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“Biotechnological control of *Gonipterus* spp. weevils”

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Objectives

- *Gonipterus* weevils are insect pests causing economic damage to plantations, as both larvae and adults feed on eucalyptus leaves and young shoots, leading to reduced tree growth and mortality.
- The aim of this study is to develop an innovative biotechnological approach for *G. platensis* control, based on behavioural responses of the weevil and of two egg parasitoids, to volatile organic compounds released by the host plants. Complementary, research will be conducted to detect plausible pheromones released by the weevil. The chemical ecology of *G. platensis* will be decoded by performing behavioural bioassays with compounds, or blends, isolated from the beetles and from eucalyptus species/clones showing different susceptibility to attack

Methodology

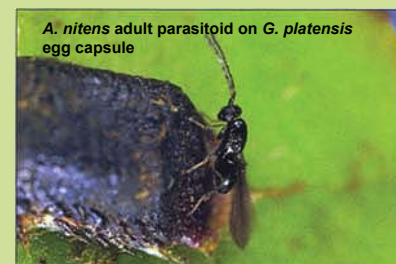
- Volatile organic compounds (VOCs) of *Eucalyptus* species will be collected and compared. Volatiles emitted by the weevils will also be collected.
- *G. platensis* and *Anaphes* egg parasitoids will be reared in the laboratory and the population dynamics of the populations studied, with life tables constructed and analyzed.
- Extraction of volatile compounds from leaves and insects will be performed by Headspace - Solid Phase Microextraction (HS-SPME). Gas Chromatography (GC) and Mass Spectrometry (MS) will be used for separation and identification of compounds from extracts.
- Dual choice olfactometer, wind tunnel and electroantennographic bioassays will be used to test the behavioural responses of insects to the isolated compounds and blends.

Expected Results

- We expect to decode the chemical ecology of *G. platensis*, identifying bioactive compounds or blends with practical application in control strategies.

Possible outcomes:

- No responses to any of the substances tested – unlikely, but it would be a clear answer: host and/or sexual selection are not mediated by olfactory cues.
- Clear responses to all the substances and blends tested - hardly probable, but would be a major achievement, with practical applications.
- Responses to some of the substances / blends but not to all - this is the most probable outcome, expanding the chemical analysis will be necessary but practical applications are nevertheless attainable.



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