



ON THE IDENTITY OF *ESTHIOPTERUM TATAUPA* CARRIKER, 1936 (PSOCODEA: PHTHIRAPTERA: ISCHNOCERA): A FURNARIID LOUSE SPECIES

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KEY WORDS ABSTRACT

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Reexamination of the holotype of the louse species *Esthiopterum tataupa* Carriker, 1936 demonstrated that the species belongs to the genus *Furnariphilus* Price and Clayton, 1995 and is conspecific with *Furnariphilus parkeri* Price and Clayton, 1995. The Tataupa tinamou *Crypturellus t. tataupa* (Temminck, 1815), originally listed as the type host of this species, is not the true host. This association likely resulted from contamination during Carriker's 1934 Bolivian collections, when a furnariid (*Sclerurus albigularis albicollis* Carriker, 1935) was obtained at the same locality. The present study refines both the taxonomy and host association of this louse species and underscores the importance of continued critical evaluation of historical type specimens and refined morphological analysis. It also underscores the value of well-documented collections of hosts and parasites with associated field notes for assessing taxonomy and documenting ecological and evolutionary relationships of hosts and their parasites.

The genus *Esthiopterum* was established by Harrison (1916) to accommodate elongate ischnoceran lice that are distinguished from the genus *Lipeurus* Nitzsch, 1818 by a distinctly divided marginal carina on the head, whereas *Lipeurus* lacks this division and has a smoothly rounded frontal head margin. This character-based distinction led to the reassignment of numerous species into *Esthiopterum*, resulting in a heterogeneous taxonomic grouping.

Hopkins and Clay (1952), in their influential checklist of Mallophaga, redefined *Esthiopterum*, restricting it to 5 valid species parasitic exclusively on birds from the family Gruidae (cranes), a concept later stabilized by Tandan (1973). Hopkins and Clay (1952) flagged *Esthiopterum tataupa* Carriker, 1936, described from the Tataupa tinamou *Crypturellus t. tataupa* (Temminck, 1815), as morphologically distinct from other species in the genus *Esthiopterum* and suggested that it might warrant placement in a new genus. Although Carriker's original illustration was insufficient for a definitive assignment, it clearly indicated that the species did not belong in *Esthiopterum*.

During a project focused on the ischnoceran lice of tinamous, we examined the holotype of *E. tataupa* (Fig. 1A–F), a single female housed at the Academy of Natural Sciences of Drexel University (ANSP), Philadelphia, Pennsylvania (ANSP-ENT150643; #9044). The holotype of *E. tataupa* displays key morphological features, including head shape, preantennal structure, and the morphology of abdominal tergites and terminalia, that are entirely inconsistent with the revised concept of *Esthiopterum*, now recognized as a morphologically and ecologically cohesive group restricted to Gruidae hosts.

Specifically, these key morphological features include the shape of the anterior dorsal head plate (wider than longer in *Esthiopterum*), with the anterior dorsal setae (ads) inserted on this plate (Fig. 1C) rather than on the roof of the head, in the area posterior to the preantennal suture delimiting the anterior head plate (as occurs in *Esthiopterum* species). Furthermore, the tergal plates are medially fused, whereas in *Esthiopterum*, the tergal plates are not medially fused and form a distinct membranous area along the midline of the abdomen. The terminal abdominal tergites of the *E. tataupa* holotype do not match other female *Esthiopterum*, which have tergal plates that are nearly translucent and bordered by distinct sclerotized markings on segments IX+X and XI. Finally, after noticing these differences, we noted that the features of the *E. tataupa* holotype are diagnostic for the louse genus *Furnariphilus*, which was described by Price and Clayton (1995) decades after Harrison's (1916) description of *Esthiopterum*. Therefore, we compared the holotype of *E. tataupa* to type specimens of the 3 species of *Furnariphilus* described by Price and Clayton (1995), which are deposited in the Field Museum of Natural History (FMNH) louse collection, Chicago, Illinois (Kuabara et al., 2023).

