

Description of the Progenetic Metacercaria of *Pseudopicoelus japonicus* (Allocreadiidae: Trematoda) from *Euphausia similis* (Euphausiacea: Crustacea) of Suruga Bay

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Dr. Yuzo Komaki, Tokyo University, recognized that a krill, *Euphausia similis* G. O. Sars (Euphausiacea: Crustacea), was infected with a slightly ellipsoidal alien body under its carapace, while working on the biomass of micronectonic crustacea of Suruga Bay in 1969. He sent the krills with the alien body to Prof. Toñoo Oshima and me for the parasitological observations.

I observed the alien body to be the progenetic metacercaria of *Pseudopicoelus japonicus* (Yamaguti, 1938) von Wicklen, 1946 (Allocreadiidae: Trematoda). Dr. Komaki previously reported the alien body as the metacercaria of *P. japonicus* or of its closely related species, under my opinion [Komaki, Y. (1970): J. Oceanogr. Soc. Japan, 26 (5), 283-295].

This paper deals with the morphology and the specific identification of the metacercaria. For the purpose of the ecological studies of this parasite, see also Komaki (1970).

Materials and Method

The krills, *Euphausia similis* G. O. Sars, were sampled by Dr. Y. Komaki with Issacs-Kidd midwater trawl with net of 5 mm aperture from the R/V Tansei-Marui of the Ocean Research Institute of Tokyo University, on her KT-69-11 cruise in Suruga Bay in early July of 1969. They were preserved in 10% neutralized formalin in seawater. In my laboratory, after the cysts were removed from the krills, the metacercariae were liberated from cysts, flattened carefully, and then

stained in Delafield's hematoxylin and mounted. The transverse sections were also prepared. Eggs having been laid in cyst were measured.

Results

The cysts lay in the cardiac region under the carapace of the krills. They were subglobular, measured 0.71 to 1.81 mm long by 0.54 to 1.61 mm wide (based on six cysts). The cyst walls consisted of two layers, and measured 0.03 to 0.06 mm thick. The metacercariae in double-position in cysts were fully gravid, and laid eggs in cysts, except few immature worms.

Description of metacercaria (Fig. 1, measurements based on ten metacercariae): Body oval, small, 0.89 to 2.50 mm long by 0.74 to 1.26 mm in maximum width. Cuticle smooth. Oral sucker subterminal, 0.17 to 0.33 mm in transverse diameter. Pharynx muscular, 0.10 mm in transverse diameter. Esophagus short, bifurcating a little in front of ventral sucker. Ceca simple, terminating blindly near posterior end of body. Ventral sucker preequatorial, slightly protrusible, larger than oral sucker, 0.27 to 0.34 mm in transverse diameter. Accessory sucker and papillae on ventral sucker absent. Testes two, irregularly indented, almost tandem, post-equatorial, anterior: 0.27 to 0.45 mm by 0.13 to 0.31 mm, posterior: 0.30 to 0.46 mm by 0.15 to 0.40 mm. Seminal vesicle external, tubular, sinuous, long, winding, extending posteriorly to ventral sucker. Prostate gland

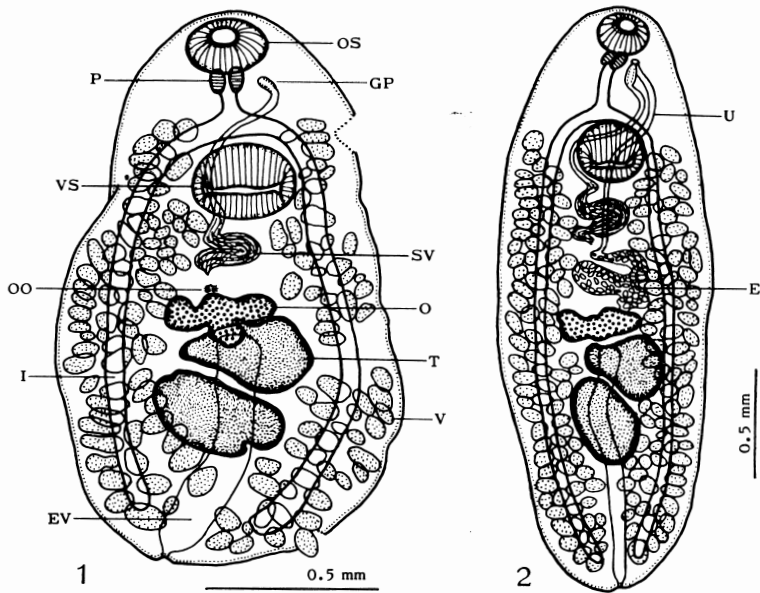


Fig. 1. Metacercaria of *Pseudopecoelus japonicus* liberated from cyst from *Euphausia similis*. Ventral view. Eggs have not been formed in this specimen. Uterus is omitted.

