

THE MALLOPHAGA OF THE WORLD: SYSTEMATIC SUMMARY.

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AFTER many tedious hours I have made an end of compiling a catalogue, with references to original descriptions, and with host and geographic records, of the Mallophaga of the world, for publication in Wytzman's *Genera Insectorum*. This is a highly needed work — not the list of Mallophaga, but the *Genera Insectorum* — and I suppose no sacrifice of time and happiness on the part of an entomologist is to be reckoned too great, if he can help further this larger enterprise. But doing the Mallophaga has approached, from my point of view, somewhere near the limit of this sacrifice.

Twelve hundred and fifty-seven species of these little parasites of birds and mammals have been described: 52 from mammal hosts and 1205 from birds. About one fourth of these are recorded from North American hosts, and of these approximately 300 species two thirds have been described as new, the other 100 being considered to be identical with species originally described from European, Asiatic or African hosts.

The order Mallophaga comprise twenty-seven genera, grouped into four families, constituting two sub-orders. Each sub-order includes a family found on bird hosts and one found on mammal hosts. However, a few species in the bird-infesting families are being found on mammals, especially on kangaroos and wallabies in Australia. Of course, in addition, a number of normally bird-infesting species have been found as stragglers on bird-catching mammals. The division of species among

these genera is so extraordinary that I give it in detail in the following complete list of genera:

Sub-order Amblycera

Family Gyropidae (found exclusively on mammals).

Genus Gyropus, 7 species.

Family Liotheidae (found almost exclusively on birds).

Genus Latumcephalum, 1 species.

Genus Heterodoxus, 1 species.

Genus Ancistrona, 2 species.

Genus Nitzschia, 4 species.

Genus Boopia, 5 species.

Genus Trinoton, 10 species.

Genus Laemobothrium, 24 species.

Genus Physostomum, 29 species.

Genus Colpocephalum, 137 species.

Genus Menopon, 212 species.

Sub-order Ischnocera.

Family Trichodectidae (found exclusively on mammals).

Genus Trichodectes, 45 species.

Family Philopteridae (found exclusively on birds).

Genus Eurymetopus, 1 species.

Genus Philoceanus, 1 species.

Genus Bothriometopus, 1 species.

Genus Kelloggia, 1 species.

Genus Ornicholax, 1 species.

Genus Nesiotinus, 1 species.

Genus Giebelia, 1 species.

Genus Ornithobius, 5 species.

Genus Akidoproctus, 6 species.

Genus Oncophorus, 19 species.

Genus Goniocotes, 56 species.

Genus Goniodes, 63 species.

Genus Lipeurus, 181 species.

Genus Docophorus, 214 species.

Genus Nirmus, 229 species.

This really extraordinary disposition of species merits some special attention. In the first place it is of interest to note that exactly the members of the pair of largest

genera in each sub-order are the ones most difficult to define satisfactorily. As a matter of fact the genera *Menopon* and *Colpocephalum* practically run into each other as do the genera *Docophorus* and *Nirmus*. Most of the aberrant monotypic genera, on the other hand, are unusually well distinguished.

It is a matter of note that the species definitions throughout the Mallophaga have to be very plastic. This comes about almost certainly through the fact that the isolation on different host individuals of groups of parasitic individuals is often (cases of nongregarious, solitary hosts for example) considerably in degree, and leads to the restriction of the swamping and evening effects of free inter-crossing. There must be much in-and-in-breeding of successive generations of the parasites on such solitary and monogamous hosts as eagles, for example. (It should be remembered that the Mallophaga are wingless and migrate from host individual to host individual only at times of the actual contact of the host bodies. Mallophaga cannot live off of the host body for more than a few hours or days and as a matter of fact are very rarely [except in hen houses] ever to be found off the host body.)

But while this isolation of groups of individuals of a Mallophagan species tends to foster and fix many slight variations and hence to break down species limits, the general similarity or identity of environment and food, viz., birds' bodies and feathers, tends to restrain any tendency toward large variation, or at least does not tend to encourage any such modification. Bird's feathers are about the same as food and bird's bodies as habitat whatever the species of bird or its habit. Mallophaga on water birds have no aquatic life at all but live against the dry warm skin of the host, surrounded by the air held among the interlacing feathers.

How then have the monotypic aberrant genera come to be developed at all? A problem. And one quite beyond my power to answer. Has there been such persistent and positive determinate variation that despite the monotony of environment these radically different types have come to exist? Or have there been considerable mutations or cases of discontinuous variation resulting in the sudden appearance of fixed new forms of markedly different type from their progenitors?

Thus even from the tedious work of competition and cataloging one may rescue some stray bits of interest. As a matter of fact if we could really understand the why of the generic relations of our twelve hundred odd Mallophaga we should have the key to the master puzzle. And then how stale and profitless would the rest of our cataloging and scrutinizing of species be!