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Paragonimus siamensis—the fourth Lung fluke reported from Ceylon.

by

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A search for the intermediate hosts of the species of *Paragonimus* already recorded has resulted in the discovery of metacercariae of certain unreported species. Out of the 3 types of metacercariae studied two have been already identified as those of *P. macrorchis* and *P. westermani* (Kannangara 1969 a and b, Kannangara and Karunaratne, 1969.) In this paper the occurrence of *P. siamensis* in Ceylon is recorded. So far this species has been reported only from Thailand (Miyazaki & Wykoff, 1965).

Out of 68 specimens of *Paratelphusa ceylonensis* collected from a paddy field at Mawanella in the Sabaragamuwa Province, 15 harboured an oval double-walled metacercaria in the heart, blood vessels, hepatopancreas and gills. The outer wall is thin and fragile with a knob at one pole, probably for attachment, and the inner cyst wall is much stronger and thicker. The ventral sucker is larger than the oral sucker and the excretory vesicle with refractile granules extends almost upto the intestinal bifurcation. The sinuous intestinal caeca are seen on either side of the excretory vesicle. The outer cyst in four specimens measures 555/427 μ, 611/482 μ, 636/374 μ and 646/476 μ. The inner cyst in the same four specimens measures 487/406 μ, 464/378 μ, 512/330 μ and 575/448 μ respectively. The metacercariae are similar to those of *P. siamensis* described from *P. germaini* in Thailand.

Subsequently we have found morphologically very similar metacercariae from *P. rugosa* in 3 streams at Siyambalanduwa, Moneragala and Lunugala in the Uva Province.*

TABLE I

Results of Crab dissection

	Number dissected	Species	Habitat	*Paragonimus* positive crabs
Mawanella (Sabaragamuwa Province)	68	*P. ceylonensis*	Paddy field	15
Siyambalanduwa (Uva Province)	12	*P. rugosa*	Stream	2
Moneragala (Uva Province)	7	*P. rugosa*	Stream	2
Lunugala (Uva Province)	20	*P. rugosa*	Stream	1

* Recently *P. siamensis* adults were recovered from an experimental cat, from the metacercariae collected from the Uva Province

The metacercariae collected from the paddy field at Mawanella were fed to several albino rats and the results obtained are given in table 2. On the whole the rat appears to be an unsuitable host.

TABLE II

EXPERIMENTAL INFECTIONS IN ALBINO RATS

Rat No.	Number of metacercariae fed	Duration of infection	Number of adults recovered
1	12	69 days	3
2	20	74 days	1
3	1	98 days	1
4	8	101 days	1

The study of the structure of the few worms recovered was sufficient to identify them as *P. siamensis*. They have cuticular spines distributed in groups, (Plate II C) a 6 lobed ovary, simply branched testes, ventral sucker which is larger than the oral sucker and eggs with a uniformly thickened wall. (Plate II B). The average size of 26 eggs is 86/46 μ

The natural host of P. siamensis

In Thailand this infection has been obtained only in cats naturally as well as experimentally. While the above studies were going on, a mongoose (*Herpestes lanka*) shot at Mahakirimetiyawa in the North Central Province was found to be infected with *P. siamensis* (Plate I C). The right lung had 2 fibrotic cysts containing two worms each and a smaller cyst in the left lung had 2 small worms. These worms had the morphological characters described for *P. siamensis*. All except 1 had 6-lobed ovaries. The remaining specimen had a 5-lobed ovary. Such specimens formed a small percentage even in the original study in Thailand.

DISCUSSION

This species has been identified as *P. siamensis* on the presence of cuticular spines arranged in groups, the 6 lobed ovary, simply branched testes, ventral sucker larger than oral sucker, eggs with uniformly thickened wall measuring 86/46 μ, on an average and the description of the metacercaria. *P. siamensis* is more or less similar to *P. westermani* except in the arrangement of cuticular spines. The species which most closely resembles this parasite is *P. compactus*, which has been described from the mongoose in India (Vevers, 1923) and from the civet cat and fishing cat in Ceylon (Dissanaike & Paramananthan, 1962).

