

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 *Phlopterus* (Phlopterae, Sub-order ISCHNOCERA). These I studied between April, 1945, and March, 1946, when I lived on the Island of Awaji of Hyogo Prefecture, to 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 of 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:

Journ. Coll. Agric., Imp. Univ. Tokyo, vol. IX, pp. 1-56, 1926.

	Lanius schach formosae
	Lanius tigrinus
	Parus ater insularis
Trabeculus subflavescens (<i>Geoffroi</i>)	Parus major minor
	Zosterops palpebrosa taiwaniana
	Anthus hodgsoni hodgsoni
	Alauda arvensis intermedia
	Emberiza rustica latifascia
	Emberiza cioides ciopsis
	Leucosticte arctoa brunneonucha
	Fringilla montifringilla
	Loxia curvirostra japonica
	Eophona personata personata
	Coccothraustes coccothraustes japonicus
	Passer montanus saturatus
	Oriolus chinensis diffusus
	Garrulus glandarius japonicus
Trabeculus <i>sp.</i> ?	Suthora webbiana fulvicauda
Trabeculus excisus (<i>Nitzsch</i>)	{ Hirundo rustica gutturalis
	{ Hirundo daurica formosae
	{ Microps pacificus pacificus
Trabeculus mitsusui <i>n. sp.</i>	Myzomela rubratura rubratura
Trabeculus kayanobori <i>n. sp.</i>	Spizixus semitorques cinereicapillus
Trabeculus reguli (<i>Denny</i>)	Regulus regulus japonensis
Trabeculus crassipes (<i>Nitzsch</i>)	Nucifraga caryocatactes japonicus
Trabeculus picae (<i>Denny</i>)	Pica pica japonica
Trabeculus corvi (<i>Linnaeus</i>)	Corvus <i>sp.</i> ?
Genus <i>Philopterus</i> <i>Nitzsch</i> .	
Philopterus ralli (<i>Denny</i>)	Rallus aquaticus indicus
Philopterus integer (<i>Nitzsch</i>)	Grus monacha
Philopterus wumisuzume <i>n. sp.</i>	Aethia cristatella
Philopterus montereyi (<i>Kellogg</i>)	Synthliborhamphus antiquus
Philopterus megacephalus (<i>Denny</i>)	Uria carbo
Philopterus gonothorax (<i>Giebel</i>)	Larus crassirostris
Philopterus albemarlensis (<i>Kellogg & Kuwana</i>)	{ Sterna sumatrana sumatrana
	{ Sterna albifrons sinensis
	{ Thalasseus bergii cristatus
Philopterus armatus <i>Johnston & Harrison</i>	Numenius variegatus
Philopterus shakushigi <i>n. sp.</i>	Numenius phaeopus variegatus
Philopterus fusiformis (<i>Denny</i>)	Calidris ruficollis ruficollis
Philopterus auratus (<i>Nitzsch</i>)	Scolopax rusticola rusticola
Philopterus temporalis (<i>Giebel</i>)	Vanellus vanellus
Philopterus semivittatus (<i>Giebel</i>)	{ Charadrius dubius curonicus
	{ Charadrius leschenaulti leschenaulti
	{ Charadrius alexandrinus dealbatus
Philopterus fuliginosus (<i>Kellogg</i>)	Charadrius dominicus fulvus
Philopterus validus var. <i>orientalis n. var.</i>	Puffinus leucomelas
Philopterus productus (<i>Piaget</i>)	Bubulcus ibis coromandus
Philopterus milvi (<i>Mjöberg</i>)	Milvus migrans lineatus
Philopterus Nisi (<i>Denny</i>)	{ Butastur indicus
	{ Accipiter virgatus gularis

	(<i>Pernis apivorus japonicus</i>)
Philopterus platyrhynchus (<i>Nitzsch</i>)	{ <i>Buteo buteo buromanicus</i>
	{ <i>Accipiter gentilis fujiiyamae</i>
	{ <i>Haematornis cheela perplexa</i>
	{ <i>Otus bakkamoena semitorquata</i>
Philopterus rostratus (<i>Nitzsch</i>)	<i>Asio flammeus flammeus</i>
Philopterus cursor (<i>Nitzsch</i>)	{ <i>Strix aluco yamadae</i>
	{ <i>Strix uralensis fubescens</i>
Philopterus cursor var. <i>laticephalus n. var.</i>	{ <i>Dryobates major hondoensis</i>
	{ <i>Picus awokera awokera</i>
Philopterus superciliosus (<i>Nitzsch</i>)	<i>Dryocopus martius</i>
Philopterus kumagera <i>n. sp.</i>	<i>Pomatorhinus ruficollis musicus</i>
Philopterus maruhashi <i>n. sp.</i>	<i>Ixos amaurotis amaurotis</i>
Philopterus hiyodori <i>n. sp.</i>	<i>Alauda arvensis salicetorum</i>
Philopterus hibari <i>n. sp.</i>	{ <i>Passer montanus saturatus</i>
	{ <i>Emberiza cioides ciopsis</i>
Philopterus sturni var. <i>affinis (Piaget)</i>	<i>Aethiopsar cristatella formosana</i>
Philopterus sturni var. <i>acutifrons n. var.</i>	<i>Ixos amaurotis ogawae</i>
Philopterus mukudori <i>n. sp.</i>	<i>Spodiopsar cinereus</i>

