STUDIES ON THE BITING-LICE (MALLOPHAGA)
OF JAPAN AND ADJACENT TERRITORIES
(SUBORDER ISCHNOCERA PT. I)

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Introduction

These studies are a sequel to "Studies on Amblycerous Mallophaga of Japan"* which I published in 1926. It is my intention to describe all the specimens of Mallophaga of Japan, which I have collected.

What are treated of in this paper (Pt. I) are species belonging to the old cosmopolitan group Philopterus (Philopteridae, Sub-order ISCHNOCERA). These I studied between April, 1945, and March, 1946, when I lived on the Island of Awaji of Hyogo Prefecture, in which I evacuated from Tokyo and where I stayed during the war time. Most of the materials of my study were specimens I had collected prior to the publication of the previous paper, the rest being those which I subsequently got hold of from time to time. The areas where I made the collection were the whole of the pre-war Japanese Empire including Korea, Formosa and the South Sea Islands under the Japanese mandate.

Pt. II comprises discussion of the whole of those left untouched in the present paper and of those sub-order Ischnocera and additions to and corrections of descriptions of sub-order Amblycera given in my paper of 1926. It is my intention to publish it in the near future.

In the present paper 52 species of Mallophaga taken from 95 species of birds are described. These include 13 new species and six new subspecies, in addition to four new genera which I have erected. All these 52 species belong to 13 genera.

List of Mallophaga treated in this paper and of their hosts

The following is a list of the Mallophaga and their hosts described in this paper:

Sub-order ISCHNOCERA Kellogg.
Family PHILOPTERIDAE Burmeister.
Sub-family PHILOPTERINAE Harrison.
Genus Ralicola Johnston & Harrison.

Rallicola bisetosa var microcephala n. var.
Gallinula chloropus indica
Genus Strigophilus Mjöberg.
Strigophilus fukuro n. sp.
Strix uralensis honoensis
Genus Columbicola n. gen.
Colymbicola graviceps (Kellogg)
Colymbus arcticus viridigularis
Genus Anatoecus Cummings.

(Aix galericulata
Anas crecca crecca
Anas platyrhynchos platyrhynchos
Anser albifrons albifrons
Genus Ibidoecus Cummings.

Ibidoecus plataleae Denny
Platalea leucoptera major
Genus Neophilopterus Cummings.
Neophilopterus tricolor (Nitzsch)
Ciconia nigra
Genus Cuculoecus Ewing.

Cuculoecus laticlypeatus (Piaget)
Cuculus fugax hypyrhyperus
Cuculus canorus telephonus
Cuculus poliocephalus poliocephalus
Halcyon coromanda major

Cuculoecus latifrons (Nitzsch)
Cuculus canorus telephonus
Genus Halcyonicola n. gen.

Halcyonicola alatoclypeata var. minor n. var.
Halcyon cinnamomina pelewensis
Halcyon chloris teraokai
Halcyon chloris reichenbachii
Halcyon chloris albicilla
Genus Incidifrons Ewing.

Incidifrons? cephaloxxys (Nitzsch) Alcedo atthis bengalensis
Genus Echinophilopterus Ewing.

Echinophilopterus inko n. sp.
Parrot (sp. not determined)
Genus Tritrabeculus n. gen.

Tritrabeculus goshikidori n. sp.
Cyanops nuchalis
Genus Bitrabeculus n. gen.

Bitrabeculus singularis var major n. var.
Dryobates major honoensis

Cinculus pallasii honoensis
Prunella rubida rubida
Tarsiger cyanurus cyanurus
Turdus cardis cardis
Pomatorhinus ruficolis musicus
Acrocephalus arundinaceus orientalis
Phylloscopus borealis xanthodryas
Muscipula narcissina narcissina
Terpsiphone atrocaudata atrocaudata
Pericrocorus solarius griseigularis
Lanius schach formosae
Lanius tigrinus
Parus ater insularis
Parus major minor
Zosterops palpebrosa taiwaniana
Anthus hodgsoni hodgsoni
Alauda arvensis intermedia
Emberiza rustica latifascia
Emberiza cisticola ciosips
Leucosticte arctoa bruneonucha
Fringilla montifringilla
Loxia curvirostra japonica
Eophona personata personata
Coccothraustes coccothraustes japonicus
Passer montanus saturatus
Oriolus chinensis diffusus
Garrulus glandarius japonicus

Suthora webbiana fulvicauda
Hirundo rustica gutturalis
Hirundo daurica formosae
Microps pacificus pacificus
Myzomela rubrata rubrata
Regulus regulus japonesis
Spizixus semitorques cinereicapillus
Nucifraga caryocatactes japonicus
Pica pica japonica
Corvus sp.?

Genus Philopterus Nitzsch.

Rallus aquaticus indicus
Grus monacha
Aethia cristatella
Synthliboramphus antiquus
Uria carbo
Larus crassirostris
Sterna sumatrana sumatrana
Sterna albifrons sinensis
Thalasseus bergii cristatus
Numerius variegatus
Numerius phaeopus variegatus
Calidris ruficollis ruficollis
Scolopax rusticola rusticola
Vanellus vanellus
Charadrius dubius curonicus
Charadrius leschenaulti leschenaulti
Charadrius alexandrinus dealbatus
Charadrius dominicus fulvus
Puffinus leucophaeus
Bubulcus ibis coromandus
Milvus migrans lineatus
Butastur indicus
Accipiter virgatus gularis

first line:

Lanius schach formosae
Lanius tigrinus
Parus ater insularis
Parus major minor
Zosterops palpebrosa taiwaniana
Anthus hodgsoni hodgsoni
Alauda arvensis intermedia
Emberiza rustica latifascia
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Regulus regulus japonesis
Spizixus semitorques cinereicapillus
Nucifraga caryocatactes japonicus
Pica pica japonica
Corvus sp.?
I have to extend my hearty thanks to Dr. Nagamichi Kuroda for his great kind help in me in various ways. Also I take this opportunity to express my high appreciation of facilities given me for carrying on my studies and living during my stay on Awaji by Mr. Eiichi Fujino, head of Sakai village, Mr. Chisato Yamazaki and Hirotsugu Taki and their families.

Key to the genera of PHILOPTERINAE

A 1. Species broad and short, with large movable trabeculae*.  
   2. Species elongate, narrow, with very small or no trabeculae.     

B 1. Head with one pair of trabeculae  
   2. Head with more than one pair of trabeculae

C 1. Trabeculae two pairs ........................................... BITRABECULUS n. sp.  
   2. Trabeculae three pairs............................ TRITRABECULUS n. sp.

D 1. Antennae different in two sexes  
   2. Antennae alike in two sexes

E 1. Head with distinct clypeal suture (on Strigidae).................. STRIGIPHILUS Miyake  
   2. Head without distinct clypeal suture (on Rallidae)  
      ............ RALLICOLA Johnston & Harris

F 1. Clypeal region remarkably expanded and with hyaline free margin  
   2. Clypeal region without such characters

G 1. Clypeus with a tuft of three or more setae above on each clypeal band. (on Cuculidae) ......... CUCULOEUS Ever  
   2. Clypeus without such setae (on Halcyonidae) .......... HALCYONICOLA n. sp.

