

# PSYCHE.

## THE MALLOPHAGA.

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A small and interesting group of insects, the Mallophaga, seems to have been pretty methodically and consistently overlooked by American insect-students. In Germany, Nitzsch of the University of Halle, and following him and profiting by the collections and notes made by him, Giebel and Taschenberg, at Leyden Piaget, and in England Denny, have undertaken to collect and describe Mallophaga, with the result that some 1000 species have been named, and several very portly volumes filled with descriptions and figures of these small parasitic insects have been printed. The Mallophaga are interesting because of their parasitic habits, their strangely specialized structure, and the still open question of their position among insects. Because they have been commonly associated with the Pediculidae in early entomological texts, and have been studied by Nitzsch, Giebel, Denny and Piaget with the true lice as external parasites of warm-blooded animals, and are called "lice," and are unknown things to most entomologists, they are commonly held as a group closely allied to the Pediculidae, which they most certainly are not.

They have an incomplete metamorphosis, biting mouth parts, are wingless, and feed on the scales, feathers and

hairs of mammals and birds. They have gradually ascended during the storm and stress of classificatory struggling from the position of a family blown with each changing wind from Hemiptera to Orthoptera to Pseudo-Neuroptera, to the position of an independent order untrammelled by near relations or affinities.

With some considerable difficulty I have made a small beginning in the study of the American forms, and have now in the course of printing the descriptions and figures of one new genus and 38 new species of Mallophaga collected by me from American water and shore birds, mostly maritime birds shot on the Bay of Monterey, California. On these water birds I have besides identified 23 species previously described from European birds. In addition I have noted on American land birds 16 previously described species and 24 new forms. No recognizable species of Mallophaga has been heretofore described from specimens taken from American birds. In this short study of the group, there are apparent many interesting problems in zoological and geographical distribution, in the relation of parasite to host, and in the peculiar opportunities for variation and species-forming.

Because of these interesting problems and of the need for a wider observation of the American forms of the group I present this table of the genera of the Mallophaga and a short paper to follow on their habits and distribution in the hope of calling the attention of American students to the group.

The Mallophaga were divided by Nitzsch into two families, the Philopteridae with filiform antennae and without maxillary (= labial) palpi, and the Liotheidae with capitata, 4-segmented antennae and maxillary (= labial) palpi. The family Philopteridae included two genera: *Trichodectes*, with 3-segmented antennae and 1-clawed tarsi, and *Philopterus* with 5-segmented antennae and 2-clawed tarsi. The latter genus was subdivided into the five sub-genera *Docophorus*, *Nirmus*, *Goniocotes*, *Goniodes*, and *Lipeurus*. The family Liotheidae similarly included two genera: *Gyropus* with 1-clawed tarsi and *Liotheum* with 2-clawed tarsi. The latter genus was sub-divided into six sub-genera.—*Eureum*, *Laemobothrium*, *Physostomum*, *Trinoton*, *Colpocephalum* and *Menopon*. The two 1-clawed genera *Trichodectes* and *Gyropus* (one belonging to each family) were found by Nitzsch exclusively upon mammals; all the other genera exclusively upon birds. In essential identity the classification of to-day is that of Nitzsch; it differs in discarding the generic groups *Philopterus* and *Liotheum*, and in considering the Nitzschian sub-genera as genera, and in the addition

of several new genera based on species since discovered.

The change of classification by which the one-time sub-genera of *Philopterus* are now put on equality with the genus *Trichodectes* and similarly the sub-genera of *Liotheum* on equality with *Gyropus*, seems to me ill-advised. The two genera found on mammals differ in so many ways and so radically from their bird-infesting congeners (?) in each family that I believe their striking host and structural differences should be recognized in the classification. I propose, therefore, in the light of the present ranking of the Mallophaga as an independent order of insects, to rank the Nitzschian families as sub-orders, the Nitzschian genera as families, and the Nitzschian sub-genera, the genera of present-day writers, as genera. This will leave unchanged the present generic names and ranking, but will restore the expression, first indicated by Nitzsch in his generic groups, of the differences between the mammalian parasites and the avian parasites. This re-ranking, which is practically a return to the classification of Nitzsch, is adopted in the following synopsis and key which I have arranged to include all the genera so far established.

### *Synopsis of the Order Mallophaga.*

Sub-order ISCHNOCERA.

Family *Trichodectidae*.

Genus *Trichodectes* Nitzsch.

Family *Philopteridae*.

Genera *Akidoproctus* Piaget, *Docophorus* Nitzsch, *Giebelia* Kellogg (MS.), *Nirmus* Nitzsch, *Eurymetopus* Taschenberg, *Goniodes* Nitzsch, *Goniocotes* Burmeister, *Ornithobius* Denny, *Bothriometopus* Taschenberg, *Lipeurus* Nitzsch, *Oncophorus* Rudow.  
Sub-order AMBLYCERA.

Family *Gyropidae*.

Genus *Gyropus* Nitzsch.

Family *Liotheidae*.

Genera *Colpocephalum* Nitzsch, *Boopia* Piaget, *Trinoton* Nitzsch, *Laemobothrium* Nitzsch, *Physostomum* Nitzsch, *Eureum* Nitzsch, *Nitzschia* Denny, *Ancistrana* Westwood, *Menopon* Nitzsch.

