

Assessing the compatibility of *Varronia curassavica* essential oil and *Beauveria bassiana* for sustainable pest management

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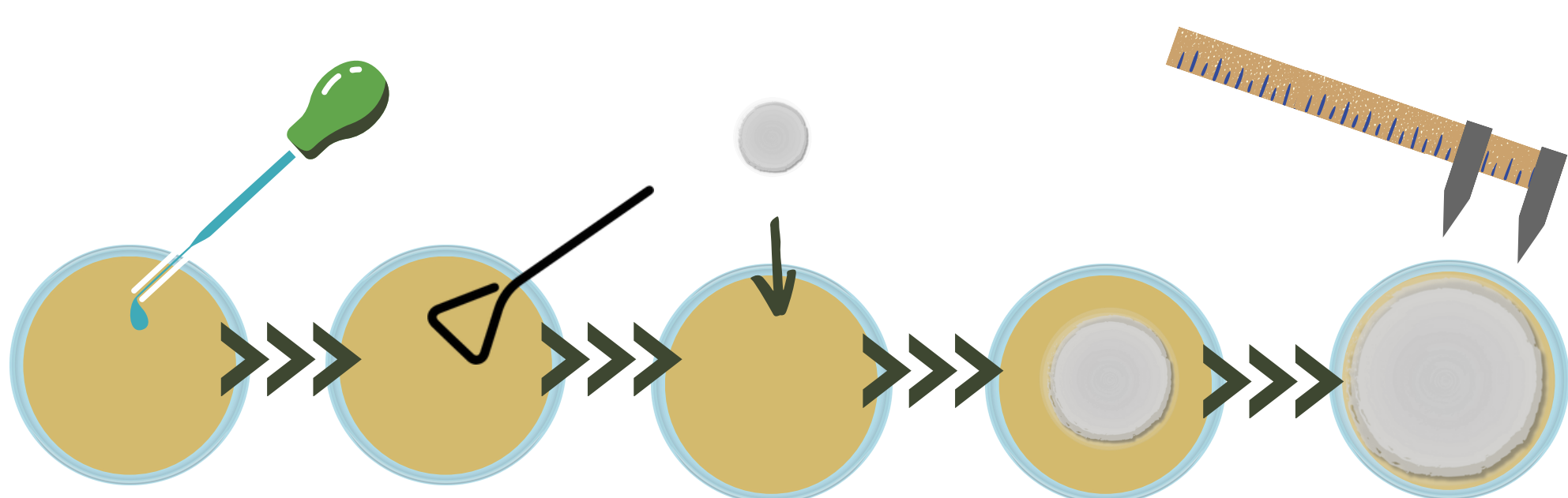
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INTRODUCTION



MATERIAL AND METHODS

Effect of essential oil on mycelial growth



Application of *Varronia curassavica* essential oil in five concentrations
0.2, 0.4, 0.6, 0.8, and 1.0%

Measurement of *Beauveria bassiana* mycelium growth over 7 days (168 hours)

Figure 1. Illustration of the experiment conducted in the laboratory with different concentrations of the essential oil of *Varronia curassavica* (“erva-baleeira”) on the growth of the entomopathogenic fungus *Beauveria bassiana*.

The effects of *V. curassavica* essential oil (EO) on *B. bassiana* mycelial was evaluated using five concentrations of EO: **0.2, 0.4, 0.6, 0.8, and 1.0%** (v/v). A control treatment consisting of distilled water with 0.05% Tween® 80 was included. For each OE concentration, we performed 30 replicates.

