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Tyranniphilopterus polioptilus new species (Phthiraptera: Ischnocera: Philopteridae) parasitic on the Masked Gnatcatcher, *Polioptila dumicola* (Passeriformes, Polioptilidae) in Argentina

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Abstract

Tyranniphilopterus polioptilus **sp. nov.** is described and illustrated from specimens collected off *Polioptila dumicola dumicola* (Vieillot, 1816) from two localities in the coastal area NE of Buenos Aires Province, Argentina. Morphologically the new species is similar to *T. titicacae* (Eichler & Freund, 1956) and several other undescribed species from the Tyrannidae, differing from all of them by proportions of the head and dorsal anterior plate, most body measurements, number of dorsal and ventral setae in both sexes, and number and arrangements of vulvar setae in females. Descriptions of the male, female, the three nymphal instars and the egg are also included. A list is presented of all known species of *Tyranniphilopterus*, arranged by host taxa.

Key words: egg morphology, oviposition sites, distribution

Introduction

The genus *Tyranniphilopterus* Mey, 2004 comprises 14 described species. Seven species are known to parasitize members of the Tyrannidae, five from the Cotingidae, one from the Pipridae – all suboscine New World hosts – and one from Platysteiridae in the Old World (Uganda). As there are no records of this genus from oscine birds in the New World, it is the purpose of this paper to describe a new species parasitic on the Masked Gnatcatcher, *Polioptila dumicola dumicola,* from Argentina, commenting briefly on its morphological affinities with allied species, together with a theoretical explanation of its presence on the Polioptilinae. This is the first ischnoceran known from this avian subfamily. The amblyceran *Ricinus polioptilus* Carriker, 1964 is the only other known louse parasitic on the Tropical Gnatcatcher, *Polioptila plumbea* (Gmelin, 1788). A list of all known species in *Tyranniphilopterus*, arranged by host taxa, is also included.

Materials and methods

A total of 17 specimens of *P. d. dumicola* were searched for lice between 1981 and 1991 from three sampling sites of Argentina and Uruguay: the NE coast of Buenos Aires Province (La Plata –La Plata District –, General Mansilla – Magdalena District (35º 05’ SL, 57º 45’ W) and Laguna Bellaca –Almirante Brown District (34º 58’ SL, 58º 24’W)), the E coast of Corrientes Province (Río Mocoretá –Monte Caseros District (30º 38’ SL, 57º69’ W)), and the W coast of Uruguay (San Gregorio – Artigas Department (30º 33’ SL, 57º 52’ W)).

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Birds were captured with mist-nets. Each netted bird was immediately euthanized, wrapped with an absorbent paper, placed in an individual plastic bag containing *ca*. 2 mls. ethyl acetate to kill lice *in situ*, and then frozen as soon as possible. In the laboratory each bird was carefully searched for lice feather-by-feather. Location of individual lice, in particular pteryla or apteria, was mapped on pre-printed cards, paying special attention to the sites of oviposition. Lice were slide-mounted in Canada Balsam following conventional procedures. The eggs were stored in vials with 70% ethanol. Lice for scanning microscopy were cleaned in an ultrasonic vibrator, then repeatedly rinsed in distilled water, dehydrated in graded to absolute ethanol, mounted in stubs, coated with gold-palladium, observed and photographed at different magnifications in a Jeol/EO 1.1 Scanning Electron Microscope of the Electronic Microscopy Laboratory of the Museo de La Plata. Nomenclature of chorionic structures follows Cicchino & Castro (1994). Drawings were made using a *camera lucida* attached to a Bausch & Lomb compound microscope. All measurements were taken from mounted specimens by means of a calibrated eyepiece, all expressed in millimeters and identified by the following abbreviations: AS3 maximum distance betwen the basis of Anterior Seta 3 of the forehead (see Clay, 1951), HL head length, POW preantennal width, OW maximum width of the head, PL prothorax length, PW prothorax width, PTW pterothorax width, AL abdominal length, AW maximum width of the abdomen, TL total body length, GL male genitalia length (taken from the apex of the basal plate to the tip of mesosomal coomplex), GW maximum width of the male genitalia. Measurements include ranges and means within parentheses.

Repository of specimens: holotype and paratypes in the collection of Museo de La Plata, La Plata, Buenos Aires Province, Argentina.

