

# New Species and Records of Mallophaga (Insecta) from Neotropical Owls (Strigiformes)

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ABSTRACT: A comprehensive review of the known species of Mallophaga that parasitize neotropical owls is presented, and the genera presently known to infest owls are briefly characterized. The following new species are described: *Conciella caputonis* (from *Ciccaba virgata*, collected in Dept. Magdalena, Colombia); *C. clamatoris* (from *Rhinopteryx clamator*, Dept. Santander N., Colombia); *C. setosa* (from *Ciccaba nigrolineata*, Dept. Magdalena, Colombia); *C. glaucidaeae* (from *Glaucidium brasilianum*, Veracruz, Mexico); *Kurodaia maculosa* (from *Lophotrix cristata*, Dept. Magdalena, Colombia); *K. stricklandi* (from *Lophotrix cristata*, Dept. Chocó, Colombia); *Strigiphilus elutus* (from *Bubo virginianus*, Dept. Bolivar, Colombia); *S. perspicillatus* (from *Pulsatrix perspicillatus*, Dept. Magdalena, Colombia); *S. crucigerus* (from *Otus choliba*, Dept. Santander N., Colombia); *S. lophotrix* (from *Lophotrix cristata*, Dept. Magdalena, Colombia); *S. minimus* (from *Otus minimus*, Rio Coroica, Bolivia); *S. heterurus* (from *Rhinopteryx clamator*, Rio Beni, Bolivia); *S. microgenitalis* (from *Glaucidium brasilianum*, Veracruz, Mexico); *S. jardini* (from *Glaucidium jardini*, Dept. Nariño, Colombia); and *S. chilensis* (from *Bubo virginianus*, Santiago, Chile). New subspecies described of *Strigiphilus speotyti* are: *S. s. altiplanus* (from the altiplano of Peru), *S. s. desertae* (from Dept. Libertad, Peru), and *S. s. magdalenae* (from Dept. Magdalena, Colombia). Genitalia of all new forms of which males were taken, and genitalia of known species of special interest are illustrated.

## INTRODUCTION

The Strigiformes are parasitized by one genus of Philopteridae (*Strigiphilus*) and two of Menoponidae (*Conciella* and *Kurodaia*). The Philopteridae are most abundant and easily recognized, whereas *Conciella* and *Kurodaia* are less abundant and not always easy to separate generally. *Conciella* is encountered more often than *Kurodaia*, and is also found on the Falconiformes.

In this paper, illustrations are represented most of the known species of Mallophaga parasitizing owls, so that ample material has been available for comparison with the new forms described.

It seems probable that in the past, too much generic significance has been placed on certain chaetotaxy and other unimportant morphological features. Examination of many specimens suggests that these characters are specific rather than generic. In separating species, not enough attention has been given to comparative size and shape of head and thoracic segments, and their very minute internal

<sup>1</sup>This paper is published posthumously, the uncorrected typescript having been found among the effects of the late Mr. Carriker. Dr. K. C. Emerson made final corrections on the typescript so that the descriptions and drawings as prepared by Mr. Carriker could be published.

structure, and lastly to the size, shape and chaetotaxy of the legs.

In this review, special emphasis has been placed on the morphology of the male genitalia, which is now recognized by entomologists to be of utmost taxonomic value.

It has not seemed necessary to give long and detailed specific descriptions, relying more on the accurately drawn figures of the whole insect, the male genitalia, or of any other morphological characters of specific importance.

Measurements have been made in the following manner. The length and width of the head, at the temples (unless otherwise stated); and width of frons (in *Strigiphilus*) from tip to tip of the marginal carinae. In the Menoponidae, the distance across the anterior portion of the head in front of the ocular slit, or notch, is given. Thoracic lengths are the entire segments (not the exposed portion), and the same criteria are used for the abdominal segments.

All measurements are in millimeters and decimals thereof.

### Genus *Conciella* Eichler, 1949

Boll. Soc. Ent. Ital., 79: p. 11. (Type species: *Colpocephalum painei* McGregor.)

Small to minute Menoponidae found only on the Strigiformes. I have seen no specimens of *C. painei*, but the author's figure and description are adequate for diagnosis and comparison with other genera.

The genus *Conciella* differs from *Kurodaia* in having the temples, usually, much more expanded laterally and posteriorly; the occiput is more deeply concave; larger, roughly rounded or oval, black ocular blotches, while those of the frons and occiput are obsolete or wanting, and with no trace of the deeply pigmented carina connecting the occipital nodi. Gular plate well developed and with marginal setae coarser and more abundant; antennae larger, with distal segment mostly exposed. The most striking and easily recognized character is the manner of attachment of the prothorax with the head, the attachment being far forward of the occipital margin, whereas in *Kurodaia* this attachment is at, or very close to, the occipital margin. I have never found *Conciella* and *Kurodaia* on the same host, but have taken each with *Strigiphilus*.

A feature not previously noted by authors is the type of movable sclerite within the male genitalia, which, without exception, is very different from that of *Colpocephalum*. This feature is not found in the species of Menoponidae from Raptores which were formerly included in *Kurodaia*.

### *Conciella painei* (McGregor, 1912)

*Colpocephalum painei*, Ent. News, 23: p. 305, fig. 1. Host: *Otus asio macalli* (Cassin).

I have not seen specimens of this species, but the original description and figure are ample for its recognition. Unfortunately we know

nothing regarding the male genitalia, although the type was a male.

The head is very large, its width almost equal to that of the abdomen, with occipital margin very deeply concave and circular; ocular blotches unusually large; the thoracic segments are very wide, but unusually short; legs slender, with black marginal carinae.

Length, 1.30; head, .30 x .53; entire thorax, .25 x .52; abdomen, .75 x .57. The holotype was deposited in the Leland Stanford University, but it could not be found by the author when he worked on the collection in 1956.

*Conciella brachysoma* (Kellogg and Chapman, 1902)

*Colpocephalum brachysomum*, Jour. N. Y. Ent. Soc., 10: p. 162, pl. 14, fig. 3. Host: *Asio flammeus sandwichensis* (Bloxham).

*Colpocephalum discrepans* Kellogg and Chapman, *idem*: p. 164, pl. 15, fig. 1. Host: *Asio flammeus sandwichensis* (Bloxham).

The host of this parasite is the only owl found in Hawaii. The two species described (see synonymy above) are the two sexes of the same parasite. The description and figure of *C. brachysomum* apply to the male, and those of *C. discrepans* to the female.

Unfortunately Kellogg's description gives the length of *C. discrepans* as 1 mm and the width as 1 mm, obvious errors. It is quite possible the female, described as *C. brachysomum*, is a last stage nymph, and that the figure is of the male. The males and females of these species are easily distinguished by the chaetotaxy of the distal segment of the abdomen. I have not collected this species in South America.

*Conciella crassiceps* (Piaget, 1885)

Fig. 7

*Colpocephalum crassiceps*, Pediculines Suppl.: p. 92, pl. 10, fig. 1. Host: *Pulsatrix frontata* Latham.

In the author's collection are 3 ♂♂ and 25 ♀♀ from the type host, collected at Camperucho, Dept. Magdalena, Colombia. The descriptions and figures of Piaget are entirely correct. However, a figure of the male genitalia, which is characteristic of the genus, is not presented here.

*Conciella subpachygaster* (Piaget, 1880)

Fig. 8

*Colpocephalum subpachygaster*, Pediculines: p. 517; pl. 43, fig. 2. Host: *Tyto alba* (Scopoli).

In the author's collection are 1 ♂ and 1 ♀ from the type host, from England; 1 ♂ and 1 ♀ from *Tyto alba subandeanus* L. Kelso, from El Difícil, Dept. Magdalena, Colombia; and 2 ♀♀ from the same host, taken at La Tigrera, Dept. Magdalena, Colombia.

