The Ectoparasites of Australian Birds and Mammals.

Since the publication of a paper by Harrison and Johnston (1916) only a single paper dealing with the Australian Marsupial Mallophaga has been published. With the hope of stimulating interest in a field of parasitology which has been little explored, I am presenting the following notes. It is to be hoped that a study of the Mallophagan parasites of these interesting mammals may ultimately throw some light on the interrelations of their hosts.

I should like to take this opportunity of pointing out that it is most essential that these parasites be studied when comparatively fresh, as I have experienced considerable difficulty in making adequate preparations of specimens which have been preserved for long periods. Specimens from a single host specimen should be placed together in a single tube of alcohol (70–80 per cent.) with a label bearing the following data:—Name of host, common and scientific (it is essential that the name of the host be correctly stated, otherwise the specimens are of little value), locality, date, position of parasites on hosts (if collected immediately after death), and collector's name.

As I am in the very fortunate position of having in my care typical or co-typical specimens of a large number of the species described to date, I shall be pleased to receive material for study.

Iredale and Troughton (1934), in their catalogue of the Australian Mammals, list fifty-five genera of Marsupials, of these fifty-five genera only eleven genera contain
the type-hosts from which Mallophaga have been described. The seven genera of Mallophaga containing the known species of Marsupial parasites are, with the exception of two, "Heterodoxus longitarsus (Piaget)," recorded from dogs, and Boopia peregrina Mjöberg, described from an Otter from India (see below), confined exclusively to the Australian Marsupials. The following table will serve to explain the distribution of the parasites on the various host genera:

<table>
<thead>
<tr>
<th>Genera of Marsupialia</th>
<th>Genera of Mallophaga</th>
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<tbody>
<tr>
<td></td>
<td>Boopia</td>
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<tr>
<td></td>
<td>Dendrologia</td>
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<tr>
<td></td>
<td>Heterodoxus</td>
</tr>
<tr>
<td></td>
<td>Latumophilium</td>
</tr>
<tr>
<td></td>
<td>Macrophiella</td>
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<tr>
<td></td>
<td>Paraheterodoxus</td>
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<tr>
<td></td>
<td>Pha eogavia</td>
</tr>
<tr>
<td>Antechinus</td>
<td></td>
</tr>
<tr>
<td>Dasyurus</td>
<td>×</td>
</tr>
<tr>
<td>Perameles</td>
<td>×</td>
</tr>
<tr>
<td>Vombatus</td>
<td>×</td>
</tr>
<tr>
<td>Æpyrymnus</td>
<td></td>
</tr>
<tr>
<td>Dendrologus</td>
<td>×</td>
</tr>
<tr>
<td>Thylagale</td>
<td>×</td>
</tr>
<tr>
<td>Wallabia</td>
<td>×</td>
</tr>
<tr>
<td>Osphrante</td>
<td></td>
</tr>
<tr>
<td>Megaleia</td>
<td></td>
</tr>
<tr>
<td>Macropus</td>
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</tbody>
</table>

Catalogue of the Valid Species of Mallophaga.

Family Boopidae Mjöberg.
Subfamily Boopinae Harrison & Johnston.


1. bettonia Le Souëf, Vict. Nat. xix. 1902, p. 50, f. 2.
   Type-host.—Æpyrymnus rufescens Gray. (Bettonia rufescens.)

2. grandis Piaget, Les Pédiculines, Suppl. 1885, p. 154, pl. xvi. f. 8.
   Type-host.—Megaleia rufa Desmarest. (Macropus rufus.)
   Type-host.—*Wallabia dorsalis* Gray. (*Macropus dorsalis.*)

   Type-host.—*Wallabia bicolor* Desmarest. (*Macropus ualabatus.*)

   Type-host.—*Perameles nasuta* Geoffroy.

   Type-host.—*Wallabia bicolor* Desmarest.

   Type-host.—*Vombatus ursinus* Shaw. (*Phascolomys fossor.*)

   Type-host.—*Dasyurus quoll* Zimmerman.


   Type-host.—*Macropus ? major* Shaw. (*Halmaturus giganteus.*)


   Type-host.—*Antechinus flavipes* Waterhouse. (*Phascologale flavipes.*)


   Type-host.—*Æpyprymnus rufescens* Gray.

* It is extremely difficult to understand what is meant by “*Halmaturus giganteus*” of the older writers.
5. Genus Dendrolagia Mjöberg.
1. pygidialis Mjöberg, Ent. Tidskr. 1919, p. 94.
   Type-host.—Dendrolagus lumholtzi Collett.

1. forcipata Mjöberg, Ent. Tidskr. 1919, p. 95.
   Type-host.—Thylogale coxeni Gray.

Subfamily Latumcephalinae Harrison & Johnston.

1. lesouëfi Harrison & Johnston, Parasitology, viii. 1915, p. 343, ff. 2, 3.
   Type-host.—Wallabia ursinus Shaw.
   Type-host.—Wallabia dorsalis Gray.

From the above list I have omitted the synonyms of H. longitarsus (Piaget), including those which have been described from dogs, and B. peregrina Mjöberg, which was said to have been taken from a specimen of Lutra pruner from India "just freshly arrived" in the Zoological Gardens, Hamburg. With regard to the synonyms of H. longitarsus (Piaget), I am at present engaged in writing a paper, in collaboration with a colleague, on the species occurring on dogs, etc., and it is to be hoped that everything will then be explained. B. peregrina Mjöberg is, I feel sure, a straggler from a Marsupial, in spite of Mjöberg's statement, and as far as I have been able to tell it will eventually prove to be the same as one of the previously described larger species of Boopía.

