

**Two Human Cases of *Stellantchasmus falcatus*
(Trematoda, Heterophyidae) Infection in Northeastern Thailand**

PRAYONG RADOMYOS, PRICHA CHAROENLARP¹⁾, BUNGERN RADOMYOS¹⁾ AND
ANCHALEE TUNGTRONGCHITR²⁾

(Accepted for publication; October 17, 1989)

Abstract

Two new human cases (Female age 38; Male age 52) of *Stellantchasmus falcatus* are reported from Skol Nakorn and Yasothorn Provinces Northeastern Thailand, obtaining adult worms after praziquantel treatment.

Key words: *Stellantchasmus falcatus* of human cases, Thailand.

Introduction

Stellantchasmus falcatus, one of the minute intestinal flukes of fish-eating birds and mammals, was first described by Onji and Nishio (1915) from cats fed with *Mugil cephalus*. Natural infection in the cat has been confirmed by Takahashi (1929). Human infection has been reported in Japan (Takahashi, 1929; Kagei *et al.*, 1964), Hawaii (Alicata and Schattenberg, 1988; Glover and Alicata, 1957), the Philippines (Africa and Garcia, 1935b) and Korea (Soe *et al.*, 1984).

In Thailand, Kliks and Tantachamrun (1974) initially reported a case of *Stellantchasmus falcatus* found at necropsy in Chiangmai Province. Tantachamrun and Kliks (1978) added three more cases from surgical sections of the intestinal ileum. In the present paper the authors report two natural human cases of *Stellantchasmus falcatus* from Northeastern Thailand. Adult worms were obtained after treatment with praziquantel.

Materials and Methods

During a clinical trial of praziquantel in the treatment of human taeniasis at the Bangkok

Department of Tropical Paediatrics, ¹⁾Department of Clinical Tropical Medicine and Hospital for Tropical Diseases and ²⁾Bangkok School of Tropical Medicine, Faculty of Tropical Medicine, Mahidol University, Bangkok, Thailand.

Hospital for Tropical Diseases, stool specimens were collected for eight hours after purging following treatment. The search for worms was done by a dilution sedimentation method and examination under a stereoscopic microscope.

Results

Two patients were treated with a single dose of 10 mg/kg body weight praziquantel and 30 gm of magnesium sulphate for purgation. The case reports and the results of the post treatment stool examination of the patients are summarized in Table 1.

Parasitological description

A total of 11 formalin-fixed worms from the case No. 1 were measured. The body (Figs. 1, 2) is small, pyriform or pear shape, 0.484 (0.450 to 0.510) mm long and 0.246 (0.220 to 0.270) mm wide. Cuticular spines are prominent over the whole body. The oral sucker is situated anterosubterminally, 0.042 (0.038 to 0.047) mm long and 0.049 (0.045 to 0.050) mm wide. The prepharynx is short; pharynx is well developed, more or less globular, 0.031 (0.027 to 0.034) mm in diameter. The esophagus, about twice as long as the pharynx, bifurcates in the middle portion of the body into two caeca which run laterally on either side and end blindly at the anterior border of the testes. The vasa efferentia open into

Table 1 Summary of Case Reports

Case No.	Sex	Age (yrs)	Resident of Province	Date of Hospitalization	Species (and No.) of worms recovered from stool
1.	F	38	Skol Nakorn	1 July 1988	<i>Taenia saginata</i> 0.24 m. long without scolex (1) <i>Stellantchasmus falcatus</i> (65)
2.	M	52	Yasothon	10 October 1988	<i>Taenia saginata</i> with scolex (1) <i>Enterobius vermicularis</i> (female 1, male 10) <i>Stellantchasmus falcatus</i> (92)

a small, usually globular seminal vesicle, connected by a short tubula with the expulsor. The