H 1. Clypeus with a pair of small peg-like spines dorsally. (on Anatidae)  
   2. Clypeus without peg-like spines (on Colymbidae and Alcidae) ...
      ANATOECUS Cuvier  
      .......... COLYMBICOLA n. sp.
1. Clypeal signature divided. (on Threskiornithidae) ...IBIDOECUS Cummings.
2. Clypeal signature not divided ........................................ K
1. Clypeal margin deeply notched in front ................................ L
2. Clypeal margin never more than broadly emarginate in front ........... M
1. Abdomen bearing many short spines on its ventral aspect. (on Loriidae)
   ..................................................... ECHINOPHILOPTERUS Ewing.
2. Abdomen without such spines ........................................... INCIDIFRONS Ewing.
1. Clypeal signature with a papilla on each posterior lateral angles
   (on Ciconiidae) ............................................... NEOPHILOPTERUS Cummings.
2. Signature without such papillae ...................................... PHILOPTERUS Nitzsch.

Family PHILOPTERIDAE Burmeister

Sub-family PHILOPTERINAE Harrison

Genus RALLICOLA Johnston & Harrison

Johnston & Harrison, 1911, p. 324; Harrison, 1915, p. 89.

Rallicola bisetosa var microcephala n. var.

* were obtained from an Indian moor-hen, Gallinula chloropus indica Blyth shot
1 Chiba, May 25, 1923; and 1*, 6** from Chinese white-breasted water hen,
Gallinula chloropus chinensis (Boddaert), collected in Formosa, April 4, 1917.

A new variety agrees closely with the type species** from Rallina plumbeiventris
that it has much smaller head and has two hairs near the middle of the dorsal
of each abdominal segment, while type species has four. Var, porzanae Piaget
and californicus Kellogg*** both have two dorsal hairs on abdomen, as in my form,
they differ radically in other respects.

Measurements (Those in parentheses are Piaget's):

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</tbody>
</table>

Genus STRIGIPHILUS Mjöberg.

Mjöberg, 1910, p. 132.

Strigiphilus fukuro** n. sp. (Fig. 1)

* were taken on a Hondo ural owl, Strix uralensis hondoensis (Klark).

Symbol denotes an immature specimen.

** Strigiphilus bisetosus Piaget, Les Pediculines, 1880, pl. XVIII, fig. 4.
*** Strigiphilus bisetosus var californicus Kellogg, New Mallephaga III. 1896, p. 196, pl. VII, fig. 6.

Fukuro in Japanese means Ural owl.
captured in Pref. Nagano, Dec. 24, 1916; and 22, 42, 9* were collected on the same
species shot in the same locality (no date). This new species somewhat resem-
bles Strigiphilus remotus Kellogg* from a great grey owl, Scotiopex cinerea, but differs
in the smaller size and in the shape of the head of the male, which is discernibly
markedly in the sexes in the latter species.

Measurements:

<table>
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<th>6 mm</th>
<th>5 mm</th>
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</thead>
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<td>0.83</td>
<td>0.83</td>
<td>0.97</td>
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<td>0.55</td>
<td>0.54</td>
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<td>0.63</td>
<td>0.62</td>
<td>0.62</td>
<td></td>
</tr>
<tr>
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<td>0.60</td>
<td>0.60</td>
<td>0.59</td>
<td>0.66</td>
<td>0.65</td>
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<td></td>
</tr>
<tr>
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<td>0.43</td>
<td>0.41</td>
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<td>0.45</td>
<td>0.45</td>
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</tr>
<tr>
<td>Width of thorax</td>
<td>0.52</td>
<td>0.52</td>
<td>0.52</td>
<td>0.52</td>
<td>0.59</td>
<td>0.59</td>
<td>0.54</td>
<td>0.54</td>
<td></td>
</tr>
</tbody>
</table>

Description of the male: Body short, stout; ground colour of head and thorax red;
brownish, with darker brown markings, abdomen paler with golden brown markings.

Head large, pentagonal, broader than long; front broad, trapezoidal; clypeal
colourless, nearly truncated anteriorly, three short hairs on each side of the clypeal
region, and a short hair in front of the sture; two hairs in front of the trabeculae,
which are very large and acutely angular; antennae well developed, with the first
segment longest and longest, as along as all the other segments taken together, the second
and the third short, with a dorsal conical projection at distal half as long as the first, the third short, with a dorsal conical projection at distal
fourth shortest, and the fifth slightly longer than the fourth; eyes clear, prominent;
with distinct ocular fleshy and a long hair. Temporal margin somewhat rounded
towards the outside of the base of antennae; occipital bands pale anteriorly, growing darker and
with distinct blackish brown occipital blotsches.

Prothorax quadrilateral, lateral margins nearly straight and slightly divergent;
posterior margin somewhat convex; posterior lateral angles each with a long hair. Colour pale brown, with brownish lateral borders which post-
extend on each side along the posterolateral angles. Metathorax short, trapezoidal,
lateral margins diverging posteriorly, with a hair and a prickle near the posterior
lateral angle rounded, each bearing three long hairs: posterior margin angulated in middle, with a series of hairs; marginal bands broad but indistinct
present on the lateral borders. Legs paler than body, with yellowish brown mark-
ing, and a few scattered spines.

Abdomen oval, widest at the fourth and fifth segments: posterior angles pro-
bearing a few long hairs on segments II-VII; dorsal surface of abdomen with a

* Kellogg, New mellophaga III, 1899, p. 107, pl. VII, fig. 7.
series of hairs on the posterior margin of the segments and one row of hairs behind the spiracles on the posterior margin. Segments I-IV approximately equal in length, and segments V, VI and VII narrowed in the middle; the last segment round, entire, with numerous hairs. Ground colour of abdomen paler than head and thorax, with dark brownish lateral bands, which become indistinct on posterior segment and end at the eighth segment; transverse band golden brown, indistinct, narrower inward, with a clear space for the spiracles and leaving a broad, whitish median space which becomes narrower on segments V, VI and VII; transverse band of segment VIII forms one continuous blotch covering the whole space between the lateral bands; segment IX entirely own. Genitalia short and broad, very indistinct, being covered by thick muscle layer.

Description of the female:-Body remarkably larger, emarginations on the sides not so deep as those of the male; first segment of the antennae thickest, and as to as the second segment, the third and fifth segments subequal and half the length of the second segment, the fourth segment shortest. Abdomen widely elliptical; transverse ends of segments I-VII leaving a broad, whitish median space, those of segments VIII fire, last segment small, emarginate.

