



Argentine *Philornis* Meinert species (Diptera: Muscidae) with synonymic notes

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Abstract

The examination of *Philornis* Meinert specimens recently collected in Argentina prompted this study, in which the presence of the previously recorded species is discussed and the literature concerning them is revised. From the seven species previously recorded from Argentina, we recognise three: *P. torquans* (Nielsen, 1913); *P. blanchardi* Garcia, 1952; and *P. seguyi* Garcia, 1952, herein considered as a senior synonym of *P. nielseni* Dodge, **syn. nov.** *Philornis pici* (Macquart, 1854) is considered a doubtful record and *P. angustifrons* (Loew, 1861) has been mistakenly recorded in Argentina. Finally, *P. umanani* Garcia, 1952 is considered an unrecognisable species (*nomen dubium*). Historical data and comments on each of these species are given.

Key words: Muscidae, *Philornis*, Taxonomy, Argentina

Introduction

Philornis Meinert is predominantly a Neotropical muscid genus known from 50 valid species (Dodge 1955; Carvalho *et al.* 2005). The biology of the larvae is very interesting as they are associated with a wide range of bird species, most of them living as subcutaneous parasites. Data on the biology of the larvae is known for less than 50% of the species (Couri 1999).

Philornis specimens are rare in collections, or at least they are present in small series. The opportunity to examine material recently collected by MQ and LRA in Argentina prompted an analysis and discussion of the species recorded in the literature from this country. The material examined included information on the immature stages, biology and hosts, which also gave support to the study.

Seven *Philornis* species have been recorded from Argentina: *P. angustifrons* (Loew, 1861), *P. blanchardi* Garcia, 1952, *P. nielseni* Dodge, 1958, *P. pici* (Macquart, 1854), *P. torquans* (Nielsen, 1913), *P. seguyi* Garcia, 1952 and *P. umanani* Garcia, 1952.

Historical data

The first records of *Philornis* in Argentina was by Nielsen (1911). The material was from Concepción (Tucumán) and was collected from wild birds of the genera *Sporophila* Cabanis, 1844 (Emberizidae) (as *Spermophila*), *Mimus* Boie, 1826 (Mimidae), *Pseudoseisura* Reichendach, 1853 (Furnariidae) (as *Homorus*) and *Pitangus* Swainson, 1827 (Tyrannidae). The species was identified as *Mydaea anomala* (Jaenicke, 1867) (originally described in *Mesembrina*).

Subsequently, Nielsen (1913) received more material from the locality of Bonpland (Misiones), collected from *Xiphocolaptes* Lesson, 1840. He realised that the species he had identified in 1911 as *M. anomala* was a new species, and he named it *Mydaea torquans* (= *Philornis torquans*), while the material examined in 1913

was, according to him, the true *M. anomala* described by Jaennicke. This *M. anomala sensu* Nielsen (1913) was later described as a new species, *Philornis nielseni*, by Dodge (1968). *Mydaea anomala* (Jaennicke) was later synonymized by Lutz & Neiva (1912) with *P. pici* (Macquart) and by Aldrich (1923) with *Philornis angustifrons* (Loew).

Nielsen (1913) separated his *Mydaea anomala* from *P. torquans* as follows:

Mydaea anomala: smaller, paler in colour, pleura quite pale; male frons a little narrower, reddish frontal triangle disappearing above; female frons considerably narrower and vitta not broader than fronto-orbital plate, sides and cheek yellow, female legs yellow. Puparium cylindrical, the surface not shining, posterior excavation truncate, much greater, middle deeply excavated; posterior spiracular slits more sinuated.

P. torquans: larger, pleura grey, male frons a little larger, reddish frontal triangle distinct up to vertex, female frons larger, sides and cheek silvery, female legs darker. Puparium ovate, broader in middle, surface smooth and shining, borders of posterior excavation rounded; posterior spiracular slits “U or “V shaped.

Stein (1918) examined Jaennicke’s type of *M. anomala* and in his description mentioned some relevant characters such as: body length 8–9mm, eyes well developed, occupying almost all of head, very close to each other (orbits touching), antenna and palpus yellow, thorax reddish with grey pollinosity, abdomen large and ovate, reddish at base and other tergites dark blue, with a fine grey pollinosity when viewed from behind; legs yellow, tarsi a little dark, fore tibia with no setae, mid tibia with 3–4 posterior setae, hind tibia with 3–4 strong anterodorsals and 2–3 fine anteroventrals. Female frons at lunula about three-quarters of the width of one eye at the same level, orbits convergent to vertex.

