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Keynote

How to improve grape moth pests control in viticulture. Which research fields should be promoted?

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Lepidopterans larvae are most exclusively phytophagous and several tortricid moth species cause severe damages to fruit production such as orchards and grapes. In viticulture, the two moths *Eupoecilia ambiguella* and *Lobesia botrana* are considered major pests in European viticulture and *L. botrana* recently invaded the American vineyards.

The larvae of these species attack the grape bunch from spring to autumn, cause direct losses and also qualitative deviation to wines, but they can also favour the development of fungi responsible of the well-known rots and may produce harmful toxins to humans like ochratotoxins. These tortricids moths have existed for a long time in viticulture, *E. ambiguella* being described as early as in the bible and roman viticulture. The other species *L.botrana* is currently the species, which is colonizing new viticulture areas. It for example invaded American viticulture a few years ago.

To drastically reduce insecticide use in viticulture, several Integrated Pest Management control methods have been developed against these pests, involving mating control, parasitoids/predators release and environmental control based on practices and landscape management. In this present talk we attempted to review the different interactions between the grape cultivars and these two pests.

In these species, the different cultivars of grapes affect life history traits, such as reproduction and immune defence, but also the parasitism success of parasitoids. Recent data also show how the landscape architecture and the grape training practices influences the activity of natural enemies. Research on trophic networks around grapes and these pests are now investigated in more detail. The effect of global warming on the immune systems and reproductive output are now investigated on these species with the perspective of future application in the biological control of these pests.

Many factors influence the biological control of *L. botrana*, depending on coevolution mechanisms between plant-pest and pest-parasitoids in the context of tritrophic interactions. Understanding factors that cause varying host/prey quality is crucial to avoid unexpected failures in biological control.

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