

Philornis Meinert, 1890 - Key to adults
(Diptera, Muscidae, Reinwardtinae)

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ABSTRACT

A key to adults of 40 of the 49 known species of *Philornis* is presented.

INTRODUCTION

Philornis Meinert, 1890 includes 49 species: 47 from South America, *Philornis porteri* Dodge, 1955 known only from Florida and *Philornis angustifrons* (Loew, 1861) known from South America and Louisiana.

Material of this genus is not easy to find in collections. Until 1972, 34 species of *Philornis* were described (PONT, 1972). More recently 15 new species were added to this genus (COURI, 1983; 1984; 1986).

The adults of some *Philornis* species are not easy to identify. Examination of the genital segments, as well as the posterior spiracular slits of pupae will assist.

The description of some species does not give sufficient data for their identification and as it was not possible to examine the types, the following species were not included in the key: *P. cinnamominus* (Stein, 1918), *P. mima* (Townsend, 1927), *P. nielseni* Dodge, 1968, *P. blanchardi* Garcia, 1952, *P. obscurus* (Wulp, 1896), *P. umanani* Garcia, 1952, *P. steini* Pont, 1972, *P. seguyi* Garcia, 1952 and *P. molestus* Meinert, 1890, known only by one larval phase (characterized by the posterior spiracular slits).

Philornis was treated by various authors both as a masculine and a feminine gramatical genus. Classical dictionaries have indicated "*ornis*" as preferably masculine and the International Commission on Zoological Nomenclature have placed names ending in *ornis* (=bird) on the Official Lists as masculine. *Philornis mimicola* and *Philornis vespidicola* have masculine termination, but are not to be modified as they are nouns in the nominative singular in apposition to the generic name (Article 11 of the "INTERNATIONAL CODE OF ZOOLOGICAL NOMENCLATURE", 1964).

MATERIAL

The material used belongs to the collections of the following Institutions: Museu Nacional do Rio de Janeiro, Fundação Oswaldo Cruz, British Museum (Natural History), Biosistematic Research Center, Snow Entomological Museum, University of Kansas and United States National Museum.

The majority of the illustrations were based on holotypes and paratypes from Fundação Instituto Oswaldo Cruz (FIOC) and Museu Nacional do Rio de Janeiro (MNRJ).

Key to adults

1. R_{4+5} and/or CuA_1 with cilia on ventral surface and/or dorsal (Fig. 1-3); males with eyes approximated (Fig. 4); females with eyes separated by parallel margins (Fig. 5) 2
 (*Philornis aitkeni* group)
- Veins bare, males with eyes separated by distance greater than diameter of anterior ocellus (Fig. 6); females with eyes separated by margins converging to vertex (Fig. 7) 10
2. Cheeks yellow-haired 3
- Cheeks black-haired 4
3. Wings slightly brown, calypter uniformly brown (Costa Rica).....
 *Philornis schildi* [Ref. DODGE, 1963]
- Wings hyaline, calypter light yellow with margin of upper one brown
 Brazil - Minas Gerais, Rio de Janeiro, São Paulo
 *Philornis setinervis* [Ref. DODGE, 1963]
4. Intra-alar bristles 1:1 or 1:2 5
- intra-alar bristles 1:3 (Panamá - Barro Colorado)
 *Philornis rettenmeyer* [Ref. DODGE, 1963]
5. Midfemur on posterior surface with two preapical bristles 6
5. Midfemur on posterior surface with three preapical bristles (Brazil - Amazonas)
 *Philornis amazonensis* [Ref. COURI, 1983]
6. R_{4+5} with cília only on ventral surface 7
- R_{4+5} with cilia both on dorsal and ventral surfaces 9
7. Supra-alar bristles 1:3, intrapostalar bristle shorter than posterior intra-alar one 8
- Supra-alar bristles 1:5, intrapostalar bristle as long as posterior intra-alar one (Brazil - Rio de Janeiro)
 *Philornis lopesi* [Ref. COURI, 1983]
8. CuA_1 bare, R_{4+5} on ventral surface with 2-3 cilia (Trinidad; Peru; Brazil - Santa Catarina)
 *Philornis aitkeni* [Ref. DODGE, 1963]
- CuA_1 on ventral surface with 2 cilia, R_{4+5} on ventral surface with 7 cilia (Brazil - Mato Grosso, Minas Gerais)
 *Philornis rufoscutellaris* [Ref. COURI, 1983]

