

## The *Picicola* (Mallophaga : Ischnocera) of the Picidae (Aves : Piciformes)\*

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### SYNOPSIS

Nine species of *Picicola* from the Picidae are recognised and a key is given to the three species-groups. Three of the species are described as new: one from *Dendropicos fuscescens*, one from *Geocolaptes olivaceus* and one from *Colaptes* spp. The following are newly synonymised: *P. praeposterus* Clay & Meinertzhagen, 1938; *P. praeposterus americana* Carriker, 1956; *P. dissors* Zlotorzycska, 1965 and *P. contiguus* Zlotorzycska, 1965.

### *Picicola* Clay & Meinertzhagen, 1938

*Picicola* Clay & Meinertzhagen, 1938, *Entomologist* 71 : 2. Type-species: *Picicola praeposterus* Clay & Meinertzhagen.

*Tyrannicola* Carriker, 1956, *Florida Ent.* 39 : 73. Type-species: *Nirmus foedus* Kellogg & Chapman. (A subgenus erected for those species found on the Passeriformes.)

*Picicola* is known from the Passeriformes and Piciformes. Of the 13 species recognised by Hopkins & Clay (1952 : 293), seven are from woodpeckers. There exists no revision of the genus, nor is its host distribution well known. Clay (1958 : 131) discussed *Picicola* and its position within the *Degeeriella* complex. It was noted that some species (e.g. the *thripias* group) closely resemble some *Degeeriella* sens. str. from the Falconids, and others (e.g. the *candidus* and *snodgrassi* groups) are similar to species of *Cuculicola* from the Cuculiformes.

The species-groups recognised herein are not concordant with host relationships, and their similarity to genera found on unrelated hosts cannot be adequately explained at this time. Until such time as the *Picicola* from the Passerines and more genera within the *Degeeriella* complex are revised, it is best to retain the present generic concept of *Picicola*.

All specimens examined were mounted on slides. Descriptions, illustrations and measurements are based on specimens macerated in KOH, cleared and mounted in Canada Balsam. The nomenclature of hosts follows that of Peters (1948), except that *Geocolaptes olivaceus theresae* Meinertzhagen, 1949, is included.

### Key to the species-groups of *Picicola* from the Picidae

- 1 Male genitalia with dorsal arms of endomere fused with basal apodeme and lacking sensilla (fig. 18). Head not smoothly rounded in front. Tergites II-VII of female not divided . . . . . *thripias* group
- Male genitalia with dorsal arms of endomere not fused with basal apodeme, each with sensilla. Head smoothly rounded in front. Tergites II-VII of female divided . . . . . 2
- 2 Marginal carina of head uniformly sclerotised. Pleural thickenings lacking re-entrant heads. Male genitalia with two sensilla on each dorsal arm of endomere (fig. 19) . . . . . *candidus* group
- Marginal carina darkly sclerotised laterally and only lightly so anteriorly. Pleural thickenings with conspicuous re-entrant heads. Male genitalia with three sensilla on each dorsal arm of endomere (fig. 20) *snodgrassi* group

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The *thripias* species-group

Male genitalia (figs. 17, 18) with endomere fused to basal apodeme and lacking sensilla; anterior margin of head not smoothly rounded; temporal carinae and lateral aspects of marginal carina moderately pigmented; tergites III–VIII entire in males and females; pleural thickenings of segments III–VII with well developed re-entrant heads: post spiracular setae on all spiracle-bearing segments (III–VIII).

The four known species of this group infest apparently unrelated woodpeckers from southern Africa.

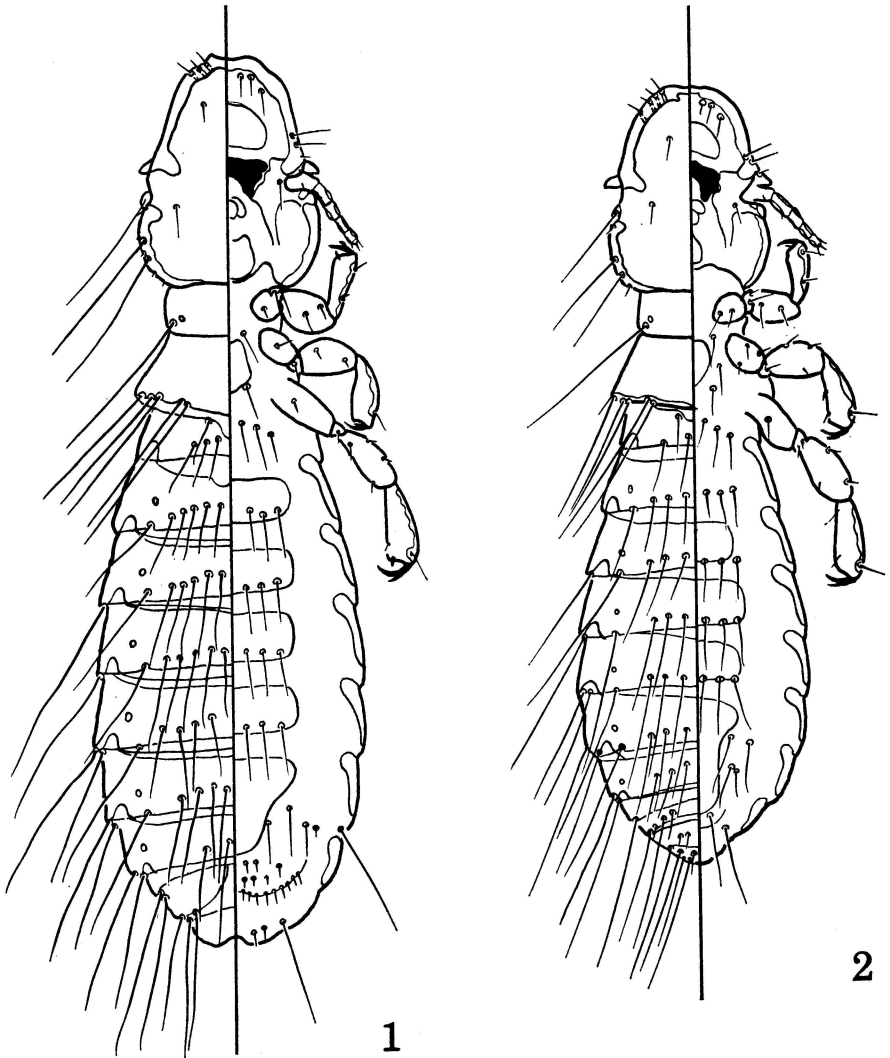
The male genitalia are of the *Degeeriella fulva* type (Clay, 1958 : 131).

