

Misidentifications have consequences: examples from Tachinidae (Diptera) and recommendations

by James E. O'Hara¹ and Pierfilippo Cerretti²

¹ Canadian National Collection of Insects, Agriculture and Agri-Food Canada, 960 Carling Avenue, Ottawa, Ontario, K1A 0C6, Canada. E-mail: james.ohara@canada.ca

² Dipartimento di Biologia e Biotechnologie "Charles Darwin", Sapienza Università di Roma, Piazzale A. Moro 5, 00185, Rome, Italy. E-mail: pierfilippo.cerretti@uniroma1.it.

We recently came across a couple of published studies that inspired us to write this cautionary note about misidentifications and their consequences. We review the circumstances of each and offer a few recommendations to authors and editors about how to help recognize misidentifications before or after publication. Both of our examples (coincidentally) concern field studies of the fall armyworm, *Spodoptera frugiperda* (J.E. Smith) (Lepidoptera: Noctuidae).

Fall armyworm in Mexico

Pierfilippo discovered our first misidentifications while searching for host data on the New World genus *Distichona* van der Wulp, 1890. He found a report of *Distichona auriceps* Coquillett (Exoristinae, Goniini) parasitizing the fall armyworm in Guanajuato, Mexico. The study was published in Spanish by Salas-Araiza & González-Márquez (2017) and (in less detail) in English by Salas-Araiza (2017). The study also reported *Hypovoria discalis* (Brooks) (Dexiinae, Voriini) parasitizing *S. frugiperda*. Prior to this study, hosts were unknown for the eight species of *Distichona* or five species of *Hypovoria* Villeneuve, although both *D. auriceps* and *H. discalis* were known from Mexico (O'Hara *et al.* 2020).

Images of reared specimens of "*Distichona auriceps*" and "*Hypovoria discalis*" were included in Salas-Araiza & González-Márquez (2017: 291, as Fig. 1 and Fig. 2, respectively) but not in Salas-Araiza (2017). Both identifications are wrong to subfamily: their "*D. auriceps*" is a member of the tribe Tachinini (Tachininae) and their "*H. discalis*" is a member of the tribe Winthemiini (Exoristinae).

Fall armyworm in Indonesia

Our second example came to light for quite a different reason. Shannon Henderson (Jim's technician) was searching for new tachinid taxa and new distributions in recently-published papers to update their tachinid database and checklist (O'Hara *et al.* 2020). Two distributions in Ginting *et al.* (2020) looked suspicious: records of the New World species *Archytas marmoratus* (Townsend) and *Winthemia trinitatis* Thompson as parasitoids of fall armyworm in Sumatra, Indonesia. Both tachinids are known parasitoids of fall armyworm (Guimarães 1977) but neither has been recorded from the Old World. Jim noticed that neither tachinid had been reared from fall armyworm; instead, flies found on corn plants infested with fall armyworm were photographed and identified as

“*Winthemia trinitatis*” and “*Archytas marmoratus*” (Ginting *et al.* 2020: 112, as Fig. 5a and Fig. 5b, respectively). Both identifications are wrong to family: their “*Winthemia trinitatis*” is a species of Calliphoridae and their “*Archytas marmoratus*” is a species of Sarcophagidae.

We contacted the editors of the journal *Serangga* and informed them of the misidentifications published in their journal, in the paper by Ginting *et al.* (2020). A correction will be published in an errata in the April 2021 issue of *Serangga*.

Recommendations

The misidentifications above caused two different types of errors to enter the world literature on Tachinidae. In the first case, two wrong host records were reported, in the second two wrong distributions were involved. If not for the published images in both papers, these errors of identification would have been difficult to detect.

Tachinid misidentifications are bound to happen for a variety of reasons including carelessness, difficulty with identifications, and unresolved taxonomic issues. It is primarily the responsibility of authors to ensure that identifications are correct in their papers but editors bear some of responsibility as well. Misidentifications could be reduced in number, or identifications later checked, if the following recommendations were adopted by journals publishing host records:

- 1) ask authors to deposit voucher specimens of reared tachinids in a permanent collection,
- 2) ask authors to publish pictures of reared tachinids, and
- 3) ask a systematist familiar with tachinids to review the manuscript to assess the likelihood of correct identifications.

The process of identifying tachinid specimens to genus or species can be difficult or impossible for non-specialists, and sometimes for specialists as well. DNA barcoding (of the COI gene) of reared tachinids is an option for authors if they have the financial and/or laboratory means to take advantage of this technology. The world inventory of DNA barcodes is growing and the accuracy of species identifications for Tachinidae is very high, greater than 95%.

References

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