I have to extend my hearty thanks to Dr. Nagamichi Kuroda for his great kindness in helping 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 sojourn 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 I
- { 2. Species elongate, narrow, with very small or no trabeculae Pt. E
- B { 1. Head with one pair of trabeculae F
- { 2. Head with more than one pair of trabeculae C
- C { 1. Trabeculae two pairs BITRABECULUS *n. gen.*
- { 2. Trabeculae three pairs TRITRABECULUS *n. gen.*
- D { 1. Antennae different in two sexes E
- { 2. Antennae alike in two sexes F
- E { 1. Head with distinct clypeal suture (on Strigidae) STRIGIPHILUS *Mjöberg*
- { 2. Head without distinct clypeal suture (on Rallidae) RALLICOLA *Johnston & Harrison*
- F { 1. Clypeal region remarkably expanded and with hyaline free margin G
- { 2. Clypeal region without such characters I
- G { 1. Alation of clypeus emarginate in front F
- { 2. Alation of clypeus entire I
- H { 1. Clypeus with a tuft of three or more setae above on each clypeal band. (on Cuculidae) CUCULOECUS *Ewing*
- { 2. Clypeus without such setae (on Halcyonidae) HALCYONICOLA *n. gen.*
- I { 1. Clypeus with a pair of small peg-like spines dorsally. (on Anatidae) ANATOECCUS *Cummins*
- { 2. Clypeus without peg-like spines (on Colymbidae and Alcidae) COLYMBICOLA *n. gen.*

- 1. Clypeal si
- 2. Clypeal si
- 1. Clypeal m
- 2. Clypeal m
- 1. Abdomen
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- 1. Clypeal signature divided. (on Threskiornithidae) ...IBIDOEUCUS *Cummings*.
- 2. Clypeal signature not dividedK
- 1. Clypeal margin deeply notched in frontL
- 2. Clypeal margin never more than broadly emarginate in frontM
- 1. Abdomen bearing many short spines on its ventral aspect. (on Loriidae)
.....ECHINOPHILOPTERUS *Ewing*.
- 2. Abdomen without such spinesINCIDIFRONS *Ewing*.
- 1. Clypeal signature with a papilla on each posterior lateral angles
(on Ciconiidae)NEOPHILOPTERUS *Cummings*.
- 2. Signature without such papillaePHILOPTERUS *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 at Chiba, May 25, 1923; and 1♀, 6♂♂ from Chinese white-breasted water hen, *Actitis phoenicurus chinensis* (Boddaert), collected in Formosa, April 4, 1917.

This 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 side of each abdominal segment, while type species has four. Var. *porzanae* Piaget var. *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):

	♂ mm	♀ mm	♀ mm	♀ mm	♀ mm	♀ mm
Length of body	1.20	1.40 (1.40)	1.35	1.35	1.34	1.31
Width of body	0.36	0.42 (0.47)	0.43	0.41	0.40	0.40
Length of head	0.35	0.40 (0.47)	0.40	0.39	0.39	0.36
Width of head	0.31	0.33 (0.38)	0.33	0.33	0.33	0.32
Length of thorax	0.25	0.27 (0.26)	0.28	0.28	0.28	0.28
Width of thorax	0.27	0.29 (0.30)	0.29	0.28	0.29	0.28

Genus STRIGIPHILUS Mjöberg.

Mjöberg, 1910, p. 132.

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

♂♂, 1♀ were taken on a Hondo ural owl, *Strix uralensis hondoensis* (Klark),

*Symbol † denotes an immature specimen.

***Strephorus bisetosus* Piaget, Les Pediculines, 1880, pl. XVIII, fig. 4.

****Strephorus bisetosus* var *californicus* Kellogg, New Mallophaga III, 1899, p. 106, pl. VII, fig. 6.

*****Fukuro* in Japanese means Ural owl.

captured in Pref. Nagano, Dec. 24, 1916; and 2♂, 4♀, 9♂ were collected on the same species shot in the same locality (no date). This new species somewhat resembles *Strigiphilus remotus* Kellogg* from a great grey owl, *Scotioptex cinerea*, but differs from it in the smaller size and in the shape of the head of the male, which is different markedly in the sexes in the latter species.

Measurements:

	♂ mm	♂ mm	♂ mm	♂ mm	♀ mm	♀ mm	♀ mm	♀ mm
Length of body	1.82	1.80	1.70	1.67	2.17	2.15	2.15	2.15
Width of body	0.81	0.83	0.83	0.83	0.97	0.95	0.92	0.92
Length of head	0.55	0.53	0.55	0.54	0.62	0.63	0.62	0.62
Width of head	0.59	0.60	0.60	0.59	0.66	0.65	0.65	0.65
Length of thorax	0.40	0.43	0.41	0.41	0.45	0.45	0.45	0.45
Width of thorax	0.52	0.52	0.53	0.52	0.59	0.59	0.54	0.54

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

Head large, pentagonal, broader than long; front broad, trapezoidal; clypeal region 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 thickest and longest, as long as all the other segments taken together, the second a half as long as the first, the third short, with a dorsal conical projection at distal end, the fourth shortest, and the fifth slightly longer than the fourth; eyes clear, prominent with distinct ocular fleck and a long hair. Temporal margin somewhat rounded with two long hairs and two prickles; occipital margin slightly sinuous, clypeal signum shield-shaped, anteriorly pale coloured, and posteriorly sharp-angled. Colour of the body golden brown; antennal bands dark brown, interrupted at the suture, bending inward at the base of antennae; occipital bands pale anteriorly, growing darker and ending in distinctly blackish brown occipital blotches.

Prothorax quadrilateral, lateral margins nearly straight and slightly diverging posteriorly; posterior margin somewhat convex; posterior lateral angles each with a long hair. Colour pale golden brown, with brownish lateral borders which posteriorly extend on each side along the postero-lateral 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 of metathorax angulated in middle, with a series of hairs; marginal bands broad but indistinctly present on the lateral borders. Legs paler than body, with yellowish brown markings, and a few scattered spines.

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

* Kellogg, New mallophaga III, 1899, p. 107, pl. VII, fig. 7.

Plate 1
Fig. 4

series of hairs
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Dacophorus bis

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 brown. Genitalia short and broad, very indistinct, being covered by thick muscle layer.

