

Review of the Species of *Rallicola* (Phthiraptera: Philopteridae) from the Woodcreepers (Passeriformes: Dendrocolaptinae)

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ABSTRACT Sixteen species of chewing lice in the genus *Rallicola* are recognized and described from members of the passerine subfamily Dendrocolaptinae. These include 12 previously described species and 4 new ones: *R. keymerae* from *Dendrocolaptes picumnus*, *R. lyali* from *Xiphocolaptes major*, *R. harveyi* from *Decomychura longicauda*, and *R. palmai* from *Campylorhamphus trochilirostris*. New synonyms include *R. guttata* and *R. pyriglena*, both of which are junior synonyms of *R. chunchotamba*, and *R. certhia microgenitalia*, which is a junior synonym of *R. colombiana*. A key is provided for identification of the species treated herein.

KEY WORDS *Rallicola*, woodcreepers, Neotropical Region, taxonomy

AT PRESENT, 31 species and subspecies of the chewing louse genus *Rallicola* Johnston & Harrison are recognized from birds in the Neotropical parvorder Furnariida (Passeriformes). All 31 taxa were described by Carriker (1944; 1963a,b; 1966), who placed them in the genus *Furnaricola* Carriker. Hopkins & Clay (1952) and Clay (1953) treated *Furnaricola* as a synonym of the genus *Rallicola*. Despite this, Carriker (1966) defended the generic validity of *Furnaricola* until his death, saying: "I think it would be most unwise to place this genus under the synonymy of *Rallicola*, since it would utterly confuse any idea of the relationships between the Mallophaga and their hosts." Carriker's defense exemplifies the circular reasoning common among earlier taxonomists who tended to classify parasites on the basis of their hosts rather than on the basis of the parasites themselves (Hafner & Nadler 1990). Because such reasoning is not justification for recognizing genera, we adopt the action of Hopkins & Clay (1952), thereby altering the position of Price & Emerson (1987) who supported the generic status of *Furnaricola*.

We have recently surveyed the 31 species and subspecies of *Rallicola* from the Furnariida. The results of this suggest a monophyletic origin for the subset of *Rallicola* occurring on members of the subfamily Dendrocolaptinae, the woodcreepers. In this paper, we restrict our attention to these woodcreeper *Rallicola*, which include 15 previously described taxa and 4 new species described herein (Table 1). Three of the new species are based on specimens collected by

D.H.C. in Peru (see Clayton 1990). The fourth new species is based on specimens of Bolivian lice on loan from The Natural History Museum (London).

Before proceeding with our taxonomic descriptions, a few cautionary notes are in order regarding Carriker's descriptions, which are seriously flawed because they were often based on inadequate series of one or two specimens; preoccupation with artifactual characters resulting from poorly prepared specimens; unreliable host associations because of apparent cases of straggling or contamination; and illustrations lacking critical detail, especially with regard to chaetotaxy.

The net result of these shortcomings is that one cannot use Carriker's descriptions or keys to identify any lice with confidence, other than by host association. Our experience has shown that even Carriker could not identify lice working with his own descriptions; gross errors were common when he attempted to incorporate additional specimens into his classification scheme. In short, when it is necessary to work with Carriker's descriptions, it is essential to obtain and reinterpret his original type material. Experienced taxonomists are aware of this problem; we merely wish to caution those new to the field who might otherwise place unwarranted trust in Carriker's work. Considerable effort will be required to clarify the fruits of Carriker's labor, given that he holds the record as the most prolific describer of chewing lice, having generated more than 860 specific-subspecific names from 1902 to 1967. Fortunately, much of the Carriker collection is available for study at the National Museum of Natural History in Washington, DC (see Carriker 1967).

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Table 1. Host-parasite list

Host taxa ^a	<i>Rallicola</i> species ^b
<i>Dendrocicla fuliginosa</i>	<i>antioquiensis</i>
<i>Deconuchura longicauda</i>	<i>fuliginosa</i>
<i>Sittasomus griseicapillus</i> *	<i>harveyi</i> , n. sp.
<i>Glyphorhynchus spirurus</i>	<i>pyrrhaphaga</i>
<i>Xiphocolaptes albicollis</i>	<i>cephalosa</i>
<i>Xiphocolaptes major</i>	<i>tergalis</i>
<i>Dendrocolaptes certhia</i>	<i>lyali</i> , n. sp.
	<i>certhia</i>
<i>Dendrocolaptes picumnus</i> *	<i>colombiana</i>
	<i>certhia</i>
<i>Xiphorhynchus picus</i>	<i>keymerae</i> , n. sp.
	<i>hirsuta</i>
	<i>microrstris</i>
<i>Xiphorhynchus ocellatus</i>	<i>chunchotambo</i>
<i>Xiphorhynchus guttatus</i>	<i>chunchotambo</i>
<i>Xiphorhynchus lachrymosus</i>	<i>lachrymosa</i>
<i>Xiphorhynchus triangularis</i> *	<i>chunchotambo</i>
<i>Lepidocolaptes souleyetii</i>	<i>triangularis</i>
<i>Campylorhamphus trochilirostris</i>	<i>palmai</i> , n. sp.

^a Host names and sequence from Sibley & Monroe (1990).

* new host association for previously named louse.

^b n. sp., new species; all others described by Carriker.

Taxonomic Characters. We find the following features useful in characterizing the *Rallicola* found on woodcreepers. For brevity, only deviations from these, along with dimensions and certain unique features, are discussed under each species description.

Very little sexual dimorphism (Figs. 1 and 5), limited to female being consistently larger and to usual differences associated with terminalia and male genitalia.

Head broadly triangular, with distinct shallow medioanterior concavity. Dorsioanterior plate longer than wide (Fig. 2), with "U" extending nearly to posterior margin. Ocular seta (Fig. 7, arrow) short, similar in length to 3 marginal temple setae between it and single very long seta on each side. Gular plate as in Fig. 3.

Pronotum with only single seta at each latero-posterior corner. Each side of metanotum with cluster of 4 short to very long setae laterally and 2 long to very long setae grouped medially of these.

Abdomen with tergal plate II (first apparent tergum) medially constricted, either divided or with weak union; each side with 2 medioanterior sensilla, with inner occasionally represented by minute seta (Fig. 10). Remainder of tergal plates undivided, with those of male posterior segments much shorter than for female. Tergal chaetotaxy of 2 median marginal setae on II-VIII, these either being short (length of seta on V of male, 0.075-0.125; of female, 0.055-0.130) or long (length of seta on V of male, 0.125-0.185; of female, 0.150-0.250). Short lateral marginal seta on VII medially of spiracle.

Without seta at lateral body margin of II, with single short lateral seta on III, and with 2-3 short to very long lateral setae on IV-VIII.

