan (Ishii, 1935), and from China. According to Liu (1987), Wang (1985) described it in detail from Sichuan, China. (This description was not available to me). Its life cycle is unknown.

Urorchis sp.

(Fig. 17)

Material examined. One gravid whole-mount (MPM Coll. No. 30023) of Ozaki (unidentified and unpublished) from *Odontobutis obscura* (Gobiidae) from Lake Biwa (other data not given).

Description. Body (Fig. 17) elongate, 2.37 by 0.59; forebody 0.79 long. Oral sucker 0.21 by 0.22. Prepharynx present. Pharynx 0.09 in diameter. Esophagus 0.13 long, bifurcating midway between pharynx and ventral sucker; ceca extending into posttesticular region. Ventral sucker 0.30 by 0.31; sucker width ratio 1: 1.41. Testes irregular in shape, tandem, separated, small, 0.16–0.20 by 0.12, in middle third of hindbody. Cirrus pouch clavate, extending to midlevel of ventral sucker, 0.38 by 0.06, including bipartite seminal vesicle, pars prostatica complex and long cirrus. Genital atrium small. Genital

pore slightly prebifurcal. Ovary 3-lobed, almost median, just pretesticular, 0.16 in diameter. Seminal receptacle 0.16 by 0.11. Neither Laurer's canal nor ootype complex worked out. Uterus reaching to posterior end of body. Eggs fully embryonated, 60–80 by 30–34 μm (collapsed). Vitelline follicles rather thin, commencing at level a little posterior to intestinal bifurcation, entering posttesticular region. Excretory vesicle possibly reaching to anterior border of anterior testis.

Discussion. This trematode is characterized by the intestines and vitellaria both extending into the posttesticular region. In these respects it resembles *U. hemibarbus* from the intestine of *Hemibarbus maculatus* from Lake Poyang, Jiangxi, China (Wang, 1983). It remains unidentified until many additional specimens are studied.

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