

NOTES ON THE TWO SPECIES OF SIPHUNCULATA  
OR SUCKING-LICE OCCURRING ON RATTUS SPP. IN  
THE MALAYAN AND PACIFIC REGIONS, WITH  
SPECIAL REFERENCE TO JAVA

by

GORDON B. THOMPSON

In another paper (Thompson, 1938) attention is called to the fact that specimens of lice from any of the numerous species and subspecies of the widely distributed genus *Rattus* and its allies should prove interesting, and might possibly throw some light on the relationships of their hosts. The notes contained in this paper are primarily based on a collection of lice obtained by Dr. Felix Kopstein from various species of *Rattus* in Java. I should like to express my gratitude to Dr. Kopstein for the opportunity of examining this interesting collection. It is to be hoped that these notes may stimulate interest in the lice of rats. The Indo-Australian and Pacific regions have a particularly rich rat fauna and specimens of lice from any forms are needed for study. I am fully aware, however, that lice are not abundant on rats, in fact in my own experience the percentage louse infestation is normally very low. Dr. Kopstein collected 96 specimens of *Rattus* spp. and only approximately 20 % were parasitised by lice.

The two species of lice occurring on the Javanese rats are *Polyplax spinulosa* (Burm.) and *Hoplopleura oenomydis* Ferris. The former is unquestionably the normal parasite of the domestic rats: *Rattus rattus* (Linn.)<sup>1</sup> and *R. norvegicus* (Berkenhout)<sup>2</sup>. With regard to *H. oenomydis* Ferris, which was originally described from specimens collected from the following hosts and localities: *Oenomys bacchante* Thomas and *Grammomys surdaster polionops* Osgood, British East Africa, *R. calcis* Hollister, and *Limnomys*

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1) Aharoni (1932, Z. Säugetierk., VII, pp. 178—181, 229) has recently shown that two forms of rat have been confused under the name *alexandrinus*, he recognises *R. r. rattus* (Linn.) and *R. r. alexandrinus* (Geoff.).

2) Tate (1935, Bull. Amer. Mus. nat. Hist., LXVIII, p. 167) has recently pointed out that according to Cabrera (1932, Trab. Mus. Cienc. nat. Madr. (Zool.), No. 57, p. 264) this species has been erroneously attributed to Erxleben in the past.

*mcarnsi* Hollister, Philippine Is., I feel that no statement could be better than that of Ferris (1932) which reads as follows: "It may be concluded, then, that in all probability *H. oenomydis* is one of those species which are capable of rather ready, even though erratic, transfer from one host species to another. Its occurrence upon *Rattus norvegicus* of which it is certainly not a normal parasite, would indicate as much. It may be suspected that it was originally a parasite of some species of *Rattus* in the Malayan region and that it has spread from that centre".

The four species of rats from which lice are recorded in this paper are as follows: (1) *R. norvegicus* (Berkenhout), (2) *R. rattus diardi* (Jentink), (3) *R. concolor ephippium* (Jentink), (4) *R. rattus brevicaudatus* de Raadt and Horst.

The first rat, better known as the Norway rat, does not, I understand, colonise as rapidly as the Black rat. It has, however, established itself in Java. The second species is the commonest rat in Java and according to Tate (1936) the general consensus of opinion is that this species is somewhat variable and about seaports may hybridise with exotics such as *rattus* and *alexandrinus*. The third species is, according to Tate (1936), a very distinct form and represents a race of rat "whose genetic integrity is well preserved". The fourth species is one of a group of rats having a very wide geographical distribution, and occurring between sea-level and 2,500 meters. As a group they appear to have an essential unity of origin" (Tate, 1936).

In the records given below, I have given the actual number of specimens of lice collected from single host specimens. Practically speaking, the numbers may be taken as representing the total louse population of the rats.