Genus COLYMBICOLA n. gen. (Fig. 2)

A Genus of Philopteridae; Head broad, conical with rounded temples and prominent head; frontal part of clypeus expanded antero-laterally, rounded, entire; free margin entire throughout; signature distinct, shield shaped, concave in front, posteriorly with accumbent tip; trabeculae large; antennae short, filiform and similar in two sexes; head rounded posteriorly along antennal bands from the bases of the antennae by a distinct, backwardly curving suture. Fused prothorax broader than long, hexagonal in shape. Abdomen slender, nirmoid, with nine segments; abdominal spiracles six pairs, short, claws dissimilar. Genitalia of the male quite characteristic, reaching obliquely in the middle portion of the sixth abdominal segment to the end of the last segment; basal plate not well chitinized, slightly expanded at the posterior ends; parameres chitinized, narrower medially and with expanded, two-pronged ends; endomere slender with blunt apex; mesosoma is conspicuous, posterior portion of it quadrangular with slight emargination on meson and filling the space between parameres.

Species occurring on Colymbidae, Alcidae and Anatidae, but the latter case probably one of a straggler.

Type of the genus, Docophorus graviseps Kellogg.

Included species;

Docophorus graviseps Kellogg (Host: Utricularia pacificus).
Docophorus colymbinus Denny (Host: Colymbus septentrionalis).
Docophorus atricolor Kellogg (Host: Synthaliborhamphus antiquus).
Docophorus monticelli Kellogg (Host: Synthaliborhamphus antiquus).
Docophorus bisclusus Piaget (Host: Mergus serrator).
Colymbicola graveiceps (Kellogg).

Docophorus graveiceps Kellogg, 1896a, p. 82, pl. III, fig. 3.
3♀, 1♂ collected by Dr. N. Kuroda from a Siberian black-throated diver, Colymba arctica viridigularis (Dwight), shot at Uchiura, Pref Shizuoka, Feb. 20, 1916.

Genus ANATOECUS Cummings.

Cummings, 1916, p. 653.

Anatoecus dentatus (Scopoli)

Pediculus dentatus Scopoli, 1763, p. 383; Docophorus icterodes Depny, 1842, p. 101, pl. v, fig. 11; Giebel, 1874, p. 115, Tab. X, fig. 8; Piaget, 1880, p. 114, pl. X, fig. 1; Kellogg, 1896, p. 96, pl. IV, fig. 1.

Numerous specimens of this common and widely distributed species were found on the following three host species.

3♀, 5♂ Aix galericulata (L.), Pref. Nagano, Dec. 21, 1914.

The present specimens do not agree with Kellogg's figure in which the temporal margins bear four short hairs or prickles and posterior margin of matathorax bears eight hairs, evenly distributed. In my specimens temples bear one long hair and four prickles and posterior margin of matathorax with ten hairs on each side of the meson. Probably Kellogg's figure is in error because the American specimen collected by Mr. Shonosuke Nakayama from a canvas back duck agrees well with the Japanese specimens on hand.

Measurements of the specimens on hand are as follows:

<table>
<thead>
<tr>
<th></th>
<th>From Aix galericulata</th>
<th>From Anas crecca crecca</th>
<th>From Anas platyrhynchos</th>
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<tr>
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<tr>
<td>Width of head</td>
<td>0.40 0.42 0.40 0.47 0.47 0.47</td>
<td>0.40 0.39 0.39 0.43 0.42</td>
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</tr>
<tr>
<td>Length of thorax</td>
<td>0.27 0.27 0.27 0.30 0.30 0.31</td>
<td>0.28 0.28 0.28 0.28 0.28</td>
<td>0.28 0.28 0.28 0.31 0.31 0.31</td>
</tr>
<tr>
<td>Width of thorax</td>
<td>0.35 0.36 0.34 0.40 0.42 0.42</td>
<td>0.34 0.33 0.33 0.36 0.36</td>
<td>0.36 0.36 0.37 0.37 0.38</td>
</tr>
</tbody>
</table>

Anatoecus obtusus (Giebel).


3♀ were obtained from a white-fronted goose, Anser albifrons albifrons (Scopoli), at the suburb of the Yamagata City, Oct. 10, 1917.

Genus IBIDOEUS Cummings.

Cummings, 1916, p. 663.
Ibidoeus plataleae (Depny).

Docophorus plataleae Denny, 1842, p. 100, pl. IV, fig. 9; Docophorus sphenophorus Nitzsch, Giebel, 1874, p. 99, tab. XII, fig. 4; Piaget, 1880, p. 89, pl. VII, fig. 5.

36♂, 5♀, 6♀ were collected on a skin of Japanese spoonbill, Platalea leucorodia major Temminck & Schlegel shot on Lake Ogura, Pref. Kyoto; and 1♂, from a skin of Eastern rey heron, Ardea cinerea jouyi Clark (No history), and further 8♂, 4♀, 9♀ taken on the same host species shot on Is. Okinoshima.

Genus NEOPHILOPTERUS Cummings.

Cummings, 1916, p. 660.

Neophiloterius tricolor (Nitzsch).

Cummings, 1916, p. 663; Docophorus tricolor Nitzsch, in Burmeister, 1838, p. 424; Denny, 1842, p. 105, pl. VI, fig. 9; Giebel, 1874, p. 96, Tab. X, fig. 9, 10, 11; Piaget, 1880, p. 94, pl. VIII, fig. 2.

6♂, 6♀ were collected from a black stork, Cicogia nigra (L.) taken on Ishigaki Is. of the Loochoo Is. March 5, 1929, and further 2♂, 2♀, 2♀ were taken on a jungle crow, Corvus levantlanti connectus Stresemann shot on the same island, March 6, 1929.

Specimens from jungle crow may be attributed to straggling, transmitted from game lag, in which host bird was carried, as these two host birds were collected at the same locality and nearly on the same date.

<table>
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<td>0.73</td>
<td>0.70</td>
<td>0.72</td>
</tr>
<tr>
<td>Width of head</td>
<td>0.62</td>
<td>0.75</td>
<td>0.72</td>
<td>0.70</td>
<td>0.72</td>
<td>0.72</td>
<td>0.72</td>
<td>0.72</td>
</tr>
<tr>
<td>Length of thorax</td>
<td>0.47</td>
<td>0.65</td>
<td>0.49</td>
<td>0.62</td>
<td>0.50</td>
<td>0.57</td>
<td>0.55</td>
<td>0.54</td>
</tr>
<tr>
<td>Width of thorax</td>
<td>0.65</td>
<td>0.65</td>
<td>0.62</td>
<td>0.61</td>
<td>0.67</td>
<td>0.72</td>
<td>0.72</td>
<td>0.72</td>
</tr>
</tbody>
</table>

Genus CUCULOEUS EWING.


Cuculoeus latielypeatus (Piaget).

Specimens were found from the following four species of bird, all captured in Pref. Nagano.

1♂, 2♀ Cuculoeus poliocephalus poliocephalus Latham May 31, 1914.
1♂ Cuculoeus canorus telephorus Heine May 8, 1915.
1♂, 2♀ Halcyon coronanda major (Temminck & Schlegel). May 25, 1916.

Cuculoeus latifrons (Nitzsch).
Docophorus latifrons Nitzsch, 1818, p. 290; Denny, 1842, p. 97, pl. 1, fig. 4; Giebel, 1874, p. 93; Piaget, 1880, p. 36, pl. II, fig. 7.

