



**BOOK OF ABSTRACTS**



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### P125. Identification and functional characterization of *Toxoneuron nigriceps* ovarian proteins involved in the early suppression of host immune response

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*Toxoneuron nigriceps* (Hymenoptera, Braconidae) is an endophagous parasitoid of the larval stages of *Heliothis virescens* (Lepidoptera, Noctuidae), the tobacco budworm. During oviposition, *T. nigriceps* injects into the host body the egg, the venom, the calyx fluid, which contains a Polydnavirus (*T. nigriceps* BracoVirus: *TnBV*), and the Ovarian Proteins (OPs). OPs, originating from the ovarian calyx cells, are involved in the induction of precocious symptoms in the host immune system alteration. Indeed, although viral gene expression in the host reaches detectable levels within a few hours, the host metabolism and immune system are disrupted shortly after parasitization. To functionally characterize the OPs, we carried out two approaches. Firstly, incubating hemocytes with OPs *in toto*, detecting several alterations on host cells. Then, we evaluated the effect of HPLC fractions deriving from *in toto* OPs. Among the 28 analyzed fractions, two fractions caused a reduction in hemocyte viability and were tested to detect changes in hemocyte morphology and functionality. In accordance with previous results, obtained with *in toto* OPs, the two fractions caused severe oxidative stress, actin cytoskeleton disruption, loss of hemocyte encapsulation ability and high mortality rate. Moreover, a transcriptome and proteomic approach was applied to identify all OPs proteins and particularly the proteins of the two fractions. The eight detected proteins might be involved in the observed host hemocyte changes. Our findings will contribute to a better understanding of the ovarian components and their role in parasitic wasp strategy to escape the host immune responses.

**Keywords:** maternal factors, host-parasitoid interaction, proteomic and transcriptomic approach

### P126. The long and challenging road to capitalize on plant-based extracts use against agricultural crop pests in Senegal

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Reducing pesticide use for plant health has become a goal shared by CILSS and ECOWAS countries and a major issue in public policies due to their negative footprint on the environment, human health, and food security in a context of augmentation of phytosanitary risks linked to climate change. In Senegal, a low-income country, where available chemical pesticides are of uncertain origin and quality, the use of unproven quality homemade plant extracts preparations tends to be normalized.

Surveys conducted in the regions of Fatick, Tamba, and Thies in 2021 and 2022 have shown that chemical pesticides are considered as effective by 97% of respondents. Less than 10% of them use natural products. Regarding organic horticulture, in the vegetable crops and fruits production area in Thiès, 98% of interviewed people were not convinced of the efficacy of homemade plant extracts preparations to control pests, while country and trans-border expertise have capitalized a set of plant species among which *Azadirachta indica*, *Cassia senegalensis*, *Eucalyptus* sp., *Allium cepa*, *Allium sativum*, and *Capsicum annum*. They invest in the production of biopesticides or source from local input suppliers without enough knowledge on pests, biopesticide preparation techniques and compliance of commercial biopesticide formulations with regulatory requirements. The adoption of the use of plant extracts against crop pest in Senegal where the chemical pesticides use, trade, and availability have reduced traditional local plant protection knowledge transmission in farmers communities, finding alternatives is challenging for producers engaged in organic and those engaged in agroecology.

**Keywords:** plant extracts, pest, agricultural crops, senegal

#### **P127. Volatile organic compounds – their repellent activity and effects on survival and reproduction of *Tenebrio molitor* pest**

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Soil pollution, accumulation of harmful substances or undirected impact on the environment are just some of the consequences of modern agriculture. To prevent or reduce these adverse effects scientists have been conducting intensive research for many years on the development of compounds that would be an alternative to classic insecticides. This approach uses, for example, compounds of natural origin, like secondary metabolites of plants, due to their broad biological activity. They can cause, for example, the reduction of food intake, the inhibition of growth or reproductive processes of insects or nematodes pests.

In research, we focused on four secondary metabolites of plants classified as volatile organic compounds (VOCs). (*E*)-2-decenal, furfural, 2-undecanone and (*E,E*)-2-4-decadienal were used in concentration 10<sup>-5</sup> M. Their activity towards survival and reproductive processes, including the number of laid eggs and their structure as well as hatchability of larvae of *Tenebrio molitor* beetle were tested after insects' injection. In turn, the repellent properties of tested compounds were analyzed in 'choice test'. Our studies indicate that compounds possess a repellent effect, as insects avoid choosing surfaces or food on which they were applied. Also, the survival rate was reduced. Tested substances impact on reproduction processes by reducing the number of laid eggs and limiting the number of hatched larvae.

Taking into account the obtained results, economy and the possibility of using plant residues like citrus peels, leaves, stems or corn cobs to obtain them, it might be stated that VOCs can be considered as sustainable natural plant protection products.

**Keywords:** insects, plant secondary metabolites, reproduction, survival, bioinsecticides