From the above records, a few points of interest present themselves. *H. oenomydis* Ferris seems to occur commonly on the following four species of rats in Java: *R. r. diardi* (Jentink), *R. r. brevicaudata* de Raadt & Horst, *R. concolor ephippium* (Jentink) and *R. norvegicus* (Berkenhout). On *R. r. diardi* (Jentink) it seems that both *P. spinulosa* (Burm.) and *H. oenomydis* Ferris are capable of existing together. *P. spinulosa* (Burm.) seems to be the normal parasite of *R. r. diardi* (Jentink) whereas *H. oenomydis* Ferris may be regarded as the acquired parasite. It may be noted that in the two cases where *R. r. diardi* (Jentink) was taken at high altitudes the only parasite present was *P. spinulosa* (Burm.). It is unfortunate that there is only a single record for *R. concolor ephippium* (Jentink) — the only parasite found on this host was *H. oenomydis* Ferris.

On the basis of our present knowledge (see below), the normal louse parasitising rats of the *concolor* group is *H. oenomydis* Ferris. From my own observations, I am inclined to think that effective transference of a

Table I. Analysis of Records of Lice found on *Rattus rattus diardi* (Jentink) in Java

Ref. No. of Host	Locality etc.	<i>Hoplopleura oenomydis</i> Ferris		<i>Polyplax spinulosa</i> (Burm.)	
		♀	♂	♀	♂
1	North coast, Tegal, XII. 1934	3	.	1	.
43	North coast, Cheribon, Weroe, 6. VIII. 1931	.	.	18	5
61	North coast, Tegal, 26. VI. 1930	3	.	.	.
3	Mid-Java, Temangoeng, 583 m, V. 1933	.	.	4	.
6	Mid-Java, Temangoeng, 583 m, V. 1933	.	1	5	1
22	West Java, Bandoeng, 750 m, VI. 1932	1	.	6	.
32	West Java, Bandoeng, 700 m, VII. 1932	5	.	12	1
45	West Java, Bandoeng, 700 m, VI. 1932	24	9	58	9
53	West Java, Bandoeng, 700 m, VIII. 1932	45	3	7	1
57	West Java, Bandoeng, 700 m, IX. 1932	110	10	42	6
54	West Java, Padalarang, 700 m, IX. 1932	1	.	.	.
64	West Java, Padalarang, 700 m, IX. 1932	3	.	.	.
	West Java, Sindanglaja, Tjipanas, 1100 m,				
27	10. II. 1931	.	.	8	.
	West Java, near Indramajoe, Pabean Ilir, 11.				
71	V. 1932	.	.	5	.
88	West Java, Lembang, Tjikidang, 1300 m, V. 1932	.	.	1	.

louse species from its normal host species or group of species to another host species or group of species, in spite of the apparent abundance of opportunities, only takes place in the event of mating and during the period from birth to the maturity of the young. I do not think that it ever takes place as a result of casual contact of host species. *R. norvegicus* (Berken-

Table II. Records from Rats other than *Rattus r. diardi* (Jentink)

<i>Rattus norvegicus</i> (Berkenhout)	
(42) North Coast Java, Pekalongan, 25. XI. 1930	<i>H. oenomydis</i> Ferris (4 ♀♀, 1 ♂)
(79) East Coast Java, Soerabaja, IX. 1931	<i>H. oenomydis</i> Ferris (34 ♀♀, 2 ♂♂)
(87) West Java, Lembang, Tjiboeriah, 1200 m, VI. 1932	<i>P. spinulosa</i> (Burm.) (20 ♀♀, 9 ♂♂)
<i>Rattus rattus brevicaudatus</i> de Raadt & Horst	
(75) West Java, Garoet, 710 m, VIII. 1931	<i>H. oenomydis</i> Ferris (350 ♀♀, 240 ♂♂)
<i>Rattus concolor ephippium</i> (Jentink)	
(50) West Java, Artjamaink, nr. Bandoeng, 1070 m, VIII. 1931	<i>H. oenomydis</i> Ferris (2 ♀♀)

