

**Metacercariae of *Stephanostomum hispidum* (Yamaguti, 1934)
(Trematoda, Digenea: Acanthocolpidae) found in the
Marine Goldeye Rockfish, *Sebastes thompsoni***

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Abstract

Many metacercarial cysts were found in the muscles of marine goldeye rockfish, *Sebastes thompsoni*, which were purchased at a market in Kanazawa City on the Japan Sea coast of central Japan. From morphological features, they were identified as *Stephanostomum hispidum* (Yamaguti, 1934) Manter, 1940 (Trematoda, Digenea: Acanthocolpidae). This is the first report of *S. thompsoni* as the second intermediate host for *S. hispidum*.

Key words: digenean, *Stephanostomum hispidum*, metacercaria, *Sebastes thompsoni*

Introduction

In the genus *Stephanostomum* (Trematoda, Digenea: Acanthocolpidae), thirteen species have been described from marine fishes of Japanese waters (Yamaguti, 1958b; Machida, 1984). Adults of these species parasitize the small and large intestine, and metacercariae encyst in the body cavity, gill chamber, muscle and swim bladder of marine fishes (Yamaguti, 1934, 1937, 1958a, b).

In this paper, the metacercariae of *Stephanostomum hispidum* (Yamaguti, 1934) Manter, 1940 is described from the muscles of marine fish, *Sebastes thompsoni*.

Materials and Methods

Encysted metacercariae were obtained from the muscles of the marine goldeye rockfish, *Sebastes thompsoni*, which were purchased at a market in Kanazawa city on the Japan Sea coast

of central Japan in 1987 to 1988. Some metacercarial worms were taken out of their cysts under a dissecting microscope. They were flattened under a cover glass, fixed in 80% ethanol, stained with carmine, dehydrated and mounted in Entellan (Merck). Fourteen whole-mounted specimens were measured. Some of them are deposited in the collection of the National Science Museum, Tokyo.

Results

Cysts subglobular, 1.02 to 1.59 mm by 0.74 to 1.26 mm, 2-layered.

Measurements of the metacercarial worms are shown in Table 1. Body fusiform (Figs. 1 and 2A). Tegument spinose in all parts of body; spines in anterior parts of body 38.9–47.8 μ m long, larger than those in posterior (Figs. 2C–2E). Oral sucker funnel-shaped, with 39 to 43 (mostly 42) triangular circumoral spines; spines arranged alternately in two unbroken rows but in a single lateral row (Fig. 2B), varying in size; oral spines a little shorter than aboral spines and shortest in ventral zone. Two eyespots present in neck region, observable in unstained specimens, but obscure in stained specimens. Prepharynx fairly long. Pharynx barrel-like. Esophagus short, bifurcating just in front of ventral sucker; intestinal caeca terminating near

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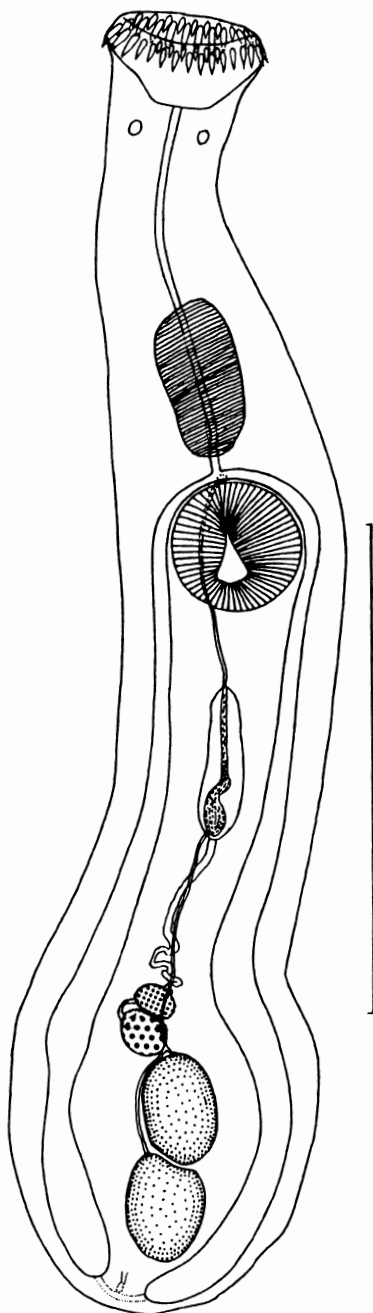


Fig. 1 Excysted metacercarial worm of *Stephanostomum hispidum* entire body. Scale, 1 mm.

posterior extremity of body. Ventral sucker located slightly anterior to mid level of body, almost circular; width ratio of oral sucker to ventral sucker 1:0.69–0.99. Cirrus pouch very long, connecting with ductus hermaphroditicus and opening into genital pore immediately in front of the ventral sucker. Ovary ovoid, situated closely in front of anterior testis. Another mass of cell present on the proximal part of uterus, may be the anlage of Mehlis' gland. Anterior testis elliptical, located at posterior one-fourth of body. Posterior testis located behind anterior one and near posterior end of body. Excretory vesicle occasionally enlarged.