*Picicola thripias* Clay & Meinertzhagen, 1938

(figs. 1, 2, 18)

*Picicola thripias* Clay & Meinertzhagen, 1938, *Entomologist* 71 : 76, fig. 4. Type-host: *Thripias namaquus namaquus* (A. Lichtenstein).

*Picicola thripias*; Hopkins & Clay, 1952, *Check list of genera and species of Mallophaga*: 294. Type-host: *Thripias namaquus [decipiens]* (Scharfe).



FIGS. 1, 2.—*Picicola thripias* Clay & Meinertzhagen, dorsal and ventral views of (1) female and (2) male. Drawn to the same scale.

This species is distinguished from others of this group by the shape of the forehead and number of abdominal setae.

Anterior margin of forehead of female produced in front, with an apical depression, that of male truncate; inner margin of marginal carina of male with a deep median notch. Tergite II of male and II-III of female each with a deep anterior median notch. Segments III-VII each with 8-10 (female) or 6-8 (male) tergo-central setae and 5-7 sterno-central setae. Pleural setae on segments IV-IX. Sternites II-III of male and II of female apparently absent.

*Dimensions (in mm.)*.—Male: total length, 1.78; head length, 0.46-0.48; head width, 0.37; prothorax width, 0.23-0.26; pterothorax width, 0.35-0.38; abdominal width, 0.48-0.53. Female: total length, 1.99-2.08; head length, 0.51-0.54; head width, 0.39-0.43; prothorax width, 0.26-0.29; pterothorax width, 0.41-0.46; abdominal width, 0.55-0.64.

The species was based on a single female, reported as being from *Thripas n. namaquus* from Kenya. According to Peters (1948 : 222), *Thripas n. decipiens*, cited as the type-host by Hopkins & Clay (1952 : 294), is found in Kenya, but *T. n. namaquus* is not. Specimens from the nominate subspecies agree with those from *T. n. decipiens* and a specimen identified by Dr. Clay.

*Material examined*.—2 ♀ from *Thripas namaquus* from South Africa; 2 ♂ 1 ♀ from *Thripas n. namaquus* from Northern Rhodesia.

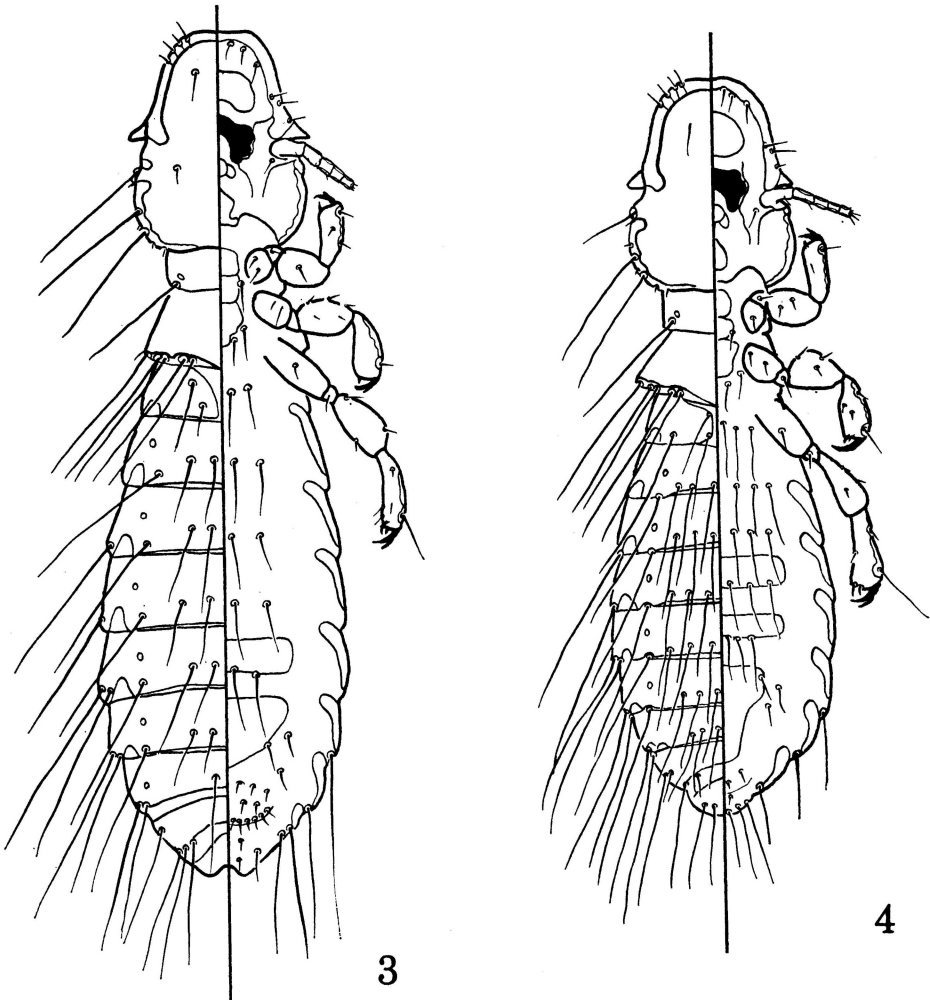


FIG. 3, 4.—*Picicola campethera* Clay & Meinertzhagen, dorsal and ventral views of (3) female and (4) male. Drawn to the same scale.