hout) has probably acquired the parasite *H. oenomydis* Ferris as a result of its continuous contact with *R. r. diardi* (Jentink) upon which it appears to occur commonly. As to how *H. oenomydis* Ferris became established on *R. r. diardi* (Jentink) (for I do not believe it is, or rather was, a normal parasite of this host) it is difficult to say. It must be borne in mind, however, that assuming Ferris' suggestion regarding *H. oenomydis* Ferris as possibly being a species "capable of rather ready, even though erratic, transfer from one host species to another" it is not difficult to explain its occurrence on *R. r. diardi* (Jentink). This rat may have hybridised, or had fairly continuous contact with, members of the *concolor* group of rats, representatives of which do occur in Java, and thus effected a transfer of the parasite.

The following table contains a summary of the records of the two species of lice occurring on rats in the Malayan and Pacific regions. Two records, one from Australia and another from Ceylon, have been included for the sake of completeness. It is not my intention to comment here on the occurrence of *H. oenomydis* Ferris on rats in East Africa, Ceylon<sup>1)</sup> or Australia.

From the records contained in Table III, it seems that *H. oenomydis* Ferris is the commonest louse of rats in the region under consideration. Regarding the forms of *Rattus* listed in the table, all<sup>2)</sup> except *R. r. brevicaudatus* de Raadt and Horst, *R. r. kandiyanus* (Kelaart), and *R. norvegicus* (Berkenhout) belong to a group known as the *Rattus concolor* group. This group of rats is somewhat smaller than the *R. rattus* group, to which the four exceptions listed above belong, and their distribution extends from the Malayan Region to New Guinea and includes Celebes, the Philippines and Borneo. The forms occurring in the Pacific Islands also belong to the *concolor* group. The members of the *rattus* group consist of a very large assemblage of forms extending from Europe and Western Asia to Australia.

Ferris's remarks concerning the origin of *H. oenomydis* Ferris are definitely supported by the records listed in the above table. *H. oenomydis* Ferris is the predominating louse of rats of the *concolor* group which originated from the Malayan region. The occurrence of *P. spinulosa* (Burm.) of some of the hosts belonging to this group is in all probability due to their long associations with members of the *rattus* group, i.e., the Shipborne species of rats. The distribution of the *concolor* group has been effected by the communications between the natives of the various islands and the

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1) *H. oenomydis* Ferris is recorded for the first time from *Rattus r. kandiyanus* (Kelaart), Ceylon in a paper which is at present in the press (Thompson 1938).

2) I am unable to say to which group *R. surdus* (Miller) belongs.

Table III. Summary of the Records of the two Species of lice from rats in the Malayan and Pacific Regions.

Species of Rat	Authority and date	Locality	<i>Polyplax spinulosa</i> (Burm.)	<i>Hoplopleura oenomydis</i> Ferris
<i>Rattus calcis</i> Hollister	Ferris (1923), Ewing (1924)	Philippine Is.	×	×
<i>R. raveni raveni</i> Miller and Hollister	Ewing (1924)	Celebes	—	×
<i>R. raveni eurons</i> Miller and Hollister	Ewing (1924)	Celebes	—	×
<i>R. hawaiiensis</i> Stone	Ewing (1924), Ferris (1935)	Hawaiian Is.	×	×
<i>Rattus</i> sp. <sup>1)</sup>	Ewing (1924)	Samoa	—	×
<i>Rattus</i> sp.	Ewing (1924)	Fanning I.	—	×
<i>Rattus</i> sp. <sup>2)</sup>	Ferris (1932) <sup>3)</sup>	Marquesas Is.	×	×
<i>R. surdus</i> (Miller)	Ewing (1924)	N.W. Sumatra	—	×
<i>R. stridens</i> (Miller)	Ferris (1923)	Tioman I., Malaya	×	—
<i>R. concolor</i> (Miller)	Ewing (1924)	Siam	—	×
<i>R. rattus diardi</i> (Jentink) <sup>4)</sup>	(The present paper)	Java	×	×
<i>R. r. brevicaudatus</i> de Raadt and Horst	(The present paper)	Java	—	×
<i>R. concolor ephippium</i> (Jentink)	(The present paper)	Java	—	×
<i>R. norvegicus</i> (Berkenhout)	(The present paper) and Ferris (1932)	Java and Australia	×	×

1) The *Rattus* sp. from Samoa may be *R. exulans* Peale.

