

Student News

SILVIA GISONDI

Dipartimento di Biologia e Biotechnologie "Charles Darwin", Sapienza Università di Roma, Piazzale A. Moro 5, 00185, Rome, Italy and Natural History Museum of Denmark, Universitetsparken 15, 2100 Copenhagen, Denmark. E-mail: silvia.gisondi@uniroma1.it



Figure 1. Silvia Gisondi in Allumiere, Rome. (Photo by A. Salituro.)

I am a first year Ph.D. student at the Sapienza University of Rome (Fig. 1). My project involves a collaboration with the University of Copenhagen. During the next three years I will be working with my supervisors Pierfilippo Cerretti (Rome) and Thomas Pape (Copenhagen) on the project "Phylogeny of Rhinophoridae and Polleniidae". My background is mainly in Conservation Biology and Chemical Ecology but then, thanks to my Master's supervisor, I became interested in Molecular Biology and Phylogeny and so could not help being involved in this project!

You may wonder why I am presenting my project in *The Tachinid Times* even though my topic is not strictly on Tachinidae. The reason for this is simple: several of the molecular and morphological analyses published so far reconstruct both the Rhinophoridae and Polleniidae as sister to Tachinidae (Singhi &

Wells 2013, Winkler *et al.* 2015). In order to test competing hypotheses and examine others, I will be studying tachinids and all possible relatives.

Another reason for my choice of project is that rhinophorids are utterly interesting (Fig. 2)! They do not, for instance, show any adult autapomorphies; instead, the only clear autapomorphies concern the morphology and the locomotion behavior of their first instar larva. It would be really exciting to find out more about the interfamilial relationships of this peculiar group and test its monophyly.

As far as the Polleniidae are concerned (Fig. 3), there has been much confusion over their phylogenetic affinities. These flies were long considered as a subfamily (Polleniinae) of the Calliphoridae *sensu lato*. Rognes (1997) conducted a cladistic analysis of Calliphoridae *sensu lato* and concluded that the group is not monophyletic. Portions of the Calliphoridae have since been elevated to family status (e.g., Rhiniidae, Mesembrinellidae) and the recognition of the polleniids as a family has not yet been published. Interestingly, all recent phylogenetic analyses employing molecular data seem to converge in reconstructing polleniids as sister to Tachinidae but only the genus *Pollenia* is included.

What about the parasitic habits of these flies? If tachinids are famous for their parasitoid lifestyle, so too is this true of rhinophorids and polleniids. While polleniids show, as far as we know, a host specificity towards earthworms, rhinophorids are even more particular because they are the only insects that select crustaceans (Crustacea, Isopoda, Oniscidea) as their hosts!

On these grounds, I would like to shed some light on different issues about the phylogeny of these two extremely fascinating groups. So, my plan is to focus on a total evidence phylogeny first for Rhinophoridae and next for Polleniidae and then to wrap up the third part of my Ph.D. with a more complete Calypratae phylogeny.



Figure 2. *Bixinia winkleri* Cerretti *et al.*, Bunya Mtns. National Park, Australia. (Photo by P. Cerretti; also shown in Fig. 18E in Cerretti *et al.* 2014.)



Figure 3. *Pollenia* sp., Ottawa, Canada. (Photo by P. Cerretti.)

References

- Cerretti, P., Logiudice, G. & Pape, T. (2014) Remarkable Rhinophoridae in a growing generic genealogy (Diptera: Calypratae, Oestroidea). *Systematic Entomology*, 39, 660–690.
- Rognes, K. 1997. The Calliphoridae (blowflies) (Diptera: Oestroidea) are not a monophyletic group. *Cladistics*, 13, 27–66.
- Singh, B. & Wells, J.D. (2013) Molecular systematics of the Calliphoridae (Diptera: Oestroidea): evidence from one mitochondrial and three nuclear genes. *Journal of Medical Entomology*, 50, 15–23.
- Winkler, I.S., Blaschke, J.D., David, D.J., Stireman, J.O. III, O'Hara, J.E., Cerretti, P. & Moulton, J.K. (2015) Explosive radiation or uninformative genes? Origin and early diversification of tachinid flies (Diptera: Tachinidae). *Molecular Phylogenetics and Evolution*, 88, 38–54.