Mixed myiasis by *Philornis glaucinis* (Diptera: Muscidae), *Sarcodexia lambens* (Diptera: Sarcophagidae) and *Lucilia eximia* (Diptera: Calliphoridae) in *Ramphocelus dimidiatus* (Aves: Thraupidae) chicks in Panama

Sergio E. Bermúdez C[1], Eliana Buenaventura R.[2], Márcia Couri[3], Roberto J. Miranda [1] & Jorge M. Herrera[4]

[1] Entomología Médica, Instituto Conmemorativo Gorgas de Estudios de la Salud. [2] Laboratorio de Sistemática y Biología comparada de insectos, Instituto de Ciencias Naturales, Universidad Nacional de Colombia. [3] Museu Nacional, Rio de Janeiro, Brasil. [4] Instituto de Investigaciones Tropicales Smithsonian – Fundación Avifauna Eugene Eisenmann, Panamá, Panamá. Corresponding autor: Apartado postal 0816-02593, Panamá, Rep. Panamá. − bermudezsec@gmail.com.

Abstract: *Philornis glaucinus* is reported from Panama for the first time, parasitizing two chicks of *Ramphocelus dimidiatus*. Additionally, we present a secondary myiasis by *Sarcodexia lambens* and *Lucilia eximia* in these chicks.
Key words: Diptera, Muscidae, Sarcophagidae, Calliphoridae, *Philornis glaucinis*, *Sarcodexia lambens*, *Lucilia eximia*, myiasis, *Ramphocelus dimidiatus*, Panama.

Miasis mixta a cargo de *Philornis glaucinis* (Diptera: Muscidae), *Sarcodexia lambens* (Diptera: Sarcophagidae) y *Lucilia eximia* (Diptera: Calliphoridae) en polluelos de *Ramphocelus dimidiatus* (Aves: Thraupidae) en Panamá

Resumen: Se reporta por primera vez para Panamá a *Philornis glaucinus*, parasitando dos polluelos de *Ramphocelus dimidiatus*. Adicionalmente, se presenta información sobre la miasis mixta causada de forma secundaria por *Sarcodexia lambens* y *Lucilia eximia*.
Palabras clave: Diptera, Muscidae, Sarcophagidae, Calliphoridae, *Philornis glaucinis*, *Sarcodexia lambens*, *Lucilia eximia*, miasis, *Ramphocelus dimidiatus*, Panamá.

Introduction

The genus *Philornis* Meinert, 1890 (Muscidae) includes near 50 species, distributed in different zones of America, especially in the Neotropic (Fessl *et al*., 2001; Couri & Carvalho, 2002). The species of this genus have a strong relationship with birds, particularly the nestlings. It has been suggested that the females can ovipose in the nests or can laid the eggs on the skin of the nestlings. The larvae, according to the species, can be free on the nests with coprophagous habits, or can penetrate the skin, living on subcutaneous tissues and blood (Couri, 1999; Teixeira, 1999; Fessl *et al*., 2001; Amat *et al*., 2007).

According to theorical patterns, Löwenberg-Neto (2008) affirmed that some species of *Philornis* could be generalist, while other are specialists. Atkinson *et al*. (2008), affirmed that the Passeriformes, Stringiformes, Psittaciformes and Falconiformes, are the most affected birds. The effect over the bird health is little know, although the infestation by subcutaneous larvae can seriously affect the nestlings, depending on their age and size, intensity of parasitism and species (flies and birds) involved. It has been speculated in literature, that the possible increase of mortality can also be affected by other environmental factors (Teixeira, 1999). Uhazy & Arendt (1986) described the damages caused by *P. deceptivus* Dodge and Aitken, 1968 on *Margarops fuscatus* (Vieillot, 1808), being one of more complete descriptions of the parasitism.

This communication presents the myiasis of *Philornis glaucinis* Dodge & Aitken, 1968 on *Ramphocelus dimidiatus* Lafresnaye, 1837 chicks, and additionally secondary myiasis by *Sarcodexia lambens* (Wiedemann, 1830) and *Lucilia eximia* (Wiedemann, 1817), in suburban environment of Panama.

Results and discussion

The occurrence was in August 5th 2009, in a Nuevo Emperador suburban community, near 20 Km to west to Panama City (8º 56´ 40.2´´ N, 79º 41´00.8´´ W). Two live *R. dimidiatus* chicks were found in the soil, after falling out of the nest. The chicks died later and it was possible to observe many subcutaneous larvae in the breast. The carcasses were taken to the Medical Entomology Branch in the Memorial Gorgas Institute of Health Research (ICGES for Spanish acronomy) in Panama City, Panama. For better evidence of the damages, both carcasses were dissected and third larval instar of Muscidae and several first and second larval instars of Calliphoridae and Sarcophagidae were extracted.

