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Editorial

Entomologia Generalis special contents: past, present, and future

Giovanni Benelli[1,*], & Francois Verheggen[2,*]

[1] Department of Agriculture, Food and Environment, University of Pisa, via del Borghetto 80, 56124 Pisa, Italy
[2] Chemical and Behavioral Ecology, Gembloux Agro-Bio Tech, TERRA, Université de Liège, Avenue de la Faculté d'Agronomie 2B, 5030, Gembloux, Belgique
* Corresponding authors: giovanni.benelli@unipi.it; fverheggen@uliege.be

Entomologia Generalis has a long history, starting in 1978, with an aim fully devoted to field of entomology. Today, the journal is ranked among the ten best journals in the field of insect science, i.e., 9 out of 173, placing it in the 95th percentile (source Scopus, October 2023). Its 2022 impact factor is 6.9, with a 2022 CiteScore of 7.7. Its current focus is on high-quality studies dealing with the biology, ecology, and management of arthropods, as well as on their importance for key ecosystem services (Desneux & Biondi 2018; Benelli et al. 2022). From 2021 to date, the number of submissions has increased by 67% in 2022, and the overall journal acceptation rate is stable around 85% (2022).

Entomologia Generalis dedicates particular attention to special contents, represented by invited reviews and Special Issues, both lead by world-class experts on carefully selected topics of timely importance for modern entomology. Invited reviews published over the last three journal volumes (i.e., 41, 42 and 43), include the following topics:

i. **Biology and ecology of invasive pest species**. Good examples are represented by major review articles e.g. on the fall armyworm, *Spodoptera frugiperda* (Kenis et al. 2023) and the emerging one such as *S. eridania* (Weinberg et al. 2022), on potential life-history strategies harbored by such invasive species (Shen et al. 2021; Wu et al. 2021; Wang et al. 2022), a recent note on an invasive bumble bee in China (Orr et al. 2022), as well as a review article by Liu et al. (2021) dedicated to the role of microbes in biological invasions.
ii. **Recent advances at the interface of insect physiology, ecology, and behaviour**, as in the case of the meta-analysis by Turchen et al. (2022) on insect vibrational communication and the related research agenda, and of the useful review by Noriega et al. (2022) about the overlooked symbioses between dung beetles (Coleoptera: Scarabaeidae: Scarabaeinae) and mites (Acari). In the same year, Pekár & Raspotnig (2022) summarised the knowledge on the defences evolved by arachnids against their natural enemies. One year before, Zhang et al. (2021) demonstrated the potential of using multiparasitism for optimizing usage of *Trichogramma* parasitoids in biological control programs, and Wang et al. (2021) showed that they could be used to carry entomopathogen.
iii. **Development and risk assessment of sustainable pest and vector control strategies** (see Benelli & Cornara 2021), such as promising interfaces integrating semiochemicals and semiophysiocals (Nieri et al. 2022), alternative aphid management tools for managing beet sugar crops without the use of dangerous neonicotinoids (Verheggen et al. 2022), and a perspective discussion on the future of area-wide management of cotton bollworm, *Helicoverpa armigera,* relying to Bt cotton in China (Lu et al. 2022). Also, Garcia et al. (2022) provided key findings for developing IPM targeting Huanglongbing (HLB) in citrus orchards.
iv. **Analysis and demonstrations of strengths and limitations of statistical methods used to analyse population dynamics data** (Ding et al. 2021; Saska et al. 2021; Amir-Maafi et al. 2022; Chi et al. 2022a, 2022b; Wang & Ma 2022; Chi et al. 2023).

Furthermore, *Entomologia Generalis* is strongly committed to develop Special Issues on themes of timely importance in the field of entomology. In 2021, a Special Issue entitled "*Recent advances on arthropod-borne diseases*", edited by G. Benelli and D. Cornara, has been devoted to the research at the interface of arthropod vector bio-ecology and the spread of arthropod-borne diseases (Benelli & Cornara 2021). In this framework, Di Giovanni et al. (2021) offered a renewed and straightforward classification of parasitic strategies of arthropods of medical and veterinary importance. This stimulated a useful and constructive discussion in the scientific community (Snyman & Jenkins 2023), highlighting the authors' need to allow an easy and clear distinction between parasitic arthropod categories that need to be treated differently from a practical perspective in applied entomology (Di Giovanni et al. 2023). Further invited reviews pub-