According to Price and Clayton (1995), the head of *Furnariphilus* is distinctly longer than wide, with a preantennal region tapering to a truncate hyaline margin. The conus is small; the ocular seta is very short; and the preocular seta is positioned anterior to the eye lens. The dorsoanterior head plate is well defined, with a broadly rounded posterior margin. Metathoracic chaetotaxy includes 5–7 long setae, and coxae II and III are articulated, not fused to the thoracic wall.

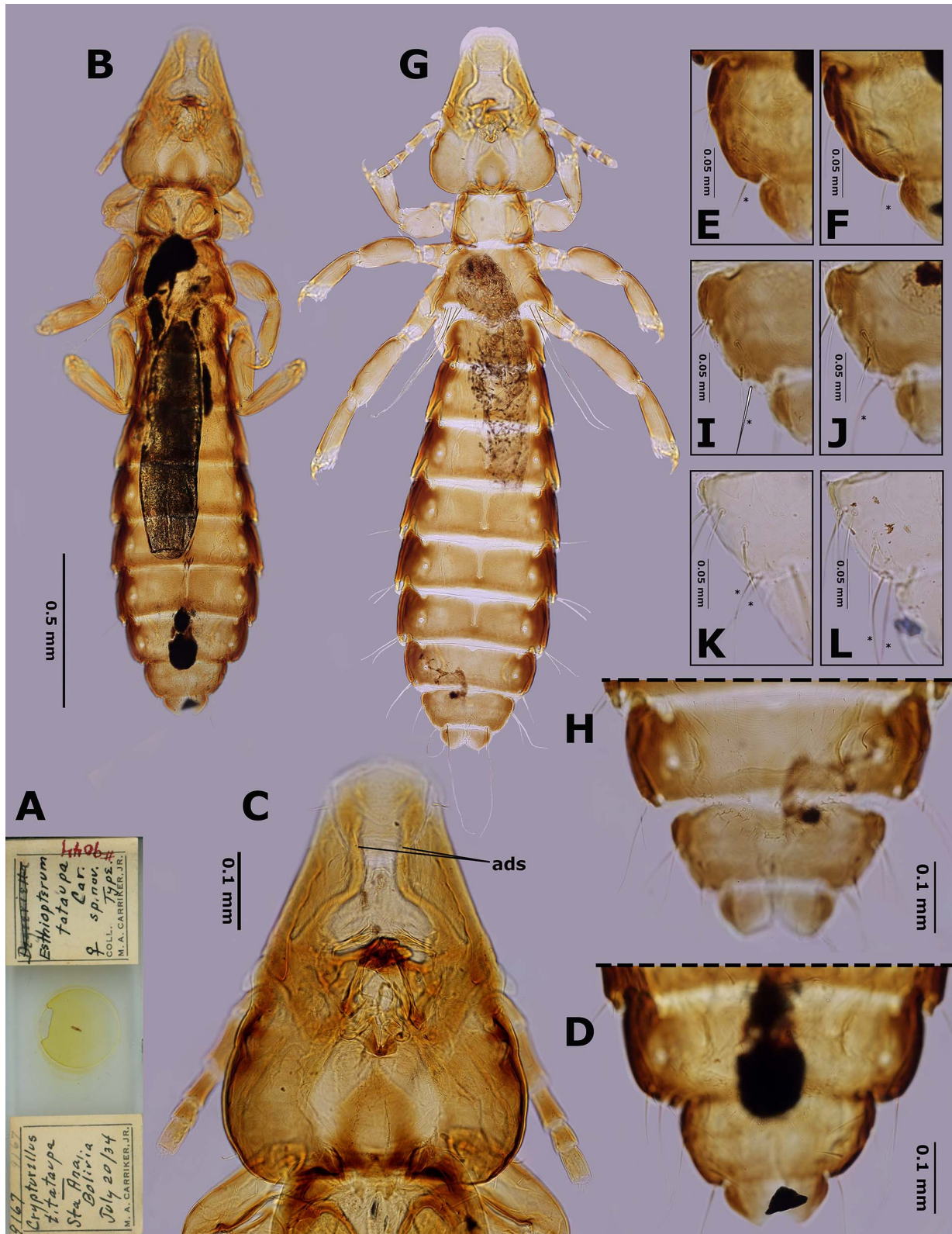


Figure 1. Holotype of *Esthiopterum tataupa* Carriker, 1936. (A) Type slide at ANSP; (B) habitus dorsal; (C) head and part of prothorax in dorsal view; (D) terminalia ventral, showing the vulvar margin; (E) setae on ventral lateroposterior corner of IX+X (left side); (F) same, right side. Holotype of *Furnariphilus parkeri* Price and Clayton, 1995. (G) Habitus dorsal; (H) terminalia ventral, showing the vulvar margin; (I) setae on ventral lateroposterior corner of IX+X (left side); (J) same, right side. Paratype of *Furnariphilus pagei* Price and Clayton, 1995. (K) Setae on the ventral lateroposterior corner of IX+X (left side); (L) same, right side. Asterisks show the difference in chaetotaxy within species; ads, anterior dorsal setae. Color version available online.

Among the currently recognized species of *Furnariphilus*, the holotype of *E. tataupa* most closely resembles *Furnariphilus griffithsi* Price and Clayton, 1995 and *Furnariphilus parkeri* Price and Clayton, 1995, sharing a single medium ventral seta on each side of abdominal segment IX (Fig. 1E–J) and an irregular row of spiniform setae along the vulval margin (Fig. 1D, H). The holotype of *E. tataupa* differs from *Furnariphilus pagei* Price and Clayton, 1995, which has a single regular row and 2 setae on each side of segment IX. Price and Clayton (1995) noted that female body lengths show no overlap between *F. griffithsi* (2.38–2.59 mm) and *F. parkeri* (2.28–2.31 mm), and thus one is a larger and the other is a smaller species; the holotype of *E. tataupa* measures 2.25 mm, grouping it with the smaller species.