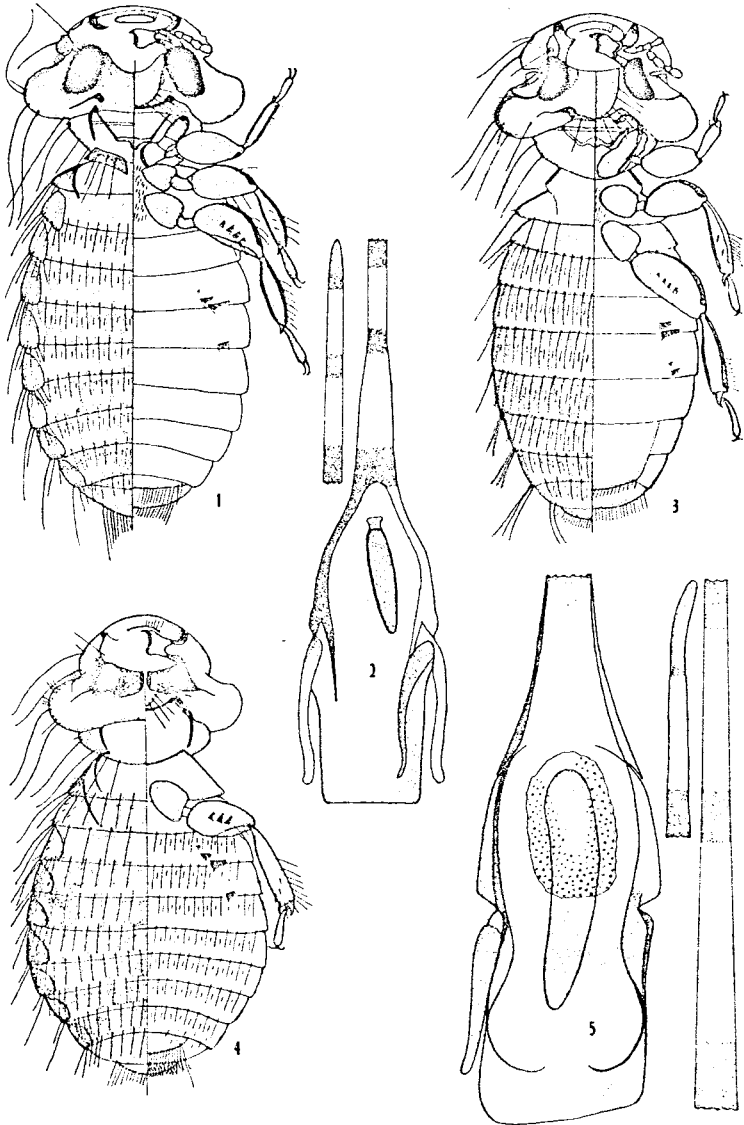
This species is a typical *Conciella*. A figure of the male genitalia is presented.

There are some slight differences between the specimens from England and those from Colombia, but they are not of nomenclatural value.

*Conciella caputonis*, n. sp.

Figs. 1, 2

Holotype ♀, allotype ♂, and 19 paratypes from *Ciccaba virgata* (Cassin), collected at La Tigrera, Dept. Magdalena, Colombia, 9 May 1913. (Type No. 743 in the author's collection.)



Figs. 1-5.—Genus *Conciella*. 1.—*C. caputonis*, n. sp., body of female. 2.—Same, male genitalia. 3.—*C. clamator*, n. sp., body of female. 4.—*C. setosa*, n. sp., body of female. 5.—Same, male genitalia.

*Diagnosis.* The head resembles that of *C. crassiceps* with one exception; the gular plate is much longer in *crassiceps*, extending considerably beyond the occipital margin, even beyond the transverse hyaline line of the prothorax. The thoracic segments, especially the meso- and metathorax, are shorter.

The male genitalia are of the same type, but the parameres are much longer and thicker in *C. caputonis*; whereas those of *C. crassiceps* are minute, very slender and pointed. The movable sclerite, within the endomeral sac, is similar in shape, but much larger.

*Measurements:*

	Male		Female	
	Length	Width	Length	Width
Body	1.48	.....	1.74	.....
Frons	.....	0.52	.....	0.542
Temples	0.375	0.76	0.40	0.78
Occiput	0.347	.....	0.37	.....
Prothorax	0.25	0.43	0.24	0.467
Pterothorax	0.14	0.54	0.155	0.575
Abdomen	0.87	0.76	1.02	0.76
Basal plate	0.51	0.11	.....	.....
Parameres	0.12	0.015	.....	.....
Endomeral sac	0.13	0.10	.....	.....

*Conciella clamatori*, n. sp.

Fig. 3

Holotype ♀ from *Rhinoptynx clamator* (Vicillot), collected at Petrolea, Dept. Santander N., Colombia, 22 July 1943. (Type No. 744 in the author's collection.)

*Diagnosis.*—Head narrower at frons and shorter than in *C. caputonis*; prothorax and pterothorax longer and narrower; abdomen shorter and much narrower. (See table of measurements.)

In *C. caputonis* the ocular slit is obsolete, but it is long and sharply outlined in *C. clamatori*. The whole preocular portion of the head differs radically in shape; the ocular blotches are smaller, more sharply defined, and of distinct shape. There are well-pronounced pleurites in *C. caputonis*, whereas in *C. clamatori* they are invisible. There is a slight thickening of the lateral margins of the paratergites. The combs of setae on the third femora and certain sternites are smaller and finer.

The abdominal chaetotaxy as shown is somewhat of a composite of the dorsal and ventral chaetotaxy, and it is similar to that of the other species of the genus figured. The composite was drawn this way because the type is in poor condition and many setae are missing.

Measurements:	Female	
	Length	Width
Body	1.75	.....
Frons	.....	0.53
Temples	0.40	0.65
Occiput	0.37	.....
Prothorax	0.26	0.43
Pterothorax	0.22	0.54
Abdomen	1.02	0.695

### *Conciella setosa*, n. sp.

Figs. 4, 5

Holotype ♀, allotype ♂, and one paratype from *Ciccaba nigrolineata* Sclater, collected at San Alberto, Dept. Magdalena, Colombia, 10 April 1961. (Type No. 745 in author's collection.)

*Diagnosis*.—Similar to *C. subpachygaster* in structure of head, but the ocular blotches are smaller and the prothorax does not extend as far beneath the head; the mandibles are wider; the temples are wider longitudinally, and the occiput more deeply concave. There is no visible ocular slit or notch (Fig. 4), and the eye is obsolete. The types are in poor condition and the first pair of legs could not be figured. Abdominal chaetotaxy figured is similar to that of *C. subpachygaster*; but the fringes of setae at tip of abdomen are longer, especially the anterior one, on margin of last sternite. Pleurites are so closely fused with the tergites that the point of fusion is invisible, except under high magnification, and both are identical in pigmentation.

Measurements:	Male		Female	
	Length	Width	Length	Width
Body	1.39	.....	1.56	.....
Frons	.....	0.447	.....	0.46
Temples	0.39	0.64	0.40	0.673
Occiput	0.36	.....	0.367	.....
Prothorax	0.26	0.395	0.25	0.447
Pterothorax	0.26	0.52	0.19	0.55
Abdomen	0.71	0.71	0.93	0.846
Basal plate	0.55	0.095	.....	.....
Parameres	0.07	0.013	.....	.....
Endomeral sac	0.098	0.08	.....	.....

### *Conciella glaucidia*, n. sp.

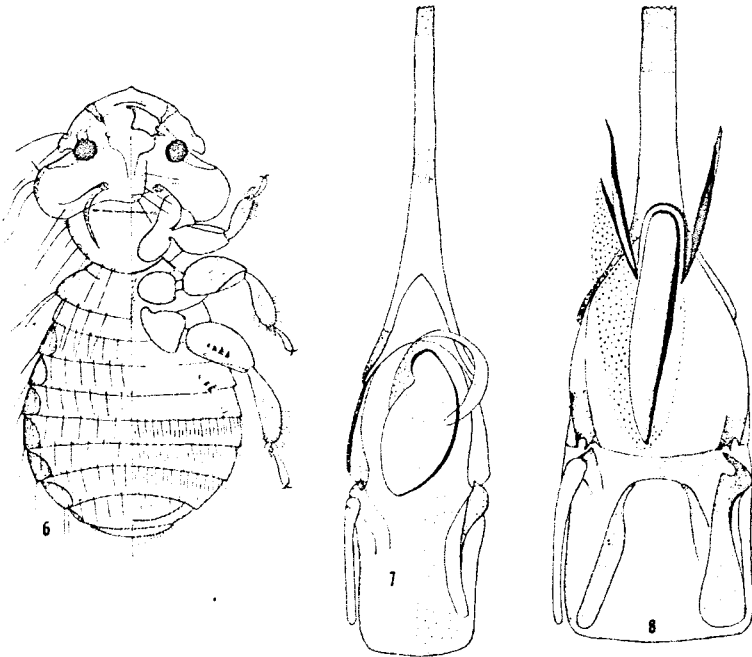
Fig. 6

Holotype ♀ from *Glaucidium brasilianum ridgwayi* Sharpe, collected at Tres Zapotes, Veracruz, Mexico, 12 March 1940. (Type No. 746 in author's collection.)