Sternal plates undivided, with sternal plate on II (first apparent abdominal sternum) bearing 2 setae; with minimum of 2 setae on each of other sterna. Outer sternal seta on VI very long, extending across VIII, often to near end of abdomen (Fig. 11, arrow).

Female with large subgenital plate (fused sterna VII-VIII) marginally having row of 5-12 short spiniform setae on each side and total of 13-30 short fine setae. With 2 prominent setae on large tubercle lateroposterior to subgenital plate; chaetotaxy posterior to this tubercle as in Fig. 1.

Male terminalia as shown in Fig. 5, with total of 8 dorsal and ventral very long setae on last segment. Genitalia with well-developed, slender parameres, each having terminal short, fine seta, 1 small sensillum about third of way from end, and lacking any strong process on median margin. With variably shaped mesosome and elongate broad anteriorly rounded to flattened basal plate.

The woodcreeper *Rallicola* all have a distinct medioanterior head concavity, a relatively short broad gula (Fig. 3), and male genitalia without a strong process on the median paramere margin (Figs. 8, 9, and 12-19). In contrast, *Rallicola* from other members of the parvorder Furnariida [Furnariinae (ovenbirds), Formicariidae (ground antbirds), and Rhinocryptidae (tapaculos)] all have a flat to slightly convex medioanterior head margin, a more attenuate gula, and often a prominent process on the median paramere margin of the male genitalia.

Materials and Methods

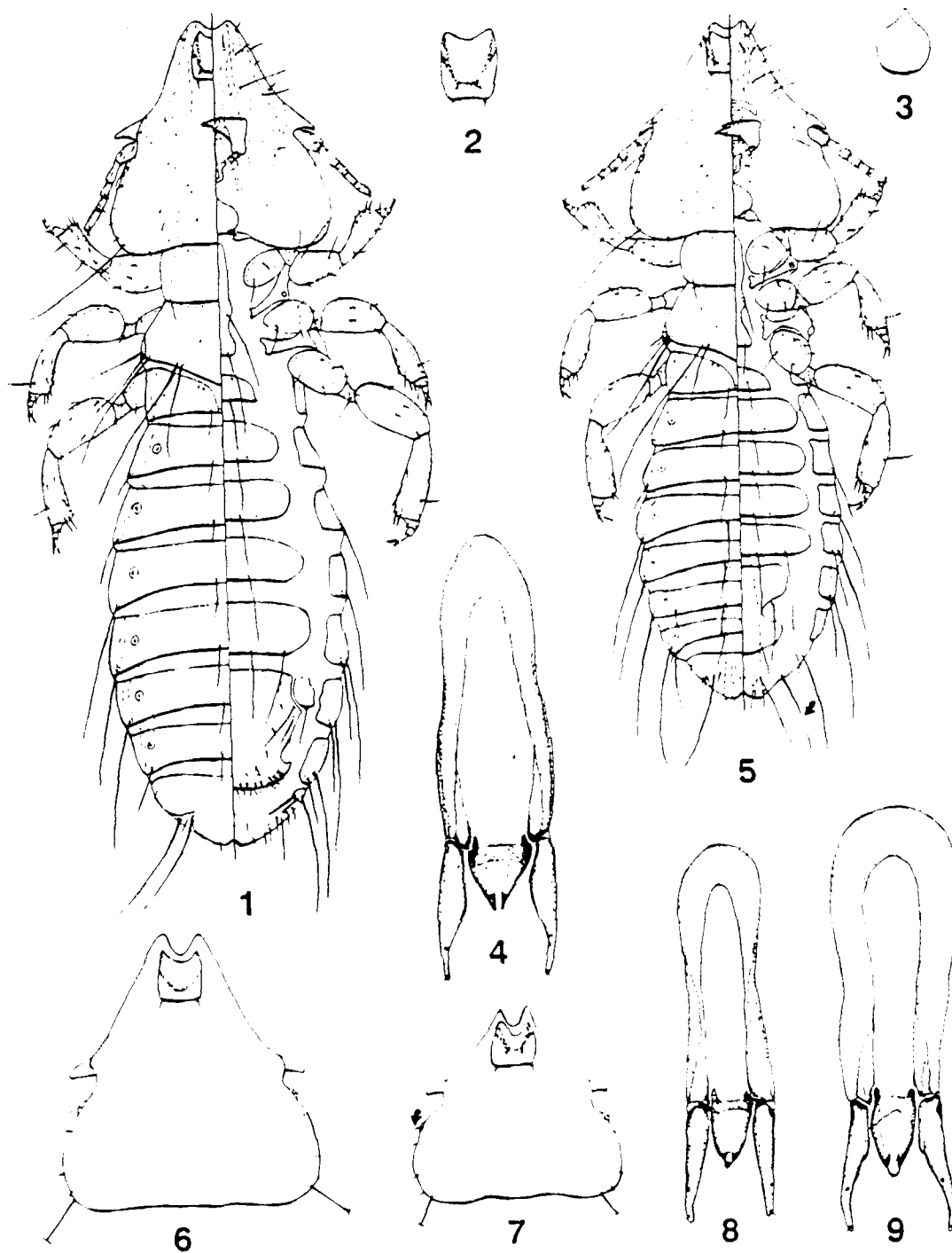
The following descriptions contain measurements given in millimeters. Explanations for abbreviations are provided the first time they are used. Illustrations for similar parts are drawn to the same magnification. Under the "Material" section following the locality, we have indicated parenthetically the cases where louse collections are from more than one host individual. Host classification to species follows Sibley & Monroe (1990), that of subspecies follows Peters (1951).

Rallicola chunchotambo (Carriker) (Figs. 1-5)

Furnaricola chunchotambo Carriker 1944: 92. Type host: *Xiphorhynchus ocellatus chunchotambo* (Tschudi).

Furnaricola guttata Carriker 1963a: 466. Type host: *Xiphorhynchus guttatus polystictus* (Salvin & Godman). N. syn.

Furnaricola pyrigena Carriker 1966: 420. Type host: *Pyrigena leuconota picea* Cabanis (error). N. syn.



Figs. 1-9. *R. chunchotambo*: (1) Female, (2) dorsoanterior head plate, (3) gula, (4) male genitalia, (5) male. *R. antioquiensis*: (6) Male head. *R. cephalosa*: (7) Male head, (8) Male genitalia. *R. triangularis*: (9) Male genitalia.

Description. Male as in Fig. 5, female as in Fig. 1. Ocular seta much longer than 3 marginal setae between it and very long seta. With short tergal setae. Sternal setae: IV-V, 2-4; VI, 4; outer seta on VI only extending as far as VIII. Male genitalia (Fig. 4) with basally swollen parameres; mesosome triangular with open apex and inwardly directed barbs.