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E. Schweizerbart'sche Verlagsbuchhandlung, 70176 Stuttgart, Germany, www.schweizerbart.de

lished in the above-mentioned Special Issue focused on the epidemiology of important arbovirus, such as dengue, investigating factors routing its spread in contiguous United States (Wilke et al. 2021), on the role of phytophagous mites and psyllids acting as vectors of plant pathogens (De Lillo et al. 2021; Moreno et al. 2021). The Special issue also hosted several innovative original articles, among which deserves a mention a study presenting a new duplex real-time PCR assay for the detection of *Leishmania* parasites (including the reptile-associated species *Leishmania tarentolae*) in phlebotomine sandflies vectors, as well as in reservoir hosts (Latrofa et al. 2021). Also, research has shed light on the impact of food source and feeding frequency on the fitness of *Triatoma pallidipennis* (Gutiérrez-Cabrera et al. 2021), a kissing bug species acting as vector of *Trypanosoma cruzi*, the aetiologic agent of Chagas disease. Further, Galetto et al. (2021) presented an ATP synthase β silencing method to trigger female sterility in a leafhopper, *Euscelidius variegatus*, acting as phytoplasma vector, while Avosani et al. (2021) successfully attempted the vibrational disruption of feeding in the spittlebug vector *Philaenus spumarius*, a well-known vector of the dangerous bacterium *Xylella fastidiosa*.

In 2022, a Special Issue was published on the "Novel trends on semiochemicals and semiophysicals for insect science and management" (Editors: J. Gross and J. C. Franco) (Gross & Franco 2022). Herbivorous insects depend on olfaction, taste but also stimuli of physical nature for their intra- and interspecific communication (Nieri et al. 2022). All these stimuli having potential in pest management. In that sense, all contributions of that special issue greatly demonstrated how the two classes of cues can efficiently be used in insect control. Insect control using semiochemicals is particularly efficient against moths, which are largely dependent on olfaction to navigate in their environment (Golov et al. 2022). Knight et al. (2022) demonstrated the synergy of mating disruption using sex pheromone with female removal, to control *Cydia pomonella*. Mating disruption of two distinct insect pests can be achieved using a single dispenser, as suggested by Ricciardi et al. (2022). While mating disruption is a method whose efficacy does not need to be demonstrated anymore, the contemporary and prospective risks of resistance to that strategy need to be assessed (Harari & Sharon 2022). Moths are not the only pest species for which mating disruption is being developed, as the strategy is being considered for Coccoidea (Franco et al. 2022). Not just pheromones are considered, by plant semiochemicals are also taking a larger place in the research laboratory and biological control industry: their important role on multitrophic interactions is no longer to be debated (Gross et al. 2022; Cruz-Miralles et al. 2022). Still, applied chemical ecologists face some remaining challenges including the development of innovative formulations for semiochemical release in the field (Muskat & Patel 2022).

In early 2023, *Entomologia Generalis* has published a special issue devoted to RNAi-based pesticides (Editors: D. Wei; S. Wang; J. Niu). Current knowledge and potential applications for Integrated Pest Management have been discussed extensively. Strategies to improve the efficiency of RNAi-mediated crop protection were summarised by Kim & Zhang (2023). They include nanoparticle-based nontransformative RNA insecticides (Yan et al. 2023) and engineering strategies for insect viruses and microbes for dsRNA production and delivery (Xue et al. 2023). Specific RNAi application cases, at varying stages of development, were described for termites (Mogilicherla et al. 2023), Colorado potato beetle (Li et al. 2023), spider mites (Hamdi et al. 2023; Sun et al. 2023), thrips (Kim et al. 2023), locusts (Han et al. 2023), aphids (Li et al. 2023) and the fall armyworm (Chao et al. 2023). Undesired effects on non-target species were also considered, including parasitoids and predators (Wang et al. 2023b; Li et al. 2023, Lui et al. 2023).

The second 2023 special issue targeted the global perspectives on insecticide resistance in agriculture and public health (Editors K. Haddi, R. Nauen, G. Benelli, R. N. Guedes). Amichot et al. (2023) opened the special issue with a presentation of the current knowledge on the origin of insecticide resistance mechanisms. Mosquitoes have naturally received an important place on the issue, with the recent advances of their insecticide resistance being detailed by Grigoraki et al. (2023) and Ingham et al. (2023). Moths are still receiving extensive attention, as suggested by the qualitative works of Wang et al. (2023a), Idier et al. (2023), Shan et al. (2023) and Olivares et al. (2023). Zhao et al. (2023) presented the long-term changes in pest resistance dynamics in China and Australia in response to the introduction of Bt cotton. A multi-year monitoring survey on insecticide resistance for cotton whitefly *Bemisia tabaci* was performed by Stavrakaki et al. (2023). Gul et al. (2023) draw the link between multiple insecticide resistance and fitness costs. Mochetti et al. (2023) describe the incidence and molecular mechanisms of insecticide resistance in economically important thrips species. Finally, the special issue presents works on the resistance mechanisms to insecticides in aphids, cockroaches, and spider mites (Xu et al. 2023; Ullah et al. 2023; Sun et al. 2023).

Overall, we are grateful to all the authors and editors of *Entomologia Generalis* for their support in these recent years, and we are glad to invite the readers to contact the Special Content Editors with carefully drafted proposals of Invited Reviews and Special Issues for the journal.

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