Specimens of the present species were taken on the following three specimens of Japanese cuckoo. Cuculus canorus telephonus Heine shot;

1♀, 4♂, 3♀♀ Pref. Nagano. May, 8, 1915.
(in company with the preceding bird-lice).


Dimensions of my specimens are larger than those given by Piaget and rather correspond to Docophorus latifrons occidentalis Kellogg*, but other characters agree well with typical latifrons.

Measurements of my specimens are as follows:

<table>
<thead>
<tr>
<th></th>
<th>♀ mm</th>
<th>♂ mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of body</td>
<td>1.96</td>
<td>1.76</td>
</tr>
<tr>
<td>Width of body</td>
<td>0.90</td>
<td>0.80</td>
</tr>
<tr>
<td>Length of head</td>
<td>0.71</td>
<td>0.63</td>
</tr>
<tr>
<td>Width of head</td>
<td>0.70</td>
<td>0.62</td>
</tr>
<tr>
<td>Length of thorax</td>
<td>0.45</td>
<td>0.36</td>
</tr>
<tr>
<td>Width of thorax</td>
<td>0.59</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Genus HALCYONICOLA n. gen. (Fig. 3).

A Genus of Philopteridae; body small, head large, conical, prominent forehand and large rounded temples; frontal part of clypeus expanded anteriorly and laterally, somewhat trapezoidal, free margin hyaline throughout, emarginate in front, and without hairs or setae on clypeal bands; signature broad, distinct, shield-shaped, emarginate anteriorly and posteriorly with acuminate dark tip; tabaculae large; antennae filiform and similar in the two sexes. Fused pterothorax broader than long, sides strongly divergent posterior margin angulate. Abdomen moderate, with nine segments; abdominal spiracles six pairs. Legs stout, claws dissimilar.

Genitalia of the male large, broad; the basal plate broadest at the posterior ends and is composed of a pair of moderately long rods, each furnishing a rather long curved paramere; endomere short but robust, broader medially than at the base, and bent inward abruptly at the middle; the penis straight, does not reach beyond the telomere.

Occurring on Halcyones (Alcedinidae).

Type of the genus Docophorus alatocephalus Piaget.

Included species:

Docophorus myxacinus Nitzsch (Host: Dacelo coromandeliana).

Docophorus delphax Nitzsch (Host: Trupédrasynthus moluccensis).

Docophorus alatocephalus Piaget (Host: Dacelo cinereifrons).

Kellogg: New mallophaga III, 1899, p. 5, pl. 1, fig. 5 and 8.
Haleyonisola alatocepta var minor n. var

Docophorus alatoceptus Uchida 1918, p. 483.

The following numerous specimens were collected on two species and two subspecies of kingfishers:

1♂, 1♂ Halecyon cinnamomina pelewensis Wiglesworth. Pelew Is. III, 1915.
3♂, 1♂ Halecyon chloris reichenbachii (Hartlaub) Ponape Is. (no date).
1♂, Halecyon chloris albicilla (Dumont). Saipan Is. (no date).

All the specimens agree well with the descriptions and figure of type species from Dacelo cinereifrons given by Piaget*, but much smaller.

Measurements of the specimens on hand are as follows (Piagets' figures in parentheses).

<table>
<thead>
<tr>
<th></th>
<th>♂ mm</th>
<th>♀ mm</th>
<th>♂ mm</th>
<th>♂ mm</th>
<th>♂ mm</th>
<th>♂ mm</th>
<th>♂ mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of body</td>
<td>1.60 (1.90)</td>
<td>1.60</td>
<td>1.60</td>
<td>1.35 (1.60)</td>
<td>1.36</td>
<td>1.36</td>
<td>1.33</td>
</tr>
<tr>
<td>Width of body</td>
<td>0.59 (0.70)</td>
<td>0.61</td>
<td>0.62</td>
<td>0.50 (0.83)</td>
<td>0.55</td>
<td>0.49</td>
<td>0.49</td>
</tr>
<tr>
<td>Length of head</td>
<td>0.52 (0.60)</td>
<td>0.51</td>
<td>0.50</td>
<td>0.47 (0.55)</td>
<td>0.48</td>
<td>0.47</td>
<td>0.48</td>
</tr>
<tr>
<td>Width of head</td>
<td>0.49 (0.55)</td>
<td>0.49</td>
<td>0.48</td>
<td>0.45 (0.55)</td>
<td>0.45</td>
<td>0.45</td>
<td>0.45</td>
</tr>
<tr>
<td>Length of prothorax</td>
<td>0.14</td>
<td>0.14</td>
<td>0.14</td>
<td>0.13</td>
<td>0.13</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td>Width of prothorax</td>
<td>0.26</td>
<td>0.26</td>
<td>0.25</td>
<td>0.22</td>
<td>0.23</td>
<td>0.23</td>
<td>0.24</td>
</tr>
<tr>
<td>Length of metathorax</td>
<td>0.18</td>
<td>0.18</td>
<td>0.17</td>
<td>0.16</td>
<td>0.17</td>
<td>0.17</td>
<td>0.17</td>
</tr>
<tr>
<td>Width of metathorax</td>
<td>0.40</td>
<td>0.40</td>
<td>0.40</td>
<td>0.36</td>
<td>0.38</td>
<td>0.37</td>
<td>0.37</td>
</tr>
</tbody>
</table>

Genus INCIDIFRONS Ewing.

Ewing, 1929, p. 189.

Incidifrons? cephaloys (Nitzsch).

Docophorus cephaloys Piaget, 1880, p. 71, pl. V, fig. 5; Docophorus alecidentus Denny, 1841, p. 111, pl. VI, fig. 1; Nirnus cephaloys Nitzsch, in Giebel, 1874, p. 145, Tab. VII, fig. 9.

2♂ were collected on an Indian common kingfisher, Alcedo atthis bengalensis Gmelin shot in Pref. Nagano, April 8, 1914. I have referred to the present species to the above genus. Incidifrons was founded by Ewing for the reception of Philopterus pertusus (Nitzsch) a parasite of the common coot which shows in conjunction with several characters, a peculiar forcipate clypeal front. The present species agrees in the shape of head with the diagnosis of the genus, given by Ewing, but has nirmoid body and remarkably long antennae, neither of those characters agreeing with Ewing's descriptions.

As has been stated by Ewing, the genus Incidifrons includes heterogeneous assembly of forms and may ultimately have to be split up, but I have not ventured to erect a new genus for the present species as my specimens lacks the male.

* Piaget, Les Flediculines, supplement. 1885. p. 10, pl. 1, fig. 11.
Genus *ECHINOPHILOPTERUS* Ewing.

*Echinophilopterus inko* n. sp. (Fig. 4)

7♂. 6♀. 3♀ were taken from a parrot (Species not determined) in captivity in Tokyo.

It is allied to *Docophorus angusticlypeatus* Piaget, but is distinguished from it by the larger body, narrower clypeus and the shape of genital plate of the female.