Discussion

The arrangement of the circumoral spines of this digenean is characteristic of the metacercarial worm of the genus *Stephanostomum* (= *Echinostephanus*) previously described by Yamaguti (1934, 1958b) and Dawes (1968). Manter and Van Cleave (1951) showed some keys to 28 species of this genus *Stephanostomum*. Wolfgang (1955) placed this genus into five groups, using as criteria with the pattern of the vitellaria whether interrupted lateral to the gonads or not, cirrus armed or unarmed, long or short. Nevertheless, the majority of metacercarial worms in this study has 42 circumoral spines. Out of many known species in the genus *Stephanostomum*, *S. tenue* (Linton, 1898) Linton, 1940 and *S. hispidum* (Yamaguti, 1934) Manter, 1940 (= *Echinostephanus hispidus* Yamaguti, 1934) possess 42 circumoral spines (Machida, 1984; Manter, 1940; Manter and Van Cleave, 1951, Martin, 1939; Stunkard, 1961; Yamaguti, 1934, 1937, 1975). These two species are differentiated from each other by the number and location of vitellaria in adult morphology (Manter and Van Cleave, 1951) and the size of cirrus (Wolfgang, 1955). In the size, number and arrangement of the circumoral spines, the present metacercaria more closely resembles the adult of *S. hispidum* as described by Yamaguti (1934, 1937) and Manter (1940). The slight differences are seen in the metacercarial stage (Table 1), however, they are considered to be within individual variations in

