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SOME GENERIC GROUPS IN THE MALLOPHAGA FAMILY MENOPONIDÆ.

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The chief interest in the study of the Mallophaga lies in the problem of their distribution, which is beyond question fundamentally the problem of the relationships of their hosts. It has already been pointed out very clearly by Kellogg and Harrison

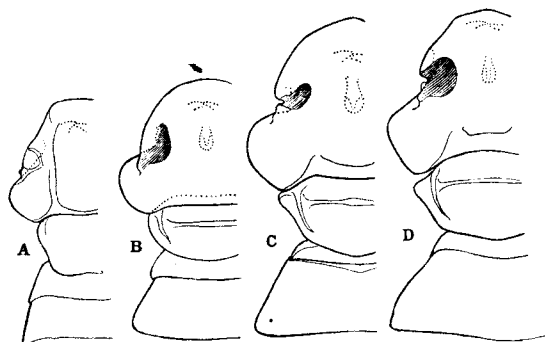


Fig. 10.—Outlines of one side of head of: A, *Dennyus distinctus*, n. s.p.; B, *Myrsidea diffusa* (Kell.); C, *Actornithophilus uniseriatus* (P); D, *Heleonomus mianarius* (Kell.).

that the solution of the first problem may legitimately be used as an aid in the solution of the second; that the student of these parasites may possibly be able to throw some light upon certain questions of the answers to which the ornithologists are at present in doubt.

However, before this happy end can be achieved, it is necessary that the classification of the Mallophaga themselves be placed upon a sound basis, something that, as it is becoming increasingly apparent, has not yet been accomplished. The generic groups that have in the past been recognized are entirely too broad adequately to express the needs of the situation. The old genera are for the most part really of family value, and many of them have quite recently been elevated to this rank; but the division of these unwieldy and complex groups into small and compact genera has as yet hardly begun, nor have the limits of many of the groups been accurately defined. It is toward this end that this paper is a slight contribution.

The two relatively very large genera, *Colpocephalum* and *Menopon*, with a few smaller genera, constitute the family *Menoponidæ*, a family that includes nearly one-fifth of all the known

Mallophagan species. The family contains a considerable number of unrecognized generic groups, for the separation of which characters must be used that have heretofore been almost entirely neglected. Of these characters those to be found in the chaetotaxy of the posterior femora are perhaps of first importance. The spines on the ventral face of these femora may be arranged in a series of "combs," which are always associated with similar combs upon certain abdominal sternites, or they may be arranged in a distinct patch or brush, usually associated with similar brushes on the abdomen, or they may be irregularly arranged or entirely lacking. The taxonomic value of the combs has already been pointed out by Harrison in the case of *Colpocephalum* (in its restricted sense) and *Tetrophthalmus*, but the brushes have apparently not, as yet, been noted in literature.

Of probably secondary importance are other characters, including the presence of either a slit or notch in front of the eye, the segmentation of the thorax, the presence of heavy spines on the ventral side of the head, the character of the chaetotaxy of the abdomen, the genitalia of the males and the presence of peculiar structures in the gular region.

Having in mind these characters, the group which this paper considers may be defined as follows.

Menoponidae with more or less distinct patches or brushes of spines upon the ventral face of the posterior femora and upon certain abdominal segments. Thorax three-segmented, usually distinctly so, although the mesothorax is sometimes much reduced. Head of a very characteristic shape, the temples very prominent, projecting well beyond the lateral margin.

The following key will serve to distinguish the included genera:

1. Head with a distinct notch (not a slit) in the lateral margin just before the eye..... 2.

Lateral margin of the head continuous to the eye..... 3.

2. Femoral and sternal patches composed of spines which are distinctly smaller than those constituting the general chaetotaxy and are very closely crowded together.

Genus *Heleonomus*, n. gen.

Femoral and sternal patches small, composed of spines as large as those constituting the general chaetotaxy, with which the ventral patches sometimes merge.

Genus *Actornithophilus*, n. gen.

3. Oesophageal sclerite and glands apparently lacking, second sternite never with asters of heavy spines.

Genus *Dennyus* Neumann.

Oesophageal sclerite and glands present, although sometimes quite small; second sternite generally with asters of heavy spines.

Genus *Myrsidea* Waterston.

Genus ***Actornithophilus***, n. gen.

Figs. 10c, 11, 13f.