*Diagnosis.*—This species resembles a *Kurodaia*, but there are several characters which are clearly those of *Conciella*, viz.: the prominent, round, ocular blotches, while smaller than in most species of *Conciella*, are characteristic of that genus, taken with the absence of occipital blotches and their connecting carina; the long ocular slit and the prothorax, with its manner of attachment with the head. The pleurites and tergites are very closely fused, as in the preceding species, and of the same pigmentation. Much smaller than the four preceding. The ocular blotches are round and smaller than usual for the genus, and there are no dark marginal carinae on the legs. The species is not a typical *Conciella*, being somewhat intermediate between that genus and *Kurodaia*, but closer to the former.

*Measurements:*

	Female	
	Length	Width
Body	1.38	.....
Frons	.....	0.49
Temples	0.40	0.65
Occiput	0.37	.....
Prothorax	0.195	0.42
Pterothorax	0.18	0.52
Abdomen	0.76	0.74



Figs. 6-8.—Genus *Conciella*. 6. *C. glaucidia*, n. sp., body of female. 7.—*C. crassiceps* (Piaget), male genitalia. 8.—*C. subpachygaster* (Piaget), male genitalia.

Genus *Kurodaia* Uchida, 1926

Japan Coll. Agri. Tokyo, 9: p. 50. (Type species: *Colpocephalum haliacti* Denny.)

Menoponidae parasitic on Falconiformes and Strigiformes. The type species of the genus differs in certain morphological features from most of the species which are included in the genus. In the female of *K. haliacti*, the genital sternite terminates posteriorly in a small lobe on each side. This feature has been given special generic significance by certain workers and it is found in several other known species of *Kurodaia* from the Falconiformes; but in none of them is it quite so prominent as in *K. haliacti*. This sclerite varies considerably in shape in other genera, therefore it should not be considered a generic character. Some workers would restrict the genus *Kurodaia* to the few species possessing these sternal lobes; I do not agree.

Opinion varies as to the presence of *Kurodaia* on the owls, and at one time I held the opinion that the genus was confined to the Falconiformes. However, there are certain species parasitic on owls which, although seemingly not typical of that genus, are nearer to *Kurodaia* than to *Conciella*. I have, therefore, placed such species, at least provisionally, in *Kurodaia*.

*Kurodaia pectinata* (Osborn, 1902)

Figs. 10, 11, 12

*Colpocephalum pectinatum*, Ohio Naturalist, 2: p. 201, pl. 14, fig. 2. Host: *Speotyto cunicularia hypugaea* (Bonaparte).

*Conciella pectinata neotropicalis* Carriker, 1963, Mem. Soc. Cien. Nat. LaSalle, 23: p. 16, pl. 2, fig. 1. Host: *Speotyto cunicularia tolimae* Stone.

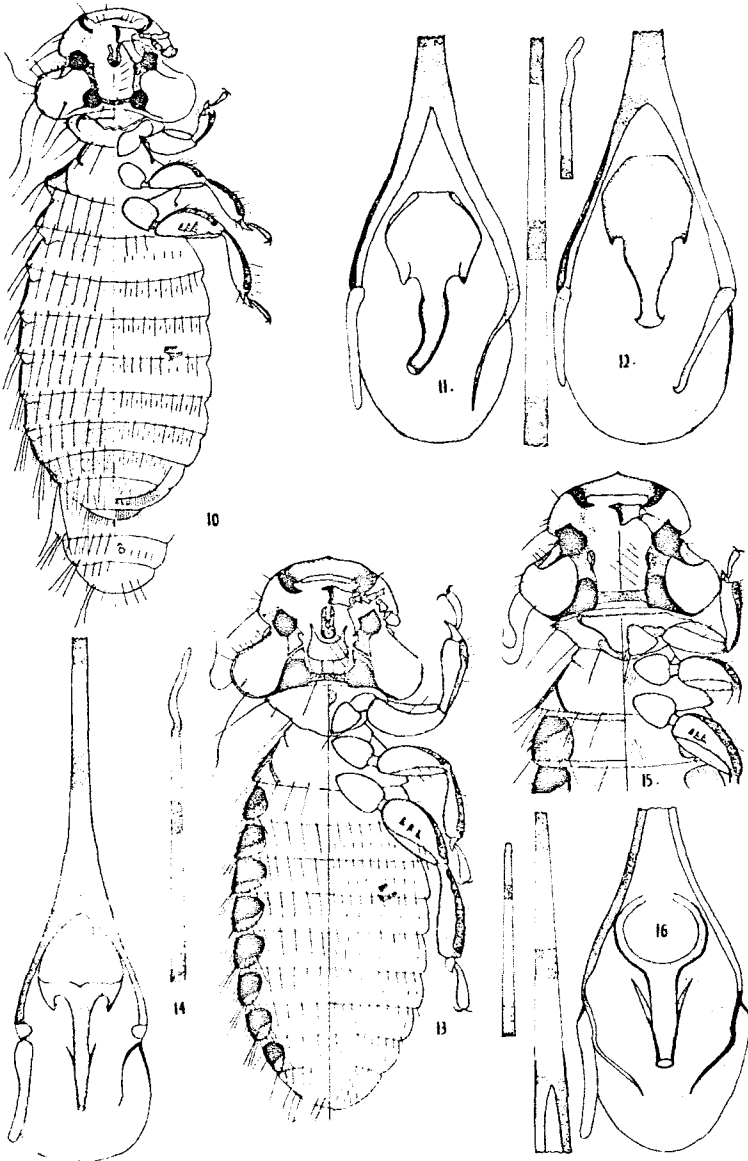
In the author's collection are syntypes of *K. pectinata* collected at Lincoln, Nebraska, by Prof. Lawrence Bruner. These have been compared with:

- 1 ♀ from *S.c. brachyptera* (Richmond) (Margarita Id. Venezuela).
- 2 ♂♂ and 6 ♀♀ from *S.c. tolimae* Stone (Casacará, Magdalena, Colombia).
- 4 ♂♂ and 6 ♀♀ from *S.c. juninensis* Berlepsch (Lake Junin and Santa Lucia, Peru).
- 1 ♂ and 5 ♀♀ from *S.c. nannodes* Stolzmann (three localities on Peruvian coast).

This material has been very carefully compared with the syntypes of *K. pectinata* (Osborn), as to measurements and all other morphological characters. Differences in measurements easily fall within the range of individual variation. The shape and proportions of the various body segments and sclerites cannot be differentiated. The male genitalia are practically the same (Figs. 9, 10).<sup>2</sup>

<sup>2</sup> Ed. Note: No "Figure 9" accompanied the manuscript; we believe the author refers here to the figures numbered 11 and 12.





Figs. 10-16.—Genus *Kurodaia*. 10.—*K. pectinata* (Osborn), body of female and tip of abdomen of male. 11.—Same, male genitalia of syntype. 12.—Same, male genitalia of specimen, probably from Lake Junin.<sup>4</sup> 13.—*K. maculosa*, n. sp., body of female. 14. Same, male genitalia. 15.—*K. stricklandi*, n. sp., head, thorax and abdominal segments I and II of male. 16.—Same, male genitalia.

