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A new species of *Poecilognathus* Jaennicke, 1867 (Diptera: Bombyliidae: Phthiriinae) from a known but unknown locality

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Abstract. *Poecilognathus damfino*, n. sp. is described and illustrated from Damfino Canyon, Arizona. A key to species in the *Poecilognathus punctipennis* group in the Nearctic is given.

The phthiriine genus *Poecilognathus* Jaennicke, 1867 is endemic to the New World and is easily distinguished from other genera in the tribe Poecilognathini by the shape and vestiture of the third antennal segment, and the presence of upper and lower parameral spines and the concave caudal margin of the epandrium in the male genitalia. Males and females are frequently similarly patterned.

Evenhuis (1990) recognized two species groups in the Nearctic, based primarily on the presence or absence of spots in the wing: the *punctipennis* group (spotted wings) and the *loewi* group (hyaline wings). These groups are also found throughout the New World into Central and South America as far south as Argentina and Chile and into Brazil (for the last country record see Evenhuis 1986, fig. 1). In treating the genera of Phthiriinae, Evenhuis & Greathead (1999) and Yamaguchi (2018), recognized 11 and one fossil species of *Poecilognathus* in the Nearctic Region. The new species described here is a member of the *Poecilognathus punctipennis* group, which (with the new species described herein) is now comprised of six species in the Nearctic Region.

MATERIAL AND METHODS

Material examined during this study derives from or are deposited in the following collections: BMNH (the Natural History Museum, London, UK), BPBM (Bernice Pauahi Bishop Museum, Honolulu, Hawai'i, USA), CNC (Canadian National Insect Collection, Ottawa, Ontario, Canada), FSCA (Florida State Collection of Arthropods, Gainesville, Florida, USA), UCB (University of California, Berkeley, California, USA); UCR (University of California, Riverside, California, USA); USNM (National Museum of Natural History, Washington, DC, USA [currently housed at BPBM]). General morphological terminology follows Cumming & Wood (2017).

Dissection of various body parts for examination were accomplished by soaking structures in cold 10% NaOH overnight (longer if clearing was not affected during the initial soak), washed in 10% acetic acid to stop the clearing process, washed in distilled H_2O, and transferred to a glycerin solution for dissection. Prepared structures are associated with pinned specimens either via slide mounts or structures placed in glycerin in a small microvial vial pinned below the specimen.

Figure 1. *Poecilognathus damfino* Evenhuis, n. sp., male holotype habitus, lateral view.

Photographic images were accomplished by obtaining a series of stacked images using a Leica M165C stereo dissecting scope via the Leica Microsystems LAS Multifocus software (v. 5.1.0.2) and using Zerene Stacker® stacked focusing software (v. 1.04) (Zerene Systems, LLC, Richmond, Washington, USA) to align and stack-focus each final image.

TAXONOMY

Genus *Poecilognathus* Jaennicke

Poecilognathus Jaennicke, 1867: 350. Type species: *Poecilognathus thlipsomyzoides* Jaennicke, 1867, by monotypy.

Geronites Cockerell, 1914: 230. Type species: *Geronites stigmalis* Cockerell, 1914 [= *Phthiria sulphurea* Loew, 1863], by monotypy.

Agenosia Hull, 1973: 195 (as subgenus of *Phthiria*). Type species: *Phthiria vittata* Hull, 1973 [= *Phthiria loewi* Painter *in* Painter & Painter, 1965], by original designation.

KEY TO NEARCTIC SPECIES OF *POECILOGNATHUS PUNCTIPENNIS* GROUP

1. Wing with spots ... (*Poecilognathus punctipennis* group) **2**
–. Wing without spots, some yellow to brown color may be present in cell sc ... (*Poecilognathus loewi* group)

2. Face with distinct black to brown spots or markings, never entirely yellow; halter knob orange to black, rarely yellow **3**
–. Face all yellow, no distinctly contrasting black to brown markings or spots, if spots exist, they are indistinct and pale in color; halter knob entirely yellow .... *P. sulphureus* (Loew)

3. Face with single dark brown to black spot laterally below antenna on gena **4**
–. Face all black, black with small lateral yellow spot, or face with at least two brown to black markings laterally below antenna on gena **7**

4. Maxillary palpus dark brown to black **5**
–. Maxillary palpus yellow, orange, or light brown ..... ***P. damfino*** Evenhuis, **n. sp.**

5. Halter knob yellow to orange, no dark brown to black color present (see also couplet 8) ..... *P. badius* (Coquillett), in part
–. Halter knob predominantly dark brown dorsally, yellow, if present, restricted to ventral and/or apical portions **6**

6. Hind margin of wing without spots at apices of veins ... *P. unimaculatus* (Coquillett)
–. Hind margin of wing with brown spots at apices of veins ... *P. punctipennis* (Walker)

7. Male **8**
–. Female **10**

8. Mesonotum dark reddish brown to black, with or without vittae; humeral callus yellow; halter knob orange; hind femur yellow (see also couplet 5) ... *P. badius* (Coquillett)
–. Mesonotum variable in color; humeral callus yellow or gray to black; halter knob with some black; hind femur brown to black, rarely yellow **9**

9. Scutellum creamy white to yellow laterally and posteriorly, without tan or brown color on those areas; notopleural stripe of yellow to white color, contrasting sharply with darker color of mesonotum, extending forward from scutellum to at least supra alar area, often to humeral callus; halter knob color variable, often all black... (Mexico)... ..... *P. thlipsomyzoides* Jaennicke, in part

Figure 2. *Poecilognathus damfino* Evenhuis, n. sp., male holotype habitus, dorsal view.