The measurements are as follows:

<table>
<thead>
<tr>
<th></th>
<th>δ mm</th>
<th>δ mm</th>
<th>δ mm</th>
<th>δ mm</th>
<th>δ mm</th>
<th>δ mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of body</td>
<td>1.77</td>
<td>1.80</td>
<td>1.80</td>
<td>2.17</td>
<td>2.20</td>
<td>2.22</td>
</tr>
<tr>
<td>Width of body</td>
<td>0.70</td>
<td>0.70</td>
<td>0.75</td>
<td>0.95</td>
<td>0.87</td>
<td>0.90</td>
</tr>
<tr>
<td>Length of head</td>
<td>0.76</td>
<td>0.74</td>
<td>0.74</td>
<td>0.74</td>
<td>0.71</td>
<td>0.78</td>
</tr>
<tr>
<td>Width of head</td>
<td>0.59</td>
<td>0.60</td>
<td>0.59</td>
<td>0.66</td>
<td>0.63</td>
<td>0.66</td>
</tr>
<tr>
<td>Length of prothorax</td>
<td>0.18</td>
<td>0.17</td>
<td>0.17</td>
<td>0.18</td>
<td>0.17</td>
<td>0.21</td>
</tr>
<tr>
<td>Width of prothorax</td>
<td>0.36</td>
<td>0.36</td>
<td>0.36</td>
<td>0.38</td>
<td>0.38</td>
<td>0.39</td>
</tr>
<tr>
<td>Length of metathorax</td>
<td>0.22</td>
<td>0.22</td>
<td>0.21</td>
<td>0.25</td>
<td>0.23</td>
<td>0.25</td>
</tr>
<tr>
<td>Width of metathorax</td>
<td>0.50</td>
<td>0.50</td>
<td>0.54</td>
<td>0.52</td>
<td>0.52</td>
<td>0.54</td>
</tr>
</tbody>
</table>

Description of the male:—Ground colour of head and thorax pale yellowish brown with golden brown markings; colour of abdomen pale yellowish with golden brown lateral and yellowish brown transverse bands.

Head large, oblong, triangular; the parts in front of antennae remarkably longer than those behind antennae; clypeus narrow, acutely projecting, sides slightly concave; front of clypeus with deep emargination enclosed in front by long, projecting forceps-like points; two longitudinal hairs rising from the dorsal surface of the forceps-like parts of the clypeus, a short marginal hair behind them, a short one at the suture and another just in front of trabeculae, two rather long hairs close together and a short hair arising from the margin between suture and trabeculae; trabeculae long, reaching the middle of the second segment of antennae; the first segment of antennae thick and as long as the fifth segment, the second longest, the third and the fourth shortest, subequal; eye prominent with a fine prickle, temples short, rounded with two hairs and a prickle; signature yellowish brown, anterior portion narrowly protruding between forceps-like part of the clypeus and posterior portion indistinct; occipital margin nearly straight, slightly convex in the middle and with a prickle on each side. Ground colour of the head pale yellowish brown, with distinct golden brown antennal bands, interrupted at the suture.

Prothorax quadrangular, with slightly diverging lateral borders, bearing a short hair on the posterior angle; lateral bands distinct, broad, golden brown. Metathorax short, with sinuous, very obtusely angled posterior margin, bearing on each side of middle three pubescent hairs; a hair and a prickle on the lateral margins, and a long, a short hair at the posterior angles, large transverse lateral blotches separated by a narrow, uncoloured mesal linear space, lateral bands golden brown, bend inward at the posterior

*“Inko” in Japanese means parrots excluding cockatoos.*
angles along the posterior margin.

Abdomen broadly oval, broadest at the fourth segment; posterior angles protruding, bearing two hairs on segment III and four or five hairs on segment IV-VII; eighth segment with three hairs at the posterior angles; ninth segment broad, entire with about ten short hairs; lateral bands distinct, golden brown, curving inward to the posterior margin of the segments; lateral transverse, triangular blotches yellowish brown, median portion of the abdomen colourless, posterior margin of the transverse blotches interrupted by colourless pustulations. Ventral surface of abdominal segments with one to three irregular rows of small spines, composed of about three to twelve spines, on each side of the segments II-IV. Genitalia of the male broad, distinct, reaching from the anterior margin of the sixth segment to the end of the last segment; the basal plate composed of a pair of well chitinized long rods, slightly expanded at the ends, each furnishing short, recurved parameres; mesosome is conspicuous, short, broad and complex.

Description of the female. - Body larger than that of male, temporal margins more convex; abdomen broadly elliptical, triangular blotches shorter, not projecting so far inwardly, whitish medial space larger; eighth segment wholly coloured, bearing two longish, dorsal hairs; the ninth segment small, but distinct, feebly and broadly emarginated. Genital blotch on ventral surface of abdominal segments VI, VII short, broad, dish-shaped, with eight or ten pustulated hairs near the posterior margin, and a deep emargination on each lateral posterior margin.

The chief character upon which I rely to separate the following two genera from all other Philopteridae is the presence of more than one pair of trabeculae. The trabeculae are chitinous process which is specially well developed and movable in Philopterus. Apparatus analogous to trabeculae has not yet been found in any other class of insect and they are not known to perform any definite function.

Kellogg has found that Philopterus singularis (Kellogg) taken on a Nuttal's woodpecker possess bipartite trabeculae which are unique among members of mallophaga. The following new species obtained on a Formosan barbet is very peculiar. It has three pairs of trabeculae of which two pairs are well developed.

Barbets and woodpeckers belong to distinct but nearly related orders, namely Scansores and Picu. Some writers prefer to consider these two groups of birds as belonging to two closely allied families of the same order—Coraciiformes.

Besides the parasites of woodpecker, many of the biting-lice of Passeres also have two pairs of trabeculae. All of the members of Piaget's groups "Corvinicolae" and "Femorati" have bipartite trabeculae, similar to those of Kellogg's Philopterus singularis.

These two peculiar groups, as mentioned above, have their special hosts and therefore new genera will ultimately be required for their reception.

Genus TRITRABECULUS n. gen.

A genus of Philopteridae, general characters those of the genus Philopterus (s. str.), belongs to Piaget's group "femorati", with three pairs of trabeculae. Two pairs of
trabeculae in front of the antennae, and the third pair behind the antennae. The first pair short, acute and weakly developed. Species occurring upon scansores.

Type of the genus is **Trirhabcus goshikidori** n. sp., the only species of the genus yet found.

**Trirhabcus goshikidori** n. sp. (Figs. 5 & 6)

The first male specimen of this new species was collected by Dr. Shiraki from a Formosan barbet. *Cyanops nuchalis* (Gould) shot at Suisha, Nanto-cho, Formosa, May 3, 1916, and further a male was taken on a large cuckoo shrike, *Coracina javensis rex-pinelli* (Swinhoe), on the same date and at the same locality. As above stated, the barbet and the cuckoo-shrike were collected by the same person on the same day, so it is possible that the specimens taken from the cuckoo-shrike are stragglers from the barbet.

The present new species is a member of Poget's group *Femorali*, with strongly emarginated clypeal front; unique in the possession of three pairs of trabeculae.