Measurements:	Male		Female	
	Length	Width	Length	Width
Body	1.48	.....	1.81	.....
Frons	.....	0.38	.....	0.41
Temples	0.365	0.52	0.376	0.57
Occiput	0.347	.....	0.347	.....
Prothorax	0.174	0.31	0.195	0.358
Pterothorax	0.17	0.423	0.205	0.50
Abdomen	0.91	0.564	1.16	0.705

### *Kurodaia maculosa*, n. sp.

Figs. 13, 14

Holotype ♂ from *Lophotrix cristata wedelli* Griscom, collected at San Alberto, Magdalena, Colombia, 10 April 1961. (Type No. 747 in author's collection.)

*Diagnosis*.—A very striking and easily recognized species, due to the intensely black frontal, ocular and occipital blotches of the head and of the pleurites, which are also largely black (Fig. 13). The gular plate is unusual, also the small coxa and large trochanter of the first pair of legs. Chaetotaxy shown in Fig. 13 is typical of the genus; excepting the ocular fringe of setae, which consists of a few long hairs and a dense row of very fine and very short submarginal setae along the anterior margin of the temples; eyes prominent; antennae very small and legs long, all femora with pronounced slots along inner side for receiving the folded tibiae.

Measurements:	Male	
	Length	Width
Body	1.26	.....
Frons	.....	0.33
Temples	0.31	0.456
Occiput	0.295	.....
Prothorax	0.12	0.285
Pterothorax	0.14	0.37
Abdomen	0.705	0.456

### *Kurodaia stricklandi*, n. sp.

Figs. 15, 16

Holotype ♂ from *Lophotrix cristata stricklandi* Sclater & Salvin, collected at Nuquí, Dept. Chocó, Colombia, 21 February 1951. (Type No. 748 in author's collection.)

*Diagnosis*.—If there had been but one specimen of this striking species I should have been doubtful of the correctness of its host, but

<sup>3</sup> There was no Figure 9 with the manuscript, and we have felt it preferable not to renumber any figures. Therefore, Fig. 9 is omitted.

<sup>4</sup> The author's original caption for this figure suggests that he intended it to illustrate the type specimen of a new subspecies. His appellation "juninensis" implies that it was from Lake Junin. Since there is no corresponding indication in the text, we have felt it best to alter this caption, deleting the new name.

since a similar species was taken on the western race of *Lophotrix cristata*, it must be admitted that their hosts are correct.

This species is larger than *K. maculosa* in all of its measurements; the head is differently shaped; the ocular fringe of setae distinct; the peculiar gular plate of *K. maculosa* is entirely wanting, the entire gular area being completely hyaline; the black area of the pleurites is considerably reduced, and the pleurites are larger.

The genitalia of both *K. maculosa* and *stricklandi* are unusual, especially the movable sclerite; although both are of the same type, there are differences between them (see Figs. 14, 16).

#### Measurements:

	Male	
	Length	Width
Body	1.39	.....
Frons	.....	0.35
Temples	0.33	0.48
Occiput	0.303	.....
Prothorax	0.13	0.322
Pterothorax	0.185	0.423
Abdomen	0.857	0.488

#### Genus *Strigiphilus* Mjöberg, 1910

Ark. Zool., 6: p. 132. (Type species: *Docophorus heterocerus* Nitzsch.)  
*Eustrigiphilus* Ewing, 1926, Proc. Ent. Soc. Wash., 28: p. 148. (Type species: *Docophorus ceblebrachys* Nitzsch.)

*Tytoniella* Eichler, 1949, Boll., Soc. Ent. Ital., 79: p. 13. (Type species: *Docophorus rostratus* Nitzsch.)

Only one genus of Philopteridae is parasitic on the owls. The two genera placed in synonymy will be commented upon below. This is a large genus, probably present on all species of the Strigiformes; some are very closely related, although separable. In addition to the new species described below, the other species in the author's collection have been studied and compared with them during the preparation of this paper.

#### *Strigiphilus rostratus* (Burmeister, 1838)

*Docophorus rostratus*, Handb. Ent., 2: p. 427. Host: *Tyto alba* (Scopoli).

In the author's collection are 1 ♂ and 3 ♀♀ from the type host, collected in England, and 1 ♂ from *Tyto alba pratincola* (Bonaparte), from Landisburg, Pennsylvania. The latter male is not in suitable condition for comparison with European specimens, but the head seems to be more slender anterior to the clavi, while the anterior plate extends further forward, beyond the tips of the lateral carinae. The genitalia of this species are totally distinct from those of all other species of *Strigiphilus* that I have seen, so that actually Eichler had some very good grounds for the erection of the genus *Tytoniella* for its reception. Without more American material, I am not prepared to say whether or not the American population differs subspecifically

from the European. To date, I have not taken the species in South America.

*Strigiphilus ceblybrachys* (Denny, 1842)

*Docophorus ceblybrachys*, Mon. Anopl. Brit., pp. 45 and 92, pl. 1, fig. 3. Host: *Nyctea scandiaca* (Linné).

In the author's collection are 1 ♂ and 4 ♀♀ from a bird in the Washington Zoo. Although this is a most aberrant species, I believe that it should remain in *Strigiphilus*. The differences in the head structure are more apparent than real. That portion of the head anterior to the clavi has been greatly shortened. All of the carinae and the anterior plate are typical of *Strigiphilus*, except that they are much shortened. The male genitalia are quite the same as the other known species of *Strigiphilus*. There are certainly more grounds for recognizing *Tytoniella* Eichler, than *Eustrigiphilus* Ewing. This species is not found on neotropical hosts. However it has much in common with some species which are found in South America.

*Strigiphilus cursor* (Burmeister, 1838)

*Docophorus cursor*, Handb. Ent., 2: p. 426. Host: *Asio f. flammeus* (Pontopidan).

In the author's collection are 2 ♂♂ and 2 ♀♀ from the type host, collected in India, and 1 ♂ and 1 ♀ from same host taken at Lincoln, Nebr. I have not collected this species in South America.

The species resembles *S. speotyti*, but the shape of the head differs, as well as the pleurites and tergites. There are apparently no appreciable differences between the Indian and American specimens.

*Strigiphilus varius* Carriker, 1958

*Strigiphilus varius*, Proc. Ent. Soc. Wash., 60: 169, figs. 3 and 4. Host: *Strix varia* Barton.

This species was fully described and figured in the original description and needs no additional remarks.

*Strigiphilus viridicus* Carriker, 1954

Florida Entomologist, 37: p. 195, figs. 13, 14, and 15. Host: *Ciccaba virgata centralis* Griseom.

This species was fully described and illustrated in the original description.

*Strigiphilus otus* Emerson, 1955

Fig. 35

*Strigiphilus otus*, Proc. Ent. Soc. Wash., 57: p. 241, figs. 1 and 2. Host: *Otus asio gilmani* Swarth.

In the author's collection are 1 ♀ paratype and a pair from *Otus asio* (Linné), collected in Indiana.

The female paratype is in very poor condition for comparative purposes (cleared too much), but it does not seem to be subspecifically distinct from the Indiana pair. My experience with *S. speotyti*, from

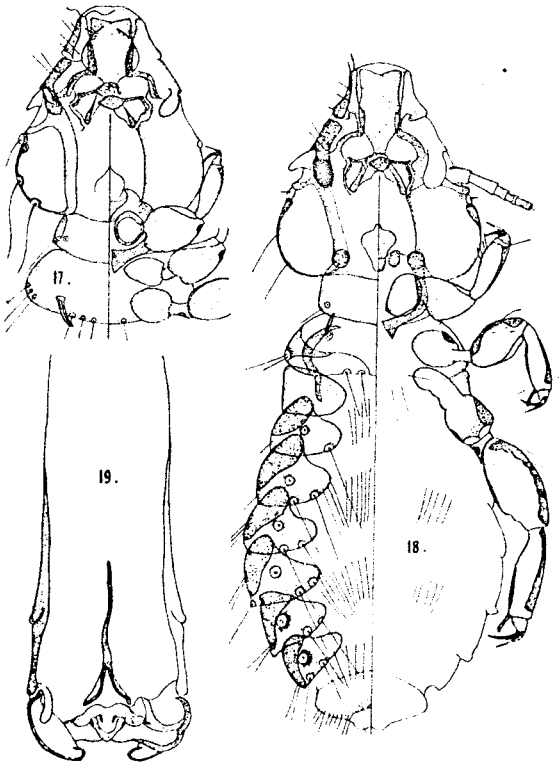
Peru, leads me to believe that different subspecies of a host may be parasitized by distinct subspecies of Mallophaga, providing that the subspecies is a well-defined one. It is, therefore, not always well to lump parasites from a number of hosts, subspecifically distinct.