Miyazaki (1969) distinguishes it from the present species by the presence of 5 lobes in the ovary of *P. compactus* in contrast to 6 lobes in *P. siamensis*. The specimens we have now recovered from natural and experimental infections in Ceylon fit perfectly with the description of *P. siamensis*. Out of the 45 paratypes of *P. siamensis* studied by Miyazaki & Wykoff (1965) the ovary was divided into 6 lobes in 29, into 5 lobes in 5 worms, into 7 and 8 in 1 worm each and in the remaining 9 the branching was not clearly seen. The

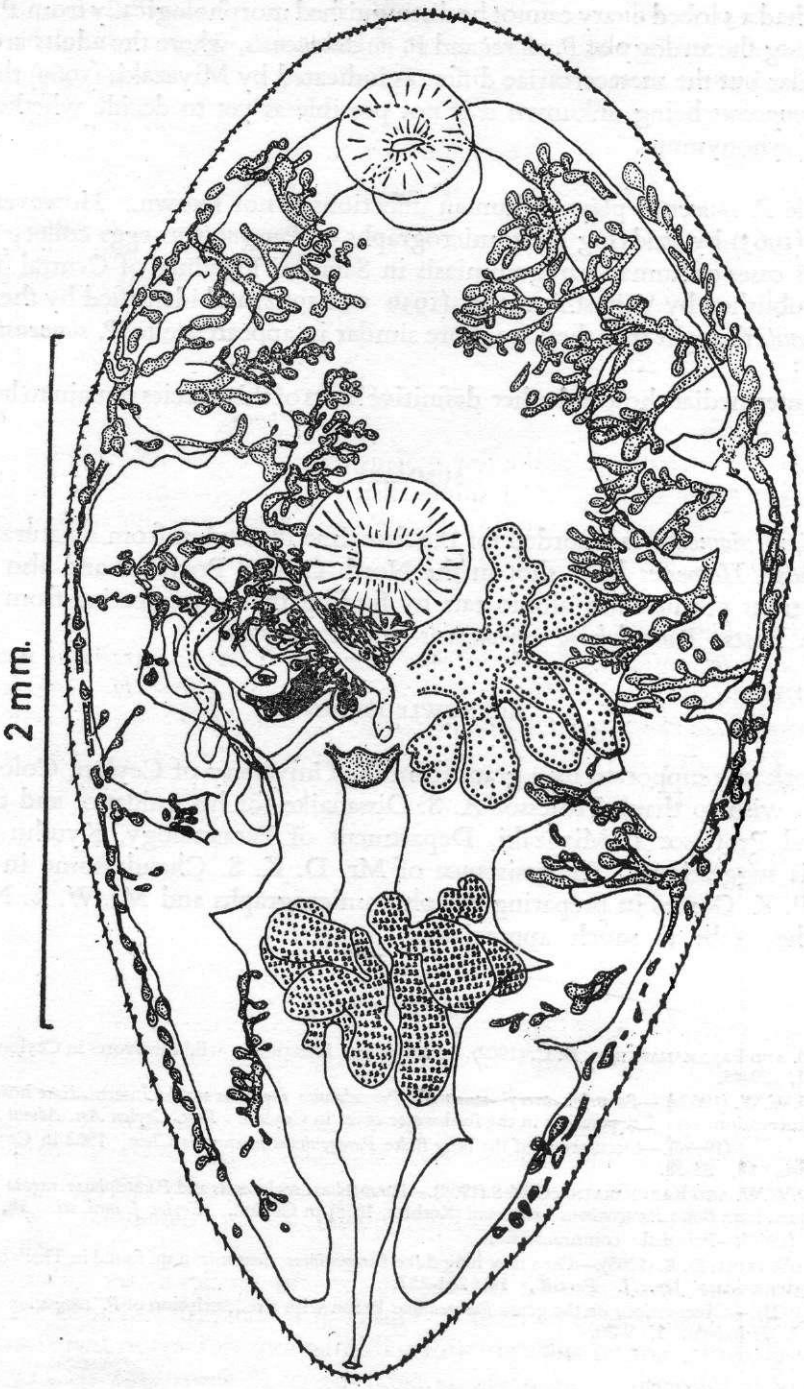

Fig.1

5 worms that had a 5 lobed ovary cannot be distinguished morphologically from *P. compactus*. However taking the analogy of *P. ohirai* and *P. iloktsuenensis*, where the adults are morphologically similar but the metacercariae differ, as indicated by Miyazaki, (1969) the metacercaria of *P. compactus* being unknown it is not possible as yet to decide whether the two species are synonymous.