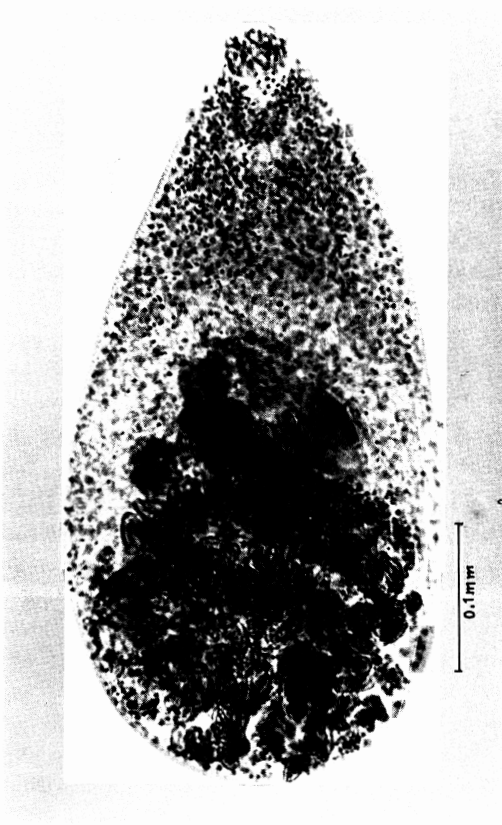


Fig. 1 Adult of *Stellantchasmus falcatus* from case No. 1.

latter is oval and relatively very large, with very thick walls in which spiral fibres are clearly seen; it is located and lone in the middle portion of the body at the left side and oblique to the long axis of the body. The ventrogenital sac is slightly submedian to the right side and contains the ventral sucker. The ventral sucker is small, 0.035 (0.029 to 0.038) mm long and 0.033 (0.029 to



Fig. 2 Adult of *S. falcatus* after treatment with praziquantel, scanning electron micrograph $\times 175$.

0.038) mm wide, and armed with two dense lateral groups of small spines on the lip. Two testes, 0.102 (0.079 to 0.117) mm long and 0.059 (0.041 to 0.068) mm wide, are opposite and situated in the posterior part of the body. The

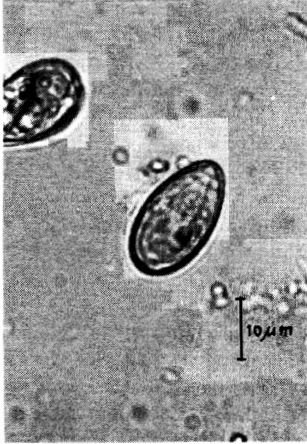


Fig. 3 Egg of *S. falcatus*.

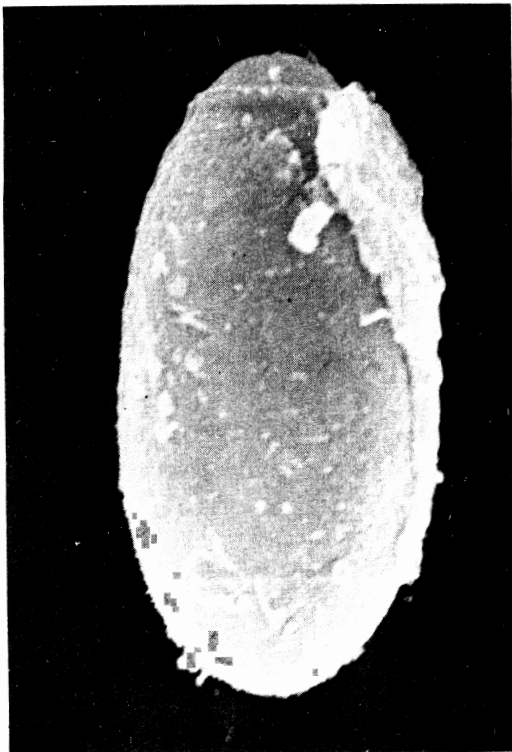


Fig. 4 Egg of *S. falcatus*, scanning electron micrograph $\times 4,000$.

globular ovary, 0.059 (0.045 to 0.068) mm long and 0.055 (0.047 to 0.063) mm wide, is submedian and lies slightly to the right side between the ventral sucker and right testis. Vitellaria are composed of several follicles and extend dorsally into the ovariotesticular zone. The uterus fills the whole free space between the expulsor and testes. The eggs (Figs. 3, 4) are in the uterus, 22.5 (22.05 to 22.95) microns long and 11.4 (11.25 to 11.70) microns wide, operculated, yellowish in colour, oval in shape and lack the muskmelon pattern on the shell surface.