Using the characters of Price and Clayton (1995), we found that the *E. tataupa* holotype has shorter sternal setae on segments III–IV and medially fused tergites III–VII, each with a distinct, narrow anteromedial notch. The dorsal abdominal chaetotaxy is simple, restricted to a single medial pair of very small setae on each tergite III–VII, and the vulval margin is composed of a simple row of marginal setae of medium length, accompanied by a submarginal row of spine-like setae arranged in 2 irregular rows. Therefore, the *E. tataupa* holotype specimen was keyed out to *F. parkeri* (Fig. 1G). Direct comparison with the type material confirmed a complete morphological match, establishing the two as conspecific. Because Carriker's (1936) name predates that of Price and Clayton (1995), it takes nomenclatural priority. Slight differences in body shape between *E. tataupa* and *F. parkeri* are attributable to variation in slide-mounting techniques.

The typical hosts of the genus *Furnariphilus* are ovenbirds (family Furnariidae) of the genera *Sclerurus* Swainson, 1827 and *Furnarius* Vieillot, 1816. The erroneous host record of *E. tataupa*, a bird from the family Tinamidae, was likely due to specimen contamination. The labels of *E. tataupa* indicate that the specimen was collected on 20 July 1934 in Santa Ana, Bolivia, host field number 9167 (Fig. 1A). Accessing Carriker's field notebooks, which are housed in the ANSP Archives and are available as PDFs in the Biodiversity Heritage Library, we found that on 19 July 1934, the day before Carriker collected the *E. tataupa* holotype, he collected a single *Sclerurus albigularis albicollis* Carriker, 1935 (host field number 9151) from the same locality. No other specimens of *Sclerurus* (or *Furnarius*) were collected by him at Santa Ana. The skin from this *S. a. albicollis* (ANSP 120562) is in the Ornithology collection at the ANSP. Carriker's field notes from 20 July 1934 begin with a description of the weather, stating: "It rained yesterday afternoon nearly all the time & hard all night. I went out early, up in the clearing above the house to the left. Started raining again about 9:30 a.m. and stayed in working." The rainy conditions likely explain the presence of wet material during the collections, which may have facilitated contamination between host skins or even on the hands or tools of Carriker as he prepared specimens and collected lice. The lice may have originated from this furnariid and were mistakenly associated with the tinamou during collection (e.g., in a collecting bag or on a skinning table).