–. Scutellum tan laterally and posteriorly, yellow to white color, if present, restricted to medial stripe; notopleural stripe not evident, if present, then not contrasting sharply with color of mesonotum, usually paler brown than mesonotum; halter knob with yellow spot at apex... (United States and northern Mexico) .... *P. scolopax* (Osten Sacken)

10. Mesonotum brown with contrasting spot of black above each humeral callus; lower portion of gena produced forward so as to extend further than upper gena ... (Mexico)... ..... *P. thlipsomyzoides* Jaennicke, in part

–. Mesonotum without such spots; lower gena receding, upper gena produced further forward than lower portion ... (United States and northern Mexico) .... *P. scolopax* (Osten Sacken)

Poecilognathus damfino **Evenhuis**, **sp**. **nov**.

(Figs. 1–5)

Types. *Holotype* ♂ (BPBMENT 0000081271) and 4♂ *paratypes* from UNITED STATES: **Arizona**: Coconino County, Damfino Canyon, 18 Jul 1989, yellow pan trap, N.L. Evenhuis. Holotype and paratypes in BPBM.

Diagnosis: Most similar in appearance to *Poecilognathus unimaculatus* (Coquillett) based on the dark body coloration combined with the absence of spots on the posterior margin

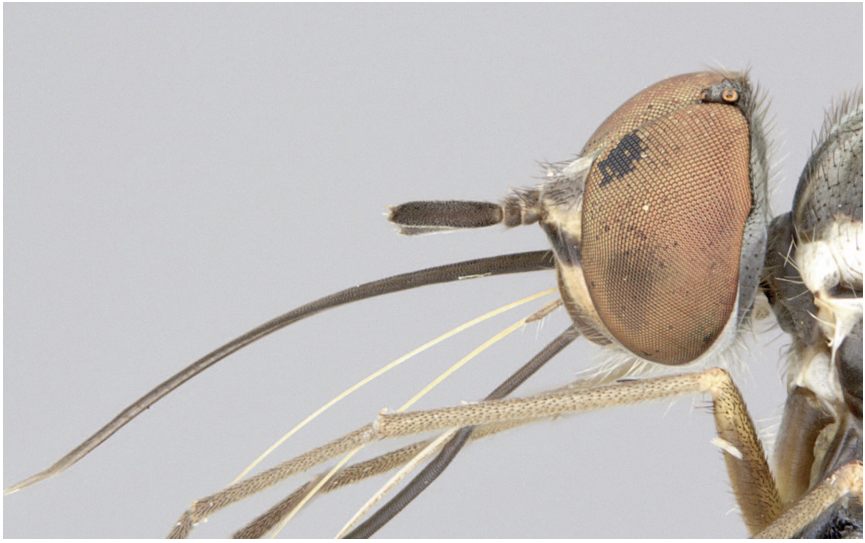

Figure 3. *Poecilognathus damfino* Evenhuis, n. sp., holotype male head, lateral view.

of the wing. It can easily be separated from it by the paler colored maxillary palpi (yellow to pale brown *in P. damfino* and dark brown to black in *P. unimaculatus*).

Description

Male (Fig. 1). Lengths: Body: 3.7–6.0 mm; wing: 3.9–6.2 mm. *Head* (Fig. 3)*:* Ocellar tubercle tear-drop shaped, black. Eyes holoptic. Occiput black, gray pollinose with short white hairs, silvery pollinose ventrolaterally; mentum gray to black, with scattered long white hairs. Antennae dark brown. Scape and pedicel subcylindrical, with erect black setae dorsally and laterally; flagellum bare, 6× length of pedicel, linear; style in apical indentation of flagellum, apex of flagellomere with dorsal prong hooked (with orange tip), longer than minute ventral prong. Frons small, triangular, bare, dark brown to black; face yellow, with broad black band laterally below antenna, brown on lower face as extension of brown color of oral margin. Palpus short, yellow to pale brown. Proboscis black, length about 2.5× head height.

Thorax (Figs. 1, 2): Mesonotum and scutellum matte brownish black, with short chocolate brown hairs dorsally and laterally; mesonotum with short medial gray stripe and yellowish gray admedian vittae coalescing in prescutellar area; scutellum white along margins, brown basomedially. Broad white notopleural stripe from humeral calli to post alar calli interrupted by black in prealar area, coalescing with white posterior border of scutellum. Pleura subshining black; anepisternum with scattered long white setae. Katepisternum white above, black below. Anepimeron and katatergite white and black colored. Halter stem yellow, knob dark brown with yellow apically.