Dimensions of Male. Temple width (TW), 0.415-0.460; head length (HL), 0.440-0.480; dorsoanterior plate length (DAPL), 0.090-0.095; prothorax width (PW), 0.225-0.260; metathorax width (MW), 0.325-0.350; abdomen width at V (AWV), 0.435-0.480; total length (TL), 1.375-1.515; genitalia width (GW), 0.075-0.080; genitalia paramere length (GPL), 0.085-0.095; genitalia length (GL), 0.270-0.305.

Dimensions of Female. TW, 0.465-0.500; HL, 0.485-0.520; DAPL, 0.095-0.105; PW, 0.260-0.275; MW, 0.365-0.385; AWV, 0.515-0.555; TL, 1.740-1.935.

Material Examined. Holotype, ♀, of *F. chunchotambo*, ex *X. o. chunchotambo*, Peru: Puerto Yessup. Holotype, ♂, of *F. guttata*, ex *X. g. polystictus*, British Guiana: Rupununi, Kanaku Mts. Holotype, ♀, of *F. pyriglena*, ex *P. l. picea* (error), Peru: Chanchamayo, Eneas, 37 ♂♂, 55 ♀♀, ex *X. ocellatus*, Peru: Dept. Madre de Dios, Cerro de Pantiacolla (11 collections), 42 ♂♂, 60 ♀♀, ex *X. triangularis* (Lafresnaye), Peru: Dept. Madre de Dios, Cerro de Pantiacolla (7 collections).

Remarks. The long ocular seta of *R. chunchotambo* is shared with only one other known species, *R. antioquensis* (Carriker); the former is easily separated from the latter by its much smaller dimensions. We can find no characters distinguishing either *F. guttata* or *F. pyriglena* from *R. chunchotambo*; hence, we consider the first two taxa to be junior synonyms of *R. chunchotambo*.

Rallicola antioquensis (Carriker) (Fig. 6)

Furnaricola fuliginosa antioquensis Carriker 1966: 416. Type host: *Dendrocincla fuliginosa lafresnaye* Ridgway.

Description. Known only from male. Head (Fig. 6) with dorsoanterior plate as shown, long ocular seta, and deep medioanterior concavity. With long tergal setae. Sternal setae: III-IV, 4; V-VI, 4-6; VII, 4. Male genitalia like those of *R. chunchotambo* (Fig. 4).

Dimensions of Male. TW, 0.550-0.555; HL, 0.580-0.585; DAPL, 0.125-0.130; PW, 0.325-0.330; MW, 0.445-0.450; AWV, 0.590-0.610; TL, 1.575-1.690; GW, 0.095-0.100; GPL, 0.100-0.115; GL, 0.365-0.380.

Material Examined. Holotype, ♂, 1 paratype, ♂, ex *D. f. lafresnaye*, Colombia: Antioquia, Taraza.

Remarks. This species and *R. chunchotambo*, which are readily separated by dimensional differences, are the only known taxa with a long ocular seta. Carriker (1966) noted the very large size of *R. antioquensis*, which serves as an excellent distinguishing character. Because female lice are consistently larger than males, we anticipate that females of this species will be easily recognized when collected.

Carriker (1966) placed *F. antioquensis* as a subspecies of *F. fuliginosa* rather than as a species, despite the morphological distinctness of the two taxa. We assume that Carriker's decision was motivated by the fact that these lice are reported from the same species of host (Table 1). However, we do not consider this to be justification for lumping such distinct morphotypes. Because the host record of *R. antioquensis* is based on only two specimens, further collecting is needed to confirm this host association.

Rallicola certhia (Carriker)

Furnaricola certhia Carriker 1963a: 465. Type host: *Dendrocolaptes certhia certhia* (Boddaert).

Description. Head similar to Fig. 20. Dorsoanterior plate with "U" extending to near middle of plate. With long tergal setae. Sternal setae: III, 4-6; IV-V, 5-7; VI, 6-8; and on male VII, 3-4. Male genitalia much as in Fig. 14a, with tendency to more abrupt "shoulder" on parameres.

Dimensions of Male. TW, 0.515; HL, 0.520-0.530; DAPL, 0.130; PW, 0.270-0.305; MW, 0.415-0.430; AWV, 0.520-0.545; TL, 1.595-1.685; GW, 0.085-0.090; GPL, 0.100-0.105; GL, 0.350-0.355.

Dimensions of Female. TW, 0.530-0.550; HL, 0.565-0.570; DAPL, 0.130-0.135; PW, 0.290-0.325; MW, 0.435-0.440; AWV, 0.575-0.610; TL, 1.900-2.020.

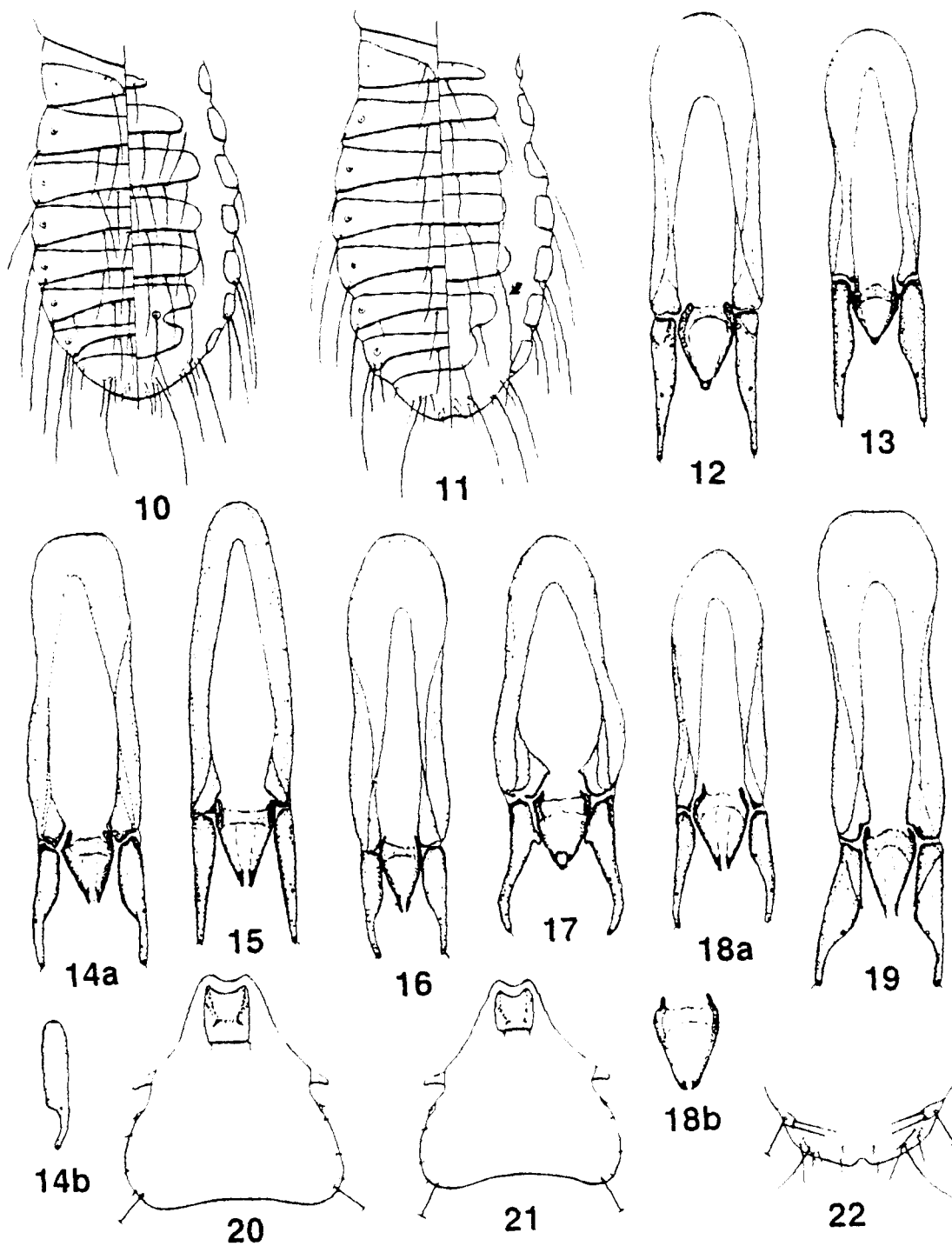
Material Examined. Holotype, ♂, allotype, ♀, paratypes, 1 ♂, 1 ♀, ex *D. c. certhia*, Guyana: Rupununi, Kanaku Mts. 1 ♂, 1 ♀, ex *D. picumnus* Lichtenstem, Bolivia: Dept. Santa Cruz, Prov. Chiquitos.