Results

Tyranniphilopterus polioptilus, new species

(Figs. 1–16)

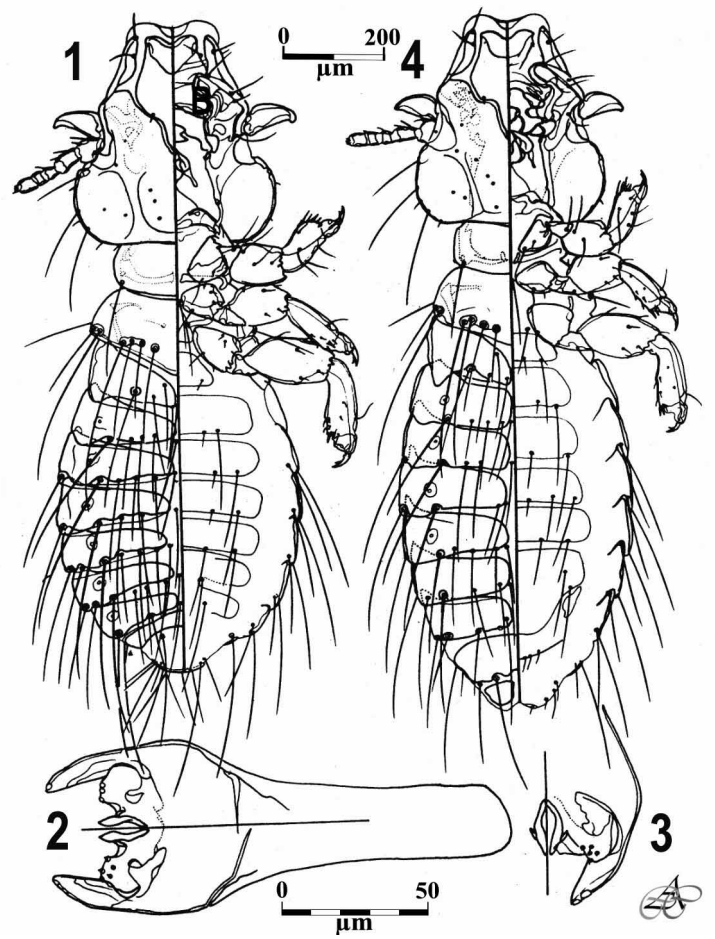
Type host*: Polioptila dumicola dumicola* (Vieillot, 1816). This species has a wide geographical range, from NE Brazil (States of Pará, Goiás, Minas Gerais, São Paulo, Mato Grosso, Paraná and Santa Catarina), Paraguay and Bolivia to Uruguay and Argentina to level of NE Buenos Aires and La Pampa Provinces (Sick 1997, Narosky & Izurieta 1987, Rohling Ghizoni, Jr 2004.

Male: (Fig. 1). Pterothorax with 7–8 setae each side. Abdominal chaetotaxy: tergocentral setae: II 6 (plus anterior pair), III–IV 8, V 6–8, VI–VII 8, IX 6; sternal setae each side: II 1–2 (small), III–V 2 (one long, one short), VI 2 (both long); paratergal setae: II–III 0, IV–VIII 2. Genitalia: parameres long, approximately of the same length as the whole mesosomal complex, best seen in Figs. 2–3. Body measurements: AS3 0.124–0.143 (0.134), POW 0.286–0.295 (0.288), OW 0.362–0.391 (0.379), HL .0.381–0.405 (0.397), PL 0.138–0.148 (0.143), PW 0,214–0.229 (0.218), PTL 0.152–0.171 (0.159), PTW 0.309–0.319 (0.315), AL 0.590–0.619 (0.607), AW 0.433–0.476 (0.444), GL 0.100, GW 0.056, TL 1.129.–1.191 (1.170).

Female: (Fig. 4) Much as for male, except in dimensions, usual sexual dimorphism and details of chaetotaxy in some abdominal segments. Abdominal chaetotaxy: tergocentral setae: II 6 (plus one anterior pair), III–VI 8, VII–VIII 6, IX 4. Paratergal and sternal chaetotaxies as for male, except for additional long seta occasionally on II or IV. Vulva with 3–4 medium setae each side (Fig. 12). Measurements: AS3 0.143–0.162 (0.154), POW 0.310–0.324 (0.317), OW 0.402–0.414 (0.409), PL 0.154–0.171 (0.168), PW 0.233–0.243 (0.236), PTL 0.143–0.171 (0.159), PTW 0.323–0.348 (0.336), AL 0.723–0.781 (0.754), AW 0.457–0.495 (0.480), TL 1.324–1.405 (1.368).