Stein (1918) had doubts when he tried to identify other specimens deposited in the collections of the Vienna and Budapest museums as *M. anomala*. The material showed variation in size, in the brown cloud on r-m cross vein (present, absent or very faint), and in the number of anterodorsal setae on hind tibia (1 or 3–4). He also considered doubtful Nielsen’s (1913) distinction between *anomala* and *torquans* based on the width of frons, arguing that the examined specimens were reared and therefore not always well developed. Based mainly on the possibility of intra-specific variation in the width of the orbits, he considered Nielsen’s *torquans* to be a doubtful species. In his world catalogue, Stein (1919) stated that *anomala* and *torquans* form a single species.

The next reference to the Argentine *Philornis* was by Bezzi (1922) who mentioned the possible occurrence of *Philornis pici* in Argentina, a supposition based on the previously known geographical distribution of this species (“if all the above records [of *P. pici*] belong really to one species, it must have a wide range of distribution over Neotropical Region, from Cuba, San Domingo and Central America to Argentina [p. 36]). Bezzi (1922: 37) also mentioned that *P. torquans* was “at present only known from Argentina. He presented a key to species, but no material was examined. *Mydaea anomala* of Nielsen (1913) was considered by Bezzi (1922) to be a synonym of *P. pici*, while *M. anomala* of Nielsen (1911) was listed in the synonymy of *P. torquans*.

Aldrich (1923) presented a summary of what was known about the genus *Philornis*, including the species recorded from Argentina. He presented in Figure 1 (op. cit.: 306) the posterior spiracular slits of *P. molestus* Meinert, *P. torquans*, *P. anomala* (Jaennicke), *P. obscurus* (van der Wulp) and *P. pici*. His Figures 2 and 3 were modified from Nielsen’s (1911, 1913) illustrations and therefore they refer respectively to *M. torquans* (as *P. torquans* Nielsen) and *M. anomala* of Nielsen (not *P. anomala* Jaennicke).

Regarding the Argentine species, Aldrich (1923) wrote that the posterior spiracular slits of the puparium of *P. torquans* are very similar to those of *P. molesta*. *Philornis anomala* of Jaennicke seemed to be different, and “before pupating made a cocoon ... whereas *P. torquans* did not. He also mentioned that Stein (1918) had redescribed the type of *anomala* in enough detail to consider the species as distinct from *P. pici*. He considered *anomala* to be a synonym of *P. angustifrons*, based on observations of the type of *P. angustifrons* (Loew) made by Nathan Banks in MCZ. In his text, Aldrich (1923) clearly referred in this synonymy to *anomala* of Jaennicke and not to *anomala* of Nielsen, and he mentioned in support of this synonymy that “both species are described from Cuba (p. 307).

Aldrich (1923) also mentioned that the distinction between the adults of *P. torquans* and *P. anomala* given by Nielsen (1913) was very exiguous (“...it seems to me that his first species, latter called *torquans*, comes nearest to agreeing with Stein’s description [p. 305]). And finally he considered *P. torquans* unidentifiable without additional characters than those of the descriptions.

Shannon and Del Ponte (1926) mentioned two females reared from larvae collected from young birds from Tucumán. The specimens were doubtfully (according to the authors) identified as *P. pici*.

Garcia (1952) studied *Philornis* material from various localities in Argentina: Monte Bello (Tucumán): reared adults collected from sub-dermal larvae in *Gallus gallus* (Linnaeus) (Phasianidae); Burreyac (Tucumán): one larva from a non-identified bird; Manantiales (Corrientes): one nestling of *Synallaxis spixi* Sclater, 1856 (Furnariidae) with a subcutaneous larva; adults collected with net from Entre Rios, Misiones, Corrientes, Formosa, Santa Fe and Córdoba; and also material donated by Dr. Umana from Villa Luján (suburb of Tucumán city) collected from *Sporophila* sp. (Emberizidae).

Although Garcia (1952) mentioned the difficulties in separating the species, he identified, among the material, three known species (*P. angustifrons*, *P. torquans* and *P. pici*) and three newly recorded ones (*P. umanani*, *P. seguyi* and *P. blanchardi*), each based on a single female. He did not exclude the possibility that the latter species could be known ones (“esto no excluye la posibilidad de que se trate de especies ya conocidas y descriptas bajo otros nombres. Ellas serán objeto de una revisión cuando se disponga de material más abundante [p. 279]).