*Picicola campethera* Clay & Meinertzhagen, 1938

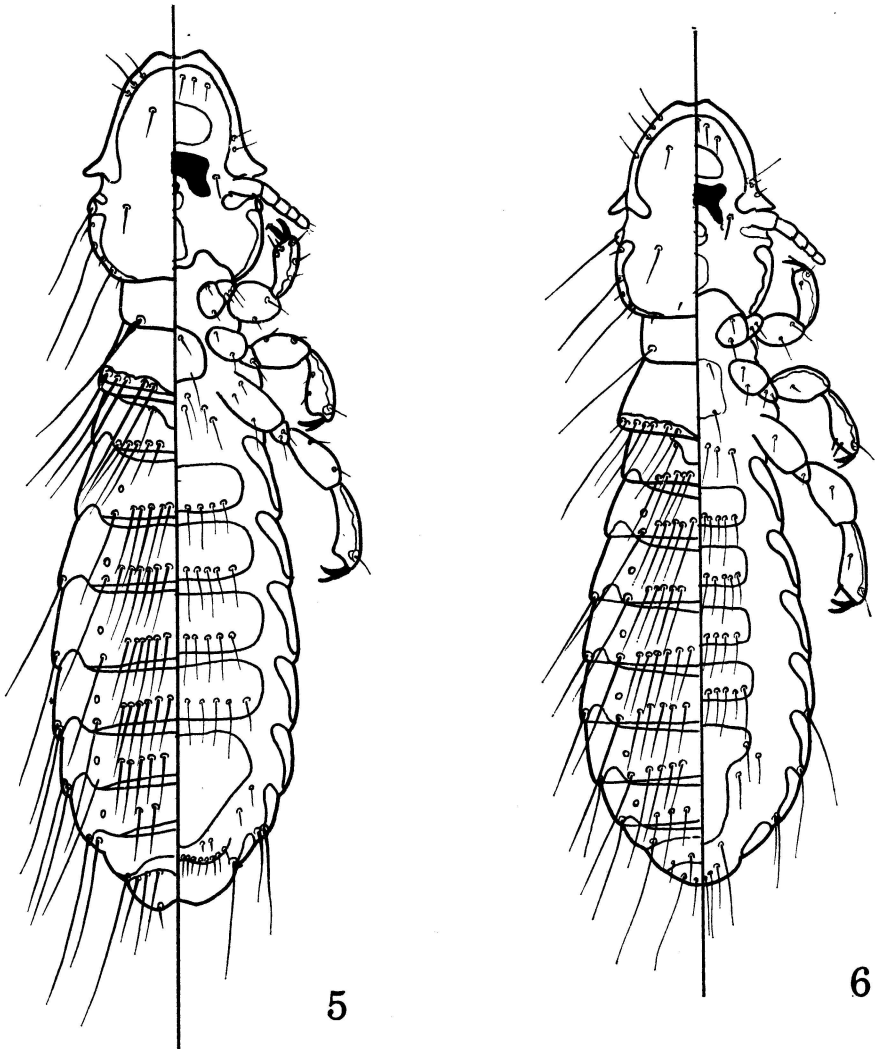
(figs. 3, 4)

*Picicola campethera* Clay & Meinertzhagen, 1938, *Entomologist* 71 : 75, fig. 3. Type-host: *Campethera abingoni mombassicus* (Fischer & Reichenow).  
*Picicola campethera*; Hopkins & Clay, 1952, *Check list of genera and species of Mallophaga* : 293. Type-host: *Campethera abingoni mombassicus* (Fischer & Reichenow).

The reduced number of abdominal setae and the truncate anterior margin of the forehead distinguish this species from others of the group.

Anterior margin of forehead of both sexes truncate, marginal carinae lacking any median notch. Tergite II divided or at least deeply notched. Segments III-VII each with 4-7 tergo-central and 3-5 sternocentral setae. Pleural setae on IV-IX. Sternites II-IV of male and II-V of female apparently absent.

*Dimensions (in mm).*—Male: total length, 1.69-1.81; head length, 0.49; head width, 0.38; prothorax width, 0.24-0.26; pterothorax width, 0.37-0.39; abdominal width, 0.52. Female: total length, 1.78-1.96; head length, 0.47-0.50; head width, 0.36-0.39; prothorax width, 0.22-0.27; pterothorax width, 0.36-0.41; abdominal width, 0.51-0.58.



FIGS. 5, 6.—*Picicola capitatus* sp. n., dorsal and ventral views of (5) female and (6) male. Drawn to the same scale.

*Material examined*.—3 ♀ from *Campethera n. nubica* (Boddaert) from Kenya and Somaliland; 1 ♂ from *Campethera notata* (Lichtenstein) from Mozambique; 5 ♂ 4 ♀ from *Campethera abingoni* (A. Smith) from Mozambique and South Africa; 1 ♀ from *Campethera abingoni mombassicus* from Tanganyika.

*Picicola capitatus* sp. n.

(figs. 5, 6)

This species is distinguished from others of the group by the greater number of sternocentral setae.

Anterior margin of head produced in front with an apical depression in both sexes. Marginal carinae entire. Tergite II with a deep anterior median notch, other tergites entire, all moderately sclerotised. Segments III–VII each with 9–12 posterior tergocentral and 8–10 sternocentral setae. Pleural setae on IV–IX. Sternite II unsclerotised, others lightly sclerotised.

*Dimensions (in mm.)*.—Male: total length, 1.81; head length, 0.50; head width, 0.40; prothorax width, 0.28; pterothorax width, 0.43; abdominal width, 0.56. Female: total length, 2.11–2.15; head length, 0.53–0.55; head width, 0.42; prothorax width, 0.29–0.30; pterothorax width, 0.48–0.49; abdominal width, 0.64–0.67.

*Holotype* ♂ and 2 ♀ *paratypes* from *Dendropicos fuscescens hartlaubii*, MOZAMBIQUE: Fingoe, 10. ix. 1964 (A. L. Moore) Colr. A–65. The holotype and a paratype will be deposited in the United States National Museum.

Type-host: *Dendropicos fuscescens hartlaubii* Malherbe

*Picicola grundespectus* sp. n.

(figs. 7, 8, 17)

The truncate forehead of both sexes and the median hyaline notch on the marginal carina of females readily distinguishes this species from *P. thripis*, to which it is otherwise similar.

Anterior margin of forehead truncate, marginal carina with an anterior median hyaline notch on females, notch absent on males. Temples broadly rounded, more so than in *thripis*. Segments III–VII each with 8–10 (female) or 6–8 (male) tergocentral setae and 5–7 sternocentral setae. All tergites entire and moderately sclerotised, except tergite II of female which is divided. Sternites II–III of males and II–V of females apparently absent.

*Dimensions (in mm.)*.—Male: total length, 1.78–1.84; head length, 0.49–0.50; head width, 0.41–0.43; prothorax width, 0.27–0.28; pterothorax width, 0.41–0.46; abdominal width, 0.56–0.63. Female: total length, 2.08–2.21; head length, 0.51–0.54; head width, 0.44–0.46; prothorax width 0.27–0.29; pterothorax width, 0.46–0.48; abdominal width, 0.68–0.72.

*Holotype* ♂ and 6 ♂ 5 ♀ *paratypes* from *Geocolaptes olivaceus theresae*, SOUTH AFRICA: Cape Province, v. 1949 (*Meinertzhagen*) No. 19058, Brit. Mus. 1951–171; deposited in British Museum (Natural History.)

