

Electrophysiological and behavioural responses of Grapevine Moth *Lobesia botrana* to odours of the non-host plant *Perilla frutescens*

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Abstract

Lobesia botrana is a major pest of grape worldwide. *L. botrana* kairomones have been extensively studied but their effectiveness for control purposes is negatively affected by the overlapping background odours in the vineyard. Thus, behaviourally active compounds from non-host plants may represent an interesting alternative for control.

Substances of food plants origins, i.e. from capsicum, garlic, pepper, 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*, native of Asia, was shown to strongly activate human Transient Receptor Potential (TRP) channels, which are also expressed in insect antennae.

We therefore screened the biological activity of metabolites isolated from *P. frutescens* on the olfactory system of *L. botrana*.

Electrophysiologically active compounds released from 3 different *P. frutescens* chemotypes were identified by gas-chromatography coupled with electroantennography. In a dual choice oviposition test based exclusively on olfactory cues, females showed a preference for the odours released by a *Perilla* variety which profile is dominated by a C8 aldehyde, even in presence of the odour bouquet of grape bunches. Future molecular, physiological and behavioural studies will focus on the mechanisms of action of *Perilla* compounds on insect senses.

Keywords: Grapevine Moth; *Perilla frutescens*; olfaction; behavior; oviposition