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A CENSUS OF THE ECTOPARASITES OF SOME CEYLON RATS

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OWING to their intimate connexion with plague a vast number of analyses of the fleas found on rats in various parts of the world have been published. As far as I am aware, however, no one has ever published a complete census of the ectoparasites occurring on a rat population. In this short paper I am presenting a complete analysis of the ectoparasites found on fifteen specimens of the common Ceylon rat (*Rattus r. kandiyanus* (Kelaart)). This rat is found everywhere in the vicinity of human habitations throughout Ceylon and it has been the subject of many investigations in connexion with the parasitology of plague (see papers by Hirst, 1926, 1927, 1933).

The whole of the material on which this paper is based was collected by Capt. W. W. A. Phillips, to whom I should like to express my thanks. Most, if not all, of the rats were trapped near his bungalow, on the outskirts of the jungle. The rats were in every case examined as soon as possible after being trapped in order to obtain the maximum number of parasites. It is possible that some of the very small mites (e.g. *Myobia* spp.) were overlooked, but otherwise it seems that the collecting was complete. The determination of the rats was done by the collector, who is a well-known authority on the mammals of Ceylon.

The ectoparasitic Arthropoda found on rats are as follows: Siphunculata (sucking-lice), Siphonaptera (fleas), Acarina (mites and ticks). Representatives of all these groups were collected from the Ceylon rats. Lice were only taken on two of the rats and this scarcity of lice is in accordance with my experience. It is interesting to note that two species are represented. *Polyplax spinulosa* (Burmeister) is the louse normally found on domestic rats wherever they occur. *Hoplopleura oenomydis* Ferris, of which only a single specimen was taken, has a very interesting distribution. It was originally described from various species of Murids occurring in British East Africa and the Philippine Islands. It has since been recorded off *Rattus* spp. from the Marquesan Islands, Federated Malay States, Queensland and Sumatra (Ferris, 1932).

With regard to the fleas, as many as twelve different species have been collected from Ceylon rats. The fact that only four of these occurred on the rats dealt with in this paper is in all probability something to do with the high altitude at which the rats were collected. Flea distribution seems to be largely controlled by environment rather than by their hosts' distribution. This is especially the case with the species *Leptopsylla segnis* Schönhr. which in Europe is extremely common on the house mouse and on rats, but in India and Ceylon

*Ectoparasites of the Common Ceylon Rat (Rattus r. kandiyanus (Kelaart))
from C. P. Gammaduwa, Mousakande*

Height and date	No. and sex of rats examined	Ectoparasites							Total no. of parasite	
		Siphonaptera	Acarina (mites)				Ixodoidea			
		Siphunculata	<i>Xenopsylla cheopis</i> Roths.	<i>Leptopsylla segnis</i> Schönh.	<i>Stivalius phoberus</i> Jord. & Roths.	<i>Laelaps nuttalli</i> Hirst	<i>Laelaps echidninus</i> Berlese	Undetermined genera and species of mites	<i>Ixodes petauristae</i> Warburton	
Alt. 3350 ft., 6. xii. 1934	1	—	—	—	1 ♀	3	4	—	—	8
12. xii. 1934	1	—	—	—	1 ♀ 1 ♂	—	—	—	—	2
16. i. 1935	1	—	—	—	2 ♀ 1 ♂	—	10	—	—	13
22. i. 1935	1 ♂	—	—	—	2 ♀	—	—	—	—	2
23. i. 1935	1 ♂	—	—	2 ♀	1 ♀	—	—	—	—	3
25. i. 1935	1 ♂	—	—	—	1 ♀ 1 ♂	2	6	—	—	10
28. i. 1935	1 ♀	1 ♀*	1 ♀ 1 ♂	1 ♀	6 ♀ 3 ♂	—	—	—	—	13
29. i. 1935	1 ♀	—	2 ♂	—	1 ♀	—	—	—	—	3
Alt. 3300 ft., 13. iv. 1935	1	—	—	—	2 ♂	—	4	—	—	6
Alt. 3400 ft., 28. vi. 1935	1 ♂	—	—	—	—	—	—	—	1 larva †	1
28. vi. 1935	1	—	—	—	1 ♀	—	5	2	3 larvae †	11
Alt. 3300 ft., 4. vii. 1935	1	—	—	—	1 ♀	3	4	—	1 nymph †	9
5. vii. 1935	1	—	—	—	1 ♀	—	—	—	—	1
13. viii. 1935	1	3 ♀	—	—	—	—	1	—	—	4
13. viii. 1935	1	—	—	—	1 ♂	—	—	1	—	2

* *Hoplopleura oenomydis* Ferris.

† Also one female of *Ctenocephalides felis felis* (Bouché).

‡ The nymph of *Ixodes petauristae* Warburton is at present undescribed. The larvae are doubtfully assigned to this species. Dr M. Sharif is publishing an account of the immature stages and I have to thank him for the identifications.

§ *Polyptax spinulosa* (Burmeister).

only occurs in numbers at high altitudes. Hirst (1933, p. 62) points out that *L. segnis* actually predominates on rats at Nuwara Eliga, which is situated in the Central province of Ceylon at an elevation of 7000 ft. From the results tabulated here it seems that *Stivalius phoberus* Jord. and Roths., which is a comparatively large flea and confined to Ceylon, is the commonest species on these rats. It is actually one of the indigenous rat fleas at the highest altitudes and has not been found below 2000 ft. The females are twice as common as the males. Another species of flea, *Ceratophyllus tamilanus* Jord. and Roths., peculiar to Ceylon and found commonly by Hirst (1933) on rats at high altitudes, was not taken by Capt. Phillips.

Ctenocephalides felis felis (Bouché), the common cat flea, of which only a single specimen was taken, is not very common in Ceylon and is almost totally replaced by the subspecies *orientis* Jordan which occurs commonly throughout

the Indo-Malayan regions. *Xenopsylla cheopis* (Roths.) is undoubtedly the most important flea from the point of view of plague and although it only occurred on two rats it is approximately in accordance with the percentage infestation found by Hirst (1926, 1933).

The immature stages of the tick *Ixodes petauristae* Warburton (1933) occurred on three rats and are of great interest, since up to the present only the female of this tick is known. Warburton's specimen was taken from *Petaurista philippensis lanka* (Wroughton) (Ceylon grey flying-squirrel), collected at Mousakande, Gammaduwa, C. P., Ceylon, 3350 ft., v. 1930.¹ The rat must therefore be regarded as a host of the immature stages of this tick and may thus aid in the propagation of the species.

The mites (Laelaptidae, etc.) frequently occur in very great numbers on rats. No great numbers were found on these rats. *Laelaps echidninus* Berlese is a world wide parasite of rats, whereas *L. nuttalli* Hirst seems only to be widely distributed in the tropics.

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¹ These are the correct data for the type specimen—not stated by Warburton (1933).