Key to the Subfamilies and Genera.

<table>
<thead>
<tr>
<th>Description</th>
<th>Genus</th>
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</thead>
<tbody>
<tr>
<td>Palpi two-segmented</td>
<td>Latumcephalinae</td>
</tr>
<tr>
<td>Palpi four-segmented</td>
<td>Boopinae</td>
</tr>
<tr>
<td>Species with dagger-like spines beneath the head</td>
<td>2.</td>
</tr>
<tr>
<td>Species without dagger-like spines beneath the head</td>
<td>3. Macrophila.</td>
</tr>
<tr>
<td>Spines stout</td>
<td>Boopia.</td>
</tr>
<tr>
<td>Spines rising from base of palpi</td>
<td></td>
</tr>
<tr>
<td>Spines not rising from base of palpi</td>
<td></td>
</tr>
</tbody>
</table>
4. Spines rising immediately behind the base of the palpi ............................................ Dendrolagia.

Spines rising still more posteriorly .................. 5.

5. Spines rising from chitinous framework which supports the palpi at a level of the eyes ...

Spines rising from posterior margin of gular plate, i.e. posterior to level of eyes ........ Paraheterodoxus.

Location of the Types of the Species of MARSUPIAL MALLOPHAGA.

Up to the present, I have succeeded in tracing the types of all the species described to date except Boopia minuta Le Souëf and B. bettongia Le Souëf. It is probable that these are lost. Le Souëf and Bullen did not designate any specimens as types, and in the cases where specimens of the species described by them are at present contained in the collection in my care I take this opportunity of designating type-specimens. The types of Mjöberg’s two species, namely Dendrolagia pygidialis and Macropophila forcipata, are, as far as I have been able to ascertain, contained in Mjöberg’s collection. Piaget’s types are in the collection of the British Museum (Natural History). The following is a list of the type material contained in the collection in my care:

Boopia phanerocerata Harrison & Johnston.

♂♀ types, 4 ♀♀, 1 ♂, paratypes off Perameles nasuta Geoffroy, New South Wales, Sydney, vi. 1911 (L. Harrison).

Boopia notafusca Le Souëf.

♂♀ types off Wallabia bicolor Desmarest, Australia Victoria, 1902 (A. S. Le Souëf).

Boopia uncinata Harrison & Johnston.

♀ type, 1 imm. off Dasyurus quoll Zimmermann, N.S. Wales, Sydney, 7. vii. 1910.

Boopia spinosa Harrison & Johnston.

♀♂ types off Wallabia bicolor Desmarest, Victoria (A. S. Le Souëf).

Paraheterodoxus insignis Harrison & Johnston.

♀ type off Aepyprymnus rufescens Gray, N.S. Wales, Sydney Zoo (L. Harrison).
Phascogalia brevispinosus (Harrison & Johnston).

♀ type off Antechinus flavipes Waterhouse, N.S. Wales, Sydney Zoo, viii. 1911 (A. S. Le Souëf).

Latumcephalum macropus Le Souëf.

♀♂ types, 2 ♀♀ paratypes off Wallabia dorsalis Gray, Victoria, 1902 (A. S. Le Souëf).

Latumcephalum lesouëf Harrison & Johnston (=L. macro-

pus Le Souëf).

♂ type and 2 imm. off Wallabia bicolor Desmarest, Victoria, 1902 (A. S. Le Souëf).

[Boopia peregrina Mjöberg.

2 ♀♀ paratypes off Lutra pruneri, India.]

The above material was in a terrible condition in its original state, but I have since remounted and labelled it all.

REPORT ON SPECIMENS CONTAINED IN THE
WEST AUSTRALIAN MUSEUM.

Through the kindness of Mr. P. Glaeurt, Director of the West Australian Museum, I have had the opportunity of studying a small collection of Mallophaga from Australian Marsupials. My notes on this collection are given below.


A very large series of males and females collected from Dasyurinus geoffroyi Gould, S.W. Australia, Forest Grove, 1906, and same host species, W. Australia, Serpentine, which seem to be referable to this species. The male has not yet been described, so I take this opportunity of figuring the male genitalia and giving a few notes.

The male differs from the female in its generally smaller measurements and in having the terminal abdominal segment simple and bearing four setae. The genitalia (see figure, p. 608) is of the same general type as B. phanero-
cerata Harrison & Johnston. The parameres seem to be somewhat stouter and more curved. A sac is present, but this is not shown in the figure.

Measurements of Male.—Length 1·6 mm.; greatest breadth 0·7 mm.

\[\text{\& genitalia of } Boopia\ uncincta\ Harrison & Johnston.\]

2. *Heterodoxus* ?; sp. n.

Two females collected from *Betongia lesueur graii* Gould, W. Australia (31–447/50).

3. *Heterodoxus* ?; sp. n.

Two males and two females collected from *Betongia penicillata* Gray, W. Australia, Margaret River District (6011).

For the present it is only possible to state that the two records given above are of species of the genus *Heterodoxus*, which are, in all probability, undescribed. When the paper referred to previously concerning the "*Heterodoxus longitarsus* (Piaget)" group has been concluded and published it is to be hoped that these specimens will be determinable to species.