Menoponiidae with small, rather indefinite patches of spines upon the ventral face of the posterior femora and upon certain abdominal sternites, the spines composing the patches as large as those constituting the general chaetotaxy and sometimes merging with it. Thorax distinctly three-segmented, the mesothorax small, but clearly distinguishable. Head of a characteristic shape, the anterior margin rounded, the temples very prominent, their anterior margins nearly at right angles with the longitudinal axis of the body. Lateral margin with a distinct notch before the eye; this notch backed up by a small chitinous area. Oesophageal sclerite and glands present. Male genitalia apparently characteristic, consisting of a very long and slender basal plate, continuous distally with a lamina at the base of which the small paramera and slender endomera (?) are set.

Species occurring, at least for the most part, upon Charadriiformes (*Laridae*, *Alcidae*, *Charadriidae*).

Type of the genus, *Colpocephalum uniseriatum* Piaget.

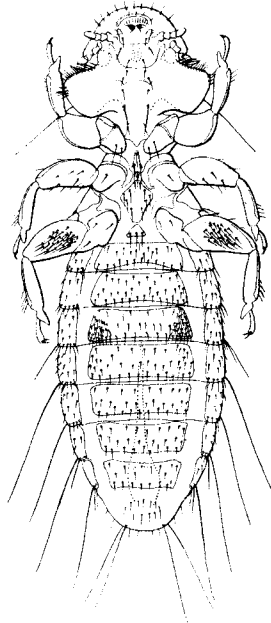


Fig. 11.—*Actornithophilus uniseriatus* (P.), ventral side of male.

## INCLUDED SPECIES.

From **Laridæ.**

- Colpocephalum abbotti* Kellogg.  
*Colpocephalum crassipes* Piaget.  
*Colpocephalum epiphanes* Kellogg and Chapman.  
*Colpocephalum funebre* Kellogg.  
*Colpocephalum fuscipes* Piaget.  
*Colpocephalum incisum* Piaget.  
*Colpocephalum latifasciatum* Piaget.  
*Colpocephalum maurum* Nitzsch.  
*Colpocephalum milleri* Kellogg and Kuwana.  
 (—*C. incisum* Piaget. ?)  
*Colpocephalum sulcatum* Piaget.

From **Alcidæ.**

- Colpocephalum perplanum* Kellogg and Chapman.

From **Charadriidæ.**

- Colpocephalum bicolor* Piaget.  
*Colpocephalum cornutum* Giebel.  
*Colpocephalum fumidum* Kellogg.  
*Colpocephalum gracile* Piaget.  
*Colpocephalum grandiceps* Piaget.  
*Colpocephalum kilauensis* Kellogg and Chapman.  
*Colpocephalum morsitans* Kellogg.  
*Colpocephalum ochraceum* Nitzsch.  
*Colpocephalum ocularis* Carriker.  
*Colpocephalum pætulum* Kellogg and Kuwana.  
*Colpocephalum patellatum* Piaget.  
*Colpocephalum pustulosum* Piaget.  
*Colpocephalum spinulosum* Piaget.  
*Colpocephalum stictum* Kellogg and Paine.  
*Colpocephalum tigrum* Kellogg and Paine.  
*Colpocephalum timidum* Kellogg.  
*Colpocephalum umbrinum* Piaget.  
*Colpocephalum uniforme* Piaget.  
*Colpocephalum uniseriatum* Piaget.

From **Passerine Hosts.**

- Colpocephalum grandiculum* Kellogg.

The genus thus formed is a very homogeneous group, and is apparently characteristic of the Charadriiformes (as that order is understood by the more recent authors), especially of the Larolimicolæ. A single species, *A. grandiculus* (Kel.) is recorded from Passerine hosts, but it is possible that these records are unnatural. Only those species of which it is possible to be practically certain have been referred to the genus, and doubtless others will later be included. The list as given probably contains some synonyms, but this cannot at present be definitely determined.

The figures illustrating the genus are of *A. uniseriatus* (P.), the genotype, and *A. timidus* (Kel.).

### Genus *Heleonomus*, n. gen.

Figs. 10d, 12, 13e.