9. R_{4+5} on dorsal surface with 2 cilia and on ventral surface with 5, CuA_1 bare (México - Vera Cruz, Tabasco) *Philornis fasciventris* [Ref. WULP, 1986]
- R_{4+5} on dorsal surface with 1-3 cilia and on ventral surface with 3-4 ones, CuA_1 on ventral surface with at least one cilia (Panama) *Philornis zeteki* [Ref. DODGE, 1963]
10. Cheeks black-haired 11
- Cheeks yellow-haired 14
11. Mid femur on posterior surface with 2 preapical bristles 12
- Mid femur on posterior surface with three preapical bristles (Trinidad; Brazil - Mato Grosso do Sul, Rio de Janeiro, Santa Catarina) *Philornis downsi* [Ref. DODGE & AITKEN, 1968]
12. Legs yellow with tarsi brown, 5th. abdominal tergite brown, with grey pollinosity 13
- Legs brown, 5th. abdominal tergite reddish (USA - Florida) *Philornis porteri* [Ref. DODGE, 1955]
13. Intrapostalar bristle long, approximately 0.80 as long as posterior intralar one (Fig. 8), basicosta and epaulet brown (USA - Texas; Guatemala; Panama; Peru; Brazil - Mato Grosso do Sul, Paraíba, São Paulo) *Philornis mimicola* [Ref. DODGE, 1968]
- Intrapostalar bristle cycliform, basicosta and epaulet yellow (Panamá; Trinidad) *Philornis niger* [Ref. DODGE & AITKEN, 1968]
14. Posterior tibia on anterodorsal surface with 0-1 median bristles 15
- Posterior tibia on anterodorsal surface with more than one bristle 18
15. Wings hyaline 16
- Wings with costal margin with a brown elongated spot extending from middle of wing to apex (Fig. 9) Peru; Brazil - Mato Grosso do Sul, Espírito Santo, Santa Catarina) *Philornis fumicosta* [Ref. DODGE, 1968]
16. Thorax brown with grey pollinosity and four brown vittae 17
- Thorax light brown with one median brown vitae (Brazil - Mato Grosso do Sul, Minas Gerais, Rio de Janeiro) *Philornis univittatus* [Ref. DODGE, 1968]
17. Midtibia on posterior surface with 3 bristles, intrapostalar bristle ciliform, calypter light-brown (Costa Rica; Panamá; Trinidad; Ecuador; Brazil - Mato Grosso do Sul) *Philornis falsificus* [Ref. DODGE & AITKEN, 1968]
- Midtibia on posterior surface with 2 bristles, intrapostalar bristle developed, calypter white (Brazil - Santa Catarina) *Philornis petersoni* [Ref. COURI, 1984]
18. Wings with dark brown spots on $r-m$ and $m-m$ cross-veins (Uruguay) *Philornis masoni* [Ref. COURI, 1986]
- Wings without brown spots on $r-m$ and $m-m$ cross veins 19