Description of the female:—Body remarkably larger, emarginations on the sides of head not so deep as those of the male; first segment of the antennae thickest, and as long 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 bands of segments I-VII leaving a broad, whitish median space, those of segments VIII entire, last segment small, emarginate.

Genus COLYMBICOLA n. gen. (Fig. 2)

A Genus of Philopteridae; Head broad, conical with rounded temples and prominent forehead; frontal part of clypeus expanded antero-laterally, rounded, entire; free margin entire throughout; signature distinct, shield shaped, concave in front, posteriorly with acute, acuminate tip; trabeculae large; antennae short, filiform and similar in two sexes; forehead 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. Legs short, claws dissimilar. Genitalia of the male quite characteristic, reaching obliquely from 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; paramere well chitinized, narrower medianly and with expanded, two-pronged ends; endomera slender with blunt apex; mesosome 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 graviceps* Kellogg.

Included species;

- Docophorus graviceps* Kellogg (Host: *Urinator pacificus*).
- Docophorus colymbinus* Denny (Host: *Colymbus septentrionalis*).
- Docophorus atricolor* Kellogg (Host: *Synthliborhamphus antiquus*).
- Docophorus montereyi* Kellogg (Host: *Synthliborhamphus antiquus*).
- Docophorus bisctosus* Piaget (Host: *Mergus scrrator*).

Colymbicola graviceps (Kellogg).

Docophorus graviceps Kellogg, 1896a, p. 82, pl. III, fig. 3.

3♂, 18♀ collected by Dr. N. Kuroda from a Siberian black-throated diver, *Colymbus arcticus viridigularis* (Dwight), shot at Uchiura, Pref Shizuoka, Feb. 20, 1916.

Genus ANATOECCUS 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.

4♂, 3♀, 3[♂] *Anas crecca crecca* L., Pref. Nagano, Feb. 21, 1914.

2♂, 3♀ *Anas platyrhynchos platyrhynchos* L., Pref. Nagano, Feb. 22, 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:

	From <i>Aix galericulata</i>						From <i>Anas crecca crecca</i>						From <i>Anas platyrh</i>			
	♂	♂	♂	♀	♀	♀	♂	♂	♂	♀	♀	♀	♂	♀	♀	♀
Length of body	1.40	1.43	1.30	1.70	1.81	1.85	1.28	1.29	1.26	1.53	1.56	1.56	1.35	1.66	1.66	1.65
Width of body	0.59	0.61	0.57	0.80	0.80	0.81	0.50	0.54	0.51	0.70	0.65	0.70	0.54	0.72	0.76	0.70
Length of head	0.43	0.46	0.43	0.49	0.51	0.57	0.42	0.42	0.42	0.45	0.46	0.45	0.42	0.46	0.45	0.48
Width of head	0.40	0.42	0.40	0.47	0.47	0.47	0.40	0.39	0.39	0.43	0.42	0.43	0.40	0.45	0.46	0.45
Length of thorax	0.27	0.27	0.27	0.30	0.30	0.31	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.31	0.31	0.31
Width of thorax	0.35	0.36	0.34	0.40	0.42	0.42	0.34	0.33	0.33	0.36	0.36	0.36	0.36	0.37	0.37	0.38

Anatoecus obtusus (Giebel).

Docophorus obtusus Giebel, 1886, p. 366; 1874, p. 115; *Anatoecus obtusus* Cummings, 1916, p. 658.

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

Genus IBIDOECUS Cummings.

Cummings, 1916, p. 663.

Volume 1
Number 4

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1842, p. 10
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1♂, 2♀
1♂
1♂, 2♀

Ibidococcus plataleae (Denny).

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 grey 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.

Neophilopterus 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, *Ciconia 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 leuallanti connectens* Stresemann shot on the same Island, March 6, 1929.

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

Measurements:

	♂ mm	♂ mm	♂ mm	♂ mm	♀ mm	♀ mm	♀ mm	♀ mm	♀ mm	♀ mm
Length of body	2.25	2.40	2.20	2.10	2.55	2.80	2.75	2.70	2.81	2.80
Width of body	0.88	1.00	0.90	0.82	0.95	1.20	1.00	1.06	1.00	1.00
Length of head	0.57	0.65	0.63	0.62	0.68	0.72	0.70	0.72	0.72	0.75
Width of head	0.72	0.75	0.72	0.71	0.81	0.80	0.81	0.81	0.72	0.81
Length of thorax	0.47	0.50	0.49	0.50	0.52	0.57	0.55	0.54	0.52	0.54
Width of thorax	0.65	0.65	0.62	0.61	0.67	0.72	0.72	0.72	0.73	0.72

Genus CUCULOECUS EWING.

Ewing, 1926, p. 148.

Cuculoecus laticlypeatus (Piaget).

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

- 2♂, 8♀, 5[♂]. *Cuculus fagax hyperythrus* Gould. May 30, 1914.
- 1♂, 2♀ *Cuculus poliocephalus poliocephalus* Latham May 31, 1914.
- 1♀ *Cuculus canorus telephonus* Heine May 8, 1915.
- 1♂, 2♀ *Halcyon coromanda major* (Temminck & Schlegel). May 25, 1916.

Cuculoecus 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).

4♂, 5♀ Togakushi village, Pref. Nagano. June, 1917.

2♂, 1♀, 25♂ Pref. Aomori. May 20, 1922.

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:

	♂ mm	♂ mm	♀ mm	♀ mm	♀ mm	♀ mm	♀ mm
Length of body	1.96	1.76	2.50	2.45	2.49	2.30	2.20
Width of body	0.90	0.80	1.05	1.00	0.99	0.90	0.85
Length of head	0.71	0.63	0.74	0.72	0.72	0.75	0.73
Width of head	0.70	0.62	0.77	0.77	0.75	0.69	0.68
Length of thorax	0.45	0.36	0.52	0.52	0.52	0.47	0.48
Width of thorax	0.59	0.50	0.66	0.65	0.65	0.62	0.60

Genus HALCYONICOLA n. gen. (Fig. 3)

A Genus of Philopteridae; body small, head large, conical, prominent forehead 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 darker tip; trabeculae 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 medianly 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 alatoclypeatus* Piaget.

