EXPERIMENTAL HOST OF *STELLANTCHASMUS FALCATUS*

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Abstract. The purpose of this research was to determine the incidence and intensity of infection in experimental host of minute intestinal trematode, *Stellantchasmus falcatus* (family Heterophyidae). Experimental hosts consisting of uninfected mice (*Mus musculus*) and one-day-old chicks (*Gallus gallus domesticus*) were orally force fed with a hundred metacercariae of *S. falcatus* obtained from the body cavity of the freshwater fish *Dermogenys pusillus*. The worms, then, were checked from 24 hours to 30 days post-infection. The heterophyid flukes were distributed in the ileum and jejunum of the chicks and small intestine of mice with 70 % (21/30) and 80 % (24/30) of incidence and intensity of infection range from 1 - 44 (24.6) and 1 - 67 (7.8), respectively. The body size of *S. falcatus* at 24 hours was 0.1 - 0.15 (0.13) x 0.29 - 0.39 (0.33) mm in chicks and 0.14 - 0.17 (0.15) x 0.29 - 0.32 (0.3) mm in mice. The maximum length and width of the worms were found within 5 days post-infection, of 0.2 - 0.25 (0.22) x 0.49 - 0.62 (0.55) in chicks and 0.19 - 0.22 (0.2) x 0.38 - 0.52 (0.44) mm in mice. Developing egg was found in the second day after infection and the number of egg increase with the age of the parasite. Embryonated eggs were recovered in the feces of mice 9 day post-infection. *S. falcatus* infection in the other experimental host was done in rat (*Rattus norvegicus*), but rats were fed with whole number of metacercariae which found in a body cavity of fish, *D. pusillus*. The results appear to be the same as in the chicks and mice.

INTRODUCTION

Stellantchasmus species have been reported from fish-eating birds, cats, dogs, mice and man. Four species of *Stellantchasmus* including *S. aspinosus, S. batillants, S. gallinae* and *S. falcatus,* were described (Pearson and Ow-Yang, 1982). Only the latter species reported infection in man in the north, northeast and central Thailand (Kliks and Tantachamrun, 1974; Tantachamrun and Kliks, 1978; Radomyos *et al,* 1990). In Chiang Mai Province, northern Thailand, adult of *S. falcatus* have been recovered from the ileum of domestic cat by natural and experimental infection, and the infective stage larva, metacercaria, found in fins of *Dermogenys pusillus* (Kliks and Tantachamrun, 1974). Previous research (Wongsawad *et al,* 1996) reported numerous *Stellantchasmus* metacercariae from the body cavity of *D. pusillus* and adults recovered from the small intestine of brown rats (*Rattus norvegicus*) from Chiang Mai city (Namue and Wongsawad, 1996). It seems that there is no host specific for this worm, it can thus develop in various vetebrate hosts. In this investigation, the incidence and intensity of *S. falcatus* infection in two different experimental hosts are determined.

MATERIALS AND METHODS

Stellantchasmus falcatus metacercariae were obtained from the body cavity of the half-beak fish, *D. pusillus,* captured from Chiang Mai moat. Experimental hosts were the previously uninfected mice (*Mus culus*) and one-day-old chick (*Gallus gallus domesticus*). A hundred of *S. falcatus* metacercariae, already checked under light microscope, were orally force fed to the hosts. Infected mice and chicks were daily killed and their digestive tracts examined for adult worms. The presented worms were observed and the body sizes measured under the light microscope. Some were fixed and passed through the process for permanent slides. After eggs appeared in the uterus of the flukes, released eggs in the hosts feces were examined. For species identification of the worms, both living and fixed metacercaria and adults were studied. The descriptions of metacercaria and adults given by Pearson (1964), Morishita *et al* (1965), Kliks and Tantachamrun (1974) and Pearson and Ow-Yang (1982) were used. Some permanent slides were sent to S. Kaewkes of the Department of Parasitology, Faculty of Medicine, Khon Kaen University for diagnosis of species. In addition, more 15 mice and 15 chicks were fed again with a hundred of metacercariae the whole body of *D. pusillus* fish containing metacercariae of *S. falcatus* fed to a number of another experimental host, *Rattus norvegicus.*

RESULTS

After infection with a hundred *S. falcatus* metacercariae (Fig 1), adults (Figs 2-5) were recovered from ileum and jejunum of the chicks and small intestines of mice with incidence of 70 % (21/30) and 80 % (24/30). The intensity of the worm ranged from 1 - 34 (7.8) and 1 - 34 (9.9) in chicks and mice respectively. After nine days of infection after infection (Fig 6). No eggs were presented in the feces of chicks. The incidences of infection in 15 mice and chicks were similar to the first experiment but there was a higher intensity of infection. The number of the worms from each experimental host are shown in Table 1. In rats, embryonated eggs were recovered in the feces 7 days post-infection. Body shape and size of worms in rats were similar to those in chicks and mice, 0.19-0.29x0.3-0.5 mm.