Remarks. This species is distinguished by its combination of short ocular seta, only two median long marginal tergal setae, generally large dimensions, and male genitalia near Fig. 14a.

Rallicola colombiana (Carriker) (Fig. 14b)

Furnaricola certhia colombiana Carriker 1966: 411. Type host: *Dendrocolaptes certhia hylearus* Wetmore.

Furnaricola certhia microgenitalia Carriker 1966: 412. Type host: *Dendrocolaptes certhia colombianus* Todd. N. syn.



Figs. 10-22. Male abdomen: (10) *R. keymerae*, (11) *R. palmai*. Male genitalia: (12) *R. pictrostris*, (13) *R. fuliginosa*, (14a) *R. keymerae*, (14b) *R. colombiana* paramere, (15) *R. lacrymosa*, (16) *R. hirsuta*, (17) *R. palmai*, (18a) *R. harveyi*, (18b) *R. pupraphaga* mesosome, (19) *R. tergalis*. Male head: (20) *R. keymerae*, (21) *R. fuliginosa*. *R. palmai*: (22) Female ventral terminalia.

Description. Head similar to Fig. 20. Dorsoanterior plate with "U" extending to near middle of plate. Abdomen much as in Fig. 10; with 4 median tergal setae on III-VII, 2-3 on VIII; with long tergal setae. Sternal setae: III-VI, 4-5; VII, 3-4. Male genitalia near Fig. 14a but with parameres as in Fig. 14b.

Dimensions of Male. TW, 0.475-0.500; HL, 0.515-0.530; DAPL, 0.115; PW, 0.290-0.300; MW, 0.375-0.415; AWV, 0.490-0.530; TL, 1.525-1.590; GW, 0.075-0.085; GPL, 0.095-0.100; GL, 0.315-0.335.

Dimensions of Female. TW, 0.500; HL, 0.555; DAPL, 0.125; TL, 1.735; other dimensions unavailable because of distorted mount.

Material Examined. Holotype, ♂, 1 paratype, ♂, of *F. c. colombiana*, ex *D. c. hyleorus*, Colombia: Dept. Bolivar, Volador. Holotype, ♀, allotype, ♂, of *F. c. microgenitalia*, ex *D. c. colombianus*, Colombia: Dept. Choco, Unguia.

Remarks. This is one of only three species with at least four median marginal tergal setae on III-VI. It is distinguished from the other two species in having only up to five sternal setae on IV-VI, a unique male genitalic paramere shape, and lacking a pair of long medioanterior setae on tergum II.

Rallicola keymerae Price & Clayton,
new species

(Figs. 10, 14a, and 20)

Type host. *Dendrocolaptes picumnus* Lichtenstein.

Description. Head as in Fig. 20. Dorsoanterior plate with "U" extending to near middle of plate. Abdomen as in Fig. 10; with 4-5 median tergal setae on III-VI, 2-4 on VII, and 3-4 on male VIII; with long tergal setae. Sternal setae: III, 4-7; IV-VI, 6-9; male VII, 2-3. Male genitalia as in Fig. 14a.

Dimensions of Male. TW, 0.450-0.480; HL, 0.470-0.505; DAPL, 0.120-0.135; PW, 0.265-0.275; MW, 0.375-0.400; AWV, 0.465-0.510; TL, 1.450-1.580; GW, 0.085-0.090; GPL, 0.090-0.100; GL, 0.300-0.330.

Dimensions of Female. TW, 0.515-0.555; HL, 0.535-0.580; DAPL, 0.130-0.150; PW, 0.310-0.330; MW, 0.440-0.470; AWV, 0.565-0.630; TL, 1.935-2.115.

Type Material. Holotype, ♂, ex *D. picumnus*, Peru: Dept. Madre de Dios, Cerro de Panticollia, 680 m, 11-XI-1985, D. H. Clayton; in collection of Field Museum of Natural History (Chicago). Paratypes, 4 ♂♂, 6 ♀♀, same data as holotype. Paratypes deposited in Field Museum of Natural History, National Museum of Natural History (Washington, DC), and Oklahoma State University (Stillwater).

Remarks. Although this species and *R. colombiana* are distinct in having at least four median marginal tergal setae on III-VI and no long me-

dioanterior pair of setae on tergum II. *R. keymerae* is separable from *R. colombiana* in having at least six sternal setae on each of IV-VI, a male genitalic paramere of different shape, and a tendency toward smaller male dimensions.

Etymology. This species is named for the junior author's friend and colleague, Anne E. Keymer, University of Oxford, in recognition of her fundamental contributions to the study of host-parasite epidemiology, ecology, and evolution.

Rallicola lyali Price & Clayton, new species

Type host. *Xiphocolaptes major* (Vieillot).

Description. Head similar to Fig. 20. Dorsoanterior plate with "U" extending to near middle of plate. Abdomen much as in Fig. 10, but with tergum II as in Fig. 11, having long medioanterior pair of setae similar in length to marginal setae; with 4-6 median tergal setae on III-VII, male with 4 on VIII; with long tergal setae. Sternal setae: III, 4-5; IV-VI, 5-9. Male genitalia similar to Fig. 14a, but with parameres as in Fig. 14b.