Included species:

Docophorus mystacinus Nitzsch (Host: *Dacelo coromandeliana*).

Docophorus delphax Nitzsch (Host: *Tropiderhynchus moluccensis*).

Docophorus alatoclypeatus Piaget (Host: *Dacelo cinereifrons*).

* Kellogg: New mallophaga III, 1899, p. 5, pl. 1, fig. 5 and 8.

Halcyonicola alatoctybeata var *minor* n. var

Docophorus alatoctybeatus Uchida 1918, p. 483.

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

4♀ *Halcyon cinnamomina pelewensis* Wiglesworth. Pelew Is. V, 25, 1915.

1♂, 1♀ *Halcyon cinnamomina pelewensis* Wiglesworth. Pelew Is. III, 1915.

21♂, 2♀ *Halcyon chloris teraokai* Kuroda. Pelew Is. V, 23, 1915.

3♂, 1♀ *Halcyon chloris reichenbachii* (Hartlaub) Ponapé Is. (no date).

1♂, *Halcyon 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 (Piaget's figures in parentheses).

	♀ mm	♀ mm	♀ mm	♂ mm	♂ mm	♂ mm	♂ mm
Length of body	1.60 (1.90)	1.60	1.60	1.35 (1.60)	1.36	1.36	1.33
Width of body	0.59 (0.70)	0.61	0.62	0.50 (0.63)	0.55	0.49	0.49
Length of head	0.52 (0.60)	0.51	0.50	0.47 (0.55)	0.48	0.47	0.48
Width of head	0.49 (0.55)	0.49	0.48	0.45 (0.55)	0.45	0.45	0.45
Length of prothorax	0.14	0.14	0.13	0.13	0.13	0.13	0.13
Width of prothorax	0.26	0.26	0.25	0.22	0.23	0.23	0.24
Length of metathorax	0.18	0.18	0.17	0.16	0.17	0.17	0.17
Width of metathorax	0.40	0.40	0.40	0.36	0.38	0.37	0.37

Genus INCIDIFRONS Ewing.

Ewing, 1929, p. 189.

Incidifrons? cephaloxys (Nitzsch).

Docophorus cephaloxys Piaget, 1880, p. 71, pl. V, fig. 5; *Docophorus alcedinius* Denny, 1841, p. 111, pl. VI, fig. 1; *Nirmus cephaloxys* 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 Pediculines, supplement, 1885, p. 10, pl. I, 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:

	♂ mm	♂ mm	♂ mm	♀ mm	♀ mm	♀ mm
Length of body	1.77	1.80	1.80	2.17	2.20	2.22
Width of body	0.70	0.70	0.75	0.95	0.87	0.90
Length of head	0.76	0.74	0.74	0.74	0.71	0.78
Width of head	0.59	0.60	0.59	0.66	0.63	0.66
Length of prothorax	0.18	0.17	0.17	0.18	0.17	0.21
Width of prothorax	0.36	0.36	0.36	0.38	0.38	0.39
Length of metathorax	0.22	0.22	0.21	0.25	0.23	0.25
Width of metathorax	0.50	0.50	0.54	0.52	0.52	0.54

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 longish 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 pustulated hairs; a hair and a prickle on the lateral margins, and a long, a short hairs 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 cackatoos.

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 paramere; 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 *Philopteri* 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 Nuttall'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 *Pici*. 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 *Tritrabeculus goshikidori* n. sp., the only species of the genus yet found.

*Tritrabeculus 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-pineti* (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 Paget's group *Femorati*, with strongly emarginated clypeal front; unique in the possession of three pairs of trabeculae.

Measurements of male specimens on hands are as follows:

	♂ on Barbet mm	♂ on Cuckoo shrike mm
Length of body	1.82	1.78
Width of body	0.88	0.96
Length of head	0.68	0.67
Width of head	0.70	0.71
Length of prothorax	0.20	0.19
Width of prothorax	0.37	0.36
Length of metathorax	0.30	0.30
Width of metathorax	0.58	0.58

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

* "Goshikidori" means in Japanese Formosan barbet.

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, emarginate anteriorly and with very long, acuminate darker coloured tip, projecting beyond the mandibles; antennal bands golden brown, interrupted by the distinct clypeal sutures and coalescing with the slightly paler, widely diverging occipital bands.

Prothorax short, with rounding angles, posterior margin flatly convex and a long pustulated hair behind the posterior angle; lateral margins with golden brown bands, bending 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 pustulated 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, well chitinized, curving directly inwards to the posterior margin of the segment; segment III-VII each with a lateral, brown triangular transverse blotch, each segment with single transverse series of long hair pustulated along on posterior margin of the triangular markings, but not pustulated in the median colourless portion of the segment; a conspicuous, clear, stigmal spot in each blotch; triangles of the first segment extending farthest inwards, and shorter on each succeeding segment; eighth segment wholly coloured; ninth segment small, colourless.

Genus BITRABECULUS n. gen.

A genus of Philopteridae, *Bitrabeculus* has general characters of Piaget's group "corvinicolae" and "femorati", of the genus *Philopterus*, with two pairs of trabeculae, one of which short, not well developed.

Species occurring on *Pici* and *Passeres*.

Type of the genus *Docophorus singularis* Kellogg.

Included species

- Bitrabeculus singularis* var. *major* n. var. (Host: *Dryobates major honoensis*).
- Docophorus subflavescens* Geoffroy. (Host: small passerines).
- Docophorus excisus* Nitzsch (Host: *Hirundo rustica gutturalis* and *Microps pacificus*).
- Bitrabeculus mitsusui* n. sp. (Host: *Myzomela rubratura*).
- Bitrabeculus Kayanobori* n. sp. (Host: *Spizixus semitorques cinereicapillus*).
- Bitrabeculus darumaenaga* 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.).