Table 1

The number of S.falcatus from 2 experimental hosts from day 1 to day 15 post infections.

Date of infection	number of worms recovered from	
	chicks	mice
1	24	54
2	44	59
3	34	53
4	38	67
5	21	48
6	35	38
7	30	56
8	26	4
9	15	1
10	0	6
11	20	0
12	0	2
13	27	0
14	0	0
15	0	8

the number of worms decreased. Under light microscope, adult worms were ovoid or pyriform in shape, tapering to the anterior end, body covered with numerous minute spines, 2 large ovoid testes near the posterior end and expulsor with muscle fiber cleary visible. The body size of the flukes at 24 hours was 0.1 - 0.15 (0.13) x 0.29 - 0.39 (0.33) mm in chicks (Fig 1) and 0.14 - 0.17 (0.15) x 0.29 - 0.32 (0.3) mm in mice. The body size of the worms reached the maximum within 5 days post-infection, 0.2 - 0.25 (0.22) x 0.44 - 0.62 (0.55) mm in chicks and 0.19 - 0.22 (0.2) x 0.38 - 0.52 (0.44) mm in mice. Developing eggs were found on the second day after infection and the number of eggs increased with the age of the worms. Embryonated eggs of flukes appeared in the feces of mice 9 days

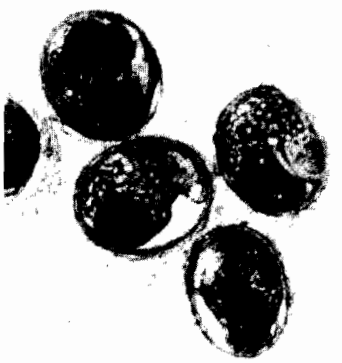

Fig 1–*S. falcatus* metacercariae from the body cavity of *D. pusillus* (Scale bar = 0.2 mm).

Fig 2–Adult of *S. falcatus* 24 hours post-infection from chick (Scale bar = 0.2 mm).

Fig 3–Adult of *S. falcatus* second days post-infection from mice (Scale bar = 0.2 mm).

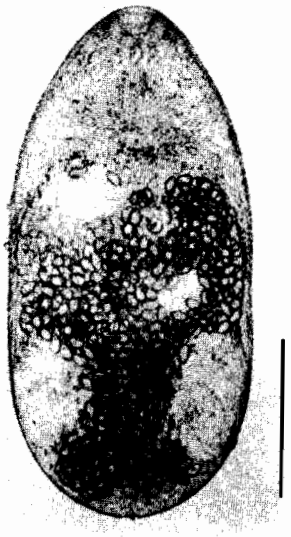

Fig 4–Adult of *S. falcatus* five day after infection from chicks (Scale bar = 0.2 mm).

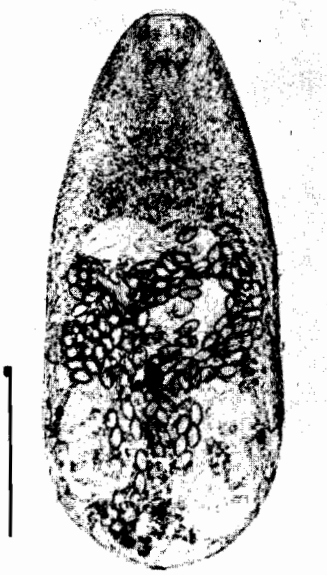

Fig 5–Adult of *S. falcatus* five day after infection from rat (Scale bar = 0.2 mm).

Fig 6–Eggs of *S. falcatus* from feces of mice (Scale bar = 0.2 mm).

DISCUSSION

Metacercaria of *S. falcatus* was previously reported in the study area from the fins of only one fish species *D. pusillus* (Kliks and Tantachamrun, 1974). Recent research detected *Stellantchasmus* sp metacercariae from the body cavity of the same fish species with a high prevalence of infection (88.04 %) (Wongsawad *et al,* 1996). The metacecariae were also reported from fins of *Xenentodon canciloides* from Nam Ngum water reservoir, Lao PDR (Ditrich *et al,* 1991).

The infection rate and the intensity of *S. falcatus* were higher in mice than in chicks. These results suggest that mice are more suitable to be the definitive host than chicks. The worm numbers during day 1 and day 7 post-infection in mice were high but after eight days post-infection the intensity of worms was lower in mice than in chicks. Probably the micro-environment in mice was suitable for the worm for the first few days but after seven days the micro-environment in chicks was better for the worms.

The developing eggs were found in the second day after infection of both experimental hosts and the number of eggs increased with the age of the worms. These results indicated that the worms have the same maturation pattern in the both experimental hosts. The eggs were recovered in feces of mice and rats nine days and seven days post-infection respectively compared to eight days in cats (Noda, 1959). The maturation and size of the worms from both experimental hosts were not different. However, the days eggs appeared in feces were different in each host, probably the anatomy of gatrointestinal tract had an effect on the maturation.

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