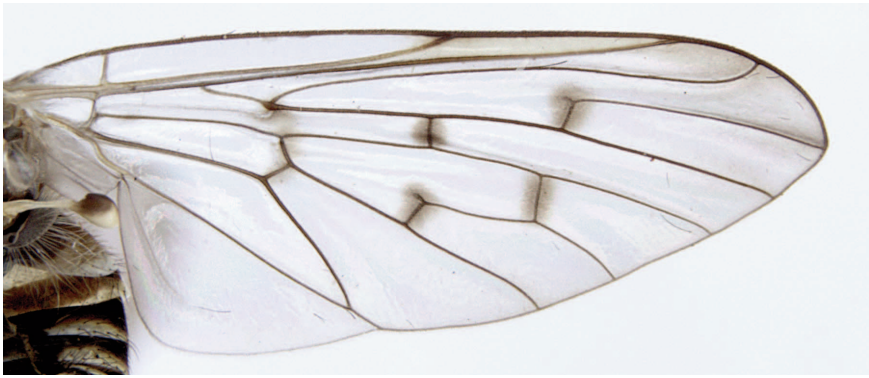

Figure 4. *Poecilognathus damfino* Evenhuis, n. sp., wing.

Wing (Fig. 3): Subhyaline with yellowish brown infuscation in cell sc along costa, some smoky infuscation apically in cell r1 and less so in cell r2+3; smoky dark brown to black infuscation on following: junction of Rs and R_{2+3}; base of R_{4+5} including small spur vein; crossvein r-m; vein at base of cell dm; crossvein m-cu; crossvein m-m; origin of vein M_3 off of M_4 including its spur vein s; anal cell closed well before wing margin; calypter with long white hairs.

Legs: Brown, except for dark brown hind femur; pulvilli well developed, ellipsoid, almost equal to length of claws.

Abdomen (Figs. 1, 2): Ovate-linear, subshining black with black hairs, with white band posteriorly on each tergite; sternites patterned as tergites, with black hairs.

Male genitalia (Fig. 4): Hypopygium yellowish white, black basally; gonocoxites subovoid in lateral view; gonostylus long, thin, with right-angled apex, apex bearing two thick peg-like spines; epandrium (Fig. 4A) subrectangular, broadly concave medially; cercus yellow-white, subellipsoidal; parameral sheath with thin slightly curved (in lateral view) ventral process bearing sharp spine subapically, bifid apically in ventral view, darkly sclerotized apically; aedeagus [distiphallus] long thin, strongly curved in lateral view; aedeagal apodeme subovate, with foliate lateral rami.

Female. Unknown.

Remarks. The type locality has an interesting history. In collecting in areas along Schnebly Hill Road outside of Sedona, Arizona, there was a small canyon that crossed the road. It had a narrow winding dry stream bed among pines and junipers and offered good places for setting yellow pan traps to collect bombyliids and mythicomyiids. After successfully collecting a number of bee flies and the new species in yellow pan traps and aerial netting, I found the name of the canyon on various local maps as Damfino. Looking into the history, I found that there apparently was no official name for the canyon, but stories told to me said that, in the 1930s, surveyors from the Civilian Conservation Corps were mapping the area and one engineer asked another what the name of this canyon was.

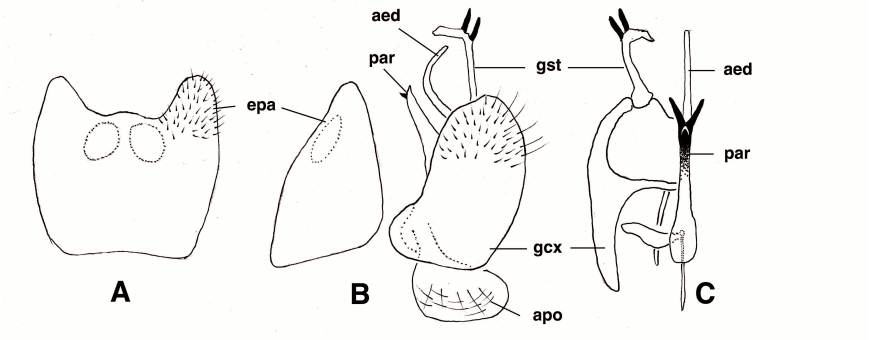

Figure 5. *Poecilognathus damfino* Evenhuis, n. sp., male genitalia. **A**. Epandrium, ventral view; **B**. Genitalia, lateral view; **C**. Gonocoxa and phallic complex, ventral view. Abbreviations: aed = aedeagus [distiphallus]; apo = aedeagal apodeme; epa = epandrium; gcx = gonocoxa; gst = gonostylus; par = parameral sheath.

"Damned if I know" was the answer, which was heard and transcribed as "Damfino", which has persisted on maps ever since.

ACKNOWLEDGMENTS

The late Jack Hall kindly reviewed an early draft of this paper and made comments and suggestions that helped improve it. The folks of Sedona, Arizona told me the story of Damfino Canyon when I frequented there in the 1980s and 1990s, the tale of which has since been retold in various media including online blogs.

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