Third nymphal instar: (Fig. 5). Antennal segment IV with two placoid sensilla arranged in oblique line, similar to adult (Figs. 10 and 11). Dorsal marginal carina internally notched near middle. Pterothorax with five medium to long posterior setae. Abdomen with sclerotized lightly pigmented paratergal plates present on II–VII. Abdominal dorsal segments II with 4 setae each side, III–V with 3 tergocentral setae, and VI–VII with 2;

ventral segments II–VII with 2 setae each side, with innermost small on II–V. Paratergal setae: II–III 0, IV–VIII 2. Body measurements: AS3 0.133, POW 0.294, OW 0.343, HL 0.381, PL 0.133, PW 0.200, PTL 0.114, PTW 0.281, AL 0.571, AW 0.405, TL 1.143.

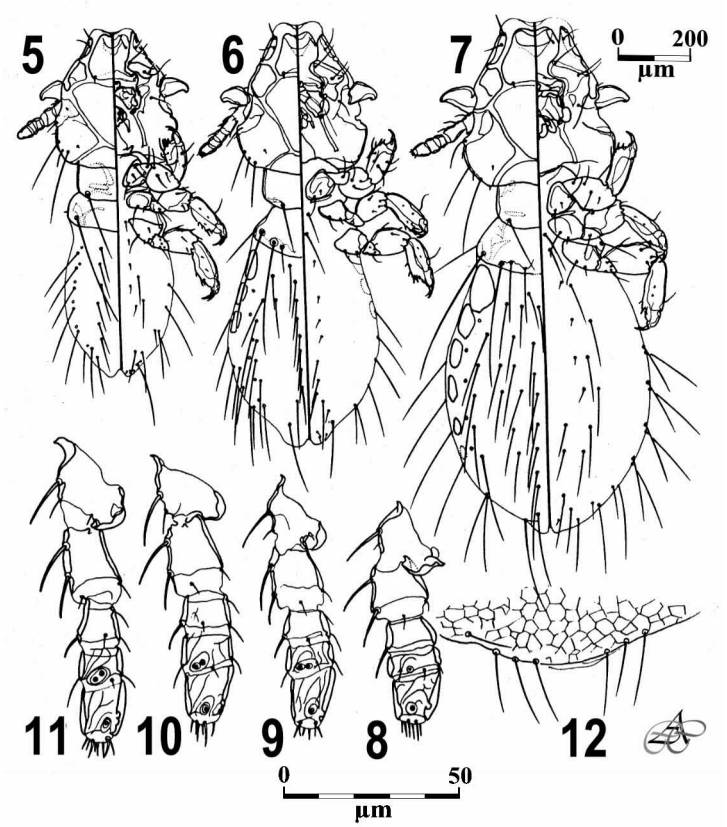


FIGURES 1–4. *Tyranniphilopterus polioptilus* n.sp., adults. 1 male, 2 male genitalia, 3 partial aspect of right paramere and mesosomal complex of other specimen, 4 female.

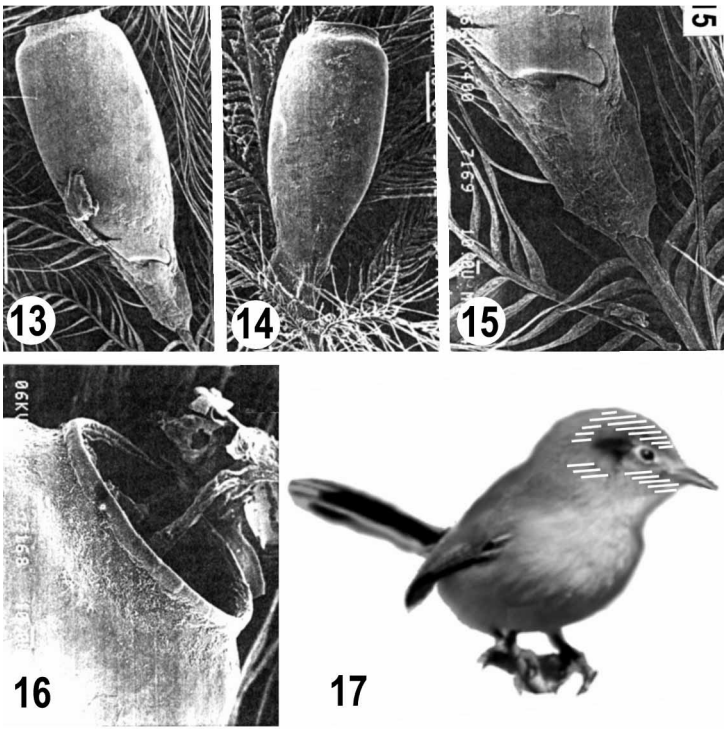
Second nymphal instar: (Fig. 6). Antennal segment IV with two placoid sensilla arranged in a straight line (Fig. 9). Dorsal marginal carina internally notched near middle. Pterothorax with four medium to long posterior setae. Abdomen with sclerotized lightly pigmented paratergal plates present on II–IV. Abdominal dorsal segments II with 4 setae each side, III with 2 and IV–VII with 1; ventral segments II–VII with 1 seta each side, those on II–V small. Paratergal setae: II–III 0, IV–VII 1, VIII 2. Body measurements: AS3 0.095, POW 0.238, OW 0.286, HL 0.333, PL 0.124, PW 0.171, PTL 0.105, PTW 0.247, AL 0.409, AW 0.333, TL 0.864.

