PERIPLANETA AMERICANA (L.) AS INTERMEDIATE HOST OF *MONILIFORMIS MONILIFORMIS* (BREMSER) IN PENANG, MALAYSIA

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INTRODUCTION

The acanthocephalan, *Moniliformis moniliformis* is a common parasite of the field rats in Malaysia (Dunn *et al.*, 1968). *Periplaneta americana* (L.) is the normal intermediate host for the acanthocephalan *Moniliformis moniliformis* (Bremser) (*M. dubius* (Mayer)) (Schaefer, 1970), though beetles have also been reported to serve as an intermediate host and few human infections have been reported (Faust and Russell, 1964).

Roth and Willis (Schaefer, 1970) reported that most infection rates in *Periplaneta americana* (L.) varied between 3% and 8%. It has also been reported that over 100 cystacanths have been found in the body cavity of one *Periplaneta americana* (L.) (Chandler, 1961).

The eggs of *Moniliformis moniliformis* hatch in the mid-intestine of the cockroach. The liberated acanthors penetrate into the gut wall. By the tenth day they appear as minute specks on the outside of the intestinal wall, from which they eventually drop into the body cavity (Moore, 1946).

MATERIALS AND METHODS

Periplaneta americana (L.) were caught in various parts of Penang by using a special trap made by PAT. P. Japan, type DS-12. The cockroaches were chloroformed and the wings and legs were removed. The cockroaches were dissected and examined for cystacanths. The specimens were dissected under dissecting microscope and thorough search for cystacanth was carried out.

RESULTS

From more than 150 cockroaches examined from different localities of Penang Island revealed that the infection rate of *Moniliformis moniliformis* was 14.84%. The results of the examinations are tabulated in Table 1.

Among the 23 infected cockroaches one had a maximum number of cystacanth of 36, while the others ranged from 15-25.

DISCUSSION

The Malaysian feral rats are frequently infected with acanthocephalans, *Monilifor-*

Table 1

Total number of *Periplaneta americana* infected by *Moniliformis moniliformis* (Bremser) and the maximum number of cystacanth found in one host.

Host	No. host examined	No. host infected	Infection rate	Maximum No. of cystacanth in one host
Periplaneta americana	155	23	14.84%	36

mis moniliformis. In this survey we found that the cockroaches collected in houses from town areas were not infected while some collected at the fringe of secondary jungle were infected. This indicates possible ecological association between *Periplaneta americana* L. and the field rats, and the feeding habits of both rats and cockroaches. The survey also showed that 14.84% of the collected specimens were infected. Thus *Periplaneta americana* as an active intermediate host for *Moniliformis moniliformis* cannot be overruled. The maximum number of cystacanth found in one host was 36, though in other parts of the world the maximum number has been reported to be about 397 (Schaefer, 1970).

Schaefer (1970) also stated that male cockroaches were more readily infected compared to female cockroaches but during the present study there seems to be no indication of any difference in infection rates, between the sexes.

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REFERENCES

BAER, J.G., (1951). *Ecology of Animal Parasites.* The University of Illinois Press, Urbana. p. 111-116.

CHANDLER, A.C., (1961). *Introduction to Parasitology with Special Reference to Parasites of Man.* 10th ed. John Wiley & Sons, Inc., New York. London. p. 382-389.

DUNN, F.L., LIM, B.L. and YAP, L.F., (1968). Endoparasite patterns in mammals of the Malayan rainforest. *Ecology, 49*: 1179.

FAUST, E.C. and RUSSELL, P.F., (1964). *Clinical Parasitology.* 7th ed. Lea & Febiger, Philadelphia. p. 698-703.

GOLVAN, J., (1964). An illustrated key to the genera of Acanthocephala. Universite de Paris, Faculte de Medicine, Institut de Parasitologie. 33 pp.

MOORE, D.V., (1946). Studies on the life history and development of *Moniliformis moniliformis*, 1933. *J. Parasit., 32* : 257.

RAJAMANICKAM, C. and LAVOIPIERRE, M.M.J., (1965). *Periplaneta australasiae* as an intermediate host of the pentastomid *Raillietiella hemidactyli. Med. J. Malaya, 20* : 171.

SCHAEFER, P.W., (1970). *Periplaneta americana* (L.) as an intermediate host of *Moniliformis moniliformis* (Bremser) in Honolulu, Hawaii. *Proc. Helm. Soc. Washington, 37* : 204.