The holotype of *E. tataupa* clearly does not belong to the genus *Esthiopertum*, not only based on morphological grounds but also because the host range of species assigned to this genus does not extend into South America (Tandan, 1973). Although it is plausible that the contamination of the tinamou host resulted from contact with another South American bird species, it is worth noting that although Carriker described several novel genera of lice parasitizing

furnariids, he never worked with any species currently considered candidates for inclusion in the genus *Furnariphilus*. Morphological evidence confirms that *E. tataupa* is conspecific with *F. parkeri*. Therefore, we establish *E. tataupa* as the senior synonym of *F. parkeri* and propose the new combination *Furnariphilus tataupa* (Carriker, 1936).

This case underscores the importance of careful field collections of ectoparasites and their hosts, which should be documented in museum collections with field notes. These notes are rich with information that can help assess potential contamination events, and continued critical reassessment of historical and morphological material is necessary to obtain accurate host-parasite associations and refine avian louse taxonomy. In this case, not only do we argue that *E. tataupa* was erroneously placed in the wrong genus but that its host association was also incorrect. Thus, this louse, as described by Carriker (1936), also has an erroneous host association. We predict that future field work may discover *F. tataupa* parasitizing other *Sclerurus* host species.

***Furnariphilus tataupa* (Carriker, 1936) (Fig. 1A–J) new combination**

Esthiopertum tataupa Carriker, 1936: 66. Type host: *Crypturellus t. tataupa* – error! Hopkins and Clay, 1952: 132; Tandan, 1973: 85; Price et al., 2003: 178.

Furnariphilus parkeri Price and Clayton, 1995: 843. Type host: *Sclerurus caudacutus* (Vieillot, 1816) (Fig. 1I, J). Price et al., 2003: 181 – New synonymy.

Measurements for female holotype of E. tataupa (in mm): PAW (pre-antennal width), 0.30; TW (temple width), 0.37; HL (head length), 0.54; PW (prothorax width), 0.29; MW (metathorax width), 0.38; AWV (abdominal width at segment V), 0.49; SPW (subgenital width), 0.22; TL (total length), 2.25.

Measurements for female holotype and paratypes of F. parkeri (in mm) taken from Price and Clayton (1995): PAW, 0.33; TW, 0.41–0.42; HL, 0.53–0.54; PW, 0.27–0.28; MW, 0.40–0.41; AWV, 0.50–0.52; SPW, 0.24–0.25; TL, 2.28–2.31.

Material examined: ♀ holotype of *E. tataupa* (ANSP-ENT150643; #9044), ex *C. t. tataupa*; Sta Ana, Bolivia, 20.vii.1934, M. A. Carriker Jr. coll. (#9167); ♀ holotype and 1 ♂ paratype of *F. parkeri* (FMNH-INS28843), ex *Sclerurus caudacutus*, Peru: Dept. Madre de Dios: Cerro de Pantiacolla, 1,030 m, above Rio Palotoa, 31.viii.1985, D. H. Clayton coll.

***Furnariphilus griffithsi* Price and Clayton, 1995**

Furnariphilus griffithsi Price and Clayton, 1995: 843. Type host: *Sclerurus mexicanus* P.L. Sclater, 1857. Price et al., 2003: 181.

Material examined ♂ holotype (FMNH-INS28841), ex *S. mexicanus*, Peru: Dept. Madre de Dios: Cerro de Pantiacolla, 20.viii.1985, D. H. Clayton coll.; 1 ♀ paratype (FMNH-INS28841), same data and slide as the holotype.

***Furnariphilus pagei* Price and Clayton, 1995 (Fig. 1K, L)**

Furnariphilus pagei Price and Clayton, 1995: 842. Type host *Furnarius leucopus* Swainson, 1838. Price et al., 2003: 181.

Material examined: ♂ holotype (FMNH-INS28842), ex *F. leucopus*, Peru, Dept Cuzco, 20 km NW Pilcopata near Rio Tono, 750 m, 25.xi.1985, D. H. Clayton coll. (#1157); 1 ♂ 2 ♀ paratypes (FMNH-INS28842), same data and slide as the holotype; 4 ♀ paratypes (FMNH-INS28844), same data as the holotype.

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