Garcia’s (1952) descriptions are very general and his drawings of male terminalia are not very informative. The studied material was supposedly deposited in the Instituto de Entomología Sanitaria – Ministerio de Salud Pública de la Nación (Buenos Aires). When this Institute was shut down, the collection was taken to Instituto Malbrán (Buenos Aires), but the material could not be found there, and there is no record of a loan. Garcia’s specimens were also not found in Museo Argentino de Ciencias Naturales “Bernardino Rivadavia” (Buenos Aires), Museo de La Plata (La Plata), nor in Instituto Miguel Lillo (Tucumán) (Luciano Patitucchi, pers. comm.). Hence, all Garcia’s material should be considered as lost.

Dodge (1968) gave redescriptions of *P. torquans* and *P. nielseni*. He redescribed *P. torquans* from a male and a female belonging to Nielsen’s (1911) original type series, adding many new characters. But the main novelty of his paper was his interpretation of *M. anomala* of Nielsen (1913) (based on his examination of the same material as Nielsen) as a new species (“not *anomala* Jaenicke). He described this new species as *P. nielseni*.

Skidmore (1985) made comments on the biology and immature stages of three species recorded from Argentina: *P. torquans*, *P. nielseni* and *P. angustifrons*. By mistake he mentioned the original Nielsen (1911) material (= *P. torquans*) as being from Concepción, Chile, and not Argentina (op. cit.: 78). This species is not recorded from Chile.

Fraga (1984) and Mason (1985) recorded an unidentified species of *Philornis* from Buenos Aires province (from Lobos and Magdalena) in many bird species (see table 1 in Couri *et al.* 2005: 632).

Nores (1995) recorded *P. pici* and *P. seguyi* from Monte Cristo (Córdoba). The material was identified by S. Ábalos (Centro de Investigaciones Entomológicas de Córdoba) “according to the descriptions of Shannon and del Ponte (1927 [sic]) and Garcia (1952) (p. 734).

Couri (1989, 1999) presented identification keys to adult *Philornis*; the data on Garcia’s (1952) species were compiled from the literature.

De la Peña *et al.* (2003) recorded subcutaneous larvae of *P. torquans* in nestlings of different bird species (some of them new host records) in Santa Fe.

Mezquida (2003) reported parasitism by unidentified *Philornis* sp. in nestlings of *Diuca diuca diuca* (Molina, 1782) in Ñacuñan, Mendoza (3402'S 6755'W).

Couri *et al.* (2005) examined material collected in Buenos Aires province and identified it as *P. seguyi*, until that time known only from the female. The authors described the larva, puparium, adults and terminalia of both sexes.

Turienzo and Di Iorio (2007) presented an interesting review of the literature on insects that have been reported in bird nests in Argentina, and included detailed information on the existing records of *P. torquans*, *P. seguyi*, *P. pici*, *P. nielsenii* and unidentified *Philornis* spp., together with their hosts and locations.

Material and methods

The material examined here was collected by Leandro Antoniazzi and Martin Quiroga, respectively in the projects “Nestlings Parasitized by *Philornis*: Significance and Potential Effect of Climate Change (Morris Animal Foundation grant # D08ZO-304) and “Host-Parasite interactions between *Philornis* sp. (Diptera: Muscidae) and *Troglodytes aedon* (AVES: Trogloditidae): parasite’s life cycle, seeking preferences and impact on host’s reproductive success. Details on hosts, dates and locations are listed under each species.

The material was deposited in MNRJ. The material of *Philornis* previously deposited in the Diptera collection of MNRJ was used for comparison.

The following acronyms are used for collections cited in the text:

MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA.
MHNL	Musée d’Histoire Naturelle de Lille, Lille, France.
MNHN	Muséum National d’Histoire Naturelle, Paris, France.
MNRJ	Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil.
MSPBA	Ministerio de Salud Publica, Buenos Aires, Argentina.
ZMHB	Museum für Naturkunde der Humboldt-Universität zu Berlin, Berlin, Germany.
ZMUC	University of Copenhagen, Zoological Museum, Copenhagen, Denmark.

Results and discussion

The examination of all these specimens made possible some observations that could help to clarify some different interpretations in the literature.

