[Jpn. J. Parasitol., Vol. 42, No. 1, 44–46, February, 1993]

Research Note

A Newly Recognized Natural Definitive Host of *Clinostomum complanatum* (Rudolphi, 1814) in Japan

YOSHIYUKI AOHAGI[1], TOSHIYUKI SHIBAHARA[1] AND KATSUMOTO KAGOTA[2]

(Accepted for publication; December 16, 1992)

Key words: *Clinostomum complanatum,* large egret, *Egretta alba,* natural definitive host

Up to now, twelve human cases caused by *Clinostomum* spp. have been reported in Japan (Yamashita, 1938; Hori, 1942; Kamo *et al.*, 1962; Sakaguchi *et al.*, 1966; Sano *et al.*, 1980; Kumada *et al.*, 1983; Hirai *et al.*, 1987; Furukawa and Miyazato, 1987; Yamane *et al.*, 1989; Umezaki *et al.*, 1990; Yoshimura *et al.*, 1991; Isobe *et al.*, 1992). The causative agent in 5 out of those cases has been identified as *C. complanatum.* In Japan, this fluke has been reported from night heron, *Nycticorax nycticorax,* grey heron, *Ardea cinerea,* little egret, *Egretta garzetta* and intermediate egret, *Egretta intermedia* (Yamaguti, 1933; Kagei *et al.*, 1988; Aohagi *et al.*, 1992b).

Between January and February 1991, two large egrets, *Egretta alba* were shot by a hunter in Tottori City. These birds were examined for parasite infection and then *C. complanatum* was detected from both of them.

The numbers of the flukes obtained from the birds were 16 and 37, respectively. Eighteen of the totaling 53 were sexually in maturity (Fig. 1) and the remaining 35 were immature. Although most of the flukes obtained were found on the surface of mucous membrane of the oral cavity and pharynx, only one immature fluke adhered to the mucosa of the lower part of esophagus, of the birds.

The obtained flukes were put in 0.85% saline solution for 6 hours to let them produce eggs, fixed in 70% alcohol under pressure of a cover glass, stained with borax-carmine and mounted in balsam. Eggs were preserved in 10% formalin.

The morphological characteristics and measurements of 18 adult flukes and 100 eggs are as follows.

Body elliptically elongated with a slight contraction at the level of ventral sucker, 4.38–7.50×1.71–2.85mm. Cuticle aspinous. Oral sucker subterminal, 0.21–0.39×0.33–0.49mm. Ventral sucker spherical, situated at the anterior fourth of body, 0.58–0.94mm in length. Testes subtriangular, tandemly situated in the posterior half of body; anterior testis 0.47–0.98×0.82–1.24mm, posterior testis 0.53–0.86×0.96–1.26mm. Cirrus pouch elliptical, situated at the right side of anterior testis, 0.29–0.57×0.16–0.36mm. Ovary spherical or elliptical, situated just posterior to cirrus pouch, 0.21–0.46×0.20–0.36mm. Ootype complex obscure. Uterine coiled in the intertesticular space, run along the left margin of anterior testis. Uterine sac extended from behind ventral sucker to the middle of anterior testis, opened into genital pore at the right side of anterior testis. Vitelline follicles extended from the midlevel of ventral sucker to near posterior end of body. Vitelline ducts opened

[1]*Laboratory Animal Research Center, Faculty of Medicine, Tottori University, Nishimachi, Yonago 683, Japan.*

[2]*Department of Veterinary Internal Medicine, Faculty of Agriculture, Tottori University, Koyama, Tottori 680, Japan.*

青萩芳幸　柴原壽行（鳥取大学医学部附属動物実験施設）

籠田勝基（鳥取大学農学部獣医学科家畜内科学教室）

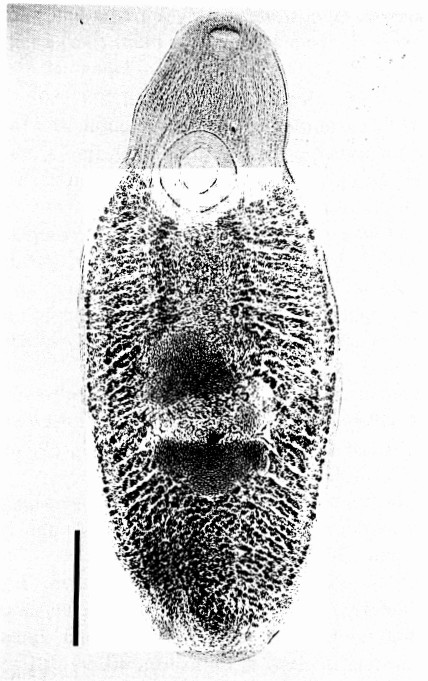

Fig. 1 Adult of *Clinostomum complanatum* obtained from the mucous membrane of the oral cavity of large egret, *Egretta alba*. Bar: 1mm

into a vitelline reservoir in front of posterior testis. Typical pharynx absent. Esophagus bifurcated into intestinal caeca in front of ventral sucker. Intestinal caeca run transversally at first, turned posteriorly, terminated at the near posterior end of body, with internal and external diverticula behind ventral sucker. Eggs elliptical, unembryonate, 0.113–0.130×0.071–0.079mm with an average of 0.121×0.074mm.

The present adult flukes well correspond with the adult *C. complanatum* as described by Grabda-Kazubska (1974), Lo *et al.* (1982) and Kagei *et al.* (1988). Large egret is herewith added as a new natural definitive host of this fluke in Japan.

