

Study of a possibly new Ecuadorian *Trichopoda* Berthold species (Diptera: Tachinidae)

by Roberto Andreocci

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I became interested in flies while pursuing an undergrad degree in Natural Sciences at Sapienza University in Rome. One of my courses was taught by dipterist Pierfilippo Cerretti, who is well known for his systematic research on Tachinidae and related families. Under his encouragement and supervision I undertook an undergrad thesis on the Rhinophoridae that I completed in the summer of 2018.

During my undergrad studies I heard about Diego Inclán, a former Master’s student with John Stireman at Wright State University in the United States and former Ph.D. student with Pierfilippo at Padova University in northern Italy. Diego studied tachinid flies for both degrees and returned to his native country of Ecuador with a background in both systematic and ecological research. He is now the Director of the Instituto Nacional de Biodiversidad (INABIO, <http://www.biodiversidad.gob.ec/>) and a professor at the Universidad Central del Ecuador in Quito. In addition to his other duties, Diego oversees a growing collection of Ecuadorian tachinids originating from some of the most biologically diverse areas of Ecuador, from the lowland rainforests of the Chocó region to the high elevation grasslands of the Andean páramo.

I contacted Diego about opportunities for graduate research on Tachinidae and he told me about a potential project involving an unstudied host-parasitoid association in Ecuador. He had stumbled upon some *iNaturalist* observations near Quito of a leaf-footed bug, *Leptoglossus zonatus* (Dallas) (Hemiptera: Coreidae), with tachinid eggs on an antenna (Fig. 1). This raised questions about the identity of the parasitoid. The study of this host and its tachinid parasitoid became the subject of my Master’s thesis under the joint supervision of Pierfilippo and Diego.

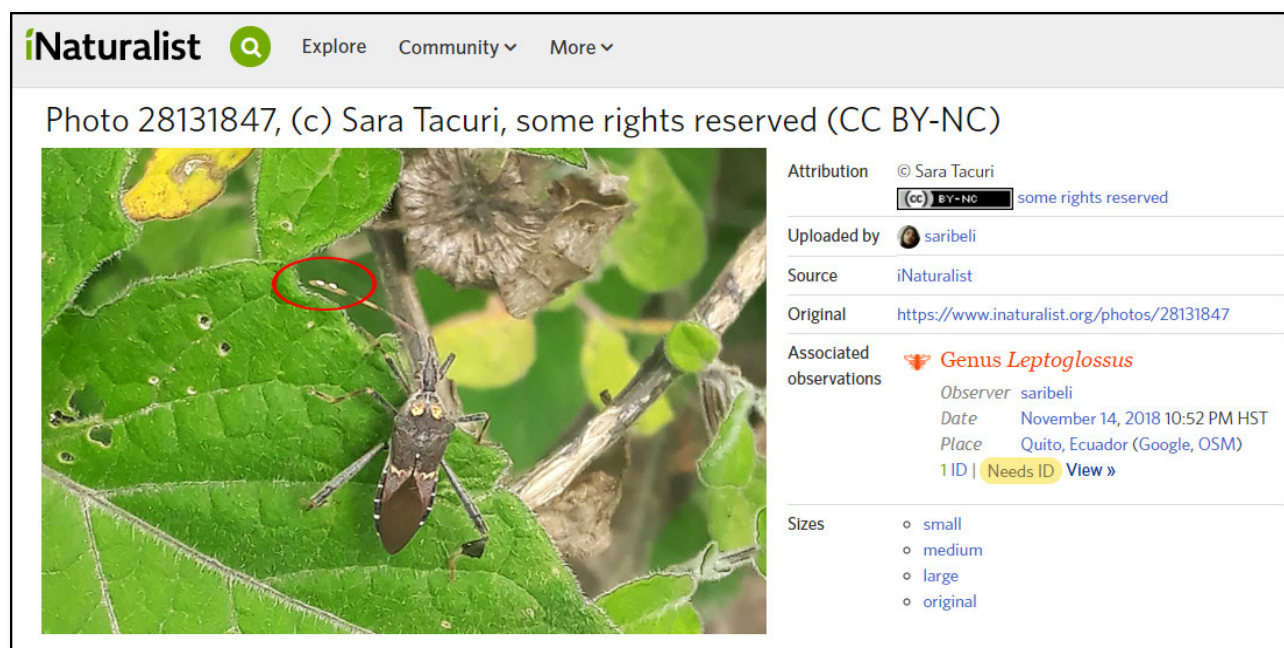


Figure 1. One of the *iNaturalist* observations of tachinid eggs (circled in red) on the antenna of a *Leptoglossus zonatus* bug near Quito, Ecuador, that led to this project (<https://www.inaturalist.org/photos/28131847>).

My thesis project includes an internship of three months in Ecuador, from December 2019 to February 2020, under Diego's guidance in an INABIO laboratory. My first task was to collect live *L. zonatus* in the field and rear them in the lab for the possible emergence of tachinid parasitoids. A population of *L. zonatus* was found feeding on *Solanum betaceum* Cav. ("tomate de arbol", a popular juicy fruit in Ecuador) near the Agronomy Faculty of the Universidad Central del Ecuador. Both nymphs and adults were collected including many individuals with tachinid eggs glued to their antennae (Fig. 2). An adult tachinid belonging to the genus *Trichopoda* Berthold was also collected at the same time. This genus was later confirmed by our rearings to be the tachinid parasitizing *L. zonatus* (Fig. 3).

Trichopoda is an easily recognized genus even by non-dipterists due to its striking yellow and black patterns on the thorax, wing and abdomen, and the row of feathery black setae on its hind tibia. The best-known species, *Trichopoda pennipes* (Fabricius), is native to the New World and has been introduced to other parts of the world for biological control of bug pests, especially the southern green stink bug (*Nezara viridula* (L.)). Other species of *Trichopoda* are often mistaken for the more widely known *T. pennipes*, in part because this species is variable in size and coloration and has been difficult to characterize by morphology and host use.