The preceding descriptions generally agree with characteristics of *S. falcatus* as described by Chen (1951) and Pearson and Ow-yang (1982).

Discussion

Seven species of *Stellantchasmus* have been reported, but Pearson (1982) mentioned that there are only four valid ones amongst the seven species, namely: *S. falcatus*, *S. aspinosus*, *S. gallinae* and *S. batillans*. The definitive hosts of *S. falcatus* other than man are cats, dogs, rats and fish-eating birds (Onji and Nishio 1924; Takahashi, 1929). The snail intermediate hosts are *Stenomelania newcombi*, *Thiara granifera* and *Tarebia granifera mauiensis* (Martin, 1958; Noda, 1959). The second intermediate hosts are *Mugil cephalus* (Noda, 1959; Waikagul *et al.*, 1985; Chai, 1988), *Mugil dussumieri*, *Anabas testudineus* (Vazquez-Colet and Africa, 1940; Waikagul *et al.*, 1985) *Liza menada*, *Acanthogobius flavimanus* (Komiya and Suzuki, 1966) and *Dermogenys pusillus* (Tantachamrun and Kliks, 1978).

Heterophyids in man have been reported as causing little disturbance and the clinical symptoms due to their presence are often negligible. The flukes bury themselves deep in the intestinal mucosa or perhaps deeper, become imprisoned and die. The eggs of these flukes, deposited in the submucosa or deeper, apparently enter the general circulation or blood stream and are carried to various organs of the body, including the brain and heart. Heterophyid eggs have been found in acute lesions of the myocardium in several autopsy cases (Africa and Garcia, 1935a;

Africa *et al.*, 1940).

In northeast Thailand, the high prevalence of *O. viverrini* infection is influenced by the customary habit of eating raw or half-cooked fish. The favourite fish dish is "Koi-Pla" which is made from chopped raw fish, lemon juice and flavoured with red onions, chillies and salt, and served with vegetables. This style of food preparation is a common mechanism for acquiring intestinal and liver fluke infections by the population.

In the past, human cases of *S. falcatus* in Thailand were based on positive tissue sections found during autopsy and surgery. This is the first reported case of *S. falcatus* infection diagnosed by discovery adult worms during fecal examination. Seo *et al.* (1984) suggested that this is probably due to the scarcity of eggs in the feces unless the person is infected with numerous flukes. Misdiagnosis of heterophyid eggs as those of *O. viverrini* has often occurred because of their similarity in size and shape.

Therefore, the diagnosis of minute intestinal fluke infections should combine application of proper laboratory techniques and assessment of the clinical features and epidemiological data available.

Acknowledgements

The authors wish to thank the technical and nursing staff of the Bangkok Hospital for Tropical Diseases for their assistance and Mr. Roberto B. Monzon for correction of English. Special thank to Prof. Dr. H. Mehlhorn and Dr. H. Taraschewski, Ruhr-Universitat, Bochum, Fed. Rep. Germany, for teaching scanning electron microscopy and to the German Academic Exchange Service (DAAD) for providing a short term scholarship to the senior author.