2) I understand from Mr. Edward P. Mumford, of the Pacific Entomological Survey, that the form of *Rattus* referred to here is as yet undescribed. It is, however, a form referable to the *R. concolor* group, and closely related to *R. hawaiiensis* Stone.

3) It appears from Ferris' host data (1932) that both *P. spinulosa* (Burm.) and *H. oenomydis* Ferris occurred on the same host specimen in the Marquesas Is.

4) Ferris (1932) recorded *H. oenomydis* Ferris off *R. r. diardi* (Jentink) from Malaya.

mainland. These rats have therefore become established in the islands for a very long time and almost certainly before the advent of the white man to these parts accompanied by the members of the *rattus* group. The rats of this latter group are therefore comparatively recent arrivals and *P. spinulosa* (Burm.) which is apparently also capable of transfer from one host species to another has only succeeded in establishing itself to a small extent on members of the *concolor* group.

In conclusion I should like to thank Dr. G. H. H. Tate for so kindly sending me a copy of his interesting paper on the *Rattus* spp. of the Indo-Australian region, from which I have obtained a wealth of information regarding the hosts of these two parasites. I must also thank Prof. G. F. Ferris for his kindness in examining a few specimens of the *Hoplopleura* off the Javanese rats.

#### Summary and Conclusions

1. The two species of lice, namely *Polyplax spinulosa* (Burm.) and *Hoplopleura oenomydis* Ferris, are apparently quite capable of easy transfer from one host species to another and occur on a wide range of allied hosts in the Malayan and Pacific regions.

2. *P. spinulosa* (Burm.) is the true louse parasite of the *R. rattus* group.

3. *H. oenomydis* Ferris is the true louse parasite of the *R. concolor* group.

#### REFERENCES

- EWING, H. E., 1924. Ectoparasites of some Polynesian and Malaysian rats of the genus *Rattus*. Bern. P. Bish. Mus., Honolulu, Bull. 14, pp. 7—11.
- FERRIS, G. F., 1921. Contributions toward a Monograph of the Sucking Lice, part II. Stanford Univ. Publ., Biol. Sci., vol. 2, pp. 82—84, figs. 47—48.
- , 1923. Contributions toward a Monograph of the Sucking Lice, part IV. Stanford Univ. Publ., Biol. Sci., vol. 2, pp. 187—191, figs. 119, 120A, 120D, 120F, 120H.
- , 1932. Ectoparasites of Marquesan Rats. Bern. P. Bishop Mus., Honolulu, Bull. 98, pp. 121—127, figs. 37, 38, 39.
- , 1935. Contributions toward a Monograph of the Sucking Lice, part VIII. Stanford Univ. Publ., Biol. Sci., vol. 2, pp. 88—89.
- TATE, G. H. H., 1936. Some Muridae of the Indo-Australian Region. Bull. Amer. Mus. Nat. Hist., vol. 72, art. VI, pp. 501—728.
- , 1935. Rodents of the genera *Rattus* and *Mus* from the Pacific Islands. Bull. Amer. Mus. Nat. Hist., vol. 68, art. III, pp. 145—178.
- THOMPSON, G. B., 1938. The Siphunculata or Sucking-Lice Recorded from the Pacific Islands. Ent. mon. Mag., vol. 74, pp. 90—94.
- , 1938. A Census of the Ectoparasites of some Ceylon Rats. J. Anim. Ecol., vol. 7, pp. 71—73.