First nymphal instar: (Fig. 7). As usual for most Ischnocera, antennal segment IV has only one placoid sensillum (Fig. 8) (see Cicchino & Abrahamovich, 1988), pterothorax with only one very long posterior seta, and abdomen lacking sclerotized paratergal plates. Dorsal marginal carina completely interrupted near middle. Abdominal dorsal segments II–VII with one long seta, ventral ones similar to N II. Body measurements: AS3 0.092, POW 0.224, OW 0.273, HL 0.285, PL 0.095, PW 0.171, PTL 0.105, PTW 0.219, AL 0.288, AW 0.262, TL 0.743.

Egg: elongated. Amphora noticeably constricted in proximity of callus (Figs. 13, 14, 16), and gradually tapering posteriad (Fig. 13), its surface being smooth. Operculum lacking in all 16 eggs examined. Measurements: total length (without operculum), 0.465–0.490 (0.485), maximum width of amphora 0.216–0.224 (0,220). Maximum diameter of amphoral opening 0.114.



FIGURES 5–12. *Tyranniphilopterus polioptilus* n.sp. 5 nymphal instar I, 6 nymphal instar II, 7 nymphal instar III; 8–11fourth antennal segment of: 8 nymphal instar I, 9 nymphal instar II, 10 nymphal instar III, 11 male adult; 12 female vulva.



FIGURES 13-17. 13-16 *Tyranniphilopterus polioptilus* n.sp., eggs, lacking operculum: 13 egg glued to an auricular feather (lateral view); 14 ídem, glued to a throat feather; 15 detail of Fig. 13, showing the type of cementation to a barb; 16 amphora in semipolar view; 17 *Polioptila dumicola dumicola*, a female specimen from General Mansilla, Buenos Aires Province, showing the egg-laying sites (for further explanations, see text).

Sites of oviposition: one, less commonly two eggs are glued to the basal half of the lower barbs of the feather vanes by means of a moderate amount of spumaline (Figs. 13–15). Eggs are laid on feathers of pteryla of the throat, mandible, periauriculars, eyebrow and lateral margins of the crown (Fig. 17).

Prevalence: low, 11.76%, two individuals parasitized of 17 examined, both from NE Buenos Aires province.

Remarks: *Tyranniphilopterus polioptilus* n. sp. is the smallest species of the genus described to date. It is morphologically similar to *T. titicacae* (Eichler and Freund, 1956) and to several undescribed species of this genus parasitic on tyrannid hosts including: *Sayornis phoebe* (Shaw, 1790), *Empidonax minimus* (Baird,W. M. and Baird,S. F., 1843), *Hemitriccus margaritaceiventer* (d´Orbigny and Lafresnaye, 1837), *Muscisaxicola macloviana* (Garnot, 1829), *Myiarchus tyrannulus* (Statius Müller, 1776), *Suiriri suiriri* (Vieillot, 1818), *Serpophaga subcristata* (Vieillot, 1817), *Leptopogon superciliaris* Tschudi, 1844, *Leptopogon amaurocephalus* Tschudi, 1846 and *Hymenops perspicillatus* (Gmelin, 1789) in having relatively narrow preantennal margin, anterior seta 3 (as3) stout, rigid and relatively long, parameres long in the male genitalia, and arrangement of the dorsal and ventral abdominal chaetotaxy. It differs from all of them by proportions of the head and dorsal anterior plate, most of the body measurements, and countings of dorsal, ventral and vulvar setae of the abdomen in both sexes.