<table>
<thead>
<tr>
<th>Measurements of male specimens on bars are as follows:</th>
<th>δ on Barbet mm</th>
<th>δ on Cuckoo shrike mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of body</td>
<td>1.82</td>
<td>1.78</td>
</tr>
<tr>
<td>Width of body</td>
<td>0.86</td>
<td>0.96</td>
</tr>
<tr>
<td>Length of head</td>
<td>0.68</td>
<td>0.67</td>
</tr>
<tr>
<td>Width of head</td>
<td>0.70</td>
<td>0.71</td>
</tr>
<tr>
<td>Length of prothorax</td>
<td>0.20</td>
<td>0.19</td>
</tr>
<tr>
<td>Width of prothorax</td>
<td>0.37</td>
<td>0.36</td>
</tr>
<tr>
<td>Length of metathorax</td>
<td>0.30</td>
<td>0.30</td>
</tr>
<tr>
<td>Width of metathorax</td>
<td>0.58</td>
<td>0.58</td>
</tr>
</tbody>
</table>

Description of the male:-Body short, head comparatively large; ground colour of head and thorax yellowish brown, with golden brown markings; abdomen paler with golden brown lateral and dark brown transverse bands.

Head large, broadly conical, front broad, with deep rounding emargination, colourless portion of clypeus expanded laterally, bearing one conspicuous, longish hair, one dorsal and one marginal short hairs in front of suture, and two hairs arising on dorsal surface and projecting beyond margin between suture and trabeculae. Two pairs of trabeculae in front of antennae and in addition one pair behind antennae: the first anterior pair weak, short and acutely angulated, just in front of the base of the second pair, on the ventral surface; the second pair well developed, nearly as long as the first two segments of the antennae; the third pair just behind the antennae, almost equal to the second pair, sharp pointed and acutely angled posteriorly. Antennae rather long, with the second segment longest, the basal segment thickened and second in length, the last three segments short and about equal; eyes inconspicuous, with one short prickle; temporal margins roundly convex with three hairs and a prickle; occipital margin slightly convex in the

*Goshidori* means in Japanese Formosan barbet.
THE BITING LICE (MALLOPHAGA) — UCHIDA

Middle and slightly concave each side of the middle, with a prickle near each temporal angle. Colour of head pale yellowish brown in median region; signature pale, broad, margined anteriorly and with very long, acuminate darker coloured tip, projecting beyond the mandibles; antennal bands golden brown, interrupted by the distinct clypeal suture and coalescing with the slightly paler, widely diverging occipital bands.

Prothorax short, with rounding angles, posterior margin flatly convex and a long postulated hair behind the posterior angle; lateral margins with golden brown bands, fading inwards narrowing and paling on posterior margin. Metathorax broadly pentagonal, postero-lateral angles with three hairs; posterior margin with a series of about twenty-four long postulated hairs; lateral margins broadly bordered with golden brown, broadest in the lateral angles. Legs paler coloured with distinct golden brown marginal markings.

Abdomen oval, broadest at the fourth segment; posterior angles slightly protruding, bearing three to four hairs on segments III–VII, lateral marginal bands golden brown, all chitinized, curving directly inwards to the posterior margin of the segment; segment VIII each with a lateral, brown triangular transverse blotch, each segment with single transverse series of long hair postulated along on posterior margin of the triangular markings, but not postulated in the median colourless portion of the segment; a conspicuous, clear, stigmatal spot in each blotch; triangles of the first segment extending furthest inwards, and shorter on each succeeding segment; eighth segment wholly coloured; ninth segment small, colourless.

Genus BITRABECULUS n. gen.

A genus of Philopteridae, Bitrabeclulus has general characters of Piaget's group corvinicolae and femorati, of the genus Philopterus, with two pairs of trabeculae, none of which short, not well developed.

Species occurring on Pici and Passeres.

Type of the genus Docophorus singularis Kellogg.

Included species

Bitrabeclulus singularis var. major n. var. (Host: Dryobates major hondoensis).
Docophorus subflavescens Goffroy. (Host: small passerines).
Docophorus excisus Nitzsch (Host: Hirundo rustica gularalis and Micros pacificus).
Bitrabeclulus mitsusui n. sp. (Host: Myzomela rubratura).
Bitrabeclulus Kayanobori n. sp. (Host: Spizixus semitorques cincerecapillus).
Bitrabeclulus darunzenaga n. sp. (Host: Suthora webbiana fulvicauda).
Docophorus reguli Denny (Host: Regulus regulus japonensis).
Docophorus crassipes Nitzsch (Host: Nucifraga caryocatactes).
Docophorus picae Denny (Host: Pica pica japonica).
Pediculus corvi Linnaeus (Host: Corvus sp.).

Bitrabeclulus singularis var. major n. var.
28 specimens of this new variety were obtained from a Hondo great spotted woodpecker, *Dryobates major hondoensis* Kuroda shot at Higashichikuma-gun, Pref. Nagano, April 9, 1915.

While it closely agrees in the main characters with the typical *Bitrabecculus singularis* (Kellogg)*, from *Dryobates nuchalis*, it is much larger in size and with remarkably broad-head.

Measurements of the specimens on hand are as follows (those in parentheses are Kellogg's):

<table>
<thead>
<tr>
<th></th>
<th>φ mm</th>
<th>ψ mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of body</td>
<td>1.74 (1.43)</td>
<td>0.17</td>
</tr>
<tr>
<td>Width of body</td>
<td>0.72 (0.71)</td>
<td>0.74</td>
</tr>
<tr>
<td>Length of head</td>
<td>0.55 (0.65)</td>
<td>0.54</td>
</tr>
<tr>
<td>Width of head</td>
<td>0.53 (0.53)</td>
<td>0.51</td>
</tr>
<tr>
<td>Length of prothorax</td>
<td>0.15</td>
<td>0.14</td>
</tr>
<tr>
<td>Width of prothorax</td>
<td>0.28</td>
<td>0.27</td>
</tr>
<tr>
<td>Length of metathorax</td>
<td>0.24</td>
<td>0.21</td>
</tr>
<tr>
<td>Width of metathorax</td>
<td>0.43</td>
<td>0.43</td>
</tr>
</tbody>
</table>

*Bitrabecculus subflavescens* (Geoffroy).

*Docoptorus subflavescens* Geoffroy, 1762, p. 599; *Docoptorus communis* Nitzsch, in Burmeister, 1838, p. 425; Giebel, 1874, p. 82. Tab. XI, fig. 13; Piaget, 1880, p. 54, pl. IV, fig. 5; Kellogg, 1896 b, p. 486, pl. LXVI, fig. 7; Uchida, 1917, p. 173; 1920, p. 637.

Large number of this widely spread species among passeres have been determined by me from the following twenty-eight species of Passerine birds. (In the following list, the specimens without locality were all collected in Pref. Nagano).

(Suisha, Formosa).
(Suisha, Formosa).
(Nanpeiisho, Formosa).

*Kellogg, New mallophaga III, 1899, p. 61, pl. V, fig. 5.*
12. 10. Alauda arvensis intermedia. IV, 29, 1917.

(Heijo, Corea)

13. 30. Emberiza rustica latifascia Portenko. no date.