Type-host: *Geocolaptes olivaceus theresae* Meinertzhagen

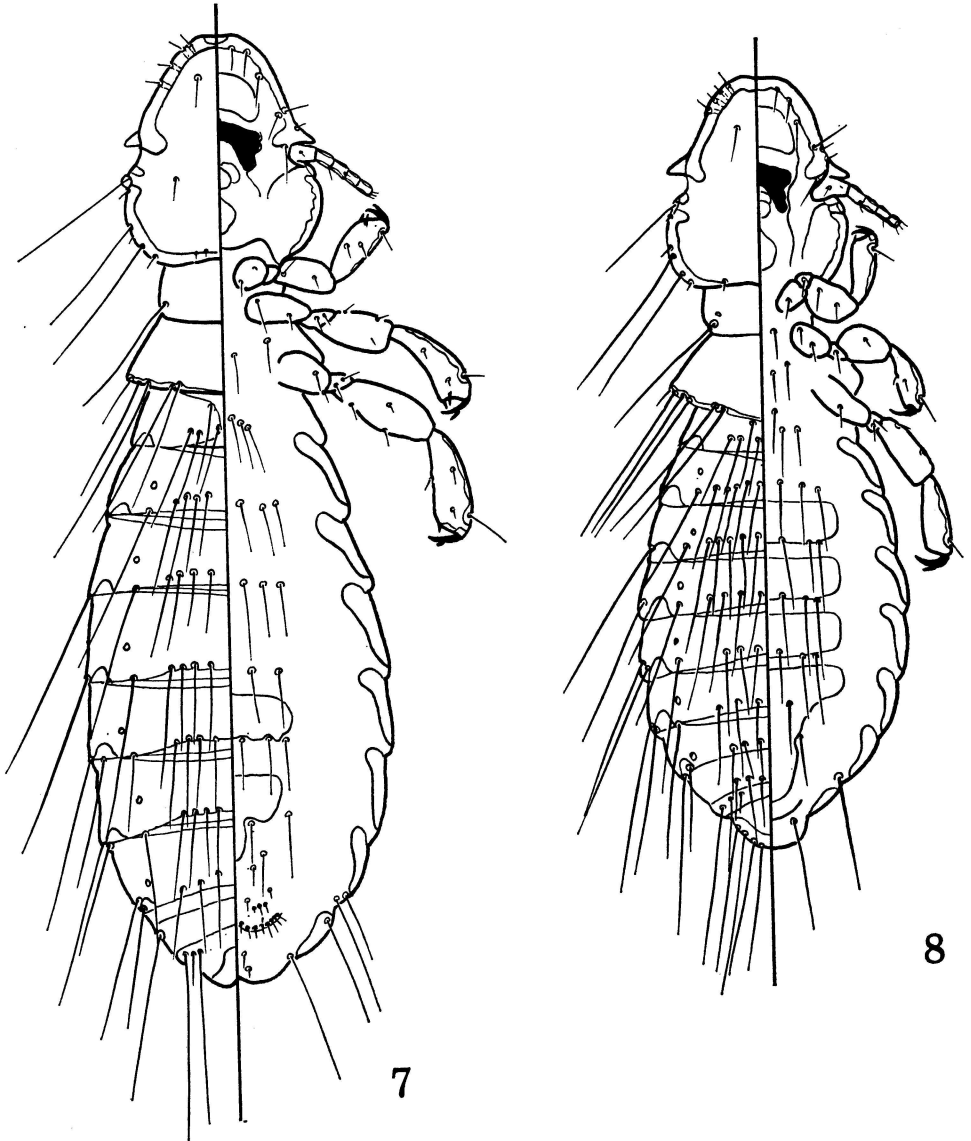
The *candidus* species-group

Male genitalia (fig. 19) with dorsal arms of endomere not fused with basal apodeme, each with 2 sensilla; anterior margin of head smoothly rounded; marginal carina uniformly sclerotised; tergites III–VII divided in female, entire in male; pleural thickenings of segments II–VII without re-entrant heads; post-spiracular setae on all spiracle-bearing segments (III–VIII).

Each of the three known species of this group exhibits well defined host specificity, although collectively they infest unrelated hosts.

These species are quite similar to one another. The diagnostic characters are small and easily missed, especially in excessively macerated specimens. Some specimens were found that could not be distinguished from one of the other members of the group (especially *P. candidus* and *P. porisma*), although other individuals from the same population<sup>1</sup> were easily identified.

<sup>1</sup> The term "population" is used for those individuals of the same species infesting one host individual, not a taxon as in the definition of Clay (1958 : 132). The plural should be used when population is used in the sense of Clay.



FIGS. 7, 8.—*Picicola grundespectus* sp. n., dorsal and ventral views of (7) female and (8) male. Drawn to the same scale.

*Picicola candidus* (Nitzsch, 1866)

(figs. 9, 10)

*Nirmus candidus* Nitzsch, 1866, *Z. Ges. NatWiss.* 27 : 117. Hosts: *Picus canus* Gmelin and *P. viridis* L. *Degeeriella candida* Nitzsch; Harrison, 1916, *Parasitology* 9 : 110. (*Degeeriella* (= *Brueelia*) *straminea* Denny placed as a synonym).

*Picicola candidus* Nitzsch; Eichler, 1942, *Mitt. Dt. ent. Ges.* 11 : 78. Type-host: *Picus canus*.

*Picicola candidus* (Nitzsch); Hopkins & Clay, 1952, *Check list of genera and species of Mallophaga* : 293. Type-host: *Picus canus canus*.