Dimensions of Male. TW, 0.495; HL, 0.545; DAPL, 0.110; PW, 0.300; MW, 0.450; AWV, 0.640; TL, 1.775; GW, 0.085; GPL, 0.115; GL, 0.405.

Dimensions of Female. TW, 0.515-0.525; HL, 0.550-0.580; DAPL, 0.105-0.120; PW, 0.310-0.320; MW, 0.460-0.465; AWV, 0.680-0.760; TL, 1.910-2.080.

Type Material. Holotype, ♂, ex *X. major*, Bolivia: Dept. Santa Cruz, Prov. Chiquitos (170); in collection of The Natural History Museum (London). Paratypes, 3 ♀♀, same data and in same collection as holotype.

Remarks. This species, *R. colombiana*, and *R. keymerae* are the only ones with at least four marginal tergal setae on III-VI. Although the male genital paramere resembles that of *R. colombiana* (Fig. 14b) rather than that of *R. keymerae* (Fig. 14a), the long pair of medioanterior setae on tergum II separates *R. lyali* from both of the other species.

Etymology. This species is named for Christopher H. C. Lval, The Natural History Museum (London), in recognition of his outstanding research on mammalian Phthiraptera and his long-time friendship and collaboration.

Rallicola lachrymosa (Carriker)
(Fig. 15)

Furnaricola lachrymosa Carriker 1966: 412.
Type host. *Xiphorhynchus lachrymosus lachrymosus* (Lawrence).

Description. With short tergal setae. Sternal setae: III, 2-3; IV-V, 2-4; VI, 4; outer seta on VI

only extending as far as VIII. Male genitalia (Fig. 15) with straight-sided parameres.

Dimensions of Male. TW, 0.470–0.480; HL, 0.495–0.505; DAPL, 0.100–0.105; PW, 0.275–0.280; MW, 0.375–0.380; AWV, 0.510–0.520; TL, 1.525–1.620; GW, 0.075–0.080; GPL, 0.100–0.105; GL, 0.335–0.360.

Dimensions of Female. TW, 0.505–0.520; HL, 0.530–0.550; DAPL, 0.105–0.110; PW, 0.295–0.300; MW, 0.410–0.420; AWV, 0.575–0.590; TL, 1.845–1.915.

Material Examined. Holotype, ♀, allotype, ♂, paratypes, 1 ♂, 3 ♀♀, all ex *X. l. lachrymosus*, Colombia: Dept. Choco, Quibdo.

Remarks. This species is distinguished from the others by the combination of short ocular seta, terga each with only two short median setae, the last segment of male with eight very long setae, the generally large dimensions, and details of the male genitalia. Included in Carriker's collection is a male supposedly collected from *X. l. alarum* Chapman, stated by Carriker (1966) to be "... inseparable from the allotype" and identified as *F. lachrymosa*. This identification is in error; the specimen is likely a contaminant because it represents a *Rallicola* from some host other than a woodcreeper.

Rallicola pipraphaga (Carriker)
(Fig. 18b)

Furnaricola pipraphaga Carriker 1966: 421.
Type host: *Pipra pipra comata* Berlepsch & Stolzmann (error).

Description. Head with dorsoanterior plate similar to Fig. 20. With short tergal setae; short lateral seta on tergum VII posterior to spiracle. Segment III lacking lateral seta on both sides. Sternal setae of male: III–V, 2–3; VI, 4–5; of female: III, 2–4; IV, 3–4; V–VI, 4–6; outer seta on VI extending only as far as VIII. Male terminalia with only 6 very long setae, lacking very long "arrow" seta of Fig. 5. Male genitalia similar to Fig. 18a, but mesosome (Fig. 18b) more rounded and lacking prominent posterior flared barbs.

Dimensions of Male. TW, 0.400–0.420; HL, 0.395–0.405; DAPL, 0.075–0.080; PW, 0.220–0.225; MW, 0.310–0.335; AWV, 0.400–0.440; TL, 1.315–1.405; GW, 0.060–0.065; GPL, 0.080–0.085; GL, 0.250–0.265.

Dimensions of Female. TW, 0.450–0.460; HL, 0.430–0.445; DAPL, 0.085–0.090; PW, 0.235–0.260; MW, 0.330–0.350; AWV, 0.455–0.495; TL, 1.625–1.720.

Material Examined. Holotype, ♀, ex *P. p. comata* (error), Peru: Chanchaniayo, Enenas. 11 ♂♂, 23 ♀♀, ex *S. griseicapillus*, Peru: Dept. Madre de Dios, Cerro de Pantiacolla (2 collections).

Remarks. This is the only species with a mesosome shaped as in Fig. 18b and which lacks a lateral seta on both sides of abdominal segment III. It is additionally characterized as having a short ocular seta, each of terga III–VI with only two short median setae, relatively small dimensions, and the last male segment with only six very long setae.

Carriker (1966) described this species from a single female supposedly collected from a Peruvian Piprinae host. This female is obviously a contaminant from a woodcreeper host and agrees in all aspects with the females from *S. griseicapillus*; thus, we consider these lice to be conspecific.

When Carriker (1966) originally described *F. pipraphaga* (as well as a second species [see below]) from hosts in the Piprinae (manakins), he noted in an appended paragraph: "There is a faint possibility of straggling in the case of [these two species], although no real proof . . . The only thing that is suspicious is . . . the two females are so very different, while both are from hosts of the same genus [*Pipra*]." Given that *R. pipraphaga* is actually a woodcreeper louse, we suggest that the second species (*R. inexpectata* (Carriker), based also on a single female which we have examined and which was supposedly collected from *Pipra coeruleocapilla* Tschudi) will also prove to be a contaminant from a host in the Furnaricinae or Formicariidae. In short, Carriker (1966) was correct in having doubts about the validity of these host records because Piprinae most likely do not harbor *Rallicola*.

It is worth noting that the locality for this erroneous host record for *R. pipraphaga* is Enenas, Peru, which is the same locality for the erroneous record for *F. pyrigena*, which was described from a Formicariidae host when it is actually a junior synonym of the woodcreeper louse *R. chunchotambo*.

Rallicola harveyi Price & Clayton, new species
(Fig. 18a)

Type host. *Deconuchura longicauda* (Pelzelin).
Description. Similar to *R. pipraphaga*, except for presence of lateral seta on 1 or both sides of abdominal segment III, outer seta on sternum VI extending near end of body, and male genitalia with prominent, inwardly directed mesosomal barbs (Fig. 18a).