What role *P. siamensis* plays in human infections is not known. However Miyazaki and Wykoff (1965) by studying photomicrographs of *Paragonimus* eggs collected from the sputum of 38 cases of human paragonimiasis in Saraburi Province of Central Thailand in two papers published by Vajrasthira *et. al.* (1959 and 1962) and identified by them as those of *P. westermani*, thought that they are more similar in appearence to *P. siamensis* ova.

The 1st intermediate host and other definitive hosts of this species remain to be identified.

SUMMARY

Paragonimus siamensis is recorded for the first time in Ceylon from a naturally infected grey mongoose, *Herpestes lanka* shot in the North Central Province and also by experimental infections produced in albino rats by feeding the metacercariae from the second intermediate hosts, *Paratelphusa ceylonensis* and *P. rugosa*.

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EXPLANATION OF FIGURES

1. *Paragonimus siamensis*, camera lucida drawing.

EXPLANATION OF PLATES

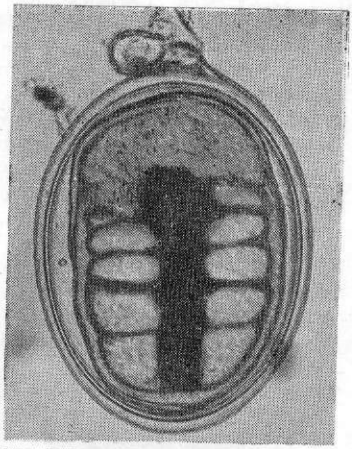
Plate I

A. Metacercaria of *P. siamensis*.
B. Lung of rat showing cysts of *P. siamensis*.
C. Adult *P. siamensis* from mongoose.

Plate II

A. Adult *P. siamensis* from experimental rat.
B. Eggs of *P. siamensis* from the stool of mongoose.
C. Cuticular spines of *P. siamensis*.

A



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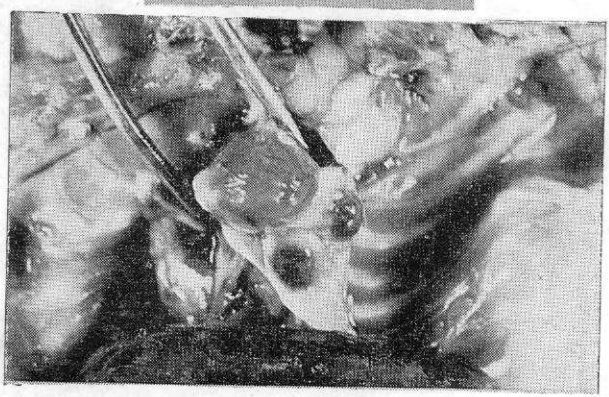

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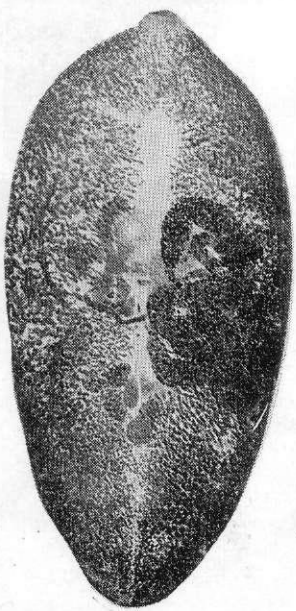

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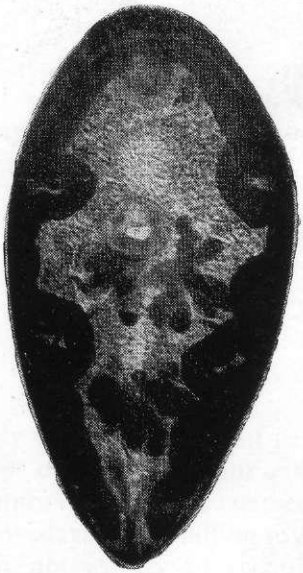

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