Almost all available adults of *Philornis* found in collections are reared material, killed just after emergence. Also due to different environmental conditions on which the flies were reared, some structures show different levels of development. This can be observed, for example, in adults killed before the total retraction of the ptilinum and therefore before the formation of the scar at the ptilinal suture, a condition that is reflected in the different widths of the frons among individuals of the same species.

Also, the curved hind tibia mentioned in the description of the male of *P. torquans* by Dodge (1968), and in the description of *Mydaea anomala* by Nielsen (1913)¹, needs to be interpreted with care. Different amounts of curvature have been observed in *P. torquans* and also in other species and on other parts of the legs, such as the hind femur, giving the impression that these insects were not totally dried and hardened when killed.

Leg chaetotaxy, especially of the hind tibia, also shows variation within a series, both among specimens of the same species and in one single specimen (varying from one side to the other). This can make the identification of the species difficult, as the number of anterodorsal setae on the hind tibia has traditionally been used to separate the adults.

The presence or absence of a cocoon should also be considered with care. The available material is not enough to conclude that it can help with the separation of the species, as Nielsen (1913: 252) supposed (“present in ‘*Mydaea anomala*’ and absent in *P. torquans*”), and also cannot be generalized as Skidmore (1985:

1. Dodge (1968) did not mention this curvature in his description of *P. nielsenii* (= *Mydaea anomala* Nielsen, 1913), although he had examined the same material.

72) inferred (as far as is known the puparia are always contained in frothy cocoons). Ferrar (1980) presented a study on cocoon formation in Muscidae, and gave information on 29 species. Thirteen species of *Philornis* were listed with some different kinds of cocoons or material. The author discussed that it is premature to draw conclusions about cocoon formation within the Muscidae as the records available in the literature are from different sources and therefore subject to different descriptions and interpretations. Probably the cocoon offers protection against, for example, predators and/or parasites during pupal quiescence. According to Ferrar (1980), not all species within individual genera form a cocoon.

The difficulty in separating *Philornis* species is also complicated by the intra-specific variation of some characters such as size, colour, number of anterodorsal setae on hind tibia, shape of male aedeagus, variation in puparium (depth and rugosity of posterior end) and also sexual dimorphism (Dodge & Aitken 1968 and Couri 1984, among others).

***Philornis* species historically recorded from Argentina**

***Philornis angustifrons* (Loew, 1861)**

Hylemyia angustifrons Loew, 1861: 41. Syntypes male and female, not found (not in MCZ or ZMHB). Type-locality: Cuba.

Described in the genus *Hylemyia* by Loew (1861), this species was based on material from Cuba. According to Carvalho *et al.* (2005), syntypes (male and female) were not found in MCZ or ZMHB.

This species has been mistakenly recorded from Argentina by Garcia (1952). In synonymy with it is *Mydaea anomala* (Jaennicke, 1867), originally described as *Mesembrina anomala*, also from Cuba. This species is not the same as *Mydaea anomala* of Nielsen (1913) (= *Philornis anomala* of Aldrich 1923), which was described as *P. nielseni* by Dodge (1968).

Both Stein (1918) and Dodge and Aitken (1968) mentioned that this species shows considerable intraspecific variation, e.g., in size and colour and, “likewise there is much variation in the puparia of such species as *trinitensis*, *sanguinis* and *deceptivus*, in general the larger puparia are dark brown with a small deep pit, whereas the smaller puparia are light brown with the pit broad and shallow (Dodge & Aitken 1968: 135).

Other references to the names *angustifrons* and *anomala* in Argentina refer to *anomala* of Nielsen (1911, 1913).

Even the synonymy of *P. angustifrons* (Loew) with *anomala* Nielsen was a confused interpretation by Aldrich (1923).

The name *P. angustifrons* of Garcia (1952) also does not correspond to this species. He used this name, following Aldrich’s (1923) synonymy. This synonymy must not be accepted. Aldrich (1923) used Nielsen’s (1911, 1913) figures to represent the posterior spiracular slits of the puparia of *M. torquans* Nielsen and *M. anomala* of Nielsen (not Jaennicke) respectively. But on page 307, when discussing the synonymy with *angustifrons* Loew, he used the name *anomala* referring to *M. anomala* Jaennicke and not *M. anomala* of Nielsen. This is clear because he mentioned that “both species are described from Cuba, clearly referring to *angustifrons* Loew and *anomala* Jaennicke. Also, *M. anomala* of Nielsen 1913 (slits figured in his Fig. 3) could not be *P. angustifrons* Loew, as the posterior spiracular slits of this species are very sinuous, much more similar to those of *P. pici*, illustrated in his Fig. 5.