Larvae of the three families were sacrificed in boiled water, and then kept in 75% ethanol. On the other hand, many larvae of Calliphoridae, Muscidae and Sarcophagidae were kept alive in a breeding chamber. All specimens were deposited in the Zoological Collection "Dr. Eustorgio Méndez" of ICGES. Muscidae adults emerged 15 days after being collected and were identified as *P. glaucinis* by MC. The larvae of Sarcophagidae and Calliphoridae started the pupation between three to six days after being extracted, and the adults emerged 10-12 days later. The Sarcophagidae adults were identified as *Sarcodexia lambens* (Wiedemann, 1830), using the key of Carvalho & Mello-Patiu (2008) and Buenaventura *et al*. (2009), and the Calliphoridae as *Lucilia eximia* (Wiedemann, 1819), using the key of Vargas (1999). We found that the myiasis produced by *P. glaucinis* did not cause damages in internal organs, as it is known to develop a furuncular sub-cutaneus myiasis; while, the larvae of *S. lambens* and *L. eximia* penetrated into the thoracic cavity. It is possible that the wounds produced by *P. glaucinis*, allowed the secondary myiasis of *S. lambens* and *L. eximia*, and consequently the death.

Sarcodexia lambens has been reported from different substrates; such as scorpions, snails, vertebrate's carcasses and causing myiasis in poison frogs of *Epipedobates* spp. (Hagman *et al*., 2005; Buenaventura *et al*., 2009). Fessl *et al*. (2001), found this species breeding on live chicks and carcasses of at least six species of Galapagos Islands birds, where the primary myiasis was caused by *P. downsi* Dodge & Aitken, 1968. On the other hand, *L. eximia* myiasis is reported in cats (Madeira *et al*., 1989), dogs (Azeredo-Espin & Madeira, 1996) and humans (Oliva, 2002). *Lucilia eximia* has a wide distribution in America (Madeira *et al*., 1989) and in Panama it has been reported specially in urban, suburban and forest localities (Bermúdez, 2007).

The distribution of *R. dimidiatus* includes Central and West Panama, Colombia and Venezuela, nesting in gardens and eventually boundary of forest (Ridgley & Gwynne, 2005). The nest of this species is built with roots, little branch and other materials. Despite *P. glaucinis* has been reported causing myiasis in other bird of this genus: *R. carbo* (Pallas, 1764) (Teixeira, 1999), this is the first record on *R. dimidiatus*. This is also the first record of *P. glaucinis* for Panama, previously recorded from Trinidad Tobago, Brazil and Uruguay (Carvalho *et al*., 2005). Additionally, the paper gives new information of the secondary myiasis for *S. lambens* and *L. eximia*.

Acknowledgments
We thank Lineth Ortega for the collection of the chicks.