(Niijima Is, Seven Is, of Izu.)


(Nanpeisho, Formosa.)

31, 60. 10. Garrulus glandarius japonicus T. & S. V, 6, 1923.

Measurements of the specimens from various hosts of Passeres

<table>
<thead>
<tr>
<th>Hosts</th>
<th>Leng. of head</th>
<th>Wid-L. of head</th>
<th>W. of L. of head</th>
<th>W. of L. of thorax</th>
<th>W. of L. of thorax</th>
<th>W. of thorax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garrulus glandarius japonicus</td>
<td>1.50</td>
<td>0.73</td>
<td>0.51</td>
<td>0.32</td>
<td>0.41</td>
<td>0.64</td>
</tr>
<tr>
<td>Coccothraustes coccothraustes japonicus</td>
<td>1.75</td>
<td>0.79</td>
<td>0.79</td>
<td>0.55</td>
<td>0.37</td>
<td>0.48</td>
</tr>
<tr>
<td>Eophona personata personata</td>
<td>1.40</td>
<td>0.60</td>
<td>0.49</td>
<td>0.34</td>
<td>0.39</td>
<td>0.78</td>
</tr>
<tr>
<td>Loxia curvirostra japonica</td>
<td>1.15</td>
<td>0.57</td>
<td>0.46</td>
<td>0.30</td>
<td>0.39</td>
<td>0.55</td>
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<td>Fringilla montifringilla</td>
<td>1.30</td>
<td>0.60</td>
<td>0.43</td>
<td>0.30</td>
<td>0.39</td>
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<td>Leucosticte arctica brunneomacula</td>
<td>1.50</td>
<td>0.67</td>
<td>0.48</td>
<td>0.34</td>
<td>0.40</td>
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<td>Emberiza cioides ciopsis</td>
<td>1.75</td>
<td>0.71</td>
<td>0.71</td>
<td>0.50</td>
<td>0.35</td>
<td>0.46</td>
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<tr>
<td>Emberiza rustica latifascia</td>
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<td>0.60</td>
<td>0.46</td>
<td>0.30</td>
<td>0.40</td>
<td>0.71</td>
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<td>Anthus hodgsoni hodgsoni</td>
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<td>0.67</td>
<td>0.48</td>
<td>0.30</td>
<td>0.42</td>
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<td>0.55</td>
<td>0.58</td>
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<td>0.79</td>
<td>0.54</td>
<td>0.54</td>
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<td>Aemophila arundinacens</td>
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<td>0.57</td>
<td>0.45</td>
<td>0.29</td>
<td>0.36</td>
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<td>Pemphiximus ruficollis musicus</td>
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<td>0.26</td>
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<td>Primella rubida rubida</td>
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<td>0.67</td>
<td>0.67</td>
<td>0.52</td>
<td>0.35</td>
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</table>

Bitrabeclus sp?

10 from a Corean crownnt, Salix webbiana fulvicruda. collected at Moppo, Corea,
April 11, 1917.

This is a Bitrabecculus of the subflavescens G. type, but it differs markedly from that species in the following points:
1. Metathorax much broader; measurement of the male of the present form being 0.47 mm, instead of 0.53-0.42 mm in subflavescens.
2. The first abdominal segment much shorter and the lateral margins of it more diverging posteriorly.
3. Abdomen shorter and the shape of abdomen semicircular.
4. Transverse blotches of abdominal segments remarkably longer.

I have, in fact, seen but one adult male of this form. The problem of separating this group of subflavescens is a difficult undertaking, and therefore, I shall make no attempt to separate the present form into new species or variety, until I have sufficient material for the purpose.

**Bitrabecculus exquisit** (Nitzsch).

*Docophorus exquisit* Nitzsch, in Giebel, 1874, p. 88, Tab. IX, fig. 1, 2, 3; Piaget, 1881, 64, pl. IV, fig. 6; Uchida, 1920, p. 637.

1s, 5* taken on an Eastern chimney-swallow, *Hirundo rustica gutturalis* Scopoli, in Pref. Nagano; 19 taken on a Formosan striated swallow, *Hirundo daurica formosana* Mayr shot in Formosa, April 5, 1917 and 5s, 3*, 2* were collected from a white-rumped swift, *Microps pacificus pacificus* (Latham) taken in Pref. Nagano, Sept. 20, 1914.

This species was found on swallows and swifts, and these two hosts have generally been taken as one, as they are both called in Japan "Tsubame". However, actually swallows and swifts are not nearly related. They belong to distinct orders, the former to Ord. Passeres and the latter to Ord. Cypseli. In Europe, Piaget has also taken *Philopterus exquisit* on house martin, *Hirundo urbica* and on common swift, *cygnaeus*.

I have collected* Denysus truncatus* (Olfers), a species of Amblycercus malleus, from a chimney swallow, *Hirundo rustica gutturalis* and from a white-rumped *Microps pacificus*.

*Eureum*, a genus of the Amblycercus mallehoga, includes only two known species, one of which, *Eureum malleus*, has been found on chimney swallow and the other, *Eureum cimicoides*, on common swift.

In another instance, two species of Hippoboscidae (Diptera), *Craterina fuscata* (Latreille) and *Stenopteryx hirundinis* (L.), have been recorded in Germany as parasites of swallows and swifts.

Kellogg says, "The occurrence of a parasitic species common to European and American birds, which is not an infrequent matter, must have another explanation than any suggested. This explanation I believe is, for many of the instances, that the parasitic species has persisted unchanged from the common ancestor of the two more distinct but closely allied bird species".

Thus the swallow and the swift are commonly supposed by ornithologists to

THE BITING-LICE (MALLOPHAGA) — UCHIDA

from distinct stocks, but their Mallophaga are so similar and so different from
bird-llice, that these two groups of birds must have evolved from a common ancestor.
ience derived from mallophaga is confirmed by the Dipterus parasites of the two
aes of birds. Thus, I think, it has brought up a question on genetic relationships
en these two orders of birds.

*Bitrabeclus mitsusii* n. sp. (Fig. 7)

5 of this new species were collected on a scarlet honey-eater, *Myzomela rubra*
*utra* (Lesson), shot in the ponape Id.

<table>
<thead>
<tr>
<th>Measurements</th>
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<tbody>
<tr>
<td>∆ mm</td>
</tr>
<tr>
<td>Length of body</td>
</tr>
<tr>
<td>Width of body</td>
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<tr>
<td>Length of head</td>
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<tr>
<td>Width of head</td>
</tr>
<tr>
<td>Length of thorax</td>
</tr>
<tr>
<td>Width of thorax</td>
</tr>
</tbody>
</table>

The present species belongs to Piaget's group *Angustoclypeus* and resembles *Philopterus*
Schrank found on Sturnidae, but is distinguished from it by the smaller body,
antatively narrower head, narrower, deeply emarginated clypeus, and having bipartite
eculae.

Description of the male:—Body small, head comparatively large; ground colour of body
yellowish brown, with clear brown and dark brown markings.