Dimensions of Male. TW, 0.420–0.430; HL, 0.425–0.440; DAPL, 0.085–0.090; PW, 0.220–0.240; MW, 0.330–0.350; AWV, 0.415–0.445; TL, 1.345–1.410; GW, 0.060–0.065; GPL, 0.080–0.085; GL, 0.270–0.290.

Dimensions of Female. TW, 0.440–0.450; HL, 0.460–0.465; DAPL, 0.090–0.095; PW, 0.250–0.255; MW, 0.345–0.360; AWV, 0.450–0.460; TL, 1.610–1.630.

Type Material. Holotype, ♂, ex *D. longicauda*. Peru: Dept. Madre de Dios, Cerro de Pantiacolla, 1,030 m. above Rio Palotoa, 29-VIII-1985. D. H. Clayton (DW-3181); in collection of Field Museum of Natural History (Chicago). Paratypes, 3 ♂♂, 2 ♀♀, same data as holotype. Paratypes deposited in Field Museum of Natural History, Natural Museum of Natural History (Washington, DC), and Oklahoma State University (Stillwater).

Remarks. In many respects similar to *R. pipraphaga*. *R. harveyi* is distinguished from the former in having a lateral seta on one or both sides of abdominal segment III and a different mesosomal structure (Fig. 18a versus Fig. 18b). The large dimensions, very long outer sternal seta on VI, and shallow anterior head concavity further characterize this species.

Etymology. This species is named for comparative biologist extraordinaire Paul H. Harvey, University of Oxford, in recognition of his fundamental contributions to the study of biological diversity.

Rallicola cephalosa (Carriker)
(Figs. 7 and 8)

Furnaricola cephalosa Carriker 1944: 94. Type host: *Glyphorhynchus spirurus sublestus* Peters.

Description. Head (Fig. 7) with "U" of square dorsoanterior plate extending to near middle of plate; with deep anterior concavity. With short tergal setae. Sternal setae on VI, 4-5; outer seta on sternum VI extending only as far as VIII. Last male segment with only 6 very long setae. Male genitalia (Fig. 8) with straight-sided parameres; solid "button" at posterior end of mesosome.

Dimensions of Male. TW, 0.420-0.470; HL, 0.385-0.410; DAPL, 0.090-0.105; PW, 0.220-0.240; MW, 0.315-0.355; AWV, 0.400-0.420; TL, 1.200-1.415; GW, 0.060-0.065; GPL, 0.080-0.085; GL, 0.240-0.275.

Dimensions of Female. TW, 0.460-0.480; HL, 0.410-0.430; DAPL, 0.100-0.105; PW, 0.240-0.250; MW, 0.330-0.355; AWV, 0.445-0.470; TL, 1.515-1.645.

Material Examined. Holotype, ♂, paratype, 1 ♂, ex *G. s. sublestus*, Costa Rica: Guapiles; 3 ♂♂, 4 ♀♀, ex *G. spirurus* (Vieillot), Brazil: Belem (3 collections); 14 ♂♂, 14 ♀♀, ex *G. spirurus*, Peru: Dept. Madre de Dios, Cerro de Pantiacolla (3 collections); 4 ♂♂, 7 ♀♀, ex *G. spirurus*, Peru: Dept. Cuzco, 20 km NW Pilcopata.

Remarks. This is the first of four species described herein with a solid "button" on the posterior tip of the male genitalic mesosome; *R. cephalosa* is distinguished from the other three species by its much shorter head with its deep anterior concavity

Rallicola fuliginosa (Carriker)
(Figs. 13 and 21)

Furnaricola fuliginosa Carriker 1963a: 467.
Type host: *Dendrocincla fuliginosa merulaoides* (Latresnaye).

Description. Head as in Fig. 21. With short tergal setae; short lateral seta on tergum VII posterior to spiracle. Sternal setae of male: III-IV, 2-3; VI, 3-4; of female: III-V, 2-4; VI, 4-6. Female, and occasionally male, with shorter outer seta on sternum VI. Last male segment as for *R. cephalosa*. Male genitalia (Fig. 13) much as for *R. cephalosa* (Fig. 8), but with basally swollen parameres.

Dimensions of Male. TW, 0.420-0.465; HL, 0.440-0.485; DAPL, 0.090-0.095; PW, 0.240-0.275; MW, 0.345-0.380; AWV, 0.450-0.510; TL, 1.420-1.585; GW, 0.065-0.075; GPL, 0.090-0.100; GL, 0.255-0.285.

Dimensions of Female. TW, 0.475-0.480; HL, 0.505-0.510; DAPL, 0.095-0.100; PW, 0.265-0.270; MW, 0.360-0.385; AWV, 0.485-0.525; TL, 1.770-1.810.

Material Examined. Holotype, ♂, ex *D. f. merulaoides*, Trinidad: Bush bush Forest; 12 ♂♂, 11 ♀♀, ex *D. fuliginosa* (Vieillot), Peru: Dept. Madre de Dios, Cerro de Pantiacolla (2 collections).

Remarks. This species is similar to *R. cephalosa* in that the male has a solid "button" at the mesosome tip. It is distinguished from the latter by the male having a longer outer seta on sternum VI and basally swollen genitalic parameres; both sexes also have longer heads than *R. cephalosa*.

Rallicola picirostris (Carriker)
(Fig. 12)

Furnaricola hirsuta picirostris Carriker 1966: 414. Type host: *Xiphorhynchus picus picirostris* (Latresnaye).

Description. Similar to *R. fuliginosa*, except with both sexes having long tergal setae and very long outer seta on sternum VI, and with male genitalia (Fig. 12) having a distinct hole in "button" of mesosome.

Dimensions of Male. TW, 0.440-0.465; HL, 0.475-0.490; DAPL, 0.095-0.100; PW, 0.250-0.265; MW, 0.360-0.375; AWV, 0.495-0.530; TL, 1.455-1.590; GW, 0.075-0.085; GPL, 0.090-0.105; GL, 0.295-0.330.

Dimensions of Female. TW, 0.465-0.495; HL, 0.495-0.510; DAPL, 0.095-0.100; PW, 0.265-0.280; MW, 0.385-0.405; AWV, 0.520-0.560; TL, 1.775-1.790.

Material Examined. Holotype, ♂, allotype, ♀, paratype, 1 ♂, ex *X. p. picirostris*, Colombia: Magdalena, El Conejo, 1 ♂, 2 ♀♀, ex *X. p. dug-*

andi (Wetmore & Phelps), Colombia: Bolivar, Rio Viejo. 1 ♂, 1 ♀, ex *X. p. saturator* (Hellmayr), Colombia: Santander, Cucuta.

Remarks. The male genitalia of *R. picirostris* are unique in having a distinct hole in the mesosome "button." *R. picirostris* is further distinguished from *R. fuliginosa*, to which it is most similar, in having long tergal setae, a very long seta on sternum VI, and minor dimensional differences.