In a Master's thesis on the Neotropical species of *Trichopoda* and *Ectophasiopsis* Townsend, Dios (2014) recognized 37 species of *Trichopoda*, including over a dozen new species. The known hosts of Neotropical *Trichopoda* species belong to the heteropteran families Alydidae, Coreidae, Pentatomidae and Scutelleridae (Guimarães 1977, Santos & Panizzi 1997). *Trichopoda* was not recorded from *Leptoglossus zonatus* until Souza & Amaral Filho (1999) reported on the parasitism of adults by *T. pennipes* in Brazil. This is the only record of *Trichopoda* parasitizing *L. zonatus*, although Tarango Rivera & González (2009) reported on *T. nr. pennipes* parasitizing a related species, *Leptoglossus clypealis* Heidemann, in Mexico.

We are looking closely at Rodrigo Dios' thesis on Neotropical *Trichopoda* to determine if our specimens reared from *L. zonatus* represent a new species. We suspect that it might be new given its host, its peculiar behavior of ovipositing on its host's antennae, its morphological features, and its geographical location in Ecuador at 2500m. However, as pointed out by Dios in his study, *Trichopoda* taxonomy is difficult because the striking body and wing coloration, which is a fundamental characteristic for species identification, may be misleading due to intraspecific variation. This makes species boundaries less clear than in other genera.

When I return to Rome, my thesis will focus on the morphological description of the larval instars, puparium and adult of this Ecuadorian *Trichopoda* species and on the analysis of its parasitism rates in *L. zonatus*. I will also compare my results with previously published information on other *Trichopoda* species. At the end, I will submit my results to a journal for publication. This project will hopefully contribute to the knowledge of Andean tachinids, a peculiar fauna not yet as studied as it deserves to be.

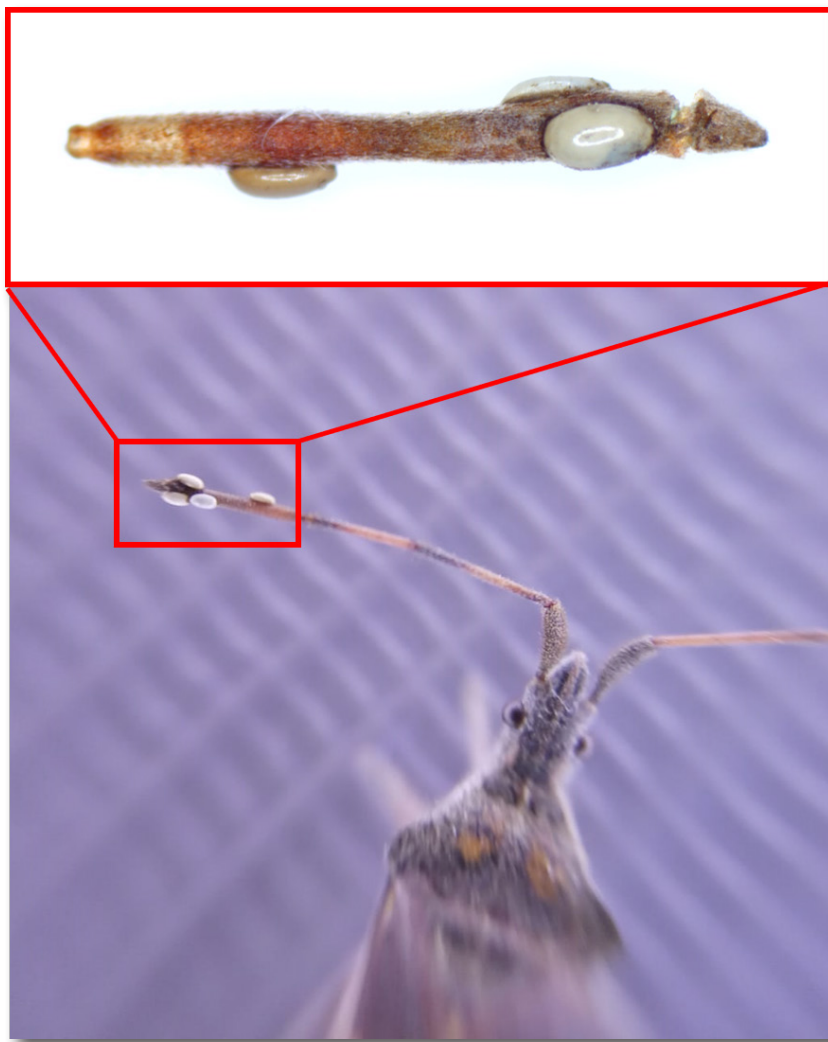


Figure 2. Eggs of *Trichopoda* sp. attached to an antenna of a *L. zonatus* bug collected near the Agronomy Faculty of the Universidad Central del Ecuador in Quito.



Figure 3. A *Trichopoda* specimen reared from a *L. zonatus* bug during this study.

Acknowledgements

I thank *iNaturalist* and the many users whose observations led to this project. The observation reproduced here (Fig. 1) is in compliance with the Creative Commons guidelines given at <https://creativecommons.org/licenses/by-nc/4.0/>. The information in Fig. 1 has been modified to fit the space available but no content has been altered. Pierfilippo Cerretti (Sapienza Università di Roma, Italy) and Diego Inclán (Instituto Nacional de Biodiversidad, Quito) are thanked for making this project possible and for their guidance and support. Jim O'Hara (Agriculture and Agri-Food Canada, Ottawa) kindly assisted with the revision of the text. I also thank Alex Pazmiño for his help and support during my work at INABIO.

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