Returning to Garcia’s (1952) *angustifrons*, his description, based on three females and one male (taken as larvae from a young chicken) from Monte Bello (Tucumán), is not very detailed, but differs from the true *P. angustifrons* in some aspects such as general colour of the thorax, r-m cross vein with a small mark and the large frons of the female with almost parallel margins. He described the female, but his Figure 1 (op. cit.: 279) shows the head of a male that is also not of *P. angustifrons* (as also observed by Dodge 1968). By mistake he mentioned the author of this species as (Jaenn., 1866) (see also Dodge 1968).

Dodge (1968) considered that Garcia's (1952) *angustifrons* could be *anomala* of Nielsen (1913), but the male head illustrated in his Figure 1 "fits neither *nielseni* nor *angustifrons* (p. 158). He doubtfully included *Philornis angustifrons* (Jaenn., 1866) of Garcia (1952) in synonymy with *P. nielseni*.

Dodge and Aitken (1968) redescribed and Couri (1984) diagnosed *P. angustifrons*. The species shows intra-specific variation in colour, size, puparial concavity (depth and rugosity) and male surstyli (Dodge & Aitken 1968; Couri 1984).

***Philornis blanchardi* Garcia, 1952**

Philornis blanchardi Garcia, 1952: 289. Holotype female, lost (formerly in MSPBA?). Type-locality: Argentina, Corrientes.

This species is known only from the original description and has never again been identified in material from Argentina. The description was based on one female (referred to as male by mistake in Carvalho *et al.* 2005) from Corrientes province (locality not specified). According to the description, this is the only Argentine *Philornis* species with black-haired cheeks and dark brown postpedicel and so could be a recognisable species. As with all Garcia's material, the type is considered lost.

The following diagnosis (from Garcia 1952) could help further identification (length of adult not mentioned): fronto-orbital plate and gena with golden pollinosity; antenna with scape and pedicel dark yellow; postpedicel dark brown; palpus light brown; cheek black haired; scutum brown with grayish pollinosity and with four brown vittae; legs with femora yellowish and tibiae brownish; wings hyaline with no dark marks; abdomen shiny brown; hind tibia with 2 anterodorsal setae on middle third, anteroventral surface with 2 fine setae. Larval habits and host association unknown.

Since the type is considered lost, a neotype should be designated if this species is recognised in new material. We do not discount the possibility that this nominal species is the same as a known species, as Garcia (1952) himself mentioned.

***Philornis nielseni* Dodge, 1968**

Details given under *P. seguyi*.

Dodge (1968: 157) gave the new name *nielseni* to *Mydaea anomala* of Nielsen (1913). The synonymy of this species with *P. seguyi* is herein proposed (see under *P. seguyi*).

***Philornis pici* (Macquart, 1854)**

Aricia pici Macquart, 1854: 659. Syntypes male lost (formerly in MNHN or MHNL). Type locality: Dominican Republic, "St-Domingue.

As stated in "Historical data, the records of this species from Argentina are based on speculation (Bezzi 1922) or on doubtful identifications (Shannon & Del Ponte 1926; Nores 1995).

Garcia's (1952) description of *P. pici*, based on five males, four from Tucumán and one from Santa Fe (all lost), is sufficiently vague that it cannot be accepted as a reliable record of *P. pici* from Argentina, and hence the species is doubtfully recorded from Argentina. None of the specimens examined in the present study correspond to *P. pici*.

The following diagnosis, based on Macquart's (1854) original description and on Aldrich (1923), could help a further identification: length of male 12mm; male eyes contiguous; antenna and palpus yellow; scutum bluish-brown with greyish pollinosity and with four brown vittae; legs yellow; wing clear, abdomen bluish-

brown with tergite 1+2 and basal half of tergite 3 yellow. Puparium light brown; with large stigmatal plates, spiracles in a deep concavity, smooth inside; spiracular slits very sinuous (Figure 5 of Aldrich 1923). Macquart (1854: 659) described a cocoon “fait de gros filaments blancs et poreux and gave an illustration of the adult male (Pl. 20. No II).

Philornis seguyi Garcia, 1952

Mydaea anomala: Nielsen (1913: 251). Misidentification, not *Mesembrina anomala* Jaennicke, 1867.

Philornis seguyi Garcia, 1952: 286. Holotype male, lost (formerly in MSPBA?) Type-locality: Argentina, Misiones.

