



ICGBG

XII International Conference on
GRAPEVINE BREEDING and GENETICS

July 15-20, 2018
Bordeaux FRANCE

ABSTRACT BOOK
GBG 2018 – Bordeaux, France
15 – 20 July



Control of the grapevine moth *Lobesia botrana* through the genetic engineering manipulation of the host plant's volatiles

Mickael Malnoy^{a,*}, Umberto Salvagnin^a, Stefan Martens^a, Gianfranco Anfora^a, Sergio Angeli^b, Marco Tasin^c

^aGenomic and advance biotechnology unit, ResInnov.Centre, Foundation Edmund Mach, Via E. Mach 1, 38010 S. Michele all'Adige, Italy

^bBolzano University, Bolzano, Italy

^cSwedish University of Agricultural Sciences, Alnarp, Sweden

* **Presenting author:** mickael.malnoy@fmach.it

The European grapevine moth *Lobesia botrana* is one of the key pests of grape. The caterpillar feeding activity leads to a direct damage on reproductive plant tissues (flower buds and berries) but also to an indirect damage by promoting secondary infections of microorganisms. Current control systems are based on the use of insecticides or on mating disruption: while the first is not environmentally friendly, the second is not particularly suitable for non-delimited areas, or areas where pest population is high. Previous studies have showed that a synthetic blend of the three terpenoids (E)- β -caryophyllene, (E)- β -farnesene and (E)-4,8-dimethyl-1,3,7-nonatriene (DMNT) was as attractive for the moth as the complete grape odour profile in laboratory conditions. The same studies also showed that the specific ratio of these compounds in the grape bouquet was crucial, because a percentage variation in any of the three volatiles resulted in almost complete inhibition of the blend's attractiveness. Here we report on the creation of stable grapevine transgenic lines, with modified (E)- β -caryophyllene and (E)- β -farnesene emission and thus with an altered ratio compared to the original plants. When headspace collections from these plants were tested in wind tunnel behavioural assays, they were less attractive than control extracts. This result was confirmed by testing synthetic blends imitating the ratio found on natural and transformed plants, as well as by testing the plants themselves. With this evidence, we suggest that a strategy based on volatile ratio modification may also interfere with the host-finding behaviour of *L. botrana* in the field, creating avenues for new pest control methods

Keywords: (E)- β -caryophyllene, (E)- β -farnesene, host selection, *Lobesia botrana*, sesquiterpenes, transgenic