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Paragonimus heterotremus Chen et Hsia, 1964, Found from a Dog in Vietnam

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Abstract

A dog was found to be infected with lung flukes in Sin Ho district, Lai Chau province in Vietnam. The morphological characteristics of the worms such as the delicately branched ovary, singly arranged cuticular spines and the oral sucker 2 times larger than the ventral sucker demonstrated that the fluke was *Paragonimus heterotremus*. This is the first record of *P. heterotremus* in Vietnam.

Key words: *Paragonimus heterotremus*; Vietnam; dog.

Introduction

Paragonimus heterotremus was first found from rats in China (Chen and Hsia, 1964), and then is known as a causative agent of human paragonimiasis in Thailand (Miyazaki and Harinasuta, 1966; Vanijanonta *et al.*, 1984) and Laos (Miyazaki and Fontan, 1970). In Vietnam, human paragonimiasis has been known among some medical institutions since several decades ago. Most of patients have been found in northern part of the country. Therefore, Institute of Malariology, Parasitology and Entomology in Hanoi began survey of paragonimiasis in the endemic area in Lai Chau province since 1994. In 1995, adult worms were found from a dog and identified as *P. heterotremus*. This is the first report of this species to be distributed in Vietnam.

Materials and Methods

The survey was done in July 1995 in Sin Ho district, Lai Chau province, north-west Vietnam, where many patients have been found through previous surveys. The lungs of 4 dogs were obtained from the residents who kept their dogs without leashing and sacrificed for food. After examination of the lungs, the worms recovered were fixed with 70% alcohol. Two of them were pressed after fixation, although not adequately flattened, and then stained with carmine. Some parts of the vitelline glands were removed for ease of observation of the organs.

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Results

Among the four dogs examined, only one dog was infected and 13 adult worms of lung fluke were recovered from the lung tissue. Most of the worms were found in cysts where many eggs were observed.

One of the worms stained (Fig. 1) was 13.5 mm in length and 6.5 mm in width, being rather thicker than ordinary specimen. The other was broken due to inadequate fixation and could not be measured. The ovary was delicately branched (Fig. 2) and situated on the left side of the body in both worms. Cuticular spines were singly arranged (Fig. 3). The oral and ventral suckers of the two worms were almost spherical. The diameters of the oral sucker were 1.24 mm and 1.06 mm and the ventral sucker 0.54 mm and 0.50 mm, respectively. So, the oral sucker was nearly 2 times larger than the ventral sucker. The testes were less delicately branched and larger than the ovary. The vitelline glands were well developed and covered most of the body. The uteri

Fig. 1 Adult worm of *P. heterotremus* found from a dog. Middle part of the body was broken due to inadequate fixation. The vitelline glands around the ovary were removed.

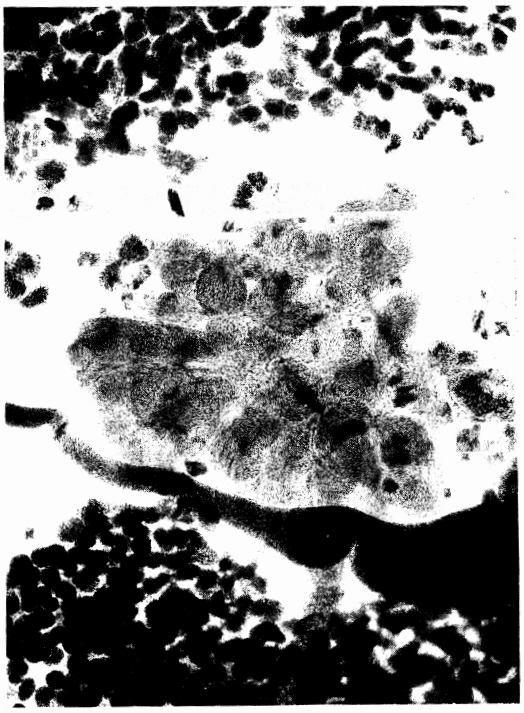

Fig. 2 The ovary of *P. heterotremus* showing delicately branched lobes.

were filled with many eggs, indicating the worms fully matured. The shape of eggs in cysts was symmetrical with the longitudinal axis. The egg shell had entirely even thickness and no thickening was observed at the terminal end of the egg.