Menoponidæ with very distinct patches of spines upon the ventral face of the posterior femora and upon the 4th abdominal sternite, the spines composing the patches very numerous, closely crowded together and distinctly smaller than those constituting the general chætotaxy. Thorax 3-segmented, the meso-thorax small. Head of characteristic shape, the lateral margins slightly swollen above the bases of the antennæ, the temples prominent, reclined with the anterior margin set at a very sharp angle to the longitudinal axis of the body. Lateral margin of the head with a deep notch just before the eye, this notch backed up by a large chitinous area. Oesophageal sclerite and glands present. Male genitalia apparently quite characteristic, the basal plate extremely long and slender, the parameres large and stout, with the distal half curved sharply outward. A pair

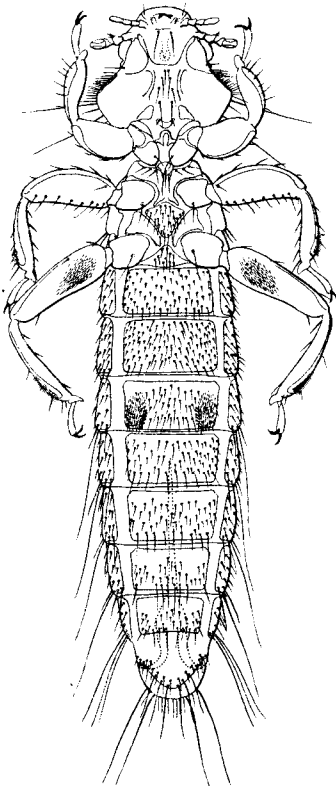


Fig. 12.—*Heleonomus miandrius* (Kell.), ventral side of male.

of conspicuous, tubular chitinous structures present in connection with the preputial sack.

Occurring, at least for the most part, upon Gruiformes.

Type of the genus, *Colpocephalum truncatum* Piaget.

#### INCLUDED SPECIES.

##### From **Gruidæ**.

*Colpocephalum abdominale* Piaget.

*Colpocephalum assimile* Piaget.

*Colpocephalum miandrium* Kellogg.

*Colpocephalum truncatum* Piaget.

*Heleonomus confusus* n. sp.

This little genus differs rather markedly in general appearance from the preceding, but the tangible characters upon which the two may be separated are few. The shape of the head and the character of the patches of spines, with the character of the male genitalia, are, however, sufficient to afford grounds for their separation. The males of three of the species are before me, and the genitalia of these three are all of the same peculiar type, so it may be assumed that they are the same throughout the genus.

Superficially the genus very closely resembles another group (*Colpocephalum* sens. str.), which occurs upon the same hosts, but which is marked by the presence of combs of spines upon the posterior femora. For this reason it is unsafe to refer species to the new genus without knowledge of this character, which has been entirely overlooked in most descriptions. Only those species of which there can be no doubt (four of them are before me) have been referred to the new genus.

The figures are of *H. miandrius* (Kel.), an entirely typical member of the group.

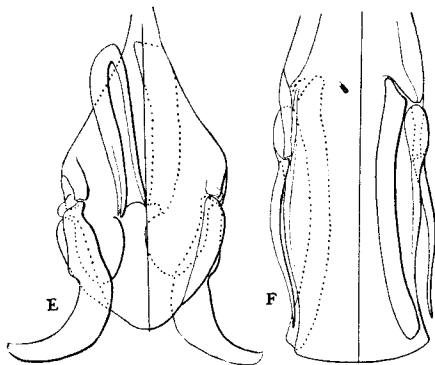


Fig. 13.—Genitalia, except basal plate of: E, *Heleonomus miandrius* (Kell.); F, *Actornithophilus timidus* (Kell.).

**Heleonomus confusus**, n. sp.

*Colpocephalum miandrium* (in part) Kellogg, Rept. Kilimandjaro Exped., No. 15, pt. 4, p. 53 (1908).

This species has already been described as the female of *H. miandrius* (Kel.). One of the two specimens at hand is a male in which the genitalia are very weakly developed, this fact, and their presence upon the same host, having led to the confusion of this species and *H. miandrius*.

Host, *Balearica regulorum gibbericeps* (Africa).

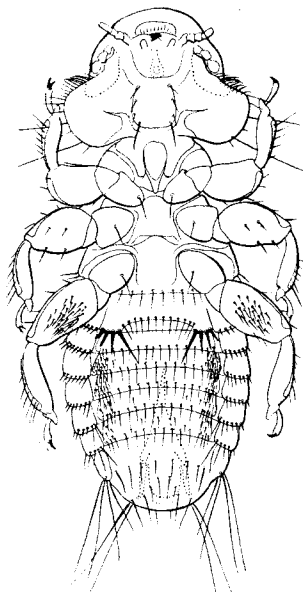


Fig. 14.—*Myrsidea diffusa* (Kell.), ventral side of male.