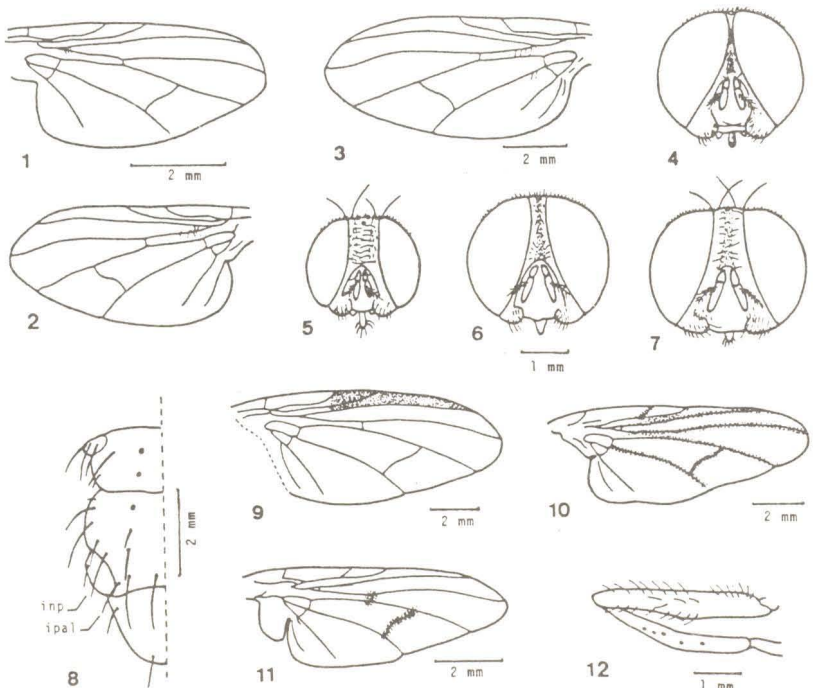
19. Wings light brown with brown clouds around longitudinal veins (Fig. 10) 20
 - Wings hyaline, sometimes r-m crossvein surrounded with brown spot 23
20. Midfemur on posterior surface with 2 preapical bristles, midtibia on posterior surface with 1-3 bristles at midthird 21
 - Midfemur on posterior surface with 3 bristles, midtibia on posterior surface with more than 3 bristles (Mexico; Equador; Brazil - Santa Catarina)
 *Philornis grandis* [Ref. COURI, 1984]
21. Eyes separated by distance at anterior ocellus of 0.06-0.09 of head width in males and 0.19-0.23 in females 22
 - Eyes separated by distance at anterior ocellus of 0.20-0.22 in males and 0.32-0.34 in females (Brazil - Espírito Santo, Rio de Janeiro, São Paulo, Rio Grande do Sul)
 *Philornis sabroskyi* [Ref. ALBUQUERQUE, 1957]
22. Posterior tibia on anterodorsal surface with 3 bristles, calypter white with margim of upper one brown (Brazil - Santa Catarina)
 *Philornis obscurinervis* [Ref. COURI, 1984]
 - Posterior tibia on anterodorsal surface with 4 bristles, calypter light brown, with margim of upper one dark brown and of inferior one yellow (Costa Rica)
 *Philornis carinatus* [Ref. DODGE, 1968]
23. Posterior tibia on anterodorsal surface with more than 5 bristles 24
 - Posterior tibia on anterodorsal surface with no more than 4 bristles 25
24. Legs yellow with brown tarsi in males and females, calypter light brown with margim of upper one brown, posterior tibia of males not bowed (Mexico)
 *Philornis bellus* [Ref. COURI, 1984]
 - Legs yellow in males and brown in females, calypter white with margim of upper one brown, posterior tibia of males distinctly bowed (Fig. 12) (Brazil - Mato Grosso do Sul, Minas Gerais, Rio de Janeiro; Argentina)
 *Philornis torquans* [Ref. NIELSEN, 1913]
25. eyes separated by distance at level of anterior ocellus of 0.03-0.05 of head width in males and of 0.09-0.14 in females 26
 - Eyes separated at level of anterior ocellus by distance greater than described above 28
26. Basicosta yellow, 4th. and 5th. abdominal tergites concolorous with thorax 27
 - Basicosta brown, 4th. and 5th. abdominal tergites paler than thorax (Trinidad; Panama)
 *Philornis querulus* [Ref. DODGE & AITKEN, 1968]
27. Legs yellow in males and females, midfemur on posterior surface with three preapical bristles (USA - Louisiana; Cuba; Costa Rica;

- Trinidad; British Guiana; Brazil - Pará, Mato Grosso, Minas Gerais, Rio de Janeiro, São Paulo, Rio Grande do Sul)
 *Philornis angustifrons* [Ref. LOEW, 1861]
- Legs yellow in males and brown in females, midfemur on posterior surface with 2 preapical bristles (Trinidad; Brazil - Amazonas, Pará, Rio de Janeiro)
 *Philornis glaucinis* [Ref. DODGE & AITKEN, 1968]
28. Basicosta brown 29
 — Basicosta yellow 33
29. Wings hyaline 30
 — Wings with brown spot at **r-m** cross-vein 31
30. Abdomen dark brown with grey pollinosity; frons red at lunule; males with eyes separated at level of anterior ocellus by distance of 0,10-0.12 of head width (Puerto Rico; Trinidad; Venezuela; Brazil - Mato Grosso do Sul, Bahia)
 *Philornis deceptivus* [Ref. DODGE & AITKEN, 1968]
- Abdomen brown with grey pollinosity, with first and basal half of second tergites yellow; frons brown; males with eyes separated at level of anterior ocellus by distance of 0.06-0.07 of head width (Costa Rica; Panama; Cuba; Republica Dominicana; Puerto Rico; Trinidad; Venezuela; Brazil; Argentina)
 *Philornis pici* [Ref. MACQUART, 1854]
31. Thorax brown with grey pollinosity, midtibia on posterior surface with 2 bristles 32
 — Thorax light brown with yellow pollinosity, midtibia on posterior surface with 3 bristles (Trinidad; Brazil - Minas Gerais)
 *Philornis sanguinis* [Ref. DODGE & AITKEN, 1968]
32. Katepisternum with black cilia, posterior tibia on anterodorsal surface with 2 bristles (Brazil - Amazonas)
 *Philornis vulgaris* [Ref. COURI, 1984]
- Katepisternum with yellow cilia, posterior tibia on anterodorsal surface with 3 bristles (Brazil - Amazonas)
 *Philornis medianus* [Ref. COURI, 1984]
33. Wings with black spot at **r-m** crossvein 34
 — Wings hyaline 36
34. Supra-alar bristles 1:3, frons of males and females with margins diverging to lunule 35
 — Supra-alar bristles 1:5, frons of males and females with margins strongly diverging to lunule (Brazil - Amazonas)
 *Philornis frontalis* [Ref. COURI, 1984]
35. Calypter light brown with margin of upper one dark brown (Peru)
 *Philornis vespidicola* [Ref. DODGE, 1968]
- Calypter white with margin of upper one brown (Peru)
 *Philornis albuquerquei* [Ref. COURI, 1983]
36. Midtibia on posterior surface with 3 bristles, legs of males and females yellow 37
 — Midtibia on posterior surface with 2 bristles, legs of males yellow