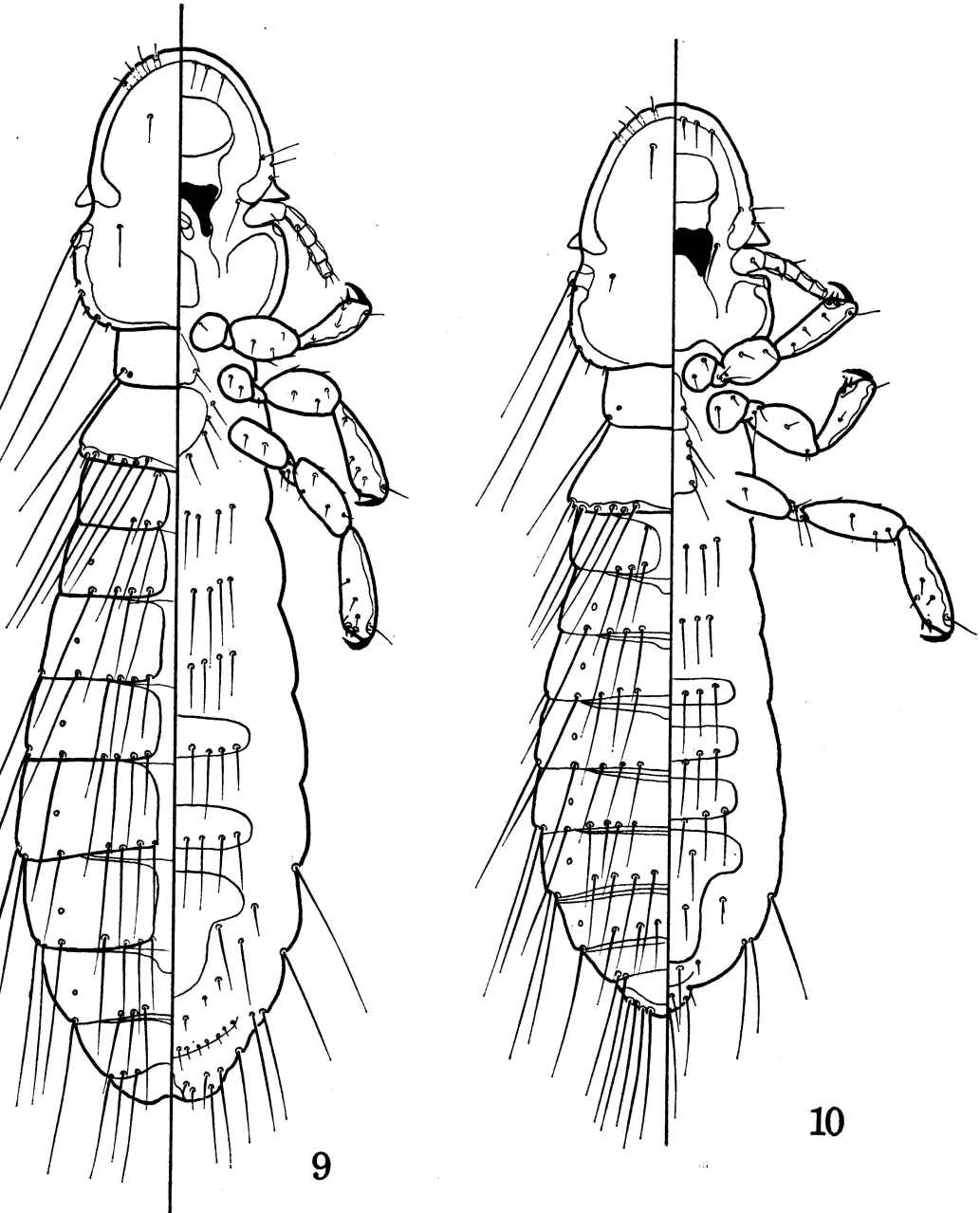
*Picicola contiguus* Zlotorzycska, 1965, *Acta Parasit. Polonica* 13 : 67, fig. 11b, Pl. 2, figs. 6, 7. Type-host: *Picus v. viridis*. syn. n.

*Picicola dissors* Zlotorzycska, 1965, *t.c.* : 67, fig. 11c, Pl. 2, fig. 8. Type-host *Dryobates major* (L.). syn. n.

This species and *P. porisma* are distinguished from *P. marginatulus* by their lack of pigmented pleural thickenings and the greater number of sternocentral setae.

Marginal carinae of head and thorax, genital plate, and sternite VI of female lightly pigmented. Pleural thickenings inconspicuous. Tergite II of male deeply notched, or divided, medially, others with shallow anterior median concavity. Sternites II-III of male and II-IV of female apparently lacking. Segments II-VII each with 6-9 elongate, posterior tergoventral and sternocentral setae. Pleural setae present on segments IV-XI.

*Dimensions (in mm.)*.—Male: total length, 1.47-1.75; head length, 0.41-0.51; head width, 0.32-0.38; prothorax width, 0.21-0.26; pterothorax width, 0.32-0.40; abdominal width, 0.35-0.57. Female: total length, 1.69-2.11; head length, 0.43-0.55; head width, 0.35-0.42; prothorax width, 0.21-0.27; pterothorax width, 0.32-0.45; abdominal width, 0.40-0.63. These measurements overlap those of *P. porisma*.



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Figs. 9, 10.—*Picicola candidus* (Nitzsch), dorsal and ventral views of (9) female and (10) male. Drawn to the same scale.

Zlotorzycza's description and figures of *P. contiguus* and *P. dissors* agree with specimens examined from their respective type-hosts, which are, in my opinion, indistinguishable from *P. candidus*.

*Material examined*.—5 ♂ 5 ♀ from *Picus viridis* from Italy, Sweden, Yugoslavia, and U.S.S.R.: Mandrazik, nr. Vetrina, 27.xi.1918 (Fordham); 6 ♂ 7 ♀ from *Picus viridis viridis* from Sweden; 1 ♂ 9 ♀ from *Picus vaillantii* (Malherbe) from Morocco; 1 ♀ from *Picus canus*, Eichler No. 358e; 1 ♂ from *Picus canus canus* from Estonia; 2 ♀ from *Dendrocopos major* from U.S.S.R.: Mandrazik, nr. Vetrina, 27.xi.1918 (Fordham). The last two females are probably contaminants from *Picus viridis* collected on the same date and place by Fordham.

*Picicola porisma* sp. n.

(fig. 19)

Very similar to *P. candidus*, differing only as follows:

Tergites II–VI of male each with a deep anterior median notch. Sternites II–VI of male apparently absent, present on female. The dimensions span the ranges given for *P. candidus*. Anterior margin of head of *porisma* converge faster than in *candidus* giving the former a less rounded forehead.

McGregor (1917 : 107), in the original description of *Lipeurus mississippiensis*, cited the flicker as type-host. *Dendrocopos villosus* is the type host of *mississippiensis*, and all previous records of this species probably refer to *porisma*.

*Holotype* ♂ and 3 ♂ 8 ♀ *paratypes*, from *Colaptes cafer* "Red-shafted flicker", U.S.A.: Colorado, Ft. Collins, (C. F. Baker); deposited in the United States National Museum. 8 ♂ 20 ♀ from *Colaptes cafer* from Mexico and U.S.A.; 8 ♂ 10 ♀ from *Colaptes cafer collaris* Vigors from U.S.A.; 31 ♂ 54 ♀ from *Colaptes auratus luteus* Bangs from U.S.A.; 1 ♂ 6 ♀ from *Colaptes chrysoides mearnsi* Ridgway from U.S.A.

Type-host: *Colaptes cafer* (Gmelin)

*Picicola marginatulus* (Harrison, 1916)

(figs. 11, 12)

*Nirmus marginatus* Osborn, 1896 (*nec* Burmeister, 1838), *Bull. U.S. Bur. Ent.* (n.s.) 5 : 288, Pl. 2, fig. b. Host: *Coephaloeus pileatus* (L.).

*Degeeriella marginatulus* Harrison, 1916, *Parasitology* 9 : 117. (*nomen novum* for *Nirmus marginatus* Osborn, 1896).

*Picicola marginatulus* (Harrison); Hopkins & Clay, 1952, *Check list of genera and species of Mallophaga* : 293. Type-host: *Dryocopus pileatus* (L.).

*Picicola marginatulus* (Harrison); Emerson, 1960, *Proc. biol. Soc. Wash.* 73 : 161. (Lectotype designation).

*Picicola praeposterus americana* Carriker, 1956, *Florida Ent.* 39 : 71, figs. 45, 46. Host: *Melanerpes carolinus zebra* (Boddaert) *syn. n.*

*Picicola americana* Carriker; Emerson, 1964, *Check list of the Mallophaga of North America (North of Mexico)* 1, Ischnocera : 108.