Bitrabeculus singularis var. *major* n. var.

2♂ specimens of this new variety were obtained from a Hondo great spotted woodpecker, *Dryobates major hondoensis* Kuroda shot at Higashichikuma-gun, Pref. Nagano, April 6, 1915.

While it closely agrees in the main characters with the typical *Bitrabeculus singularis* (Kellogg)*, from *Dryobates nuttallii*, it is much larger in size and with remarkably broader head.

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

	♀ mm	♀ mm
Length of body	1.74 (1.43)	0.17
Width of body	0.72 (0.71)	0.74
Length of head	0.55 (0.65)	0.54
Width of head	0.53 (0.53)	0.51
Length of prothorax	0.15	0.14
Width of prothorax	0.28	0.27
Length of metathorax	0.24	0.21
Width of metathorax	0.43	0.43

Bitrabeculus subflavescens (Geoffroy).

Docophorus subflavescens Geoffroy, 1762, p. 599; *Docophorus 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 passerines 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).

1♀, 1♂. *Cinclus pallasi hondoensis* Momiyama. III, 4, 1917.

2♀. *Prunella rubida rubida* (Temminck & Schlegel). XII, 2, 1916.

1♂. *Tarsiger cyanurus cyanurus* (Pallas). V, 3, 1916.

1♀, 1♂. *Turdus cardis cardis* Temminck. V, 10, 1916.

1♂. *Pomatorhinus ruficollis musicus* Swinhoe. V, 3, 1917.

(Shinnensho, Formosa).

1♂, 7♀, 1♂. *Acrocephalus arundinaceus orientalis* T. & S. V, 12, 1916.

1♂, 1♂. *Phylloscopus occipitalis coronatus* T. & S. V, 17, 1917.

9♀. *Phylloscopus borealis xanthodryas* Swinhoe. X, 6, 1916.

1♀, 3♀. *Muscicapula narcissina narcissina* (Temminck). V, 17, 1916.

1♀. *Terpsiphone atrocaudata atrocaudata* (Eaton). V, 17, 1916.

3♀, 4♂. *Pericrocotus solaris griseigularis* Gould. V, 3, 1916.

(Suisha, Formosa).

3♀. *Lanins schach formosae* Swinhoe. VI, 4, 1917.

(Nanpeisho, Formosa).

* Kellogg, New mallophaga III, 1899, p. 61, pl. V, fig. 5.

75. *Lani*37. *Paru*27. *Paru*49. *Zost*

16, 4♀,

19, 1♂.

(H

16, 3♀.

16. *Emb*

(N

56, 3♀,

46, 2♀,

27. *Loxi*

16, 2♀,

19, 3♀. C

19. *Passe*19. *Oriol*

(Na

33, 6♀, 1

*Garrulus gl**Coccothraust**japonicus**Eophona pe**Loxia curv**Fringilla m**Leucosticte d**Emberiza ci**Emberiza ru**Anthus hodg**Terpsiphone**Muscicapula**Acrocephalus**Pomatorhinu**Prunella rub**Cinclus palla*

12 from a

- 7♂. *Lanius tigrinus* Drapiez. I, 6, 1917.
 3♂. *Parus ater insularis* Hellmayr. II, 27, 1917.
 2♂. *Parus major minor* T. & S. IV, 24, 1917.
 4♀. *Zosterops palpebrosa taiwaniana* Momiyama. VI, 4, 1917.
 1♂, 4♀, 2♂. *Anthus hodgsoni hodgsoni* Richmond. V, 17, 1917.
 1♀, 1♂. *Alauda arvensis intermedia*. IV, 29, 1917.
 (Heijo, Corea)
 1♂, 3♀. *Emberiza rustica latifascia* Portenko. no date.
 1♂. *Emberiza cioides ciopsis* Bonaparte. IV, 12, 1916.
 (Niijima Is, Seven Is, of Izu.)
 5♂, 3♀, 3♂. *Leucosticte arctoa brunneonucha* (Brandt). II, 13, 1916.
 4♂, 2♀, 1♂. *Fringilla montifringilla* Linnaeus. II, 10, 1916.
 2♀. *Loxia curvirostra japonica* Ridgway. XI, 23, 1917.
 1♂, 2♀, 2♂. *Eophona personata personata* T. & S. IX, 20, 1917.
 1♀, 3♂. *Coccothraustes coccothraustes japonicus* T. & S. XI, 9, 1916.
 1♂. *Passer montanus saturatus* Stejneger. II, 23, 1917.
 1♀. *Oriolus chinensis diffusus* Sharpe. VI, 4, 1917.
 (Nanpeisho, Formosa).
 3♂, 6♀, 1♂. *Garrulus glandarius japonicus* T. & S. V, 6, 1923.