- and of females brown (male of *Philornis spermophila* unknown) 38
37. Calypter white with margin of upper one brown, greater ampulla brown, darker in males (Brazil - Amazonas) *Philornis diminutus* [Ref. COURI, 1984]
- Calypter white, greater ampulla yellow (Brazil - Rio de Janeiro) *Philornis insularis* [Ref. COURI, 1983]
38. Third antenal segment yellow 39
- Third antenal segment brown (Trinidad; Brazil - Amazonas, Para) *Philornis trinitensis* [Ref. DODGE & AITKEN, 1968]
39. Posterior femur on anteroventral surface with 3 strong bristles at apical third, posterior tibia on anterodorsal surface with 3-4 bristles (Trinidad) *Philornis gagnei* [Ref. COURI, 1983]
- Posterior femur on anteroventral surface with 4 strong bristles at apical third, posterior tibia on anterodorsal surface with 2 bristles (Jamaica; Trinidad) *Philornis spermophilus* [Ref. TOWNSEND, 1985]

Acknowledgements

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Figs. 1-12:

1,2,4,5: *Philornis aitkeni* Dodge. 1963. 1, wing dorsal view (male, paratype (FIOC):

- Trinidad, Fort Read, B.W.T., 27/V/58, Aitken & Downs col; ex nest *Galbula ruficauda*). 2, wing, ventral view; 4, head of male; 5, head of female (paratype (FIOC): Vega de Oropouche, Sangué Grande, 23/IV/1958, Aitken & Downs col.; ex nest of *Galbula ruficauda*).
- 3, *Philornis rufoscutellaris* Couri, 1962. Wing, ventral view. (female, holotype (MNRJ): Brasil, Mato Grosso, SINOP (12° 31'S, 55° 37'W), Br. 163, km 500-600, XI/75, Alvarenga & Roppa col.).
- 6, *Philornis downsi* Dodge & Aitken, 1968. Head of male; (paratype (FIOC): Trinidad, Cunaripo, R.S. School, 7/III/1957; Aitken & Downs col, ex *Pitangus sulphuratus trinitatis*).
- 7, *Philornis downsi* Dodge & Aitken, 1968. Head of female, frontal view, (paratype (FIOC): Trinidad, Cunaripo, R. S. School, 7/III/1957, Aitken & Downs col, ex *Pitangus sulphuratus trinitatis*).
- 8, *Philornis mimicola* Dodge, 1968. Mesothorax (**inp**: intralar posterior br stle; **ipal**: intra-postalar bristle). (male (MNRJ): United States of America, Texas, Uvalde, 19/VI/1957).
- 9, *Philornis fumicosta* Dodge, 1968. Wing, dorsal view. (male, paratype (FIOC): Brazil, Goiás, Campinas, XII/1935, Borgmeier & Lopes col.).
- 10, *Philornis grandis* Couri, 1984. Wing, dorsal view. (male, paratype (MNRJ): Equador, Pastaza, Pompeya, Napo River, 14-22/V/1965, L. Pena col.).
- 11, *Philornis masoni* Couri, 1986. Wing, dorsal view. (male, holotype, (MNRJ): Uruguay, Department of Colonia, Route 12, km 194, XI/83 - I/84, P. Mason col, ex *Anumbis annambis*).
- 12, *Philornis torquans* (Nielsen, 1913). Male, posterior leg. (femur and tibia, anterior view). (male, (MNRJ): Brazil, Rio de Janeiro, Teresópolis, 19/X/1957, Sick col.)

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