This is another instance in which Carriker (1966) assigned subspecific status to a louse that differs substantially from the nominate form, thereby overlooking the taxa closer to it. Given that both forms are found on the same host taxon (Table 1), Carriker was likely again following a preconceived notion derived from host association rather than basing his decision on louse morphology. To further complicate matters, and to further illustrate Carriker's lack of a grasp of specific detail, he identified the above pair of lice from *X. p. saturator* as *F. h. hirsuta* rather than as *F. h. picirostris*.

Rallicola hirsuta (Carriker)

(Fig. 16)

Furnaricola hirsuta hirsuta Carriker 1966: 413.
Type host: *Xiphorhynchus picus saturator* (Hellmayr).

Description. Head similar to Fig. 20; dorsoanterior plate ≈50% longer than wide, with "U" extending to near middle of plate. Tergal setae long. Sternal setae: III-IV, 3-4; V, 4-6; VI, 6. Ventral female terminalia similar to Fig. 22, with longer setae flanking long marginal seta posterior to tubercle. Male genitalia (Fig. 16) with basally swollen parameres and apically open mesosome with small lateral barbs.

Dimensions of Male. TW, 0.395; HL, 0.415; DAPL, 0.110; PW, 0.240; MW, 0.350; AWV, 0.425; TL, 1.230; GW, 0.060; GPL, 0.080; GL, 0.300.

Dimensions of Female. TW, 0.415-0.445; HL, 0.445-0.475; DAPL, 0.120-0.130; PW, 0.260-0.265; MW, 0.355-0.385; AWV, 0.475-0.510; TL, 1.400-1.565.

Material Examined. Holotype, ♀, allotype, ♂, paratypes, 3 ♀♀, ex *X. p. saturator*, Colombia: Caqueta, Puerto Venecia.

Remarks. This species is distinguished from all others by its combination of short ocular seta, long tergal setae, dimensions, female ventral terminalia chaetotaxy, and unique male genitalia mesosome. It is grossly different from *R. picirostris*, placed as a subspecies of *R. hirsuta* by Carriker (1966).

In the Carriker collection, there are three series identified as *F. h. hirsuta*: the type series described above, a male and a female also re-

ported from *X. p. saturator* but actually representing *R. picirostris*, and a female supposedly collected from *X. p. dugandi*. However, the last is not even a *Rallicola* of the Dendrocolaptinae group. Carriker (1966) alluded to this last specimen in a footnote to the *F. h. hirsuta* description: "... a single female ... in the range of *X. p. dugandi* which cannot be separated from them ... and must be called *F. h. hirsuta*." This quote serves as further testimony of the ambiguous descriptions by Carriker and his inability to differentiate among morphologically distinct forms.

Rallicola tergalis (Carriker)

(Fig. 19)

Furnaricola tergalis Carriker 1966: 410. Type host: *Xiphocolaptes albicollis albicollis* (Vieillot).

Description. Head similar to Fig. 21. Tergal setae long. Sternal setae: III, 3-5; IV-VI, 4-7; outer seta on sternum VI extending only to VIII. Male genitalia (Fig. 19) with basally swollen parameres having slight pointed process on medial margin; mesosome broadly open posteriorly.

Dimensions of Male. TW, 0.485-0.510; HL, 0.505-0.545; DAPL, 0.105-0.110; PW, 0.280-0.305; MW, 0.395-0.415; AWV, 0.520-0.565; TL, 1.500-1.565; GW, 0.085-0.090; GPL, 0.100-0.120; GL, 0.345-0.350.

Dimensions of Female. TW, 0.545-0.555; HL, 0.550-0.595; DAPL, 0.120-0.125; PW, 0.315-0.320; MW, 0.430-0.445; AWV, 0.665-0.670; TL, 1.795-1.960.

Material Examined. Holotype, ♀, allotype, ♂, paratypes, 3 ♂♂, 2 ♀♀, ex *X. a. albicollis*, Brazil: Edo. Rio de Janeiro, Serra do Angrada; 1 ♀, ex *X. a. albicollis*, Brazil: Espirito Santo, S. Jose.

Remarks. The combination of short ocular seta, long abdominal tergal setae, dimensions, and genitalia as in Fig. 19 distinguish *R. tergalis* from all other taxa treated herein.

Carriker (1966) mentioned three females from *X. promecopterhynchus* (Lesson) which he could not distinguish from *R. tergalis*. These specimens likely represent two taxa, neither of which is *R. tergalis*, however, we agree with Carriker that a final decision must await the collection of male specimens.

Rallicola triangularis (Carriker)

(Fig. 9)

Furnaricola triangularis Carriker 1966: 415.
Type host: *Lepidocolaptes souleyetii lineaticeps* (Latrell).

Description. Head similar to Fig. 20; dorsoanterior plate \approx 30–50% longer than wide, with "U" extending to near middle of plate. Tergal setae long. Sternal setae: III–IV, 3–6; V–VI, 4–7; on male VII, 2–4. Female ventral terminalia as in Fig. 22. Male genitalia (Fig. 9) with parameres slightly swollen basally; mesosome apically as shown, with thin rounded closure.

Dimensions of Male. TW, 0.390–0.415; HL, 0.400–0.435; DAPL, 0.105–0.110; PW, 0.230–0.245; MW, 0.345–0.365; AWW, 0.435–0.500; TL, 1.315–1.385; GW, 0.065–0.080; GPL, 0.095–0.100; GL, 0.295–0.320.

Dimensions of Female. TW, 0.440–0.445; HL, 0.425–0.460; DAPL, 0.115–0.125; PW, 0.245–0.260; MW, 0.390–0.395; AWW, 0.525–0.570; TL, 1.480–1.680.

Material Examined. Holotype, ♀, allotype, ♂, paratypes, 2 ♂♂, 1 ♀, ex *L. s. lineaticeps*, Colombia: Bolivar, Tierra Alta; paratype, 1 ♂, ex *L. s. lineaticeps*, Colombia: Bolivar, Coloso; 2 ♂♂, 1 ♀, ex *L. souleyetii* (Des Murs), Venezuela: 24 km S, 93 km E Maracaibo.

Remarks. As with the foregoing species, *R. triangularis* is characterized by its short ocular seta, long abdominal tergal setae, dimensions, and genital details.

We were initially at a loss to explain why the collection data for the type series are given by Carriker (1966) as "El Conejo, Sierra Perija, Colombia, March 18, 1945," when the slides involved are clearly labelled "Tierra Alta, Bolivar, Colombia, 11-16-1949." However, we subsequently noted that the former data are those given for the preceding species on the facing page of Carriker (1966); hence, they apparently represent a lapse in transcription.

***Rallicola palmai* Price & Clayton, new species**
(Figs. 11, 17, and 22)

Type host. *Campylorhamphus trochilirostris* (Lichtenstein).

