LICE EGG MORPHOLOGY AS A GUIDE TO TAXONOMY
and
THE MICROTOPOGRAPHY OF AVIAN LICE EGGS
BY
R. S. BALTER


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EDWARD GREY INSTITUTE
OF FIELD ORNITHOLOGY
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Lice (Phthiraptera) are obligate ectoparasitic insects infesting vertebrate animals. They are wingless and are flattened dorsoventrally; they have claws adapted for clinging, and a strong protective cuticle is always present.

Two probably closely interrelated groups exist. The Anoplura (sucking lice) have heads as narrow or narrower than the thorax and are confined solely to mammals. Structurally their eggs are less exotic than those of the Mallephaga (bird lice) in which fascinating adaptive differences occur appropriate to the particular habitat of the bird concerned.

The major super families of Mallephaga are the Amblycera which require blood or serum. They are not adapted for life on specific parts of the bird, lack morphological specialization, diverge less from one another and are therefore divided into fewer genera. They are thus more difficult to distinguish at species level than are the Ischnocera whose eggs are laid at carefully selected sites to prevent damage by the host. These lice are more varied in form, feed upon feathers and occupy specialized habitats.

Biological knowledge of the Mallephaga is scant. Eggs of a few species infesting domestic animals have occasionally been described but drawings and photographs show few useful details of structures. Richter (1870) accompanied fine steel engravings (see opposite) with the comment, ‘Eggs of insects have long been favourite objects for the microscope . . . among the little bird parasites (Mallephaga) are to be found the most extraordinary and apparently fantastic structures’. Hobor (1939) described lice and their eggs from the fowl. Blagowezensky (1933) also described several eggs.

Studies now in progress seek the identification of eggs to genera and, where possible, to species level; the formation of a national collection and the taxonomic study of various distinctive microstructures visible on or within the egg. The present contribution is no more than an introduction to the subject, and a more comprehensive paper describing the various structural modifications of the eggs according to the ecology of the parasite concerned will appear in a later issue of this journal.

During the course of this latter study, it was found that certain external features of the egg were difficult to resolve by light microscopic techniques and that reconstruction of the egg shell from serial sections was thus impossible. However, a scanning electronmicroscope proved to be an ideal instrument for this purpose, as it enabled a detailed surface study of the specimens to be made.

The advantages of this instrument over the light microscope and the transmission electronmicroscope have been described previously (Boyd and Quilliam, 1966) but may be briefly summarized: (1) Enhanced depth of focus; (2) magnification intermediate between and overlapping the ranges achieved by the light and electron microscopes; (3) ease of preparation of specimens.
The eggs of various Mallophaga prove and their hosts: (A) Boullia, host not mentioned; (B) Kedelittimopon; (C) Australian Malleer Beetle; (D) Anthridites macula (Ehrenberg) arctica; Indian Peacock; (E) Ischnohanassa; Crow-wed Crane; (F) Oxylophagia; Pheasant; (G) Euhistites; Australian Crane; (H) Chalcoptera; Ground Hornbill; (I) Biotrophagia; Ground Hornbill; (J) Oxylophagia; Temmeck’s Tragopan; (K) Oxylophagia; Golden Pheasant.

R. S. BALTER

1 Chestrey Road, West Bridgford, Nottingham

References