*Strigiphilus acutifrons* Emerson, 1961

Fig. 17

*Strigiphilus acutifrons*, Proc. Biol. Soc. Wash., 74: p. 187, fig. 1. Host: *Bubo virginianus* (Gmelin).

In the author's collection are 3 ♀♀ collected at Lincoln, Nebraska. I agree with Emerson's statement that *S. bubonis* (Osborn) is a synonym of *S. oculatus* (Rudow), and that my specimens are *S. acutifrons*. I herewith present a figure (Fig. 17) of the head and thorax of a female to facilitate comparison with closely related species or subspecies.



Figs. 17-19.—Genus *Strigiphilus*. 17.—*S. acutifrons* Emerson, head and thorax of female. 18.—*S. elutus*, n. sp., body of female. 19.— Same, male genitalia.

*Strigiphilus elutus*, n. sp.

Figs. 18, 19

Holotype ♀, allotype ♂ and 23 paratypes from *Bubo virginianus elutus* Todd, collected at La Raya, Dept. of Bolivar, Colombia, 22 January 1948. (Type No. 749 in author's collection.)

*Diagnosis.*—The female is larger in some measurements than the female of *S. acutifrons*, excepting the width at the frons, which is slightly less (.225 against .239). The head is particularly wider at the temples and narrower at the clypeal suture; the anterior plate is much longer, narrower, and of a decidedly different shape (Fig. 18). The posterior end of the preantennary carinae is wider and intensely black, quite distinct from that of *S. acutifrons*; in *S. elutus* there is a circular nodus at the posterior end of the occipital carinae, to which is also attached the lateral, submarginal carinae of the prothorax.

This circular nodus is absent in *S. acutifrons*, but is present in all neotropical species of the genus that I have seen.

In *S. acutifrons* the abdominal pleurites, at least dorsally, are reduced to a very narrow, marginal sclerite, with a faint indication of a wider, ventral portion. In *S. elutus* the pleurites are large, closely fused with the tergites, with large re-entrant heads and with a striated surface (the latter not shown in the figure).

I wish to note here a peculiar structure of the claws, which is present in all species of this genus which I have examined. There is a thickened, spinelike rod attached near the end, on the inside of tibiae 2 and 3, which extends forward to a point between the two curving claws, thus enabling the parasite to grasp tightly a barbule of the feathers. The tip of this rod is rounded in some species, pointed in others.

Not having seen a male of *S. acutifrons*, I am unable to state whether or not the genitalia differ between the two species.

I also have 1 ♂ and 5 ♀♀ from another individual of the type host, collected at Casacará, Dept. Magdalena, Colombia, which are not designated paratypes.

*Measurements:*

	Female	
	Length	Width
Body	2.35	.....
Frons	.....	0.225
Temples	0.79	0.74
Occiput	0.79	.....
Prothorax	0.347	0.434
Pterothorax	0.237	0.68
Abdomen	1.28	0.95

*Strigiphilus perspicillatus*, n. sp.

Figs. 20, 21

Holotype ♀, allotype ♂, and 10 paratypes from *Pulsatrix perspicillatus* (Latham) collected at Camperucho, Dept. Magdalena, Colombia, 7 July 1948. (Type No. 750 in author's collection.)

*Diagnosis.* Differs from *S. elutus* in having narrower head at

temples and at base of clavi; anterior plate similar in shape to that of *S. clutus*, but wider, especially in median portion; nodi on occipital margin smaller; the small sclerites at sides of gular plate different.

All of the body measurements are greater than in *S. acutifrons*, except those of the pterothorax, and abdomen, which are less. The pleurites differ somewhat in shape from those of *S. clutus*, and are less deeply pigmented, being paler than the adjoining tergites. The male genitalia are very distinct from those of *S. clutus*, both in parameres and the endomeral sclerites.

Measurements:	Male		Female	
	Length	Width	Length	Width
Body	2.02	.....	2.41	.....
Frons	.....	0.217	.....	0.24
Temples	0.74	0.66	0.77	0.695
Prothorax	0.28	0.40	0.36	0.44
Pterothorax	0.24	0.59	0.25	0.65
Abdomen	1.05	0.74	1.30	0.90
Basal plate	0.30	0.14	.....	.....
Parameres	0.082	0.13	.....	.....

### *Strigiphilus crucigerus*, n. sp.

Figs. 22, 23

Holotype ♀, allotype ♂, and 4 paratypes, from *Otus choliba crucigerus* (Spix), collected at Hacienda Villa Felisa, Santander N., Colombia, 18 October 1947. (Type No. 751 in author's collection.)

*Diagnosis*.—A rather large species for the size of the host. The head resembles that of *S. perspicillatus* in shape, but is smaller and narrower at the temples; the frons is wide and the anterior plate large, of a distinct pattern (Fig. 22); the preantennary carinae are wide and strongly pigmented, ending in a rounded, black nodus; occipital carinae rather narrow, rather faintly pigmented, and with occipital nodi brown, not black.

Prothorax quadrangular, with sides parallel and concave (very unusual). Abdominal sclerites typical; legs with wide marginal carinae and only first femora with slot to receive folded tibia.

Male genitalia resemble those of *S. otus*, especially the basal plate, but parameres and endomera differ. I also have 7 ♂♂ and 1 ♀ from another individual of the type host, collected at Las Vegas, Santander, Colombia above Bucaramanga, 26 September 1943.

Measurements:	Male		Female	
	Length	Width	Length	Width
Body	1.95	.....	2.22	.....
Frons	.....	0.217	.....	0.217
Temples	0.65	0.61	0.675	0.64
Prothorax	0.25	0.37	0.27	0.393
Pterothorax	0.217	0.555	0.24	0.60
Abdomen	1.08	0.78	1.21	0.80
Basal plate	0.26	0.13	.....	.....
Parameres	0.082	0.112	.....	.....

**Strigiphilus lophostrix**, n. sp.

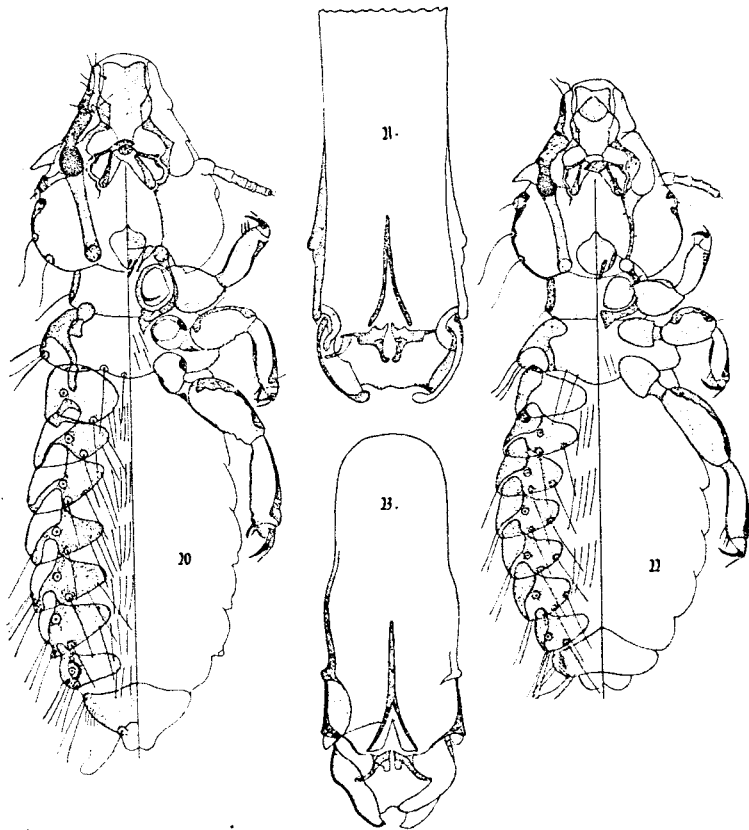
Figs. 24, 25

Holotype ♀ and allotype ♂ from *Lophostrix cristata wedeli* Griscom, collected at San Alberto, Dept. Magdalena, Colombia, 10 April 1961. (Type No. 752 in author's collection.)