RESULTS

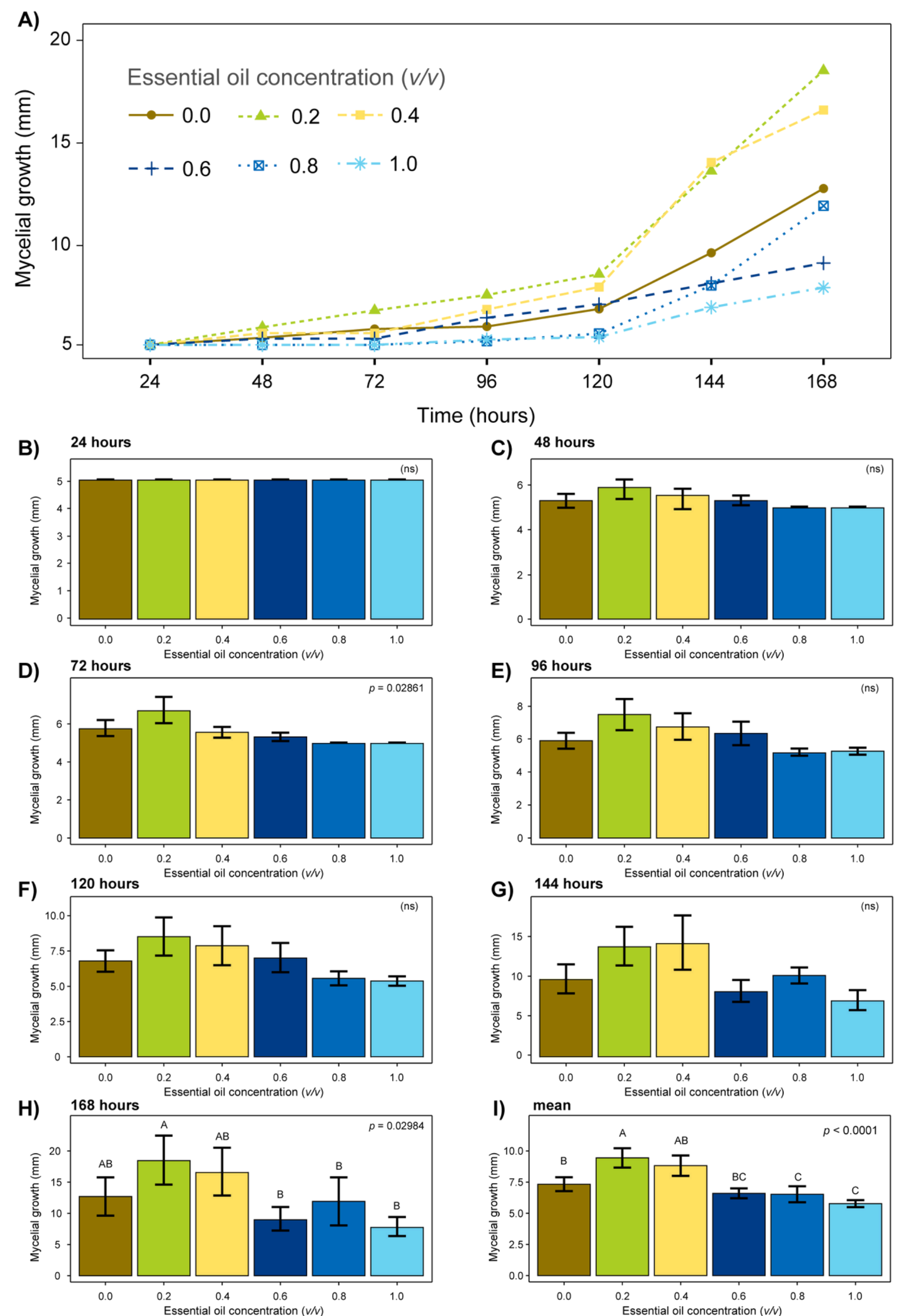


Figure 2. Effects of different concentrations of *Varronia curassavica* essential oil (0.0, 0.2, 0.4, 0.6, 0.8, and 1.0% v/v) on the mycelial growth of *Beauveria bassiana* over 168 hours (A), their respective effects analyzed hour by hour (B–H), and the overall mean effect (I) (n = 30).

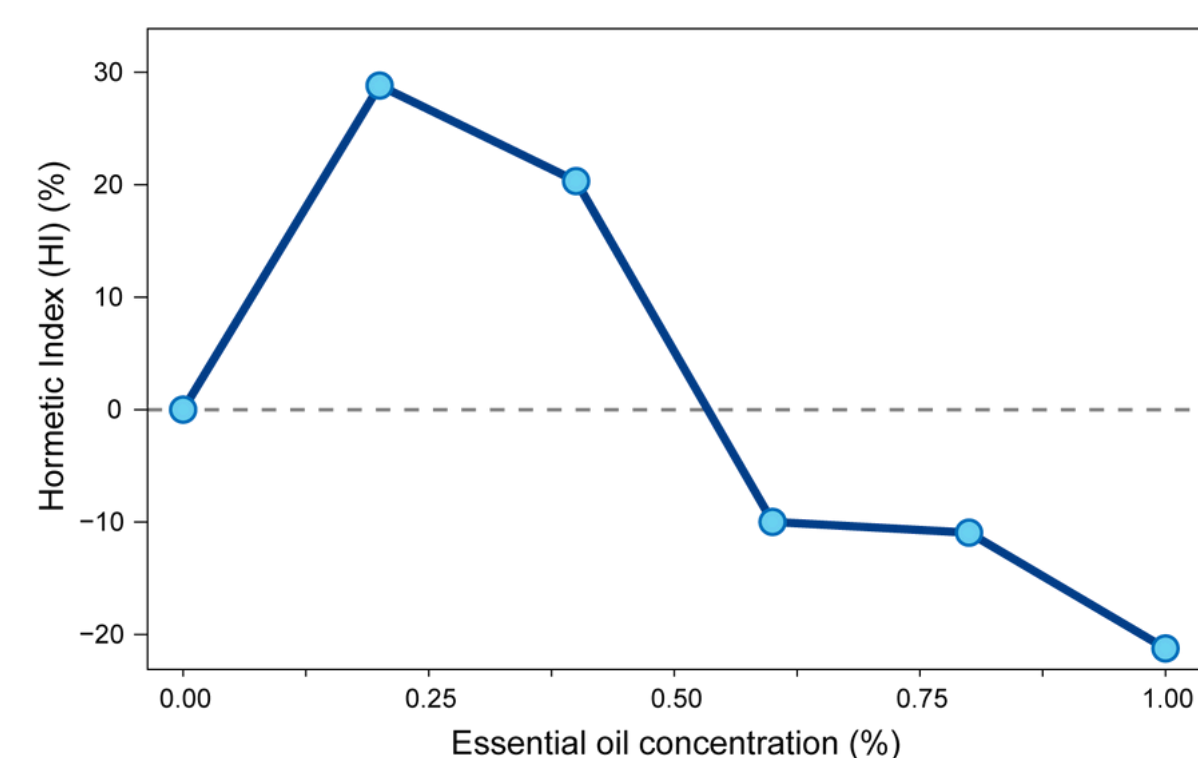


Figure 3. Hormetic Index of different concentrations of *Varronia curassavica* essential oil (0.0, 0.2, 0.4, 0.6, 0.8, and 1.0% v/v) on the mycelial growth of *Beauveria bassiana* (n = 30).

CONCLUSIONS

The observed stimulation of fungal growth at sublethal EO concentrations suggests a hormetic effect, with an increase of 28.82% in mycelial growth compared to the control. These findings highlight the potential compatibility and even synergy between *V. curassavica* EO and *B. bassiana*, supporting their integrated use in regenerative and sustainable pest management strategies for coffee, particularly in the control of CBB and potentially other pests within the coffee agroecosystem.