*Key to the Sub-orders.*

- A With filiform 3- or 5-segmented antennae, and no labial palpi. Sub-order ISCHNOCERA.
- AA With clavate (or capitate) 4-segmented antennae, and 4-segmented labial palpi. Sub-order AMBLYCERA.

*Key to the Genera of the Sub-order Ischnocera.*

- A With 3-segmented antennae; tarsi with 1 claw; infesting mammals (family Trichodectidae). *Trichodectes* N.
- AA With 5-segmented antennae; tarsi with 2 claws; infesting birds (family Philopteridae).
- B Antennae similar in both sexes.
  - C Front deeply angularly notched. *Akidoproctus* P.
  - CC Front convex, truncate, or rarely with a curving emargination, but never angularly notched.
    - D Species broad and short; with large movable trabeculae (at the anterior angle of antennary fossa).
      - E Forehead with a broad transverse membranous flap projecting beyond lateral margin of the head in the male, barely projecting in female. *Giebelia* Kell.
      - EE Without such membranous flap. *Docophorus* N.
      - DD Species elongate, narrow; with very small or no trabeculae. *Nirmus* N.
- BB Antennae differing in the two sexes.
  - C Species wide, with the body elongate-ovate to sub-orbicular.
    - D Temporal margins rounded; last segment of abdomen roundly emarginated; antennae of male without appendage, third segment very long. *Eurymetopus* Tasch.

- DD Temporal margins usually angulated; last segment of abdomen convex, rarely angularly emarginated with two points.
- E First segment of antenna of male large, sometimes with an appendage; third segment always with an appendage. *Goniodes N.*
- EE First segment of antenna of male enlarged, but always without appendage; third segment without appendage; last segment of abdomen always rounded behind. *Goniocotes Burm.*
- CC Species elongate, narrow, sides sub-parallel.
- D Third segment of antenna of male without an appendage. *Ornithobius Denny.*
- DD Third segment of antenna of male with an appendage.
- E Front deeply angularly notched. *Bothriometopus Tasch.*
- EE Front not angularly notched.
- F Antennae and legs long; a semi-circular oral fossa. *Lipeurus N.*
- FF Antennae and legs short; oral fossa narrow, elongate, extending as a furrow to the anterior margin of head. *Oncophorus Rudow.*

*Key to the Genera of the Sub-order Amblycera.*

- A Tarsi with one claw; infesting mammals (family Gyropidae) *Gyropus N.*
- AA Tarsi with two claws; infesting birds (except *Boopia?*) (family Liotheidae).
- B Ocular emargination distinct, more or less deep.
- C Forehead rounded without lateral swellings; antennae projecting beyond border of the head. *Colpocephalum N.*
- CC Forehead with strong lateral swellings.
- D Antennae projecting beyond border of the head; temporal angles projecting rectangularly; eye large and simple. *Boopia P.*
- DD Antennae concealed in groove or under side of head; temporal angles rounded or slightly angular; eye divided by an emargination and fleck.
- E Mesothorax separated from metathorax by a suture. *Trinoton N.*
- EE Meso- and metathorax fused, no suture. *Laemobothrium N.*
- BB Ocular emargination absent or very slight.
- C Sides of the head straight or slightly concave; forehead with two small laterally-projecting labral lobes. *Physostomum N.*
- CC Sides of the head sinuous; forehead without labral lobes.
- D Body very broad; metathorax shorter than prothorax. *Eureum N.*
- DD Body elongate; prothorax shorter than metathorax.

- E Ocular emargination filled by a strong swelling; sternal markings forming a quadrilateral without median blotches.  
*Nitzschia Denny.*
- EE Ocular emargination without swelling, hardly apparent or entirely lacking; median blotches on sternum.
- F Very large; with two 2-pointed appendages on ventral aspect of hind-head; anterior coxae with very long lobe-like appendages.  
*Ancistrona Westwood.*
- FF Small or median; without bi-partite appendages of hind-head.  
*Menopon N.*

NOTES ON THE WINTER INSECT FAUNA OF VIGO COUNTY,  
 INDIANA.—V.

BY W. S. BLATCHLEY, INDIANAPOLIS, INDIANA.

COLEOPTERA (CONT.).

A number of beetles belonging to the families Dytiscidae, Gyrinidae and Hydrophilidae, doubtless pass the winter as imagoes,\* hibernating in the waters of the deeper pools of ponds and streams, or beneath the mud and driftwood near their margins. The opportunity did not occur to make a special investigation of such pools, and therefore but two species of water beetles were taken during the winter collecting.

HYDROPHILIDAE.

78, *Berosus striatus* Say. The only specimen taken in the county was found Feb. 26, deeply buried in damp sand, beneath a log on margin of old canal.

\* Imagoes of the genera *Dytiscus* and *Hydrophilus* have been seen by the writer on numerous occasions in early April.

79, *Philhydrus cinctus* Say. On two occasions in February from beneath logs close to ponds. Common in summer.

SILPHIDAE.

80, *Silpha surinamensis* Fab. Dec. 18.

81, *S. inequalis* Fab. Jan. 16.

The above were taken on several occasions beneath logs close to carrion. *Surinamensis* is found only singly or in pairs. *Inequalis* is gregarious, winters in different stages, and in Indiana is the most abundantly represented species of the family.

82, *Choleva basillaris* Say. One specimen, Dec. 5, from beneath a rail in upland field.

83, *Agathidium* sp.? One Dec. 25. Beneath chunk.

Besides the four species mentioned, two others, *Necrophorus orbicollis*