*Diagnosis.*—Shape of head resembles that of *S. cursor*, also *S. viridicus*, but the preantennary portion is longer and lateral margins constricted at the clypeal signature, so that the head is not a truncated cone as in *S. viridicus* and *cursor*.

The entire insect, as well as the head, is much smaller in both sexes; the preantennary carinae differ decidedly in shape; the clavi are more pointed; the anterior plate is longer, reaching considerably posterior to the mandibles. Much of the abdominal chaetotaxy is obscured by foreign matter, but it is similar to that of *S. viridicus*.

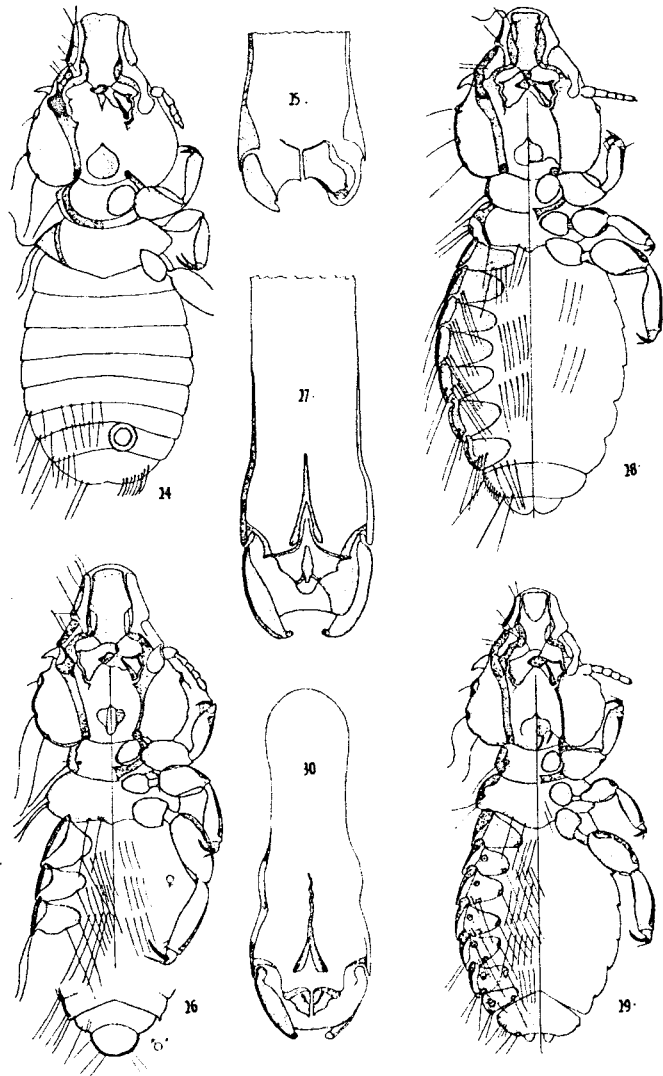
The prothorax is very differently shaped, being widest at the



Figs. 20-23. Genus *Strigiphilus*. 20. —*S. perspicillatus*, n. sp., body of female. 21. —Same, male genitalia. 22. —*S. crucigerus*, n. sp., body of female. 23. —Same, male genitalia.



bluntly rounded lateral angles, close to the occipital margin, and thence curving uniformly backwards. In *S. viridicus* the lateral margins are almost straight, but slightly divergent; pterothorax much wider than abdominal segment I, with lateral angles decidedly more



Figs. 24-30. Genus *Strigiphilus*. 24.—*S. lophostrix*, n. sp., body of female (abdomen incomplete). 25.—Same, male genitalia. 26.—*S. minimus*, n. sp., head, thorax and abdominal segments, I-III of female; tip of abdomen of male. 27.—Same, male genitalia. 28.—*S. heterurus*, n. sp., body of female. 29.—*S. microgenitalis*, n. sp., body of female. 30.—Same, male genitalia.

pointed. There is a curving, submarginal row of eight curving, stiff setae on each side of posterior portion of abdominal segment VIII, not present in either *S. viridicus* or *cursor*.

The types are not in a condition to properly illustrate the abdominal sclerites, but the pleurites seem to be wider than in *S. viridicus*.

The male differs little from the female in size, but the head is proportionately wider at the temples. The genitalia are typical of the genus, but the endomera differs from that of *S. viridicus*.

Measurements:	Male		Female	
	Length	Width	Length	Width
Body	1.58	.....	1.67	.....
Frons	.....	0.20	.....	0.195
Temples	0.59	0.53	0.65	0.553
Prothorax	0.14	0.33	0.14	0.35
Pterothorax	0.15	0.456	0.17	0.50
Abdomen	0.80	0.56	0.90	0.65
Basal plate	.....	0.112	.....	.....
Parameres	0.05	0.026	.....	.....

### *Strigiphilus minimus*, n. sp.

Figs. 26, 27

Holotype ♀, allotype ♂, and 7 paratypes from *Otus minimus* (Carriker), collected at Sta. Ana, Rio Coroica, Bolivia, 9 August 1934. (Type No. 753 in author's collection.)

*Diagnosis*.—Much smaller than *S. crucigerus*, and differing strongly in many ways. Head narrower and more converging in clypeal area; preantennary carinae narrow and nodi brown, with a near-hyaline area in anterior portion; anterior plate long and narrow, and but slightly expanded laterally; gular sclerite small, with paler median portion; occipital nodi small and brown in color.

Prothorax small, with straight, divergent sides and flatly circular posterior margin; pterothorax short, with undulating, transverse posterior margin, slightly pointed medially. Pleurites narrow, with darker, narrow margins and with very small heads; tergites small and typical in shape; abdomen strongly hirsute.

Male genitalia with sides of basal plate smooth (not as in *S. crucigerus*); parameres similar to those of *S. otus* Emerson, but endomera differs from both *S. otus* and *crucigerus*.

Measurements:	Male		Female	
	Length	Width	Length	Width
Body	1.73	.....	1.80	.....
Frons	.....	0.174	.....	0.185
Temples	0.62	0.53	0.66	0.59
Prothorax	0.195	0.326	0.217	0.347
Pterothorax	0.174	0.42	0.195	0.49
Abdomen	0.93	0.49	0.976	0.61
Basal plate	0.30	0.12	.....	.....
Parameres	0.09	0.117	.....	.....

*Strigiphilus heterurus*, n. sp.

Fig. 28

Holotype ♀ and 3 paratypes from *Rhinoptynx clamator* (Vieillot), collected at Chatarona, near Rio Beni, Bolivia, 26 September 1934. (Type No. 754 in author's collection.)

*Diagnosis*.—A rather small species, with short preantennary area and wide, flatly rounded temples; head unusually wide at base of clavi; anterior plate swollen laterally, and with short, narrow posterior tip, reaching only to anterior articulation of mandibles; clavi short, and curving backwards; nodi of preantennary carinae not swollen, and scarcely darker than carinae; occipital carinae wide, broader at anterior end, and with small, dark brown occipital nodi. Prothorax short, with blunt lateral angles in median portion, and posterior margin flatly rounded; pterothorax with rounded sides (almost no angle) and a very slight median point on posterior margin. Pleurites narrow, darker along outer margin, with short heads and closely fused with tergites; chaetotaxy of tergites unusual (Fig. 28), in fact most of the abdominal chaetotaxy is not typical of the genus. Legs short and stout, especially the femora.

*Measurements:*

	Female	
	Length	Width
Body	1.87	.....
Frons	.....	0.165
Temples	0.64	0.542
Prothorax	0.217	0.337
Pterothorax	0.175	0.456
Abdomen	1.01	0.716

*Strigiphilus microgenitalis*, n. sp.