The dark pleural thickenings and the fewer sternocentral setae readily distinguish this species from others of the group.

Marginal carinae of head and thorax, and pleural thickenings darkly sclerotised. Segments II–VII each with 5–7 elongate posterior tergoventral setae and 3–6 slender sternocentral setae. Pleural setae present on segments IV–IX.

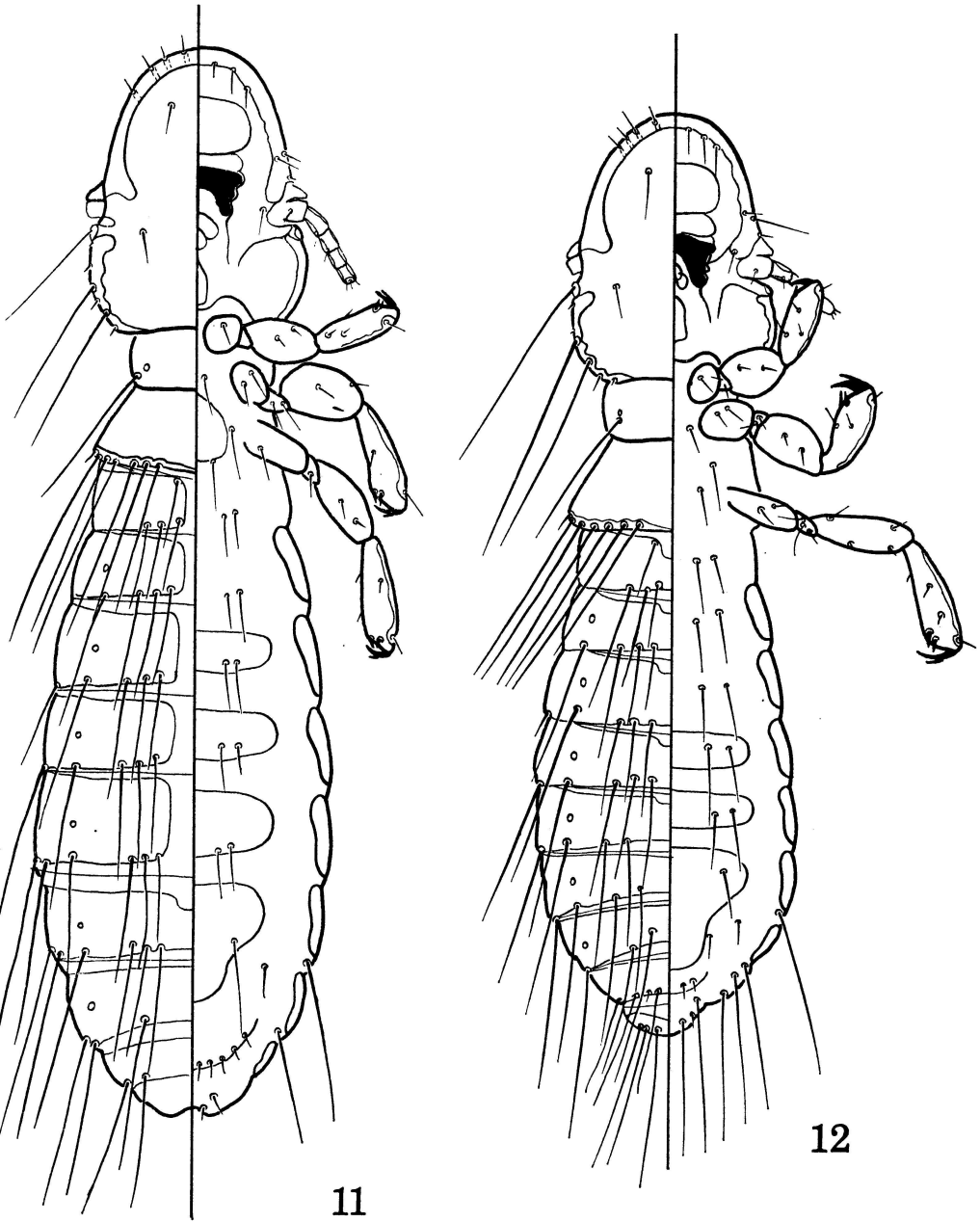
*Dimensions (in mm.)*.—Male: total length, 1.63–1.79; head length, 0.50–0.54; head width, 0.38–0.41; prothorax width, 0.24–0.29; pterothorax width, 0.36–0.45; abdominal width, 0.41–0.52. Female: total length, 1.93–2.15; head length, 0.52–0.56; head width, 0.41–0.43; prothorax width 0.26–0.30; pterothorax width, 0.39–0.46; abdominal width, 0.41–0.63.

The female lectotype (Emerson, 1960 : 161), slide No. 27339 (326), in the Museum of Comparative Zoology, Harvard University, has been examined. The type is in poor condition, but the discernible characters do agree with material recently collected from the type-host.



*Picicola praeposterus americana* was based on a series that had been excessively macerated. The pigmented pleural areas are lacking, but all other discernible characters agree with *P. marginatulus*. The absence of pigment can be caused by the excess maceration. It is possible that this series represents some straggling from the pileated to the red-bellied woodpecker, although an error in labelling is more likely.

*Material examined*.—15 ♂ and 18 ♀ from *Dryocopus pileatus* from Canada and U.S.A.; 6 ♂ 4 ♀ from *Melanerpes carolinus zebra* from Kansas, U.S.A.