Philornis nielseni Dodge, 1968: 157 (new name for *anomala* Jaennicke *sensu* Nielsen 1913). Holotype male (ZMUC).

Type-locality: Argentina. **Syn. nov.**

The species can be recognised as follows: body length 7–9mm; frons yellowish, eye with a faint golden reflection; width of frons at level of anterior ocellus 0.07–0.09 of head width in male and 0.13–0.14 in female; antenna and palpus yellow; cheek yellow-haired; scutum brown with greyish pollinosity, with the quadrivittate pattern typical of the genus; wing clear, some specimens with a faint brown spot on r-m cross vein; legs yellow in male and somewhat brown in female; hind tibia on anterodorsal surface with 2–4 setae on middle third, anteroventral surface with 3–4 fine bristles on middle third. Abdomen brown with greyish pollinosity. Larva intradermal. Puparium brown, cylindrical, posterior end deep with rugose margins; spiracular slits “U or “V shaped. (Figures in Couri *et al.* 2005).

Couri *et al.* (2005) described the larva, puparium, adult male and the terminalia of both sexes, based on material collected in Buenos Aires province and identified using the original description of Garcia (1952). The slight differences in size and colour of the legs described in *P. nielseni* by Dodge (1968) are here considered as intraspecific variation, as in other *Philornis* species. The synonymy of *P. nielseni* with *P. seguyi* is herein proposed as there is no justification to consider them as separate species.

The species was found among the material recently collected in Argentina as below.

Material examined: (MQ): Argentina, Santa Fe, Santa Fe, 3138'S 6091'W. Ex nest of *Troglodytes aedon*: 27 males and 44 females reared from larvae. (LRA): 4 adults reared from larvae. Host: *Certhiaxis cinnamomea* (Furnaridae); location: Puente de Hierro, Arroyo Culul, Santa Fe (3121'S 6056'W); collection date: November 2003; accession # SF00027b.

Philornis torquans (Nielsen, 1913)

Mydaea anomala: Nielsen (1911: 195). Misidentification, not *Mesembrina anomala* Jaennicke, 1867.

Mydaea torquans Nielsen, 1913: 252 (new name for *anomala* Jaennicke *sensu* Nielsen 1911). Lectotype male (ZMUC), by designation of Dodge (1968: 156). Type locality: Argentina, Concepción.

This species can be recognised as follows: frons silvery, antenna and palpus yellow; cheek yellow haired; scutum dark brown with grayish pollinosity, with the quadrivittate pattern typical of the genus; post-pronotum sometimes brownish yellow in female; tip of scutellum yellowish; legs yellow in male and brown in female; wing clear, some specimens with a faint brown mark on r-m and sometimes also on dm-cu cross vein; abdomen brown in female; tergites I–III yellow in male; width of frons at level of anterior ocellus 0.06–0.09 of head width in male and 0.19–0.20 in female; hind tibia variably curved in male with 4–6 anterodorsal setae and 2–3 anteroventrals on middle third. Female with 2–3 anterodorsal setae on middle third. Larva intradermal. Puparium brown, ovate, a little broader medially, surface shining, posterior end deep with rugose margins; spiracular slits “U or “V shaped. (Fig 2 of Aldrich 1923). No cocoon mentioned in the literature on this species.

Comments: The species is well known in the literature, from larvae, puparia, adults male and female. Skidmore (1985: 78) mistakenly mentioned the provenance of the type material as Concepcion (Chile), but it originated from Concepción, Argentina (Nielsen 1913).

The original description mentioned two anterodorsal setae on the hind tibia of the male, but Dodge (1968: 156) in the description of his lectotype for *P. torquans* corrected this to “hind tibia distinctly bowed, with four strong AD on more than middle third while the female has 2 anterodorsals.

The species was found among the material recently collected in Argentina as below.