References:
AMAT, E., J. OLANO, F. FORERO & C. BOTERO 2007. Notas sobre *Philornis vulgaris* (Couri, 1984) (Diptera: Muscidae) en nidos del sinsonte tropical *Mimus gilvus* (Viellot, 1808) en los Andes de Colombia. *Acta Zoológica Mexicana,* **23**(2): 205-207. ● ATKINSON, C.A., N.J. THOMAS & B.D. HUNTER 2008. *Parasitic Diseases of Wild Birds*. I edition. Wiley-Blackwell. 598 pp. ● AZEREDO-ESPIN, M. & N. MADEIRA 1996. Primary myiasis in dog caused by *Phaenicia eximia* (Diptera: Calliphoridae) and preliminary mitocondrial DNA analysis of the species in Brazil. *Journal of Medical Entomology,* **33**(5): 839-843. ● BERMÚDEZ, S.E. 2007. Listado Preliminar de la familia Calliphoridae (Diptera) en Panamá *Tecnociencia,* **9**(1): 101-112. ● BUENAVENTURA, E., G. P. CAMACHO, A. GARCÍA & M. WOLFF 2009. Sarcophagidae (Diptera) de importancia forense en Colombia: claves taxonómicas, notas sobre su biología y distribución. *Revista Colombiana de Entomología,* **35**(2): 189-196. ● CARVALHO, C. J. B., M. S. COURI, A. C. PONT, D. PAMPLONA & S. LOPES 2005. A Catalogue of the Muscidae (Diptera) of the Neotropical Region. *Zootaxa,* **860**: 1-282. ● CARVALHO, C. J. & C. A. MELLO-PATIU 2008. Key to the adults of the most common forensic species of Diptera in South America. *Revista Brasileira de Entomologia,* **52**(3): 390-406. ● COURI, M.S. 1999. Myiasis caused by obligatory parasites. *Philornis* Meinert (Muscidae). *In*: *Myiasis in man and animals in the Neotropical region – Bibliographic database*. Guimarães, J. H. and N. Papavero (eds.). Plêiade/FAPESP, São Paulo, pp. 51-70. ● COURI, M.S. & C. J. CARVALHO 2002. Part II. Apical Groups. *In: Muscidae (Diptera) of the Neotropical Region: Taxonomy*. C. J. Carvalho (eds). Universidade Federal do Paraná Ed., Curitiba, pp. 133-262. ● FESSL, B., M.S. COURI & S. TEBBICH 2001. *Philornis dowsi* Dodge & Aitken, new to the Galapagos Islands (Diptera, Muscidae). *Studia Dipterologica,* **8**: 317-322. ● HAGMAN, M., T. PAPE & R. SCHULTE 2005. Flesh fly myiasis (Diptera, Sarcophagidae) in Peruvian poison frogs genus *Epipedobates* (Anura, Dendrobatidae). *Phyllomedusa,* **4**: 69-73. ● LÖWENBERG-NETO, P. 2008. The structure of the parasite–host interactions between *Philornis* (Diptera: Muscidae) and neotropical birds. *Journal of Tropical Ecology,* **24**: 575-580. ● MADEIRA, N.G., G. SILVEIRA & C. PAVAN 1989. The occurrence of primary myiasis in cats caused by *Phaenicia eximia* (Diptera: Calliphoridae). *Memórias do Instituto Oswaldo Cruz,* **84**: 341. ● OLIVA, A. 2002. Miasis en la Argentina. En: *Actualizaciones en artropología sanitaria en Argentina*. RAVE. Serie de enfermedades transmisibles, Monografía 2. pp. 45-51. ● RIDGLEY, R.S. & J. A. GWYNNE 2005. *Guía de las Aves de Panamá. Incluyendo Costa Rica, Nicaragua y Honduras*. Sociedad Audubon de Panamá. Segunda edición. 614 pp. ● TEIXEIRA, D.M. 1999. Myiasis caused by obligatory parasites. General observations on the biology of species of the genus *Philornis* Meinert, 1890 (Diptera, Muscidae). In: Guimarães, J.H. and N. Papavero. *Myiasis in man and animals in the Neotropical region*; Bibliographic database. Plêiade/FAPESP, pp. 71-96. ● UHAZY, L. S. & W. J. ARENDT 1986. Pathogenesis associated with *Philornis* myiasis (Diptera: Muscidae) on nestling pearly-eyed thrashers (Aves: Mimidae) in the Luquillo Rain Forest, Puerto Rico. *Journal of Wildlife Diseases* **22**: 224-237. ● VARGAS, J.F. 1999. *Distribución y morfología de adultos e inmaduros de moscas califóridas (Diptera: Calliphoridae) de importancia forense en Costa Rica*. Tesis Universidad de Costa Rica. 94 pp.

First Portuguese record of the family Opetiidae

Rui Andrade[1] & Jorge Almeida[2]

[1] Rua Dr. Abel Varzim 16 2 – D, 4750-253 Barcelos, Portugal. − ruiamandrade@yahoo.com
[2] Rua da Póvoa Dão – Casal Jusão, 3500-532 Silgueiros – Viseu, Portugal. − jorgemotalmeida@gmail.com

The Opetiidae is a small family of flies of uncertain affinity within the Lower Cyclorrhapha, for which the biology is not very well known, though there is a record of it being reared from birch logs from Ireland (Speight *et al*., 1990). The only European Opetiidae species, *Opetia nigra* Meigen, 1830, is recorded here for the first time from Portugal. The two specimens collected are deposited in R. Andrade's personal collection, preserved in 70% ethanol.

***Opetia nigra* Meigen, 1830**
Portugal: Parque Municipal da Lavandeira – Oliveira do Douro – Vila Nova de Gaia, 41º7'19.25''N, 8º35'43.33''W, 8.IX.2009 1 male, 29.IX.2009 1 male. Both specimens were collected by the first author with a vial while running on leaves of a bush.

The specimens were identified using Chandler (2001). Parque Municipal da Lavandeira is a small public garden, and the specimens were found on the edge of a patch of trees and bushes (including the species *Salix atrocinerea* Brot., *Alnus glutinosa* L., *Sambucus nigra* L., *Rubus* sp. and *Laurus nobilis* L.) near a small stream, in a well lit area.

The authors wish to thank Peter Chandler for reviewing this article.

References: CHANDLER, P.J. 2001. *The Flat-footed flies (Opetiidae and Platypezidae) of Europe*. Fauna Entomologica Scandinavica 36: 1-278. ● SPEIGHT, M.C.D., R.E. BLACKITH & R.M. BLACKITH 1990. *Antichaeta brevipennis*, *Leucophenga maculata*, *Polyporivora picta* and *Tephrochlamys tarsalis* (Diptera): insects new to Ireland. *BIBS*, **13**: 131-136.