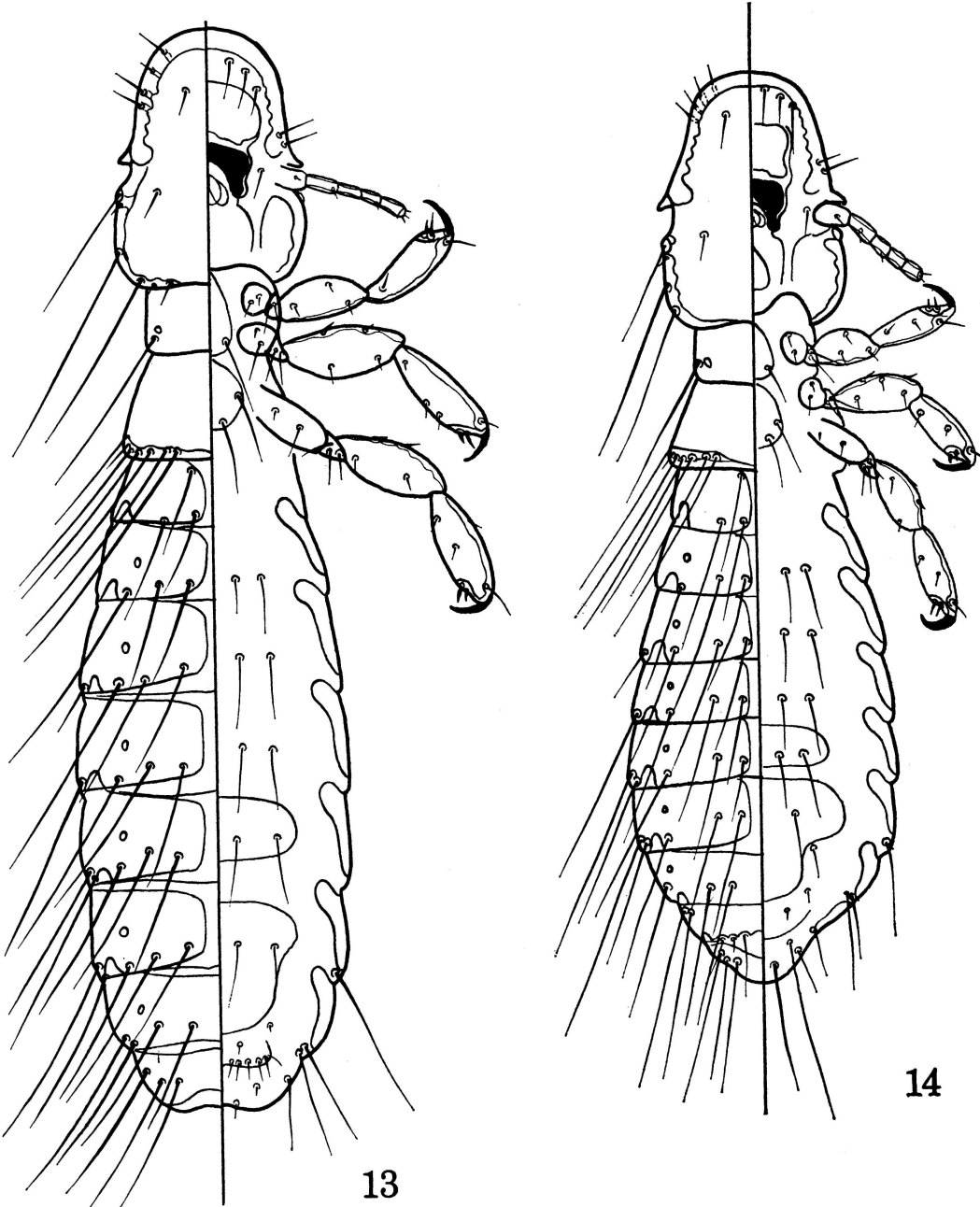


FIGS. 11, 12.—*Picicola marginatulus* (Harrison), dorsal and ventral views of (11) female and (12) male. Drawn to the same scale.

The *snodgrassi* species-group

Male genitalia (fig. 20) with dorsal arms of endomere not fused with basal apodeme and each with 3 sensilla; anterior margin of head smoothly rounded; marginal carina darkly sclerotised laterally, not anteriorly; tergites II-VII divided in male and female; pleural thickenings II-VII darkly pigmented and with well developed re-entrant heads; post-spiracular setae on all spiracle-bearing segments (III-VIII).

This group infests species of *Dendrocopos*, *Melanerpes*, *Asyndesmus* and *Veniliornis*.



FIGS. 13, 14.—*Picicola snodgrassi* (Kellogg), dorsal and ventral views of (13) female and (14) male. Drawn to the same scale.

*Picicola snodgrassi* (Kellogg, 1896)

(figs. 13, 14, 16, 20)

*Lipeurus snodgrassii* Kellogg, 1896, *Proc. Calif. Acad. Sci.* (2) 6 : 502, Pl. 68, fig. 2. Type-host: *Trochilus rufous*.*Picicola snodgrassi* (Kellogg); Hopkins & Clay, 1952, *Check list of genera and species of Mallophaga* : 294. Type-host: *Selasphorus rufus* (Gmelin).

The elongate forehead distinguishes this species from *P. mississippiensis*, to which it is otherwise similar.

Head elongate, lateral margins of forehead almost parallel for most of their length. Prenodal length is conspicuously longer than postnodal length.

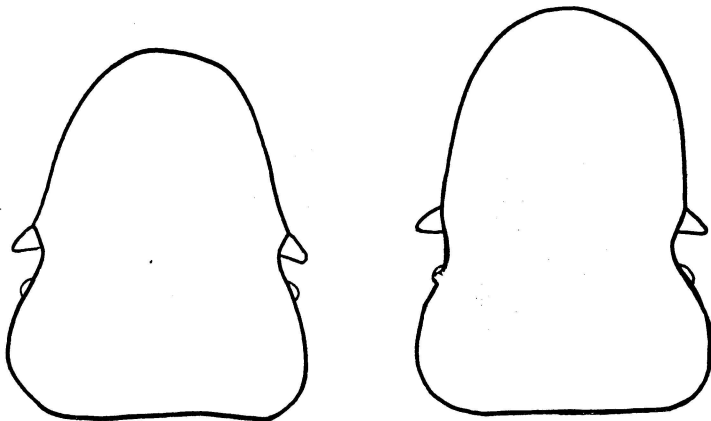
Pleural thickenings darkly pigmented, pigment extending to the spiracle and post-spiracular seta. Segments II–VIII with 3–6 elongate, posterior tergo-central and sterno-central setae. Other setal groups exhibit less variation and only differ slightly from that of the figures. Sternites II–V generally conspicuous, becoming more so posteriorly.

*Dimensions (in mm).*—Male: total length, 1.66–1.78; head length, 0.48–0.51; head width, 0.33–0.35; prothorax width, 0.23–0.27; pterothorax width, 0.33–0.39; abdominal width, 0.43–0.49. Female: total length, 1.96–2.18; head length, 0.50–0.56; head width, 0.35–0.42; prothorax width, 0.26–0.29; pterothorax width, 0.38–0.44; abdominal width, 0.45–0.59. These measurements overlap those of *P. mississippiensis*.

*Lipeurus snodgrassii* is based on a single female on slide No. 376, collected 2. v. 1896 from *Trochilus rufous* by R. E. Snodgrass (Nelson, *personal communication*). On that same date Snodgrass collected Mallophaga from at least the following hosts: No. 375, acorn woodpecker; No. 377, *Spinus tristis* and No. 378, *Turdus ustulatus*. (Nelson, *pers. comm.*). A large series of *Picicola* from the acorn woodpecker, *Melanerpes formicivorus* (Swainson), was examined and found to be identical with the type of *snodgrassi*. No *Picicola* have been subsequently reported from *Selasphorus rufus* or any other humming-bird. I consider the original host citation to be in error, and the acorn woodpecker, *Melanerpes formicivorus* (Swainson), to be the type-host.