Material examined: (LRA): 2 adults reared from larvae. Host: *Pitangus sulphuratus* (Tyrannidae); location: Reserva de la Escuela de Agricultura, Ganadería y Granja [REAGG], Santa Fe (3123'S 6055'W), collection date: November 2007, accession # SF00053c, 2 adults reared from larvae, host: *Polioptila dumicola* (Poliopitilidae); REAGG, Santa Fe (3123'S 6055'W), collection date: January 2008, accession # SF00059c, 1 adult reared from larva, host: *P. dumicola* (Poliopitilidae); REAGG, Santa Fe (3123'S 6055'W), collection date: January 2008, accession # SF00060c, 1 adult reared from larva, host: *P. dumicola* (Poliopitilidae); REAGG, Santa Fe (3123'S 6055'W), collection date: January 2008, accession # SF00060c, 1 adult found in nest, host: *Phacellodomus striaticollis* (Furnaridae); REAGG, Santa Fe (3123'S 6055'W), collection date: late March 2008, accession # SF00061, 2 adults reared from larvae, host: *Zenaida auriculata* (Columbidae); REAGG, Santa Fe (3123'S 6055'W), collection date: late December 2007, accession # SF00062c, 6 adults reared from pupae found in nest, host: *P. dumicola* (Poliopitilidae); REAGG, Santa Fe (3123'S 6055'W), collection date: early February 2008, accession # SF00065, 1 adult reared from larva, host: *Phacellodomus ruber* (Furnaridae); Road between Esperanza and Empalme San Carlos (3131'S 6051'W), collection date: February 2007, accession # 002.

Philornis umanani Garcia, 1952

Philornis umanani Garcia, 1952: 284. Holotype male, lost (formerly in MSPBA?) Type-locality: Argentina, Corrientes. *Nomen dubium*.

Garcia's (1952) original description is very general and does not allow the species to be recognised. Under the taxonomic discussion he mentioned that this species can be distinguished from the others by the brown-orange colour of the abdomen. As no other morphological characters can be recognised in this species, together with the fact that intra-specific variation in colour has been already mentioned in the literature for other *Philornis* species (see *P. angustifrons* in Dodge & Aitken 1968 and Couri 1984), we consider this species to be unrecognisable and treat the name *P. umanani* Garcia as a *nomen dubium*. The species was described from one female specimen, which has been lost along with the rest of Garcia's material.

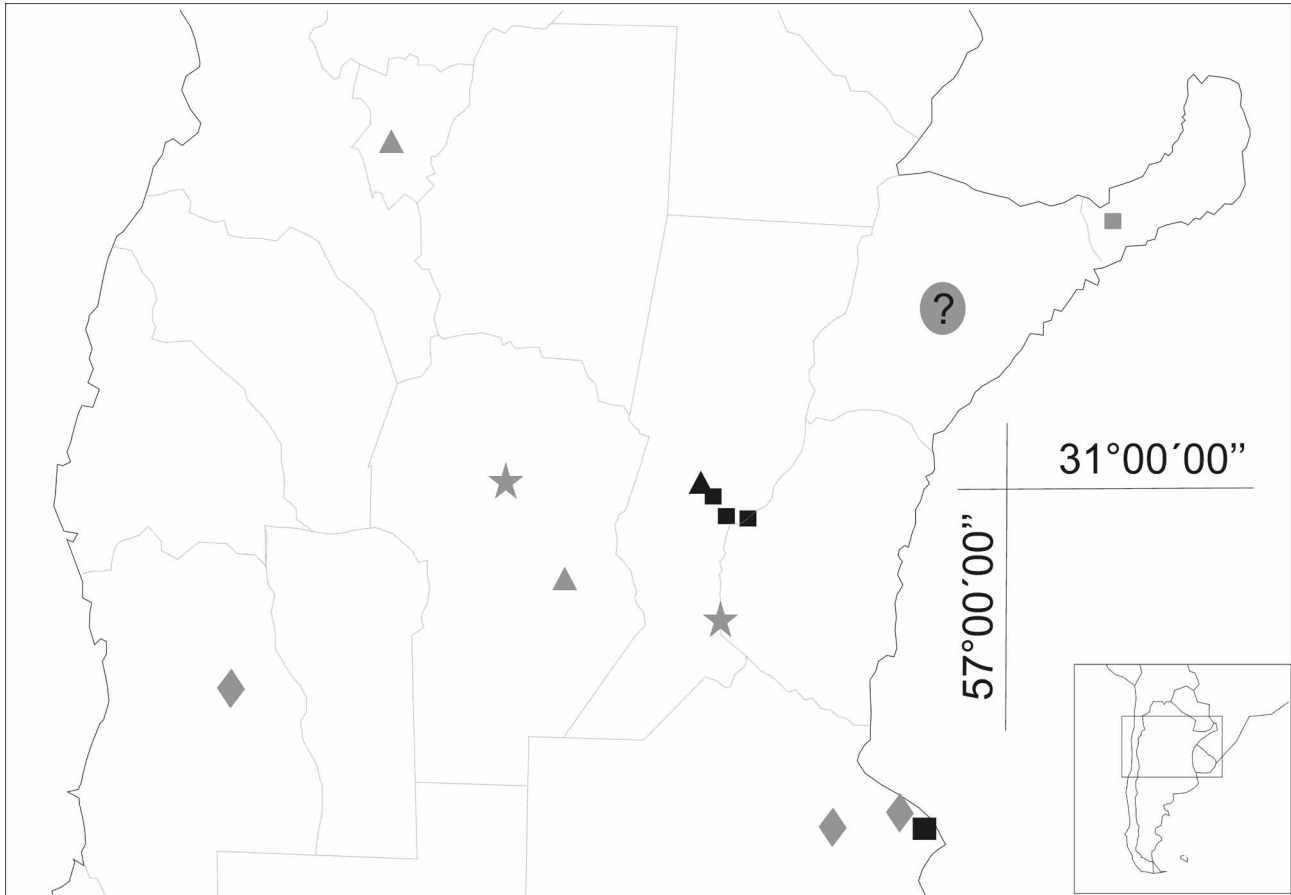
Key to *Philornis* species herein considered to occur in Argentina

