

## *Tullia Zetto – short history of a gentle mind*



June 2010, Pollino National Park

Tullia Zetto was born in Trieste 1949, January 15, and graduated in Natural Sciences 1972 at the University of the same city. After a short parenthesis in planarian regeneration research and fish endocrinology, she turned to carabid beetles and their biology, encouraged also by her husband Pietro Brandmayr, who worked as independent and voluntary researcher of entomology in the Institute of Zoology. In the years 1974-1980 she was active as granted

research assistant of Comparative Anatomy for Biology and Natural Sciences, focusing at the same time on larval biology of this large beetle family, that shelters still so many incredible predatory and behavioural adaptations. Several approaches were especially successful in investigating larval feeding both in predatory ground beetles species, as well as in phytophagous Harpalines, among them practically all the most important *Ophonus* taxa living in Italy. In 1981, after many years of provisional job, she obtained a permanent position as “researcher” at the University of Trieste. This allowed her to implement the knowledge of larval morphology of unknown old-world genera, among them: *Harpalophonus*, *Graphipterus*, *Stomis*, *Metapedius*, *Platyderus*, *Myas*. Many of these larvae were collected in the field by pit fall traps during ecological surveys on Italian biodiversity. Tullia demonstrated here an uncommon ability to organise sorting and identification of the trapped material, providing that no specimen of any taxon went lost or damaged. Especially two CNR (Centro Nazionale Ricerche) field surveys/collections, the first on the Dolomites (published 1988) and the second in Sicily (Nebrodi Mountains) were cared by her. In Sicily she was able to discover the first specimen of a new and unexpected woodlice genus, *Siciloniscus tulliae* Caruso 1982, a relict living in the pristine forest of Malabotta in Northern Sicily.

Despite her contributions to larval systematics and morphology, Tullia was not really devoted to carabid taxonomy. Anyway in the 80’s she was able to identify any larva we presented her, in fact on the basis of van Emden’s key she “self constructed” for her personal use a sort of specular preimaginal system of carabids; unfortunately her key to Italian larval ground beetles remains ... in the drawer. The collection of carabid larvae is now conserved at the Ecology Department of the University of Calabria; it has to be considered the largest for the Mediterranean area.

Since the very first years of her scientific life Tullia’s inquisitive mind was already impressed by the variety of behavioural patterns and morphofunctional solutions the larvae were able to display. The best of her work appeared after 1987, when she went to Calabria, as associate professor, to the Dipartimento di Ecologia in Rende near Cosenza. Here the shortage of teaching staff forced her to act as President of the Faculty Course of Natural Sciences for about thirteen years, meanwhile taking care of the work in a small morphofunctional laboratory on behavioural ecology of ground beetles. Two directions were immediately clear: behaviour and communication in relation to morphology, and chemical defence and avoidance mechanisms, always in the preimaginal stages.

On the one side she tried to put the “morphoecological types” of M.me Sharova into a more understandable framework, updating and reinterpreting them at least at an European level. On the other side more attention was paid to larva-larva interactions, to chemical cues and sensory complements –at both ultrastructural and functional level- in many taxa. Especially outstanding findings are those leading to the demonstration that some *Chlaenius* larvae are able to avoid intraspecific aggressive interactions by sharing the prey, a fact that contradicts

the old idea that all carabid larvae behave as cannibalistic in laboratory or in the field (Zetto Brandmayr et al., 2004). The research on antipredatory mechanisms was perhaps also more fruitful, and here the collaboration with other research groups (prof. E. Ferrero, Trieste), allowed for the first time the identification of the allomones of the pupae of *Carabus lefebvrei*, together with their abdominal glands secretion mechanisms (Giglio et al., 2009). This target is of particular importance, because the chemical defences of a coleopteran pupa detected and identified could provide, perhaps for the first time, a carabid species as a research “model” for the entire order. The history of Tullia’s research needs to be completed by remembering the large amount of work devoted to the myrmecophagous habits of *Siagona europaea*, started 1993 with the discovery of ant remainings in the midgut of dissected adults. *Siagona europaea*, the only largely distributed European species of this old-tropics genus, revealed to be a large spectrum ant feeder catching its prey in the clay fissures of the Mediterranean soils. Many of its sensory specializations and chemocological adaptations represent a step towards true myrmecophily. The finding of the blind larva that was done with the help of Thomas Bauer, using subterranean pitfall traps was a real happening for us, following the “serendipity” tradition of entomologists. Tullia’s “vision” about carabid defence mechanisms is outlined in a review on this topic written for the “Festschrift” of Professor Pietro Omodeo (Brandmayr et al., 2009).

2002/03 Tullia became full professor of Zoology. On her academic side, she was always deeply engaged in student welfare problems. As Rectors delegate she looked after for about 10 years and more the international student exchange procedures (Erasmus, LLP projects) at the University of Calabria, and still after the first attack of cancer, she was tireless active as vice-dean of the Faculty of Math., Phys. and Nat. Sciences. As an enthusiast and motivated teacher and organizer she dealt with a lot of subjects: zoology, population ecology, ethology and animal communication, basic ecology and environmental education for elementary school teachers in close related faculties. Except for some short periods in various hospitals, she never missed a day of work at the university. Only in the last months of her life she used to spend the afternoon at home, still preparing slides or texts for her own courses or reading the manuscripts of co-workers: Anita Giglio, Teresa Bonacci, Emilia De Rose, Federica Talarico.

Tullia died November 24, 2010 in the Annunziata Hospital of Cosenza at 3.15 pm, surrounded by Pietro and their children Giulia and Enrico.

*May God have mercy*

*Pietro Brandmayr, December 2010  
(Enrico Ferrero, University of Trieste, gave me precious hints for this eulogy)*

- BRANDMAYR P. & T. ZETTO BRANDMAYR (con la collab. di R. Pizzolotto), 1988 - Comunità a Coleotteri Carabidi delle Dolomiti Sudorientali e delle Prealpi Carniche. *Studi trent. Sci. nat. 64, Acta biol. suppl.*:125-250.
- ZETTO T., T. BONACCI, A. MASSOLO & P. BRANDMAYR, 2004 – Peace in ground beetle larvae: non-aggressive outcome in *Chlaenius* spp. larvae interactions. *Ethology Ecology & Evolution, Nuova Serie*, 16(4):351-361.
- BRANDMAYR P., BONACCI T., GIGLIO A., TALARICO F. F., ZETTO BRANDMAYR T., 2009 - The evolution of defence mechanisms in carabid beetles: a review. S. Casellato, P. Burighel & A. Minelli, eds. *Life and Time: The Evolution of Life and its History*. Cleup, Padova 2009.
- CARUSO D., 1982 – *Siciloniscus tulliae*, nuovo genere e nuova specie di crostaceo Isopode della foresta di Malabotta nei M.ti Peloritani (Sicilia Nordorientale). *Animalia*, 9:293-302.
- GIGLIO A., BRANDMAYR P., DALPOZZO R., SINDONA G., TAGARELLI A., TALARICO F., ZETTO T., FERRERO E., 2009 - "The defensive secretion of *Carabus lefebvrei* Dejean 1826 pupa (Coleoptera, Carabidae): gland ultrastructure and chemical identification.". *Microsc. Res. Tech.*, 72:351-361. DOI 10.1002/jemt.20660.



May 2003, near Squillace, with Thomas Bauer and Antonio Mazzei on the field, burying traps for *Siagona*.