The single cleared female, on slide No. 376, obviously remounted and agreeing with the figure and original description, is labelled Holotype and the host recorded as *Melanerpes formicivorus*. The type has been returned to the Kellogg Collection in the Department of Entomology, University of California at Berkeley, California.

*Material examined.*—1 ♂ 6 ♀ from *Asyndesmus lewis* (G. R. Gray) from Oregon, U.S.A.; 6 ♂ 4 ♀ from *Melanerpes formicivorus* from California, U.S.A.; 2 ♀ from



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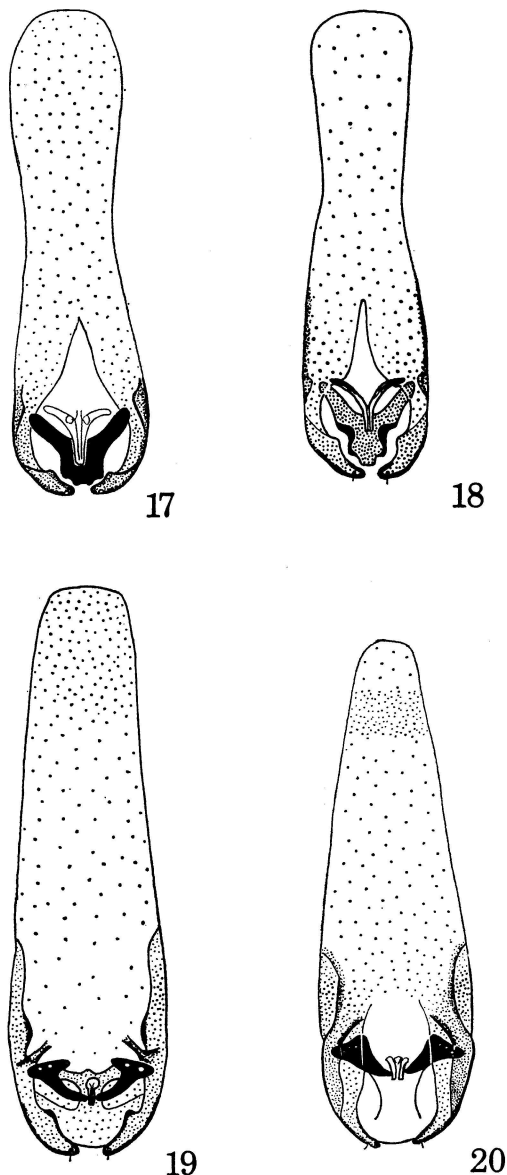
FIGS. 15, 16.—Outlines of heads of males: (15) *Picicola mississippiensis* (McGregor); (16) *P. snodgrassi* (Kellogg). Drawn to the same scale.

*Melanerpes formicivorus bairdi* Ridgway from California, U.S.A.; 1 ♂ 3 ♀ from *Melanerpes formicivorus flavigula* (Malherbe) from Colombia, S.A.; 1 ♂ from *Dendrocopos pubescens* (L.) from California, U.S.A.

*Picicola mississippiensis* (McGregor, 1917)

(fig. 15)

*Lipeurus mississippiensis* McGregor, 1917, *Psyche*, Camb. 24 : 107, Pl. 1, figs. 1, 5. Host: Flicker.  
*Picicola praeposterus* Clay & Meinertzhagen, 1938, *Entomologist* 71 : 74, figs. 1, 2. Host: *Dryobates sindeanus* [sic] (Horsfield and Moore). syn. n.  
*Picicola mississippiensis* [sic] (McGregor); Hopkins & Clay, 1952, *Check list of genera and species of Mallophaga* : 293. Host: *Colaptes auratus*.  
*Picicola praeposterus* Clay & Meinertzhagen; Hopkins & Clay, 1952, *Check list of genera and species of Mallophaga* : 294. Type-host: *Dendrocopos assimilis* (Blyth).



FIGS. 17-20.—Male genitalia of: (17) *Picicola grundespectus* sp. n.; (18) *P. thripas* (Clay & Meinertzhagen); (19) *P. porisma* sp. n.; (20) *P. snodgrassi* (Kellogg).

This species is distinguished from *P. snodgrassi* by the shorter forehead, whose sides converge to produce a more rounded preantennal region. The other characters are as described and figured for *P. snodgrassi*.

Sternites II-V inconspicuous in macerated specimens although visible in unmacerated specimens.

The dimensions of *P. mississippiensis* span the ranges given for *P. snodgrassi*.

*Lipeurus mississippiensis* was originally reported as being a female taken from a flicker; it is in fact a male, most likely from a hairy woodpecker. I have examined the holotype male, No. 21368, in the United States National Museum, from a "flicker", Hamburg, Miss., 24.xii.1914 (*W. E. Dove*), Bishop No. 4053. It is identical to *Picicola* recently collected from hairy woodpeckers as well as to specimens on two slides bearing Bishop No. 4054, collected by *W. E. Dove* from hairy woodpeckers at the same place and date as No. 4053. The hairy woodpecker, *Dendrocopos villosus* (L.), and not the flicker, *Colaptes auratus* (L.), is in all probability the type-host of *P. mississippiensis*.

Three male and one female paratypes of *P. praeposterus* were examined; all are over-macerated and differ only in features attributable to this condition.

It should be noted that no *Picicola* have been collected from woodpeckers in the prairie states of the United States. Additional collecting is required in these states and may produce intermediates between *mississippiensis* and *snodgrassi*.

*Material examined*.—2 ♂ 11 ♀ from *Melanerpes erythrocephalus* (L.) from Minnesota, Mississippi, and South Carolina, U.S.A.; 4 ♂ 6 ♀ from *Melanerpes carolinus* (L.) from Georgia and Indiana, U.S.A.; 1 ♀ from *Melanerpes aurifrons* (Wagler) from Texas, U.S.A.; 4 ♂ 12 ♀ from *Dendrocopos major* (L.) from Korea; 2 ♂ 3 ♀ from *Dendrocopos darjellensis* (Blyth) from Sikkim; 3 ♂ 1 ♀ from *Dendrocopos assimilis* (Blyth) from Pakistan; 3 ♀ from *Dendrocopos leucotos* (Bechstein) from Formosa; 2 ♂ 1 ♀ from *Dendrocopos m. macei* (Vieillot) from India; 3 ♂ 2 ♀ from *Dendrocopos villosus* (L.) from Mississippi and Oklahoma, U.S.A.; 1 ♀ from *Dendrocopos pubescens* (L.) from Massachusetts, U.S.A.; 2 ♂ 2 ♀ from *Veniliornis kirki* (Malherbe) from Colombia, S.A.

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