Philornis angustifrons (mistakenly recorded) and *P. umanani* (unrecognisable) are not included; *P. nielseni* is considered a synonym of *P. seguyi*.

1. Parafacial black-haired; postpedicel dark brown; hind tibia on anterodorsal surface with 2 setae on middle third (Corrientes) *P. blanchardi* Garcia
Parafacial yellow-haired, postpedicel yellow, orange-yellow or reddish; hind tibia on anterodorsal surface with 1 or more setae on middle third..... 2
2. Length of male 12mm; male frons very narrow, eyes almost touching; legs entirely yellow in males and females; body colour with bluish reflections. Larva: posterior spiracular slits very sinuous. Puparium enclosed in a cocoon (Tucumán, Córdoba, Santa Fe). Doubtful record. *P. pici* (Macquart)
Length of male less than 12mm; male frons varying; leg colour varying; body colour without bluish reflections. Larva: posterior slits “U or “V shaped. Puparium enclosed in a cocoon or not 3

3. Frons silvery. Male: hind tibia with 4–6 anterodorsal setae on middle third. Female: width of frons 0.20 (Córdoba, Santa Fe) *P. torquans* (Nielsen)
 Frons yellowish. Male: hind tibia with 3–4 anterodorsal setae on middle third. Female: width of frons 0.13–0.14; (Buenos Aires, Córdoba, Misiones, Santa Fe) *P. seguyi* Garcia

Map 1 shows the present known distribution of *Philornis* species in Argentina.



MAP 1. Known geographical distribution of *Philornis* species in Argentina. Symbols: oval, *P. blanchardi* (unknown location within Corrientes province); squares, *P. seguyi*; triangles, *P. torquans*; stars, *P. pici*; diamonds, *Philornis* sp. Grey: material not examined; black: material examined.

Conclusions

Until a molecular approach sheds some light on the systematics of this group, three recognisable species of *Philornis* plus one species doubtfully identified are recorded from Argentina. It should be acknowledged that the existing material is scanty, and limited to certain areas where sampling has been conducted. More sampling is needed, with more extensive regions of the country represented, to be able to know the diversity of the genus in Argentina. In general, *Philornis* is still very poorly known in South America. Even in Brazil, with the greatest number of species recorded, the genus is very poorly represented geographically and its biology largely unknown. Most of the other countries have very few records (Carvalho *et al.* 2005) (e.g., Venezuela: 3, Colombia: 1, Ecuador: 4, Peru: 7, Paraguay: 2, Uruguay: 3, Bolivia and Chile: 0 (mistakenly recorded by Skidmore 1985)). In Argentina, the genus is also poorly known. Only seven provinces have records of *Philornis* species. The ongoing projects carried out by MQ, LRA and PMB will certainly add much new scientific knowledge on this matter.

From the point of view of biological conservation, increasing our knowledge on this genus is of great importance, as a negative impact on the survival and development of their hosts has been documented (Arendt 1985a; Arendt 1985b; Spalding *et al.* 2002; Dudaniec *et al.* 2006; Rabuffetti & Reboresda 2007; Beldomenico 2009), and evidence suggests that their abundance and their impact on hosts may increase as a consequence of climate change (Beldomenico 2009).

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