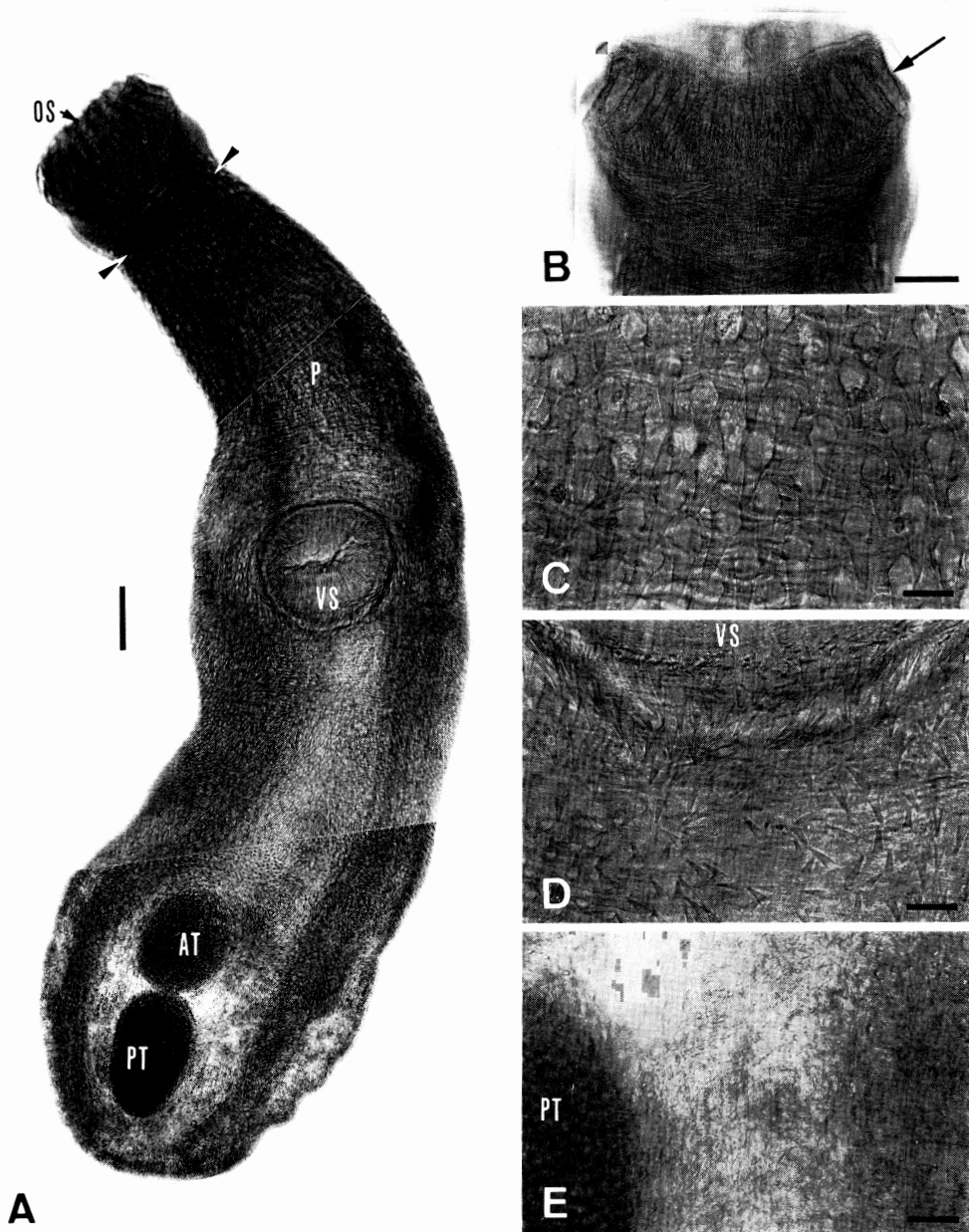


Fig. 2 Another excysted metacercarial worm of *Stephanostomum hispidum*.

A: Entire body, having eyespots (arrow heads).

OS, oral sucker P, pharynx; VS, ventral sucker; AT, anterior testis; PT, posterior testis. Scale, 100 μm .

B: Anterior part of body, showing circumoral spines (arrow). Scale, 50 μm .

C: Neck region, showing large spines. Scale, 20 μm .

D: Middle part of body near the ventral sucker, showing smaller spines. Scale, 20 μm .

E: Posterior part of body near the posterior testis (PT), showing the smallest spines. Scale, 20 μm .

Table 1 Comparison of measurements (in μm unless stated otherwise) of metacercarial worms of *Stephanostomum hispidum* (= *Echinostephanus hispidus*) found in the muscles of marine fishes

	The present paper*	Yamaguti (1934)	Yamaguti (1937)	
Body length	2.55 (2.02–3.59)mm	4.08mm	3.9mm	
No. of circumoral spines	39–43 (mostly 42)	40	42	
Length of Circumoral spines				
Dorsal oral spines	68.0 (61.3–75.1)	65.8	76	
Dorsal aboral spines	78.2 (67.3–85.1)	60.5	70	
Ventral oral spines	37.9 (33.1–42.4)	26.3	33	
Ventral aboral spines	46.2 (36.4–54.9)	36.8	42	
Lateral spines	57.3 (54.6–61.7)	55.2	75	
Oral sucker	width	320 (274–397)	230–270	188
Prepharynx	length	408 (256–604)	230–400	400
Pharynx	length	265 (232–293)	150–170	195
	width	161 (133–165)	80–110	93
Ventral sucker	length	251 (209–281)	260–280	240
	width	235 (201–261)	ND†	ND
Cirrus pouch	length	315 (251–437)	ND	780
	width	84.5 (72.8–101.9)	ND	90
Ovary	length	67.4 (51.5–77.8)	84	70
	width	62.0 (50.1–76.2)	63	75
Anterior testis	length	190 (148–249)	250	250
	width	141 (119–170)	240	135
Posterior testis	length	211 (180–264)	ND	310
	width	135 (102–179)	ND	138

* Means (min.–max.) from 14 larvae.

† ND, no data.

the second intermediate host.

On the other hand, the metacercarial cysts of 5 species had been collected from marine fishes of Japanese waters (Yamaguti, 1934, 1937, 1958a, b). Of them, two species as *S. hispidum* and *S. japonicum* are parasitic in the flesh of the second intermediate host. They can be easily classified each other by the number of circumoral spines. The metacercariae of *S. tenue* as described previously encyst in the visceral organ (Martin, 1939), those of *S. hispidum* in the flesh.

Therefore, the metacercariae in the present study are identified as *S. hispidum*.

Yamaguti (1934) reported the adult of *S. hispidum* from the small and large intestines of *Seriola quinqueradiata* from the Pacific coast of Japan. Kifune and Iwata (unpublished) found it in the intestine of *S. quinqueradiata* and the stomach and the intestine of *S. dumerili* from Kyushu waters. The metacercariae have already

been recorded from the flesh of *Argentina kagoshimae* of Toyama Bay, the Japan Sea (Yamaguti, 1934), and *Pseudorhombus pentophthalmus* and *Neopercis sexfasciatus* at Maisaka on the Pacific coast of central Japan (Yamaguti, 1937). The present study adds *S. thompsoni* as the second intermediate host for *S. hispidum*.

Metacercarial cysts are so large as to be discernible to the naked eyes. It is important in the public health that the unpleasant worms are present in the flesh of fishes coming on the market, even though they are not zoonotic.

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