

SOME PSOCOPTERA FROM PLUMAGE OF BIRDS

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Although psocids have been recorded on a number of instances from the fur of wild and domestic mammals (literature reviewed by Pearman, 1960), and from the nests of birds (Hicks, 1959, Rapp, 1961, Włodarczyk, 1963), there are apparently no records of these insects from the plumage of living birds.

The following records are of considerable interest from a biogeographic point of view. At least for smaller psocids, it appears that phoresy on birds offers a means of dispersal over long distances and lacks the formidable difficulties presented by wafting in the open air. The plumage of a bird offers a constant warm temperature, probably high relative humidity, and perhaps a food supply in the form of skin scurf and other debris.

The migratory habits of many birds, including the emberizine finches of the present records, assure that any insect riding the plumage of one of these birds with some regularity will have access for colonization to the terrestrial areas along the bird's migration route. Thus, if the insect fails to become established in a particular area once, it has many more chances. The fairly common occurrence of wandering or being blown out of its usual migratory course may result in the bird's finding its way across a vast water area to an island or a continent new to it. Whereas the bird may have little chance of establishing its species in the new area, the insects riding its plumage, especially the parthenogenetic ones, may have a much greater chance. In this connection, it is interesting to note that three of the four psocid species of the present records have very wide distributions involving more than one continent even when we ignore the obvious records of transport in human commerce.

Whereas psocids are doubtless most likely to crawl onto birds at the nest, three of the present records were made outside of the nesting seasons of the birds involved, and strongly suggest that psocids may crawl onto birds from a feeding area or a roosting area.

The remarks of Pearman (1960) concerning the bearing of mammal- and mammal-lair inhabiting psocids on the evolution of the Mallophaga apply equally to birds.

Information on ranges of the birds involved is taken from Delacour (1947) and Vaurie (1959, 1965).

The specimens were received from the Entomology Research Division of the United States Department of Agriculture, whence they were sent by Dr. H. Elliott McClure of the Migratory Animal Path-

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ological Survey, Bangkok, Thailand. The bird identifications were made by Dr. McClure. A letter accompanying the specimens states that a rapidly killing insecticidal dust was used which allowed collections to be made from the live birds.

The specimens have been deposited in the collection of Illinois State University.

Family ATROPIDAE

Lepinotus reticulatus Enderlein

Chin Chup Myun, Kyunggi Prov., Korea; August 21, 1965, 1 female on adult *Emberiza fucata* Pallas (gray-hooded bunting). Same locality, September 12, 1965, 1 female on adult *Emberiza rutila* Pallas (chestnut bunting). Same locality, September 22, 1965, 1 female on subadult *E. rutila*.

This psocid occurs over the drier parts of the United States and Mexico, is well represented in Chile, is recorded from France, Germany, Egypt, Algeria, Mozambique, Canary Islands, Southern Australia, and Tasmania. The present records are the first for Asia. Only the records from France are clearly from domestic situations. Males are known only from Germany, and the species is presumably parthenogenetic throughout much of its range.

This psocid inhabits principally ground litter and grass clumps on well-drained soil in arid and semi-arid regions and on sand dunes in more humid regions. It has been found in the nests of several species of birds (Hicks, 1959). The three instances of its occurrence on buntings of the genus *Emberiza* suggest that this relationship is regular.

Emberiza rutila breeds in eastern Siberia, migrates through eastern China and Korea, and winters in southeastern China, the Indo-Chinese countries, Assam, and northern Bengal. It straggles east to Japan and Formosa and west to Holland and France. *Emberiza fucata* breeds somewhat further south than *E. rutila* and in Japan. Its northern populations are migratory and winter in the Ryu Kyus, southeastern China, the Indo-Chinese countries, and eastern India.

Family LIPOSCOLIDAE (=Troctidae)

Embidopsocus trichurensis Menon.

Balian, Luzon, P.I.; June 5, 1964, 1 macropterous female from male *Chalcophaps indica* (L.) (green-winged ground dove). The identification of the psocid was made by comparison with two topotypic specimens, one determined by Menon.

E. trichurensis was known previously only from the type locality, Trichur, Kerala, India. The present record suggests that the species is widespread in southeastern Asia. It occurs on dried leaves on the ground or hanging from plants.

Chalcophaps indica occurs from India east to the Philippines and south to Australia. It lives under cover in bush and forest. I have found no information about its movements.

Liposecelis entomophilus Enderlein

Limot, Davao Prov., Mindanao, P.I. June 9, 1965, 1 female on fledgling *Dicrurus hottentottus* (L.) (spangled drongo).

L. entomophilus is widespread in tropical Africa where it apparently occurs as part of the native fauna. Records from Europe, Chile, United States, and Japan are from domestic situations. The present record suggests that it may also be native in the Philippines. It was reported from the nest of a weaver finch, *Ploceus cucullatus* (Müller), in Angola (Badonnel, 1955).

Dicrurus hottentottus occurs from India east to the Philippines, south through Australia, and in Borneo and the Sunda Islands. I have found no information about its movements. Since it is a tropical polytypic species, there is probably little movement from one region to another.

Family PERIPSOCIDAE

Ectopsocopsis cryptomeriae (Enderlein)

Chin Chup Myun, Korea, July 13, 1964, 1 male on adult male *Alcedo atthis bengalensis* Gmelin (river kingfisher).

E. cryptomeriae occurs as part of the native fauna in Japan, Taiwan, Hong Kong, eastern United States, northern Mexico, and Puerto Rico. It enters houses occasionally and is carried at times in human commerce. It is generally found on dried leaves of plants, hanging from the plant or on the ground.

Alcedo atthis bengalensis breeds in eastern Siberia south through central China and occasionally further south on the continent, also in Japan, the Ryu Kyus, and Formosa. It winters in the Malay Peninsula, the Indo-Chinese countries, the Greater Sundas, Philippines, and some surrounding islands.

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