References

- 1) Africa, C.M. and Garcia, E. Y. (1935a): Intestinal heterophyidiasis with cardiac involvement; a contribution to the etiology of heart failure. J. Phil. Is. Med. Ass., 15, 358–361.
- 2) Africa, C. M. and Garcia, E. Y. (1935b): Heterophyid trematodes from man and dogs in the Philippines with description of three new species. Phil. J. Sci., 57, 253–267.
- 3) Africa, C. M., de Leon, W. and Garcia, E. Y. (1940): Visceral complications in intestinal heterophyidiasis of man. Rep. Proc. III Internat. Congr. Microbiol. N.Y. 447–449.
- 4) Alicata, J. E. and Shatenburg, O. L. (1938): A case of intestinal heterophyidiasis of man in Hawaii. J. Amer. Med. Ass., 110, 1, 100–1101.
- 5) Chai, J. Y. and Sohn, W. M. (1988): Identification of *Stellantchasmus falcatus* metacercariae encysted in mullets in Korea. Korean J. Parasit., 26, 65–68.
- 6) Chen, H. T. (1951): *Stictodora manilensis* and *Stellantchasmus falcatus* from Hong Kong, with a note on the validity of other species of the two genera (Trematoda: Heterophyidae). Lingnan Sci. J., 23, 165–175.
- 7) Glover, B. A. and Alicata, J. E. (1957): Intestinal heterophyidiasis. Hawaii Med. J., 16, 636–688.
- 8) Kagei, N., Oshima, T., Ishikawa, K. and Kihata, M. (1964): Two cases of human infection with *Stellantchasmus falcatus* Onji et Nishio, 1915 (Heterophyidae) in Kochi Prefecture. Jap. J. Parasit., 13, 472–478.
- 9) Kliks, M. and Tantachamrun, T. (1974): Heterophyid (Trematoda) Parasite of cats in north Thailand, with notes on a human case found at necropsy. Southeast Asian. J. Trop. Med. Pub. Hlth., 5, 547.
- 10) Komiya, Y. and Suzuki, N. (1966): The metacercariae of trematodes belonging to the family Heterophyidae from Japan and adjacent countries. Jap. J. Parasit., 15, 208–214.
- 11) Martin, W. E. (1958): The life histories of some Hawaiian heterophyid trematodes. J. Parasit., 44, 305–323.
- 12) Noda, K. (1959): The larval development of *Stellantchasmus falcatus*. (Trematoda: Heterophyidae) in the first intermediate host. J. Parasit., 45, 635–642.
- 13) Onji, Y. and Nishio, T. (1915): Studies on the trematode metacercaria in *Mugil cephalus* 2. Tokyo Iji Shinshi, (1946), 2390–2395, (1948), 2499–2505, (1950), 2600–2603.
- 14) Onji, Y. and Nishio, T. (1924): A monograph of intestinal trematodes. Chiba Igakkai Zasshi, 2, 351–399, 4, es.
- 15) Pearson, J. C. and Ow-Yang, C. K. (1982): New species of *Haplorchis* from Southeast Asia, together with keys to the *Haplorchis* — Group of Heterophyid trematodes of the region. Southeast Asian J. Trop. Med. Pub. Hlth., 13, 35–60.
- 16) Soe, B. S., Lee, S. H., Chai, J. Y. and Hong, S. J. (1984): Studies on intestinal trematodes in Korea XII. Two cases of human infection by *Stellant-*

- chasmus falcatus*. Korean J. Parasit., 22, 43–50.
- 17) Takahashi, S. (1929): On the eggs of several kinds of intestinal trematodes, which resemble that of *Clonorchis sinensis*, especially the eggs of *Stellantchasmus falcatus* and *Pygidiopsis summus* found in human stools with a supplement on the examinations of the helminthic parasites of the dogs and cats in Okayama Prefecture. Okayama Igakkai Zasshi, 41, 1502–1513.
- 18) Tantachamrun, T. and Kliks, M. (1978): Heterophyid infection in human ileum: report of three cases. Southeast Asian J. Trop. Med. Pub. Hlth., 9, 228–231.
- 19) Vazquez — colet, A. and Africa, C. M. (1940): Morphological studies on various Philippine heterophyid metacercariae with note on the incidence, site and degree of metacercarial infection in three species of marine fish. Phil. J. Sci., 72, 395–419.
- 20) Waikagul, J., Yingyourd, P., Chiamratana, B. and Visiassuk, K. (1985): Study on helminthic infections which brackish water fish is intermediate host. J. Thai Vet. Practitioner Circle, 7, 245–257.