Genus **Myrsidea** Waterston.

Figs. 10b, 14.

*Myrsidea* Waterston, Ent. Monthly Mag., Vol. 51, pp. 12-13. (1915).

Menoponidæ with indistinct patches of spines upon the ventral face of the posterior femora and certain abdominal sternites, those upon the sternites merging more or less with the general chaetotaxy. Thorax distinctly 3-segmented, the metathorax frequently curiously modified and produced posteriorly. Head of characteristic shape, the forehead rounded, the temples very prominent and with the anterior margins nearly at right angles to the longitudinal axis of the body. Lateral margin of the head continuous with the eye. Oesophageal sclerite and glands present, although sometimes very small. Abdominal tergites of the female sometimes modified. Second abdominal sternite usually, but not always, with asters of heavy spines. Male genitalia of a type common to this genus and to *Dennyus*, the basal plate moderately long, continuous distally with a broad rounded lamina at the base of which the stout, apically recurved parameres are set.

Occurring for the most part upon Passeriformes, particularly the *Corvidæ*, but also occurring upon certain families of the *Cora-ciiformes*.

Type of the genus, *Myrsidea victrix* Waterston.

INCLUDED SPECIES.

Order PASSERIFORMES.

Family **Corvidæ**.

- Menopon albiceps* Piaget.  
*Menopon anathorax* Nitzsch.  
*Menopon brunneum* Piaget.  
*Menopon consimile* Piaget.  
*Menopon euryternum* Nitzsch.  
*Menopon funereum* Kellogg and Chapman.  
*Menopon indivisum* Piaget.  
*Menopon insolitum* Kellogg and Paine.  
*Menopon interruptus* Osborn.  
*Menopon mesoleucum* Nitzsch.  
*Menopon nigrum* Kellogg and Paine.  
*Menopon obovatum* Piaget.  
*Menopon ovatum* Piaget.  
*Menopon robsoni* Cummings.  
*Colpocephalum sjoestedti* Kellogg.  
*Menopon trinoton* Piaget.  
*Menopon trithorax* Piaget.

Family **Fringillidæ**.

- Menopon conspicuum* Kellogg and Chapman.  
*Menopon incertum* Kellogg.  
*Menopon melanorum* Kellogg.

Family **Sturnidæ**.

- Menopon cucullaris* Piaget.  
*Menopon invadens* Kellogg and Chapman.

Family **Drepanididæ**.

- Menopon cyrtostigmum* Kellogg and Chapman.

Family **Hirundinidæ**.

- Menopon dissimile* Kellogg.  
*Trinoton stramineum* Giebel.



Family **Icteridæ.***Colpocephalum mirabile* Carriker.

## Order CORACIIFORMES.

Family **Caprimulgidæ.***Colpocephalum extraneum* Carriker.Family **Rhamphastidæ.***Myrsidea victrix* Waterston.Family **Alcidinidæ.***Nitzschia latifrons* Carriker.

The genus was well characterized by Waterston, but, as it appears to be a member of the group under discussion, the description has been repeated, with certain modifications and additions, in order to emphasize the resemblances to and differences from these other genera. No list of included species has heretofore been published.

Many of the included species, especially those upon the *Corvidæ*, are in some respects among the most peculiar of all the Mallophaga, due to the curious modifications of the metathorax of the female. Waterston has suggested that the genus should be still further divided, those species not sexually dimorphic being placed in another genus. However, it hardly seems best to do this, for every degree of dimorphism appears, nor are the modifications of any constant type. Even the asters of heavy spines on the second sternite of the abdomen, which appear in almost all of the species are lacking in *M. sjoestedti*, in other respects one of the most typical members of the group. It would seem that there is throughout the genus an "inherent" tendency to vary, and any further division is liable to result in artificial groupings. The figures are of *M. diffusa* (Kel.), a typical species.

Genus **Dennyus** Neumann.

Figs. 10a, 15.