Figs. 29, 30

Holotype ♀, allotype ♂, and 15 paratypes from *Glaucidium brasilianum ridgwayi* Sharpe, collected at Tres Zapotes, State of Veracruz, Mexico, 12 March 1940. (Type No. 755 in author's collection.)

*Diagnosis*.—One of the smallest species of the genus. Head more or less conical, with truncated tip, with sides of clypeal area strongly converging; anterior plate long, with distal portion tapering to a slender tip, with a shield-shaped, darker area at anterior end, which is flatly convex and with sides expanded medially at the attachment of the unusually wide supporting carinae; mandibles large; clavi short and thick; lateral margins of temples somewhat irregular in outline, the setae being set in depressions. Pterothorax produced backwards and rounded medially.

First and third femora large, the second very small. Pleurites well developed, with rather long, rounded heads, and with inner portion paler than outer (Fig. 29); tergites typical; abdominal segment VIII unusually large.

Male genitalia small; basal plate with sides of basal half un-

dulating; parameres typical of the genus but endomera differs from other species.

Measurements:	Male		Female	
	Length	Width	Length	Width
Body	1.37	.....	1.67	.....
Frons	.....	0.16	.....	0.16
Temples	0.54	0.477	0.60	0.52
Prothorax	0.185	0.26	0.185	0.31
Pterothorax	0.152	0.40	0.20	0.456
Abdomen	0.65	0.51	0.846	0.63
Basal plate	0.25	0.107	.....	.....
Parameres	0.07	0.10	.....	.....

### *Strigiphilus jardini*, n. sp.

Figs. 31, 32

Holotype ♂ from *Glauucidium jardinii* (Bonaparte), collected at El Guabo, Dept. Nariño, Colombia, 31 July 1957. (Type No. 756 in author's collection.)

*Diagnosis*.—Entirely different from *S. microgenitalis*, resembling *S. speotyti altiplanus*, from which it differs in head being much narrower at temples and in clypeal area; the anterior plate is almost circular, with short distal tip, a short anterior projection, and with a short spinelike seta on each side, set in a hyaline pustule.

Thoracic segments small; pleurites well developed and with long anterior heads, as in *speotyti*; tergites long and rather narrow, with 4-5 long, slender, pustulated setae along posterior margin; abdominal chaetotaxy long and very fine. The genitalia are not clearly visible, but seem to be as figured, the endomera less complicated than in other species.

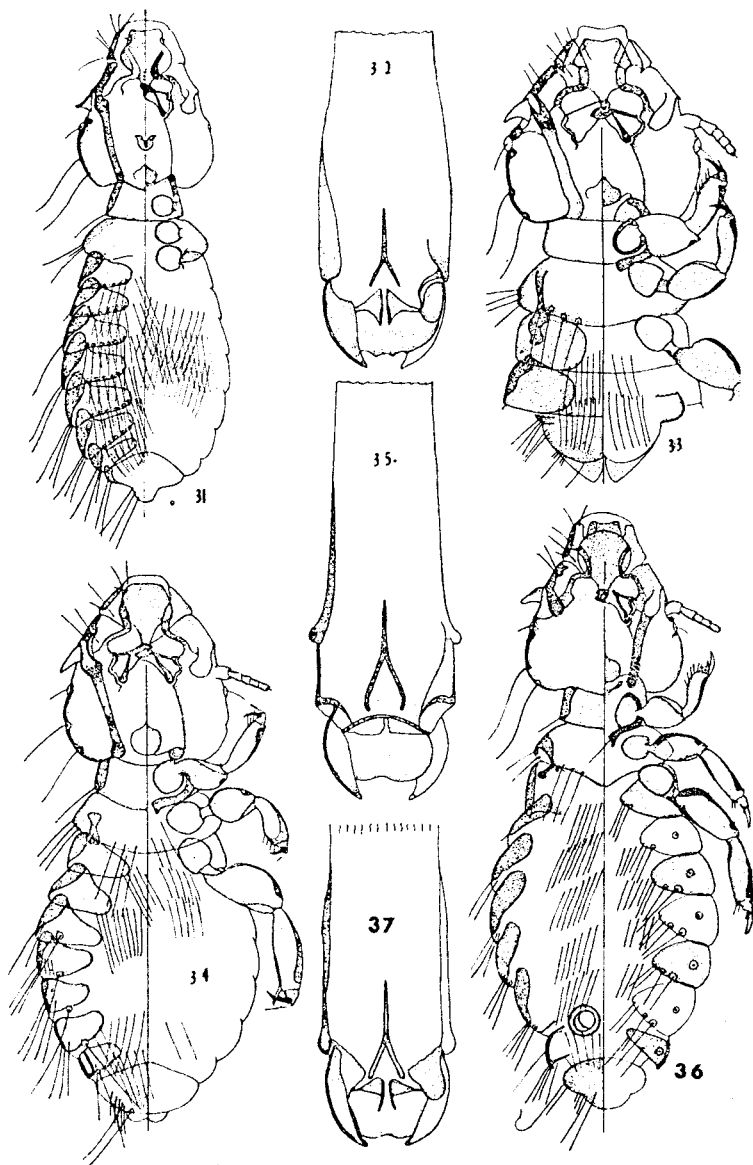
Measurements:	Male	
	Length	Width
Body	1.70	.....
Frons	.....	0.16
Temples	0.586	0.477
Prothorax	0.195	0.28
Pterothorax	0.25	0.445
Abdomen	0.74	0.586
Basal plate	0.26	0.11
Parameres	0.077	0.56

### *Strigiphilus oculus* (Rudow, 1870)

Fig. 33

*Nirmus oculus*, Z. ges. Nat. Wiss., 35: p. 465. Host: *Bubo virginianus* (Gmelin).

In the author's collection are 2 ♂♂ and 2 ♀♀ of this species, from *Bubo v. virginianus* (Gmelin), collected at Indiana, Pennsylvania, U.S., 28 June 1904, also a single ♀ from *B. v. occidentalis* Stone, taken at Lincoln, Nebraska, 4 November 1902.



Figs. 31-37.—Genus *Strigiphilus*. 31.—*S. jardini*, n. sp., body of male. 32.—Same, male genitalia. 33. *S. oculatus* (Rudow), head thorax and abdominal segments I-III and VIII-X: of female. 34. *S. chilensis*, n. sp., body of female. 35.—*S. otus* Emerson, male genitalia. 36. *S. speotyti* (Osborn), body of female. 37.—Same, male genitalia.

There are, apparently, no differences between the females from the two hosts.

*Measurements:*

	Female	
	Length	Width
Body	2.06	.....
Frons	.....	0.195
Temples	0.67	0.677
Prothorax	0.205	0.395
Pterothorax	0.23	0.56
Abdomen	1.17	0.825

*Strigiphilus chilensis*, n. sp.

Fig. 34

Holotype ♀ and 1 paratype from *Bubo virginianus nacurutú* (Vieillot) collected at Santiago, Chile, by D. Gonzalez, in 1958. (Type No. 757 in author's collection.)

*Diagnosis.*—The same type of head as *S. oculatus*, but much narrower; anterior plate of distinct shape, as well as the cerebral carinae, while there are two circular nodi on occipital margin, the same as in all other neotropical species of the genus, but which is not found in *S. oculatus*, and to which are attached the occipital carinae and the lateral, marginal carinae of the prothorax. The thoracic segments are smaller; the pleurites and tergites narrower; last two segments of abdomen of different shape. The fact that the same type of *Strigiphilus oculatus* has been taken on another subspecies of *Bubo virginianus* from Chile, seems to give added proof of the theory that *S. oculatus* and *chilensis* may possibly not be congeneric with the common type of *Strigiphilus*.

*Measurements:*

	Female	
	Length	Width
Body	1.95	.....
Frons	.....	0.163
Temples	0.67	0.545
Prothorax	0.20	0.37
Pterothorax	0.22	0.53
Abdomen	1.02	0.785

*Strigiphilus speotyti speotyti* (Osborn, 1896)

Figs. 36, 37

*Docophorus speotyti*, Bull. U.S. Bur. Ent. (n.s.), 5: p. 222, fig. 144. Host: *Speotyto cunicularia hypugaea* (Bonaparte).