Measurements of the specimens from various hosts of Passeres

Hosts	♂				♀							
	Leng. of head mm	Wid. of body mm	L. of head mm	W. of head mm	L. of tho-rax mm	W. of tho-rax mm	L. of body mm	W. of body mm	L. of head mm	W. of head mm	L. of tho-rax mm	W. of tho-rax mm
<i>Garrulus glandarius japonicus</i>	1.50	0.73	0.51	0.51	0.32	0.41	2.00	0.87	0.64	0.64	0.43	0.56
<i>Coccothraustes coccothraustes japonicus</i>							1.75	0.79	0.79	0.55	0.37	0.48
<i>Eophona personata personata</i>	1.40	0.60	0.49	0.49	0.34	0.39	1.92	0.78	0.78	0.55	0.38	0.47
<i>Loxia curvirostra japonica</i>							1.50	0.67	0.67	0.52	0.35	0.42
<i>Fringilla montifringilla</i>	1.30	0.60	0.43	0.42	0.30	0.39	1.45	0.64	0.64	0.49	0.32	0.42
<i>Leucosticte arctoa brunneonucha</i>	1.50	0.67	0.48	0.47	0.34	0.40	1.80	0.87	0.87	0.53	0.36	0.47
<i>Emberiza cioides ciopsis</i>							1.75	0.71	0.71	0.50	0.35	0.46
<i>Emberiza rustica latifascia</i>	1.45	0.60	0.46	0.45	0.30	0.40	1.56	0.71	0.71	0.52	0.35	0.46
<i>Anthus hodgsoni hodgsoni</i>	1.44	0.67	0.48	0.48	0.30	0.42	1.80	0.74	0.74	0.53	0.36	0.45
<i>Terpsiphone atrocaudata</i>							1.44	0.55	0.55	0.58	0.30	0.39
<i>Muscicapula narcissina</i>							1.85	0.79	0.79	0.54	0.37	0.46
<i>Acrocephalus arundinaceus</i>	1.30	0.57	0.45	0.45	0.29	0.36	1.62	0.67	0.67	0.51	0.32	0.42
<i>Pematorhinus ruficollis musicus</i>	1.10	0.40	0.39	0.39	0.26	0.30						
<i>Pranella rubida rubida</i>							1.83	0.76	0.76	0.52	0.35	0.44
<i>Cinclus pallasi hondoensis</i>							1.75	0.67	0.67	0.52	0.35	0.43

Bitrabeclus sp?

1♂ from a Korean crowntit, *Sathora webbiana fulvicauda*, collected at Moppo, Corea,

April 11, 1917.

This is a *Bitrabeclus* of the *subflavescens* G. type, but it differs markedly from type species in the following points:

1. Metathorax much broader; measurement of the male of the present form being 0.47 mm, instead of 0.30-0.42 mm in *subflavescens*.
2. The first abdominal segment much shorter and the lateral margins of it much 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 the 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.

Bitrabeclus excisus (Nitzsch).

Docophorus excisus Nitzsch, in Giebel, 1874, p. 88, Tab. IX, fig. 1, 2, 3; Piaget, 1880, p. 64, pl. IV, fig. 6; Uchida, 1920, p. 637.

1♂, 5♀ taken on an Eastern chimney-swallow, *Hirundo rustica gutturalis* Scopoli; 1♂ in Pref. Nagano; 1♀ taken on a Formosan striated swallow, *Hirundo daurica formosensis* Mayr shot in Formosa, April 5, 1917 and 5♂, 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 *Philoater excisus* on house martin, *Hirundo urbica* and on common swift, *Cypselus cyllinerus*.

I have collected* *Dennyus truncatus* (Olfers), a species of Amblycerous mallophaga from a chimney swallow, *Hirundo rustica gutturalis* and from a white-rumped swift, *Microps pacificus*.

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

In another instance, two species of Hippoboscidae (Diptera). *Crataerina pallipes* (Latreille) and *Stenopteryx hirundinis* (L.), have been recorded in Germany as common 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 or more distinct but closely allied bird species".

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

* Uchida. 1926, Journ. Coll. Agr., Imp. Univ. Tokyo. vol. IX, p. 31.

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

*Bitrabeculus mitsusui** n. sp. (Fig. 7)

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

Measurements:

	♂ mm	♂ mm	♂ mm	♀ mm	♀ mm	♀ mm	♀ mm
Length of body	1.10	1.10	1.05	1.23	1.23	1.38	1.33
Width of body	0.44	0.43	0.43	0.49	0.48	0.56	0.53
Length of head	0.40	0.40	0.39	0.43	0.42	0.46	0.43
Width of head	0.37	0.38	0.38	0.42	0.41	0.44	0.43
Length of thorax	0.28	0.29	0.27	0.26	0.27	0.30	0.27
Width of thorax	0.30	0.30	0.30	0.33	0.32	0.36	0.35

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

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 hair on each side of it; sides slightly concave, two minute marginal hairs and a short hair in front of clypeal suture and two marginal hairs and a prickle in front of tuberculae: first pair of tuberculae well developed, conical, second pairs large, pointed, and downward; antennae medium, first segment largest, second a trifle smaller, and last segment smaller and subequal; eye large, clear, with a hair; temples expanded, slightly 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; tuberculae: occipital band yellowish brown, strongly diverging anteriorly and bending inwardly and separated from antennal bands by a broad space; occipital margin sinuous, middle third convex, with two minute spines on each lateral margins; clypeal suture large, oblong, pointed posteriorly, anterior margin deeply emarginate, slightly concave at sides.

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

*"mitsusui" 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 I-VI with narrow, elongate, yellowish brown, triangular, transverse blotches, acute anteriorly; each one of segments I-VI, bearing three or four pustulated hairs, one on the lateral margin of the blotch, all along the posterior margins of the blotch; and 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 brown 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 small, colourless, deeply emarginated, bearing three short spines at each posterior end.

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

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

Description of the male:—Body, length 1.30 mm, width 0.56 mm; with large head and small abdomen; ground colour of body pale yellowish brown, with clear brown and pink markings on head, thorax and abdomen.

Head conical, length 0.57 mm, width 0.49 mm; front of clypeus narrow, emarginate, clear, with a stiff hair in rounded angles, and extending forward beyond the margin; sides 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 large, 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 three long, pustulated hairs and a prickle; occiput convex; antennal bands dark chestnut brown, distinctly interrupted at the suture; posterior extremities bend inward and back, moderately well defined, diverging, clear brown occipital bands; clypeal signature long, narrow, distinct, anterior margin concave, with a slight lateral constriction near the anterior angles, posterior portion, darker, very long, gradually tapering to a point at margin.

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

* "Kayanobori" means Japanese finch-billed bulbul.