*Nitzschia* (not of Baer), Denny, Mon. Annot. Brit., p. 230 (1842).*Dennyus* Neumann, Bull. Soc. Zool. France, Vol. 20, p. 60. (1906)

Menoponidæ with distinct patches of spines upon the ventral face of the posterior femora and upon the 8th and 6th abdominal sternites. Thorax distinctly 3-segmented, the prothorax very

narrow. Head of characteristic shape, the lateral margins continuous with the eye and slightly swollen above the base of the antennæ, the temples prominent. Oesophageal sclerite and glands apparently lacking. Anterior femora much flattened and expanded. Second abdominal sternite never with asters of spines. Genitalia of the male of the same type as in *Myrsidea*.

Occurring, as far as known, only on Micropodidæ (Order Coraciiformes).

Type of the genus *Nitzschia burmeisteri* Denny.

The genus is in many respects very similar to some of the species of *Myrsidea* (*M. dissimile*, for instance), but the combination of characters given is sufficient to distinguish the two. There are less than a dozen species known, and some of these are apparently synonyms. *Dennyus dubius* (Kel.), which was described from immature specimens, is very likely a synonym of either *D. burmeisteri* or *D. tibialis*, but, in the absence of specimens of these two species, little can be done to settle the matter. *D. bruneri* (Car.) is almost certainly a synonym of *D. dubius*, as a cotype of the former which I have before me shows, and some of Carriker's other species appear doubtful. *Nitzschia latifrons* Carriker is almost certainly a *Myrsidea*.

### ***Dennyus distinctus*, n. sp.**

*Description of female*—Length 2.2 mm., colour a uniform dark brown.

*Head* as long as wide, triangular in shape, except for the rather broadly truncate anterior margin, which distinguishes the species from all the others in the genus. Occipital bands distinct, extending forward to above the bases of the mandibles. Principal points of the chaetotaxy as follows: A pair of slender hairs directly above the base of each mandible; a longer hair on the lateral

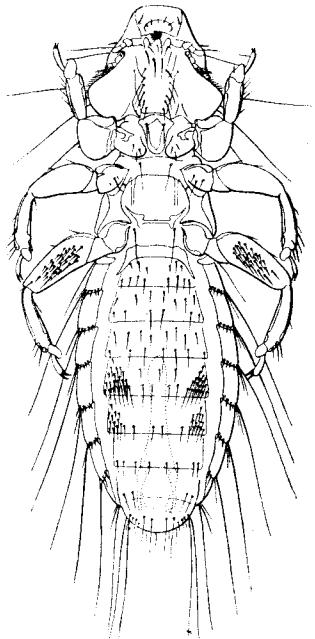


Fig. 15.—*Dennyus distinctus*, n. sp., ventral side of male.

swelling slightly in from the margin; a single long hair and two or three shorter ones at the margin on the lateral swelling; a close fringe of short hairs on the anterior margin of the temples; a transverse row of four long hairs on the occiput between the occipital bands.

*Prothorax* nearly as long as wide, rather quadrate in shape, rounded posteriorly; two or three short spines and a hair on each "shoulder," and six short hairs along the posterior margin.

*Mesothorax* and *metathorax* nearly equal in length, separated by a distinct suture. *Metathorax* with a transverse row of long hairs on the posterior margin.

*Legs* of the type common to the genus, the anterior femora flattened and much expanded.

*Abdomen* elongated, with nearly parallel sides, widest across the fourth or fifth segment. Each segment with a single transverse row of hairs along the posterior margin, the hairs not as long as the succeeding segment. Second to ninth segments each with a single extremely long hair and one or two shorter hairs at each posterior lateral angle.

Pleurites distinct, separated from the sternites by a narrow clear area, the posterior margin of each pleurite bearing a row of five or six short, thorn-like spines. First sternite short, heavily chitinized, the posterior angles produced back over the second sternite. Remaining sternites less heavily chitinized, but quite distinct. Each sternite with a transverse row of four to eight short, slender hairs along the posterior margin, the second to fifth with a few other scattered hairs. Fifth and sixth each with a distinct patch of closely set spines in each posterior lateral angle.

*Description of male*—Length 1.9 mm. Very similar to the female, the abdomen somewhat more pointed. Genitalia of the type common to this genus and to *Myrsidea*.

Two males, a female and two immature forms from *Collocalia* sp. (Samarang, Java, E. Jacobson coll.).

A very distinct species, differing in the truncate anterior margin of the head from any other of the genus, but in other respects an entirely typical *Dennyus*. Types in the Stanford University collection.