In the author's collection is a female, collected by Lawrence Bruner at Lincoln, Nebr., which formed part of the small series from which Osborn described the species. This female was designated lectotype by Dr. Emerson. There are also in the author's collection a male and a female collected by W. H. Bergtood at Denver, Colorado. The figure published by Osborn is fairly good but lacks important

details, and a new figure drawn from the female lectotype is here presented, chiefly for comparison with the new subspecies described below.

*Measurements:*

	Male		Female	
	Length	Width	Length	Width
Body	1.72	.....	2.04	.....
Frons	.....	0.175	.....	0.195
Temples	0.586	0.50	0.63	0.564
Prothorax	0.174	0.303	0.195	0.326
Pterothorax	0.178	0.467	0.217	0.51
Abdomen	0.933	0.673	1.20	0.835
Basal plate	0.24	0.115	.....	.....
Parameres	0.074	0.108	.....	.....

*Strigiphilus speotyti altiplanus*, nom. nov.

Figs. 38, 39

*Eustrigiphilus speotyto* Eichler, 1952 (not *Docophorus speotyti* Osborn). Peruanische Mallophagen, Beitr. zur Fauna Perus., Bd. IV (1954): p. 38; fig. 16. Host: *Speotyto cunicularia juniniensis* Berlepsch and Stolzmann.

I have compared 3 ♂♂ and 3 ♀♀ taken on the type host at Sta. Lucia and Lake Junin, Peru, with my specimens of *Docophorus speotyti* listed above. The population from the altiplano of Peru is subspecifically distinct. Eichler's name for this race cannot be used since it is a homonym of *Docophorus speotyti* Osborn. I do not believe that the difference of one letter in Eichler's name (o for i) would make its use valid. The race *altiplanus* differs from *speotyti* as follows: The difference in measurements is too small to be considered, but the shape of the head is very different (Fig. 38), that of *S. s. altiplanus* being much wider in the preantennary portion, with the lateral margin very slightly convex instead of concave at clypeal suture; the anterior plate is very differently shaped, the anterior half having the shape of a truncated cone, while in *S. s. speotyti* it is circular, with an anterior, quadrangular projection; marginal carinae also differ in shape, as well as the carinae of the thoracic segments.

The male genitalia differ decidedly (Figs. 37, 39).

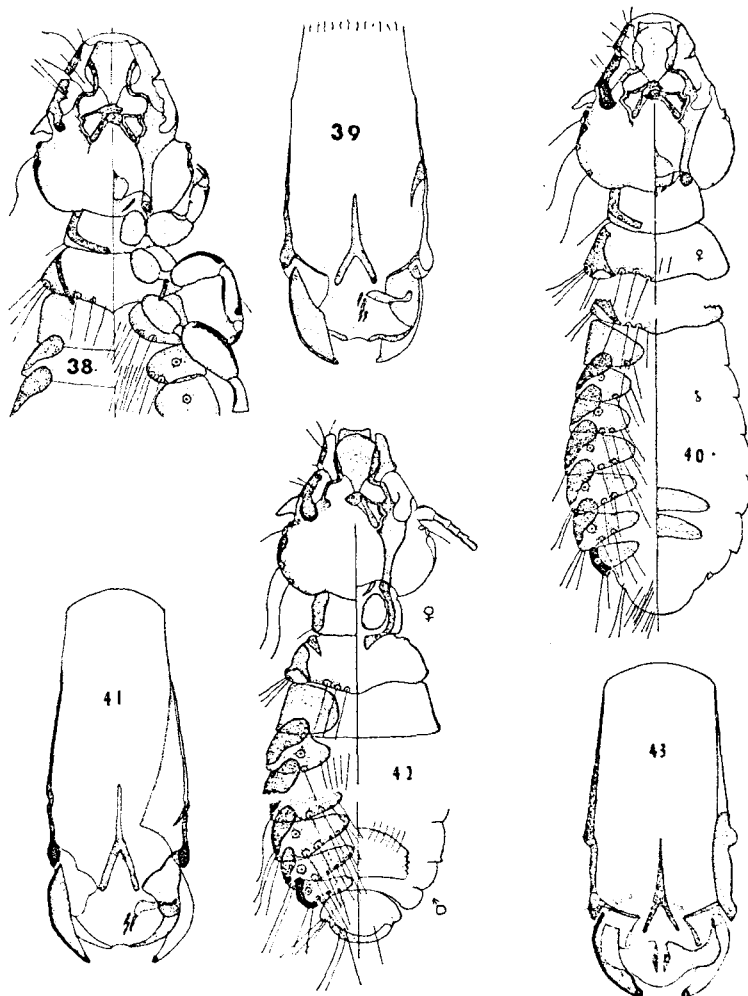
*Measurements:*

	Male		Female	
	Length	Width	Length	Width
Body	1.74	.....	2.19	.....
Frons	.....	0.15	.....	0.185
Temples	0.565	0.50	0.62	0.553
Prothorax	0.17	0.29	0.174	0.337
Pterothorax	0.21	0.445	0.22	0.51
Abdomen	1.00	0.716	1.17	0.76
Basal plate	0.30	0.13	.....	.....
Parameres	0.17	0.11	.....	.....

*Strigiphilus peotyti desertae*, n. subsp.

Figs. 40, 41

Holotype ♀, allotype ♂, and 12 paratypes from *Speotyto cunicularia nan-nodes* Berlepsch and Stolzinson, collected at Guadalupe, Dept. Libertad, Peru, 4 May 1933. (Type No. 758 author's collection.)



Figs. 38-43. --New subspecies of *Strigiphilus peotyti*. 38.--*S. s. altiplanus*, n. subsp., head, thorax and abdominal segments I-III of female. 39. --Same, male genitalia. 40.--*S. s. desertae*, n. subsp., body of female. 41. --Same, male genitalia. 42.--*S. s. magdalanae*, n. subsp., head, thorax and abdominal segments I-II of female and abdominal segments V-VIII of male. 43.--Same, male genitalia.



*Diagnosis*.—Differs from both *S. s. speotyti* and *S. s. altiplanus* in much smaller size; the shape of the head rather like *altiplanus*, but much smaller, narrower at frons and temples, and with anterior plate slightly different, as well as clavi. I have also 7 ♂♂ and 3 ♀♀ from Pisco, Paramonga and Végeta, Peru, all from the coastal deserts.

*Measurements:*

	Male		Female	
	Length	Width	Length	Width
Body	1.76	.....	1.86	.....
Frons	.....	0.185	.....	0.185
Temples	0.555	0.50	0.575	0.505
Prothorax	0.185	0.294	0.163	0.28
Pterothorax	0.185	0.456	0.206	0.434
Abdomen	0.985	0.716	1.08	0.705
Basal plate	0.30	0.119	.....	.....
Parameres	0.17	0.117	.....	.....

*Strigiphilus speotyti magdalenae*, n. subsp.

Figs. 42, 43

Holotype ♀, allotype ♂, and 5 paratypes from *Speotyto cunicularia tolimae* Stone, collected at Casacará, Dept. Magdalena, Colombia, 21 May 1942. (Type No. 759 in author's collection.)

*Diagnosis*.—Slightly larger than *S. s. desertae*, but smaller than both *speotyti* and *altiplanus*. The head is short and wide at temples, but with the same width at frons as in *S. s. speotyti*, and with the same type of anterior plate. The head is slightly longer than in *S. s. desertae*, but with portion anterior to clypeal suture narrower (see Figs.)

The male genitalia are nearest to those of *S. s. speotyti*, but differ, as well as the genital sternite of the male.

	Male		Female	
	Length	Width	Length	Width
Body	1.65	.....	1.91	.....
Frons	.....	0.185	.....	0.185
Temples	0.542	0.50	0.586	0.532
Prothorax	0.174	0.303	0.20	0.31
Pterothorax	0.15	0.467	0.217	0.488
Abdomen	0.91	0.61	1.30	0.705
Basal plate	0.23	0.12	.....	.....
Parameres	0.065	0.108	.....	.....

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