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ax. 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 and angulated posterior margin; posterior angles with three pustulated hairs and a row of seven or eight pustulated hairs on each side; concolourous with head and thorax, with clear blown marginal markings and roughly scattered short hairs.

Abdomen broadly oval, length 0.40 mm, width 0.56 mm: with lateral margins of segments more or less convex and the posterior angles projecting, with one to three hairs in segments II-VII, a row of hairs across the segments I-VII, pustulated along posterior margin of transverse bands; narrow clear brown lateral bands on segment I-VII; yellowish brown transverse bands extending inward about one-third the width of abdomen, narrowing inwardly with a large, round, clear area just within the lateral bands; transverse 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 1.60 mm, width 0.73 mm; head, length 0.62 mm, width 0.54 mm; thorax length 0.38 mm, width 0.49 mm; very similar to male, except the ninth abdominal segment being deeply emarginated.

Bitrabeclus reguli (Denny).

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

1♂ from a Japanese goldcrest, *Regulus regulus japonensis* Blakiston taken in Pref. Nagano (no date).

Bitrabeclus crassipes (Nitzsch).

Docophorus crassipes Nitzsch, in Bürmeister, 1838, p. 425; Denny, 1842, p. 68, pl. III, fig. 6; Giebel, 1874, p. 82, taf. IX, fig. 6; Piaget, 1880, pl. III, fig. 7.

2♂, 1♀, 7♂ were obtained on a Japanese nutcracker, *Nucifraga caryocatactes japonicus* Mart. shot at Higashi-chikumagun, Pref. Nagano, Jan. 26, 1917.

Bitrabeclus picae (Denny).

Docophorus picae Denny, 1842, p. 67, pl. II, fig. 9; *Docophorus subcrassipes* Nitzsch, 1866, p. 51; Piaget, 1880, p. 51, pl. III, fig. 8.

1♂ from a Corean magpie, *Pica pica japonica* Temminck & Schlegel, collected at Torai, Distr. Shonan, Corea, April 6, 1917.

Bitrabeclus corvi (Linnaeus).

Bitrabeclus corvi L., 1758, p. 612; *Docophorus atratus* Denny, 1842, p. 63, pl. IV, fig. 8; Piaget, 1880, p. 44, pl. III, fig. 2.

2♂, 1♀ were collected from a crow (*Corvus leuillanti* or *Corvus corone*?) shot on Shima, Seven Is. of Izu, April 30, 1916.

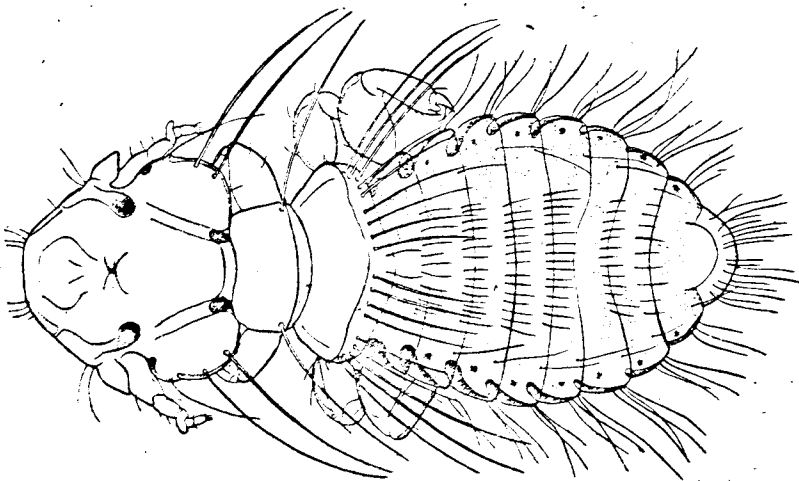


Fig. 1
Strigiphilus fukuro n. sp. ♂, x50

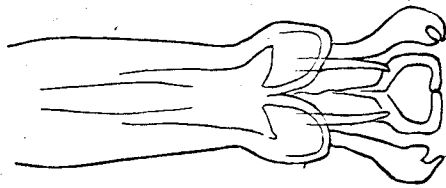


Fig. 2
Genitalia of the male of *Colymbicola*
graminea Kellogg x210.

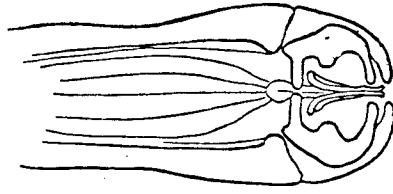


Fig. 3
Genitalia of the male of
Halcyonicola dilatoclypeata
var. *minor* n. var. x210