Mey (2004) recognized two phenotypes based on the size and number of claws of the third pair of legs. All the specimens available of the new species belong to phenotype II by having all legs essentially of similar size and the third pair double-clawed. Mey also pointed out that the clypeal carina is interrupted laterally in the upper third for all nymphal instars, being interrupted or notched in adult stage, generating his types D1 and D2, respectively. *Tyranniphilopterus polioptilus* **sp. nov.**, together with species parasitic on members of the Elaeninae (*Suiriri*, *Serpophaga*) and Fluvicolinae (*Hymenops*), showed N I with the carina interrupted, N II deeply notched, N III and adult stage notched, showing a regressive status of this character affecting N II and NIII.

The genus *Tyranniphilopterus* is known to parasitize suboscine passeriform birds belonging to the Tyrannidae, Pipridae, Cotingidae (Mey, 2004) and Sapayoidae (Cicchino & Barreto, in prep.) in the New World, as well as two families of oscines, Platysteiridae (Mey, 2004) in the Old World (Uganda) and Polioptilidae in the New World (Argentina). The latter includes the subfamily Polioptilinae, with the genus *Polioptila* Sclater, 1855, which has 11 described species, ranging from the south of Nearctic to Uruguay and central Argentina in the Neotropics. Until recently (eg. A.O.U., 1998; Sibley & Monroe, 1990), *Polioptila* has been classified within the Sylviidae or, alternatively, in a single family of its own, Polioptilidae, presumably linked to sylvioid stock of the Old World. Molecular studies using DNA-DNA hybridization techniques concluded that *Polioptila* fit well within the Certhiidae, being the sister group of the Wrens (Troglodytidae) (Barker, 2004). It is an interesting that Certhiidae in the New World and Troglodytidae (in both Old and New World) are parasitized by species of *Philopterus* Nitzsch, 1818 (Mey, 2004; Cicchino & Castro, 1998), whilst *Polioptila* is parasitized by *Tyranniphilopterus*. True Certhiidae are parasisized by *Philopterus* species (Mey, 2004) and this supports the opinion that the Gnatcatchers (Polioptilidae) are not part of the Treecreepers (Certhiidae). This agrees with Dickinson (2003), who stated that they belong to their own family, Polioptilidae, and are not closely related to the Certhiidae. *Tyranniphilopterus* also parasitizes *Sapayoa aenigma* Hartert, 1903. This New World species is included in Sapayoidae, a suboscine family cladistically linked to Philepittidae, Eurylaimidae and Calyptomenidae (Irestedt et al., 2006), all from the oriental half of the Old World and not reported to be parasitized by *Philopterus* species.

Modern theories regarding the Gondwanian origin of the perching birds leads me to conclude that *Tyranniphilopterus* originated in austral Gondwana, parasitizing primarily the tyrannoid stock, and secondarily on several unrelated, but partially sympatric, suboscine and oscine taxa. With the break-up of austral Gondwana, this tyrannoid stock became isolated in the New World. By the end of the Cretaceous the Polioptilidae and Sapayoidae reached the New World by some of the ways suggested by Fjeldså et al. (2003). Others, as Platys-

teridae, remained in occidental Gondwana. Alternatively, Polioptilidae may have acquired *Tyranniphilopterus a posteriori* in the New World from tyrannids, cotingas or mankins.

Etymology: the word "polioptilus" refers to the generic name of its host.

Specimens examined: all from Buenos Aires province, Argentina: male holotype, 1 male and 4 females paratypes, 3 nymphs III, 1 nymphs II, 1 nymph I and numerous eggs from Punta Piedras, Magalena District, 23-IX-1984, A.C. Cicchino coll.; 2 males paratypes, Laguna Bellaca, Almirante Brown District, I-1991, A.C. Cicchino coll.

