SEX-SPECIFIC RESPONSE OF THE TORTRICID PEST *LOBESIA BOTRANA* TO VOLATILES EMITTED BY THE ASIAN FOOD-PLANT *PERILLA FRUTESCENS*

Cattaneo A.M.[1], Bassoli A.[2], Bengtsson J.M.[1], Borgonovo G.[2], Anfora G.[1]

[1]Research and Innovation Centre, Fondazione Edmund Mach, San Michele all'Adige, Italy; [2]Università degli Studi di Milano, DeFENS - Dipartimento di Scienze per gli Alimenti, la Nutrizione e l'Ambiente, Milan, Italy

Grapevine Moth *Lobesia botrana* (Denis & Schiffermüller, 1775) is a major pest of grape worldwide. By multiple generations per year in its native range and its generalist feeding, *L. botrana* also affects the production of other fruit crops at different ripening stages. Control of this pest still largely relies on insecticide applications and on the combination of chemical, biological and integrated pest-managements. *L. botrana* kairomones have been extensively studied but their effectiveness for control purposes is limited by overlap with background odors in the vineyard. Behaviorally active compounds from non-host plants may represent an interesting alternative. Volatiles of food plants origin, i.e. from capsicum, garlic, pepper and mint, are known to activate specific receptors across species and phyla, giving the so called somatosensory sensation. These plants have also been used in agriculture for their known ability to interfere with insects and nematodes. Among those plants, *Perilla frutescens* (L), native of Asia, was shown to produce compounds strongly activating sensory rat Transient Receptor Potential (TRP) channels, also involved in the perception of the above mentioned volatiles, which were found expressed in the antennae of tortricid pests. We screened the biological activity of essential oil metabolites isolated from *P. frutescens* on the olfactory system of *L. botrana*. Then, we investigated the expression of candidate TRP-genes comparing full length cDNAs samples synthesized from several tissues of another tortricid model (*Cydia pomonella*). Electrophysiologically active compounds released from two different *P. frutescens* varieties having specific chemical makeup (chemotypes) were identified by gas chromatography-coupled with electroantennography (GC-EAD). In a dual choice oviposition test based exclusively on olfactory cues, females showed a preference for the odors released by a Perilla variety which profile is dominated by S-(-)-Perillaldehyde (PA), even in presence of the odor bouquet of grape bunches. In a Y-olfactometer test compared with an odorant-free control experiment, males showed a significant behavioral enhancement in the presence of odors released by a Perilla variety which profile is dominated by ketones Perillaketone (PK) and Isoegomeketone (IK). Comparing cDNA samples, we identified a singular pattern of expression in tortricid antennae for specific TRP candidates and sex-specific relevance of different level of expression of other candidates. Future molecular, physiological and behavioral studies will focus on the mechanisms of action of Perilla compounds on insect senses, with the aim to validate the motivation of different sex responses to Perilla compounds.