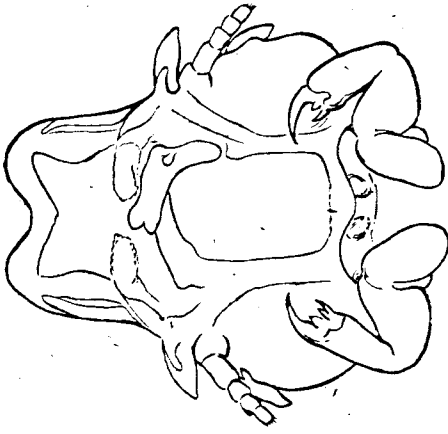


Fig. 6
Ventral aspect of the head of
Tritabeculus goshikidori n. sp. ♂, x67

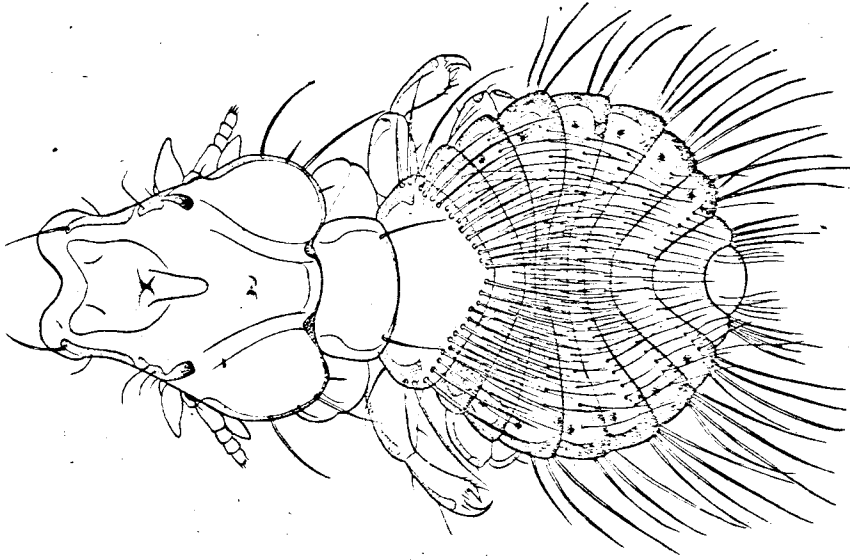


Fig. 5
Tritabeculus goshikidori n. sp. ♂, x50

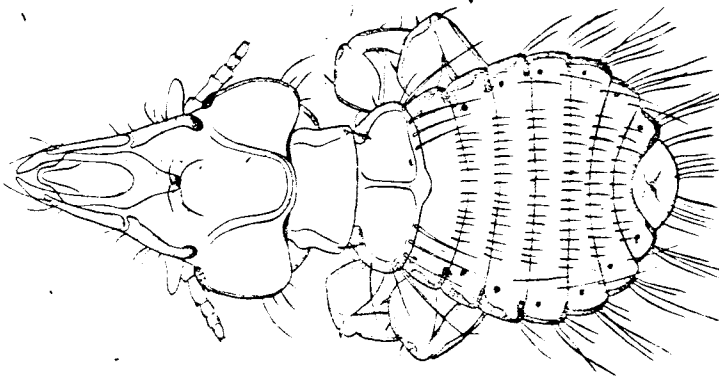


Fig. 4
Echinophiloterus inko n. sp. ♂, x50

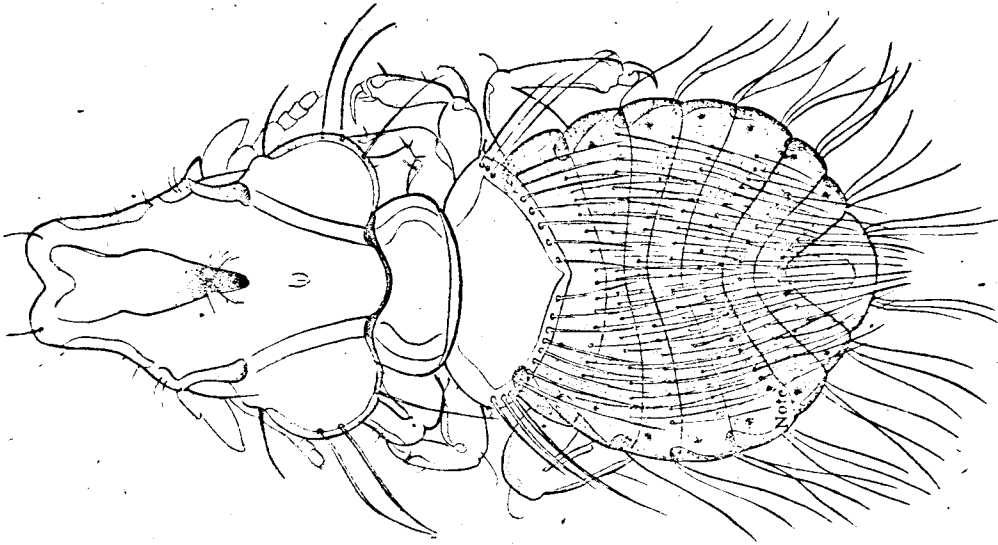


Fig. 8
Bitabeculus longus n. sp. ♂

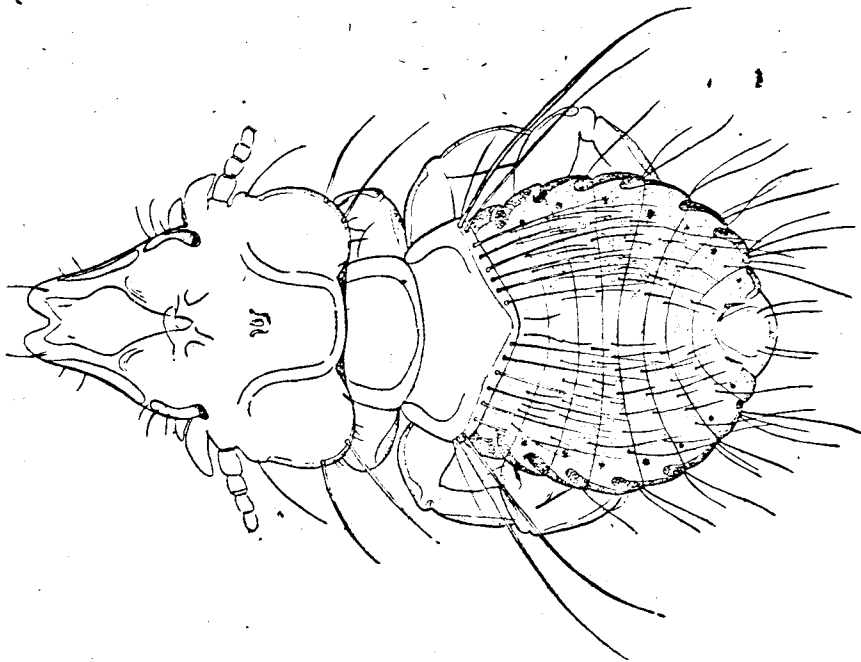


Fig. 7
Bitabeculus misusui n. sp. ♂, x100

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