Passerine hosts known to be parasitized by *Tyranniphilopterus* species, including the remaining louse species known from them. (T) indicates type host, taken at species level. (Avian taxonomy as per Dickinson, 2003)

SUBOSCINES

TYRANNIDAE

Genus *Tachuris* Lafresnaye, 1836

T. rubrigastra (Vieillot, 1817) – Many-colored Rush-Tyrant

Tyranniphilopterus titicacae (Eichler and Freund, 1956) **(T)**

Machaerilaemus maestus (Kellogg and Chapman, 1899)

Genus *Contopus* Cabanis, 1855

C. virens (Linnaeus, 1766) – Eastern Wood-Pewee

Tyranniphilopterus fuscoventralis (Osborn, 1896) **(T)**

Ricinus marginatus (Children, 1836)

Ricinus sucinaceus (Kellogg, 1896)

C. cinereus (Spix, 1825) – Tropical Pewee

Tyranniphilopterus fuscoventralis (Osborn, 1896)

Myrsidea contopi Price, Hellenthal and Dalgleish, 2005 **(T)**

Ricinus marginatus (Children, 1836)

Genus *Pyrocephalus* Gould, 1839

P. rubinus (Boddaert, 1783) – Vermilion Flycatcher

Tyranniphilopterus insulicola (Kellogg and Kuwana, 1902) **(T)**

Picicola foedus (Kellogg and Chapman, 1899)

Ricinus marginatus (Children, 1836)

Genus *Myiarchus* Cabanis, 1844

M. cinerascens (Lawrence, 1851) – Ash-throated Flycatcher

Tyranniphilopterus rufus (Kellogg, 1899) **(T)**

Menacanthus distinctus (Kellogg and Chapman, 1899) **(T)**

Ricinus leptosomus (Carriker, 1903)

Genus *Attila* Lesson, 1830

A. spadiceus (Gmelin, 1789) – Bright-rumped Attila

Tyranniphilopterus minutus (Carriker, 1963) **(T)**

Myrsidea spadicei Price, Hellenthal and Dalgleish, 2005 **(T)**

Genus *Myiodynastes* Bonaparte, 1857
M. maculatus (Statius Müller, 1776) – Streaked Flycatcher
Tyranniphilopterus venezuelensis Mey, 2004 **(T)**
Ricinus marginatus (Children, 1836)

Genus *Elaenia* Sundevall, 1836
E. albiceps (d´Orbigny and Lafresnaye, 1837) – White-crested Elaenia
Tyranniphilopterus delicatulus Mey, 2004 **(T)**
Ricinus arcuatus (Kellogg and Mann, 1912)

COTINGIDAE
Genus *Tityra* Vieillot, 1816
T. semifasciata (Spix, 1825) – Masked Tityra
Tyranniphilopterus tityra (Carriker, 1963) **(T)**
Kaysius tityrus (Carriker, 1903) **(T)**
Ricinus brevicapitis Carriker, 1964 **(T)**

Genus *Pachyramphus* Gray, 1840
P. rufus (Boddaert, 1783) – Cinereous Becard
Tyranniphilopterus cotingae (Carriker, 1963) **(T)**
Ricinus arcuatus (Kellogg and Mann, 1912)
P. polychopterus (Vieillot, 1818) – White-winged Becard
Tyranniphilopterus cotingae (Carriker, 1963)
Ricinus arcuatus (Kellogg and Mann, 1912)
P. aglaiae (Lafresnaye, 1839) – Rose-throated Becard
Tyranniphilopterus platypsarus (Carriker, 1963)

Genus *Pipreola* Swainson, 1837
P. aureopectus (Lafresnaye, 1843) – Golden-breasted Fruiteater
Tyranniphilopterus festivus (Carriker, 1963) **(T)**
Cotingacola tergalis Carriker, 1956 **(T)**
Pseudocophorus decoratus Carriker, 1940 **(T)**

PIPRIDAE
Genus *Manacus* Brisson, 1760
M. manacus (Linnaeus, 1766) – White-bearded Manakin
Tyranniphilopterus bruneri (Carriker, 1903) **(T)**
Menacanthus eurysternus (Burmeister, 1838)
Myrsidea edgarsmithi Dalgleish & Price 2003
Ricinus pessimalis Eichler, 1956

OSCINES
PLATYSTEIRIDAE
Genus *Platysteira* Jardine & Selby, 1830
P. cyanea (Mueller, 1776) – Common Wattle-eye
Tyranniphilopterus beckeri Mey, 2004 **(T)**

POLIOPTILIDAE

Genus *Polioptila* Sclater, P. L., 1855

P. dumicola (Vieillot, 1817) – Masked Gnatcatcher

Tyranniphilopterus polioptilus new species **(T)**

P. plumbea (Gmelin, 1788) – Tropical Gnatcatcher

Ricinus polioptilus Carriker, 1964

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