Description. Head similar to Fig. 21. Abdominal tergum II with pair of medioanterior setae similar in size to marginal setae (Fig. 11); tergal setae long. Sternal setae: III–IV, 2–5; V–VI, 3–6. Female ventral terminalia (Fig. 22) with longer setae flanking long seta posterior to tubercle. Male genitalia (Fig. 17) with markedly curved parameres, basally swollen, with faint median process; mesosome with posterior "button."

Dimensions of Male. TW, 0.445–0.470; HL, 0.465–0.480; DAPL, 0.100–0.105; PW, 0.245–0.270; MW, 0.360–0.405; AWW, 0.485–0.515; TL, 1.480–1.645; GW, 0.075–0.080; GPL, 0.085–0.105; GL, 0.300–0.315.

Dimensions of Female. TW, 0.470–0.500; HL, 0.485–0.515; DAPL, 0.105–0.110; PW, 0.260–0.290; MW, 0.390–0.435; AWW, 0.560–0.590; TL, 1.700–1.920.

Type Material. Holotype, ♂, ex *C. trochilirostris*, Peru: Dept. Madre de Dios, Cerro de Pautacolla, 20-VIII-1985, D. H. Clayton (85–216); in collection of Field Museum of Natural History (Chicago). Paratypes, 5 ♂♂, 9 ♀♀, same data as holotype; 5 ♂♂, 23 ♀♀, same except (85–217); 7 ♂♂, 6 ♀♀, same except 9-XI-1985 and no host number; 25 ♂♂, 27 ♀♀, ex *C. trochilirostris*, Peru: Dept. Cuzco, 20 km NW Pilcopata, nr. Rio Tono (820 m), 30-XI-1985, D. H. Clayton; 16 ♂♂, 16 ♀♀, same except 1-XII-1985 (DW-1234, 1235, 3476); 5 ♂♂, 18 ♀♀, same except 2-XII-1985. Paratypes deposited at Field Museum of Natural History, National Museum of Natural History (Washington, DC), The Natural History Museum (London), University of Minnesota (St. Paul), and Oklahoma State University (Stillwater).

Remarks. This taxon is readily distinguished from all others except *R. lyali* by the pair of conspicuous medioanterior setae on abdominal tergum II. It is distinguished from *R. lyali* in having only two medioanterior marginal setae on abdominal terga III–VI. This recognition is further reinforced by the unique male genitalia in combination with a short ocular seta, dimensions, and other features.

Etymology. This species is named for Ricardo L. Palma, National Museum of New Zealand, in recognition of his outstanding contributions to the taxonomy of avian Phthiraptera and his long-time friendship and collaboration.

Key to the Species of *Rallicola* from the Woodcreepers

1. Ocular seta much longer than any of 3 marginal temple setae posterior to it (Figs. 1, 5, and 6) 2
2. Ocular seta similar in length to 3 marginal temple setae posterior to it (Figs. 7, 20, and 21) 3
3. Very large, TW >0.53, HL >0.53 *antioquiensis* (Carriker)
4. Smaller than above *chunchotambo* (Carriker)
5. Each of terga III–VI with at least 4 median marginal setae (Fig. 10) 4
6. Each of terga III–VI with only 2 median marginal setae (Figs. 1, 5, and 11) 6
7. Tergum II with medioanterior pair of long setae in addition to pair of marginal setae (Fig. 11) *lyali* Price & Clayton, n. sp.
8. Without such medioanterior setae on tergum II (Figs. 1, 5, and 10) 5
9. At least 6 setae on each of sterna IV–VI. Male paramere as in Fig. 14a; HL <0.510; PW <0.280; DAPL at least 0.120. Female TW >0.510; DAPL at least 0.130 *keymerae* Price & Clayton, n. sp.
10. Only up to 5 setae on each of sterna IV–VI. Male paramere with broad "shoulder"

- and short curved distal portion (Fig. 14b); HL at least 0.510; PW >0.280; DAPL not >0.115. Female TW <0.510; DAPL not >0.125 *colombiana* (Carriker)
6. Tergum II with medioanterior pair of setae similar in size to marginal setae (Fig. 11); male genitalia as in Fig. 17 *palmai* Price & Clayton, n. sp.
- Tergum II lacking medioanterior pair of prominent setae (Figs. 1, 5, and 10); male genitalia otherwise 7
7. Long tergal setae, those on V of male at least 0.125 long, of female >0.140 long 8
- Short tergal setae, those on V of male not >0.125 long, of female <0.140 long (Figs. 1 and 5) 12
8. Male TW >0.430, HL >0.450. Female TW >0.455, HL >0.485 9
- Smaller than above 11
9. Male genitalia (Fig. 12) with parameres and mesosome as shown, medioposterior "button" with distinct small hole in center. Female TW not >0.495, HL <0.520 *picirostris* (Carriker)
- Male genitalia (Figs. 14a and 19) with parameres and mesosome as shown, without medioposterior "button." Female TW at least 0.500, HL >0.540 10
10. Male genitalia as in Fig. 14a. Female AWV <0.630; DAPL at least 0.130 *certhia* (Carriker)
- Male genitalia as in Fig. 19. Female AWV >0.645; DAPL not >0.125 *tergalis* (Carriker)
11. Male genitalia (Fig. 16) with distinct mesosomal barbs medioposteriorly and GPL <0.090. Female MW <0.390 *hirsuta* (Carriker)
- Male genitalia (Fig. 9) with mesosome smoothly rounded medioposteriorly and GPL at least 0.090. Female MW at least 0.390 *triangularis* (Carriker)
12. Male with last segment having 8 very long setae (Fig. 5, 10, and 11); genitalia (Fig. 15) with medioposterior opening of mesosome and straight-sided parameres. Female TW at least 0.500, HL >0.520 13
- Male with last segment having only 6 very long setae (without "arrow" seta of Fig. 5); genitalia otherwise. Female TW <0.500, HL <0.520 13
13. Abdominal segment III without lateral seta. Male genitalia grossly as in Fig. 18a, but with mesosome as in Fig. 18b *pipraphaga* (Carriker)
- Abdominal segment III with very short to short seta on at least 1 side. Male genitalia otherwise 14
14. Female HL >0.480. Male HL at least 0.440; genitalia (Fig. 13) large, GW at

- least 0.065. GPL at least 0.090 *fuliginosa* (Carriker)
- Female HL <0.480. Male HL not >0.440; genitalia (Fig. 8 and 18a) smaller, GW not >0.065, GPL not >0.085 15
15. Head with deep anterior concavity (Fig. 7). Male genitalia as in Fig. 8 *cephalosa* (Carriker)
- Head with shallow anterior concavity (Fig. 21). Male genitalia as in Fig. 18a *harveyi* Price & Clayton, n. sp.

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