Fig. 2. Metacercaria of *P. japonicus* from *E. similis* ingested in the stomach of *Chlorophthalmus albatrossis* of Tosa Bay. Ventral view. E: eggs, EV: excretory vesicle, GP: genital pore, I: intestine, O: ovary, OO: ootype, OS: oral sucker, P: pharynx, SV: seminal vesicle, T: testis, U: uterus, V: vitellaria, VS: ventral sucker.

cells not observed. True cirrus pouch probably absent, but cirrus short in sheathlike structure. Genital pore slightly to left of pharynx. Ovary lobed, median, immediately pretesticular, 0.03 to 0.57 mm by 0.11 to 0.15 mm. Ootype immediately in front of ovary. Lauer's canal not observed. Seminal receptacle absent. Uterus intercecal, coiled between ventral sucker and ovary, with few eggs in it. Eggs operculate, sometimes with a small knoblike process at anoperculate pole, and with a thin hyaline membrane around shell, 67 to 81 μ by 37 to 42 μ (based on ten eggs), and embryo not developing to miracidium. Vitelline follicles extending from level of intestinal bifurcation to posterior end of body. Excretory vesicle tubular, dorsal to testes, reaching ovary.

Discussion

These metacercariae belong to the genus

Pseudopecoelus von Wicklen, 1946 (Allocreadidae: Trematoda), because they have the smooth cuticle, the ventral sucker with no papillae, no accessory sucker, the ceca ending blindly, no true cirrus pouch, and the external tubular seminal vesicle. The characteristics of this metacercaria agree to the description of the adult of *P. japonicus* by Yamaguti (1938), in having the lobed ovary, the genital pore being to left of pharynx, the ventral sucker slightly larger than the oral sucker (sucker ratio—1:1.00 to 1.51), the egg size, and the same locality, though the vitellaria extending slightly anteriorly to the ventral sucker. Consequently, the metacercaria from *E. similis* is identified with that of *Pseudopecoelus japonicus* (Yamaguti, 1938) von Wicklen, 1946.

Yamaguti (1938) recorded the cyst of *P. japonicus* from the peribuccal connective tissue of a jack mackerel, *Trachurus trachurus*,

of Suruga Bay, where he obtained also the adult trematode, and he described it very briefly. Yamaguti's cyst was subglobular, measured 1.3 mm by 1.2 mm, and it contained a fully gravid worm. The present cysts from the krills are slightly larger than his cyst, and they contain also a fully gravid worm, namely the 'progenetic' metacercaria.

Accordingly, in the life cycle of *P. japonicus*, both the crustacea and the fish serve as the second intermediate host. It is not common that the fish serves as the second intermediate host among the closely related species to *P. japonicus*, as far as their life cycles or their second intermediate hosts are now known. No first intermediate hosts of *Pseudopecoelus* are found out.

Summary

1) The morphology of the metacercariae which were found out from *Euphausia similis* G. O. Sars (Euphausiacea: Crustacea) of Suruga Bay by Dr. Yuzo Komaki (Komaki 1970) is described.

2) The species of the metacercaria is identified with *Pseudopecoelus japonicus* (Yamaguti, 1938) von Wicklen, 1946 (Allocreadiidae: Trematoda).

3) The metacercariae were progenetic.

4) As the second intermediate host of *P. japonicus*, *E. similis* of Suruga Bay is added.

Acknowledgments

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to thank also Dr. Satoru Kamegai, Meguro Parasitological Museum in Tokyo, for his courtesy of my re-examination of the types of *P. japonicus* in Yamaguti's Helminthological Collections.

References

- 1) Komaki, Y. (1970): On the parasitic organisms in a krill, *Euphausia similis*, from Suruga Bay. J. Oceanogr. Soc. Japan, 26 (5), 283-295.
- 2) Von Wicklen, J. H. (1946): The trematode genus *Opecoeloides* and related genera, with a description of *Opecoeloides polynemi* n. sp. J. Parasitol., 32, 156-163.
- 3) Yamaguti, S. (1938): Studies on the helminth fauna of Japan. Part 21. Trematodes of fishes. IV. 139 pp. Author's publication.

Addenda

1) Mr. Hiroaki Munemiya, the postgraduate student of Nagoya University, sampled some *Chlorophthalmus albatrossis* (Aome-eso in Japanese name) in Kumano-nada from the depth of 300 m in October of 1969, for the purpose of studying the food habit of this benthic fish. In the stomach of one of the fish, above 27 individuals of *Euphausia similis* had been ingested. Three of the krills (11%) have two metacercariae of *P. japonicus* each, and 17 (63%) have one metacercaria each (Shimazu's observation). Aome-eso is included in the host records of *P. japonicus* in Suruga Bay (Yamaguti, 1938).

2) I obtained also the fresh metacercariae from *E. similis* ingested in the stomachs of Aome-esos and Tsumaguro-aome-eso, *Ch. nigromarginatus*, in which intestines *P. japonicus* were found parasitizing as adult, of Tosa Bay and Kumano-nada in January of 1971. One metacercaria obtained is given in Fig. 2. These data will be reported in detail elsewhere.

駿河湾産オキアミ *Euphausia similis* (Euphausiacea : Crustacea) からえられた
Pseudopecoelus japonicus (Allocreadiidae : Trematoda) の
 メタセルカリアについて

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1) 小牧勇蔵博士 (Komaki, 1970) が, 駿河湾産オキアミ *Euphausia similis* G. O. Sars (Euphausiacea : Crustacea) からえたメタセルカリアの形態を記載し, 種を同定し, そしてその生活史を簡単に考察した.

2) 種類は *Pseudopecoelus japonicus* (Yamaguti, 1938) von Wicklen, 1946 (Allocreadiidae) と同定さ

れた.

3) メタセルカリアはいわゆる progenetic であつた.

4) *P. japonicus* の第2中間宿主として, 駿河湾産の *E. similis* を追加する.