Some researchers reported that the adult *C. complanatum* was aspinous (Abidi and Nizami, 1987; Kalantan *et al.*, 1991). In Japan, the adult flukes described by Kagei *et al.* (1988) and the present authors were also aspinous. But Yamaguti (1933) reported that the body surface of the adult *C. complanatum* was covered with minute single spines. Therefore, further investigation will be needed from taxonomical view point of Japanese *Clinostomum* in regard to the surface structure of the adult fluke.

Up to date, five species of herons and egrets have been reported as natural definitive hosts of *C. complanatum* in the eastern part of Tottori Prefecture, Japan (Aohagi *et al.*, 1992b; Aohagi *et al.*, the present study). In this area, 6 species of freshwater fish have been already reported as intermediate fish hosts of this fluke (Aohagi *et al.* 1992a). Therefore, such fish-eating birds also might be infected easily with this fluke through preying on fish hosts in this district.

References

1) Abidi, S. M. A. and Nizami, W. A. (1987): Developmental changes and histopathology of *Clinostomum complanatum* (TREMATODA) infection in an experimental host. Ind. J. Parasitol., 11, 235–238.
2) Aohagi, Y., Shibahara, T., Machida, N., Yamaga, Y. and Kagota, K. (1992a): *Clinostomum complanatum* (Trematoda: Clinostomatidae) in five new fish hosts in Japan. J. Wildl. Dis., 28, 487–489.
3) Aohagi, Y., Shibahara, T., Machida, N., Yamaga, Y., Kagota, K. and Hayashi, T. (1992b): Natural infections of *Clinostomum complanatum* (Trematoda: Clinostomatidae) in wild herons and egrets, Tottori Prefecture, Japan. J. Wildl. Dis., 28, 490–491.
4) Furukawa, T. and Miyazato, T. (1987): A case of *Clinostomum* sp. infection in human pharynx. Med. J. Kinki Univ., 12, 665–669. (in Japanese)
5) Grabda-Kazubska, B. (1974): *Clinostomum complanatum* (Rudolphi, 1819) and *Euclinostomum heterostomum* (Rudolphi, 1809) (Trematoda, Clinostomatidae), their occurrence and possibility of acclimatization in artificially heated lakes in Poland. Acta Parasitol. Pol., 22, 285–293.
6) Hirai, H., Ooiso, H., Kifune, T., Kiyota, T. and Sakaguchi, Y. (1987): *Clinostomum complanatum* infection in posterior wall of the pharynx of a human. Jpn. J. Parasitol., 36, 142–144.
7) Hori, K. (1942): *Clinostomum complanatum* (Rud. 1819) an der Rachenschleimhaut des Menschen schmarotzend. Jibi Inkoka (Otolaryngology), 15, 249–252. (in Japanese)
8) Isobe, A., Yoneyama, T., Ohshita, M., Hojo, N., Fukushima, K., Shiwaku, K., Yamane, Y. and Kinoshita, S. (1992): The 13th human case of *Clinostomum* sp. infection in Japan. 48th Nippon

Kiseichu Gakkai Nishinippon Sibu Taikai Kiji, 77. (in Japanese)

9) Kagei, N., Yanohara, Y., Uchikawa, R. and Sato, A. (1988): Natural infection with *Clinostomum complanatum* (Rud., 1819) in the birds of southern Japan. Jpn. J. Parasitol., 37, 254–257.

10) Kalantan, A. M. N., Arfin, M. and Nizami, W. A. (1991): The effects of age, sex and breed of chicken on susceptibility to *Clinostomum complanatum* (Digenea: Clinostomatidae). J. Helminthol., 65, 31–37.

11) Kamo, H., Ogino, K. and Hatsushika, R. (1962): A unique infection of man with *Clinostomum* sp., a small trematode causing acute laryngitis. Yonago Acta Med., 6, 37–40.

12) Kumada, N., Mizuno, S., Kawamoto, F., Fujioka, H. and Nakanishi, K. (1983): A case of *Clinostomum* sp. infection in Aichi Pref., Japan. Jpn. J. Parasitol., 32, suppl., 17. (in Japanese)

13) Lo, C. F., Wang, C. H., Huber, F. and Kou, G. H. (1982): The study of *Clinostomum complanatum* (Rudolphi, 1814) II. The life cycle of *Clinostomum complanatum*. CAPD Fisheries Series No. 8, Reports on Fish Disease Research (IV), 26–56.

14) Sakaguchi, Y., Yamamoto, T. and Yamada, N. (1966): *Clinostomum* sp., a trematoda parasite, removed from larynx of a man. End. Dis. Bull. Nagasaki Univ., 8, 40–44. (in Japanese)

15) Sano, M., Mogi, K. and Kamegai, S. (1980): A case of *Clinostomum* sp. throat infection. Jibi Inkoka (Otolaryngology), 52, 1037–1039. (in Japanese)

16) Umezaki, T., Shin, T., Oda, M., Kifune, T. and Mogi, M. (1990): A case of acute laryngitis caused by *Clinostomum complanatum* with a complaint of throat irritation. Jibi to Rinsho (Otologia, Fukuoka), 36, 665–668. (in Japanese)

17) Yamaguti, S. (1933): Studies on the helminth fauna of Japan. Part 1. Trematodes of birds, reptiles and mammals. Jpn. J. Zool., 5, 66–71.

18) Yamane, Y., Osaki, Y., Fujino, N. and Nagasako, R. (1989): The 8th human case of *Clinostomum* sp. infection in Japan. Jpn. J. Parasitol., 39, suppl., 117. (in Japanese)

19) Yamashita, J. (1938): *Clinostomum complanatum*. A trematode parasite new to man. Annot. Zool. Japon., 17, 563–566.

20) Yoshimura, K., Ishigooka, S., Satoh, I. and Kamegai, S. (1991): *Clinostomum complanatum* from the pharynx of a woman in Akita, Japan. A case report. Jpn. J. Parasitol., 40, 99–101.