Discussion

Morphological characteristics of *P. heterotremus* are described to be the delicately branched shape of the ovary, singular arrangement of cuticular spines, larger size of the oral sucker than the ventral sucker and additionally less delicately branched shape and larger size of the testis when compared with the ovary (Chen and Hsia, 1964: Miyazaki and Vajrasthira, 1967: Miyazaki and Fontan, 1970). The morphology described above satisfied these features and thus the present flukes were identified as *P. heterotremus*. Although the delicately branched ovary has been also known in *P. africanus*, the oral sucker of *P. africanus* is smaller and the testes are much larger than those of *P. heterotremus* as has been pointed out by Miyazaki and Vajrasthira (1967) and Miyazaki and Fontan (1970).

The geographical distribution of this species in surrounding countries such as China, Laos and Thailand has suggested that it could be also distributed in Vietnam (Miyazaki and Toh, 1988). The present study firstly ensured the distribution of *P. heterotremus* in Vietnam. The location of Lai Chau province is coincided well with the continuum of the known distribution of the species, suggesting existence of some other foci around this area including southern part of China near Vietnamese border

In Lai Chau province, people have a habit of

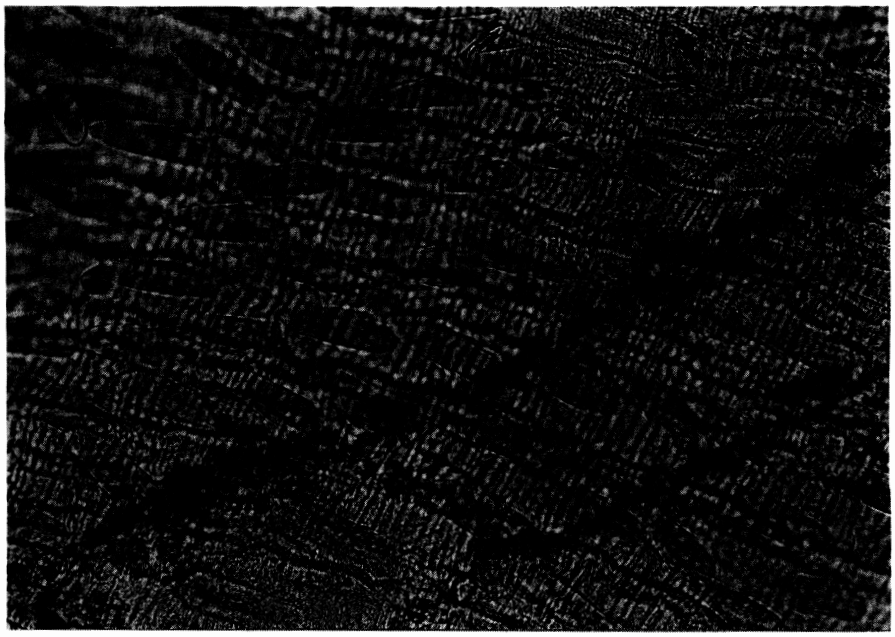

Fig. 3 Cuticular spines of *P. heterotremus* showing single arrangement.

eating a freshwater crab, *Ranguna kimboiensis*, which is suspected to serve as the second intermediate host of the causative species of human paragonimiasis. Although no adult worms have been so far obtained from the patients, human paragonimiasis in this area could be also caused by *P. heterotremus* which is the main human species among several species distributed in Thailand (Vanijanonta *et al.*, 1984).

Dogs in this area are not held on a leash and could have an opportunity to eat crabs. Debris of crab food in and around houses can also be a source of infection. Previous survey showed an infection rate of nearly 30% in dogs in Sin Ho district (unpublished data). Dogs may play an important role as a definitive host in the life cycle of *P. heterotremus* and a reservoir host of human paragonimiasis.

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