Head conical; front of clypeus very narrow and deeply emarginate, clear, with a stiff
in each side of it; sides slightly concave, two minute marginal hairs and a short
al hair in front of clypeal suture and two marginal hairs and a prickle in front of
eculae: first pair of trabeculae well developed, conical, second pairs large, pointed,
downward; antennae medium, first segment largest, second a trifle smaller, and last
segment smaller and subequal; eye large, clear, with a hair: temples expanded,
dy rounded, bearing two long hairs and two spines: antennal bands distinct, clear
broken at suture, not reaching clypeal angles, and with bases slightly bent inward
eculae; occipital band yellowish brown, strongly diverging anteriorly and bend
ardly and separated from antennal bands by a broad space: occipital margin sinuous,
middle third convex, with two minute spines on each lateral margins: clypeal
ature large, oblong, pointed posteriorly, anterior margin deeply emarginate, slightly
ave at sides.

Thorax quadrilateral, with slightly diverging sides and convex posterior margin,
a long hair on each side; posterior angles rounded, colour yellowish brown, with
brown lateral bands, extending around the posterior angle and a short way along

"mitsusii" in Japanese means honey-sucker.
the posterior margin. Metathorax pentagonal, with widely diverging, slightly concave sides and angulated posterior margin; posterior angles rounding, bearing two long and short hairs and posterior margin with a row of seven pustulated hairs on each side. Legs paler than body with pale yellowish marginal markings.

Abdomen broadly elliptical; lateral margins of segments more or less convex, posterior angles slightly projecting, bearing one to three hairs in segments III-VIII; segments IV-VIII with narrow, elongate, yellowish brown, triangular, transverse blotches, acute and inwardly: each one of segments I-VI, bearing three or four pustulated hairs, one pustulated hair near the middle of the posterior margins of segments; triangular blotch of the segments VII and VIII narrow, curving, transverse, nearly continuous; segment IX wholly coloured but paler; outer margin of each transverse blotch broadly clear, producing dark lateral abdominal bands; posterior margin of segment IX flatly rounded, with four longish hairs, segments III-VII with one to three longish hairs in posterior angles.

Description of the female: body larger than that of male; temples more rounded; triangular blotches of abdomen not projection so far inwardly; segment IX very slightly colourless, deeply emarginated, bearing three short spines at each posterior end.

*Bitrabeculus kyanobori* n. sp. (Fig. 8)

1♂, 1♀ were collected from a Formosan finch-billed bulbul, *Spizixos semitorques cinereicapillus* Swinhoe, shot at Bohoshô, Dist. Nanto, Formosa, May 4, 1916.

Description of the male: Body, length 1.30 mm, width 0.55 mm; with large head; small abdomen; ground colour of body pale yellowish brown, with clear brown and pale markings on head, thorax and abdomen.

Head conical, length 0.57 mm, width 0.49 mm; front of clypeus narrow, emarginate, with a stiff hair in rounded angles, and extending forward beyond the mandible concave, with three short marginal hairs in front of the suture and two submarginal hairs in front of trabeculae; trabeculae two pairs, the anterior ones short conical; in front of the base of the second pair on the ventral surface; the second pair larger, blunt tipped; antennae rather long, with the second segment longest, the basal segment thickened and second in length, and last three smaller and subequal; eye large, with a long hair; temples evenly rounded, narrowly margined with brown, bearing long, pustulated hairs and a prickle; occiput convex; antennal bands dark chestnut in distinctively interrupted at the suture; posterior extremities bend inward and back, well defined, diverging, clear brown occipital bands; clypeal signature long, narrow, distinct, anterior margin concave, with a slight lateral constriction near the angles, posterior portion, darker, very long, gradually tapering to a point at mandible.}

Prothorax quadrilateral, length 0.14 mm, width 0.30 mm; with rounded, anterior posterior angles and flatly convex, slightly diverging sides; posterior margin s.  

*"Kyanobori" means Japanese finch-billed bulbul.*
bearing a spine near the posterior angles: dark brown lateral, marginal bands.

Thorax pentagonal, length 0.18 mm, width 0.40 mm: with widely diverging sides

Angulated posterior margin; posterior angles with three postulated hairs and a

And posterior margin with a row of seven or eight postulated hairs on each side;

Broncolourous with head and thorax, with clear brown marginal markings and roughly

ired short hairs.

Abdomen broadly oval, length 0.40 mm, width 0.56 mm: with lateral margins of segments

or less convex and the posterior angles projecting, with one to three hairs in

ments II-VII, a row of hairs across the segments I-VII, postulated along posterior

gin of transverse bands; narrow clear brown lateral bands on segment I-VII; yellowish

transverse bands extending inward about one-third the width of abdomen,

wing inwardly with a large, round, clear area just within the lateral bands; trans-

bands of the seventh and eighth segments nearly covering whole space between

lateral bands; ninth segment small rounded, wholly coloured with pale yellowish brown.

Description of the female: — Body larger than that of male, length 1.00 mm, width 0.73

head. length 0.62 mm, width 0.54 mm; thorax length 0.38 mm, width 0.49 mm; very

ar to male, except the ninth abdominal segment being deeply emarginated.

**Bitrabeculus reguli** (Denny).

**Docophorus reguli** Denny, 1842, p. 91, pl. VI, fig. 4.

from a Japanese goldcrest, *Regulus regulus japonicus* Blakiston taken in Pref.

ano (no date).

**Bitrabeculus crassipes** (Nitzsch).

**Docophorus crassipes** Nitzsch, in Burmeister, 1838, p. 425; Denny, 1842, p. 68, pl. III, fig.

bdl. 1874, p. 82, taf. IX, fig. 6; Piaget, 1880, pl. III, fig. 7.

11, 14, 7 were obtained on a Japanese nutcracker, *Nucifraga caryocatactes japonicus*


**Bitrabeculus picae** (Denny).

**Docophorus picae** Denny, 1842, p. 67, pl. II, fig. 9; **Docophorus subcrassipes** Nitzsch, 1866,

14; Piaget, 1880, p. 51, pl. III, fig. 8.

: from a Corean magpie, *Pica pica japonica* Temminck & Schlegel. collected at Torai-

istr. Shonan, Corea, April 6, 1917.

**Bitrabeculus corvi** (Linnaeus).

**Docophorus corvi** L., 1758, p. 612; **Docophorus atratus** Denny. 1842, p. 63, pl. IV, fig. 8;

1860, p. 44, pl. III, fig. 2.

14: 1 were collected from a crow (*Corvus levaillantii* or *Corvus corone*) shot on

ama. Seven Is. of Izu, April 30, 1916.
Fig. 1
Stratophillus fischeri, sp. n., × 50

Fig. 2
Genitalia of the male of Calydea kelpi, Kelpf. × 210

Fig. 3
Genitalia of the male of Halicyonella denticulata var. minor n. var. × 210
Fig. 4
Echinophilotherus inko n. sp. ♂, ×50

Fig. 5
Tritrobaculus goshikidori n. sp. ♂, ×50

Fig. 6
Ventral aspect of the head of
Tritrobaculus goshikidori n. sp. ♂, ×67