



Effective, safe and novel insect repellent for use in crop protection

BACKGROUND

Fruit flies are the most significant insect pests of horticulture globally, responsible for many hundreds of millions of expenses in control and lost product.

Australia's most economically important insect pest of horticulture is *Bactrocera tryoni*, also known as the Queensland fruit fly ('Q-fly'). Its broad host range, climate tolerance and high reproductive rate makes it a serious pest with extreme invasive potential. With more than 200 host crops, Q-flies cause immense loss to Australia's horticulture industry. Equally, other fruit fly species pose similar economical and agricultural problems in other parts of the world.

Traditional methods, such as insecticides, traps and Sterile Insect Technique (SIT) programs all have significant limitations. Therefore, there is a strong need for new, safe and sustainable methods to protect fruit crops from Q-fly and other fruit flies in Australia as well as globally.

OUR SOLUTION

We have discovered **effective, safe and novel repellent** compounds that had been isolated from a fruit fly predator. It demonstrated profound effects in modifying locomotory behaviour and reducing egg laying by flies (5 species). **Different formulations** were tested in **field cage trials** using actual fruit in outdoor settings and demonstrated effectiveness and significant reductions in number of larvae found in the fruit.

Broad range of formulations is possible, including spraying, spot applications, slow release devices hung on trees to protect home gardens and commercial horticultural production. The compound has a Generally Regarded as Safe (GRAS) status.

Having proven effective with each tested species, this product is expected to be effective for many fruit fly pests, including several species that are the world's most devastating insect pests of fruit and vegetable production (Oriental fruit fly, Mediterranean fruit fly).

APPLICATIONS

- ✓ Commercial Agriculture
- ✓ Horticultural Producers
- ✓ Pest Management
- ✓ Home Gardens

INVENTORS

Vivek Kemparaju is an applied chemical ecologist, focusing on the chemical relations between Q-flies and their enemies, such as ants, spiders and wasps, to bio-prospect effective repellent compounds.

Dr Soo Jean Park is a synthetic/analytical chemist with research interests in exploitation of chemical ecology to develop sustainable control strategies for economically significant invertebrates.

Professor Phil Taylor is Director of the ARC Centre for Fruit Fly Biosecurity Innovation. His interests include the sustainable and benign management of fruit flies and other insect pests.

UNIQUE FEATURES AND ADVANTAGES

Effective against several species of fruit fly
Safe and effective (GRAS status)
Low impact on horticultural crops
Large potential market, broad applications
Formulation flexibility
Likely to be accepted for organic production
No product withholding period
Anticipated easy product registration

INTELLECTUAL PROPERTY POSITION

Patent Cooperation Treaty (PCT) application filed - PCT/AU2021/050415

PARTNERING OPPORTUNITY

We are seeking an industry partner for further development and commercialisation of this repellent technology through a research collaboration or technology licence.

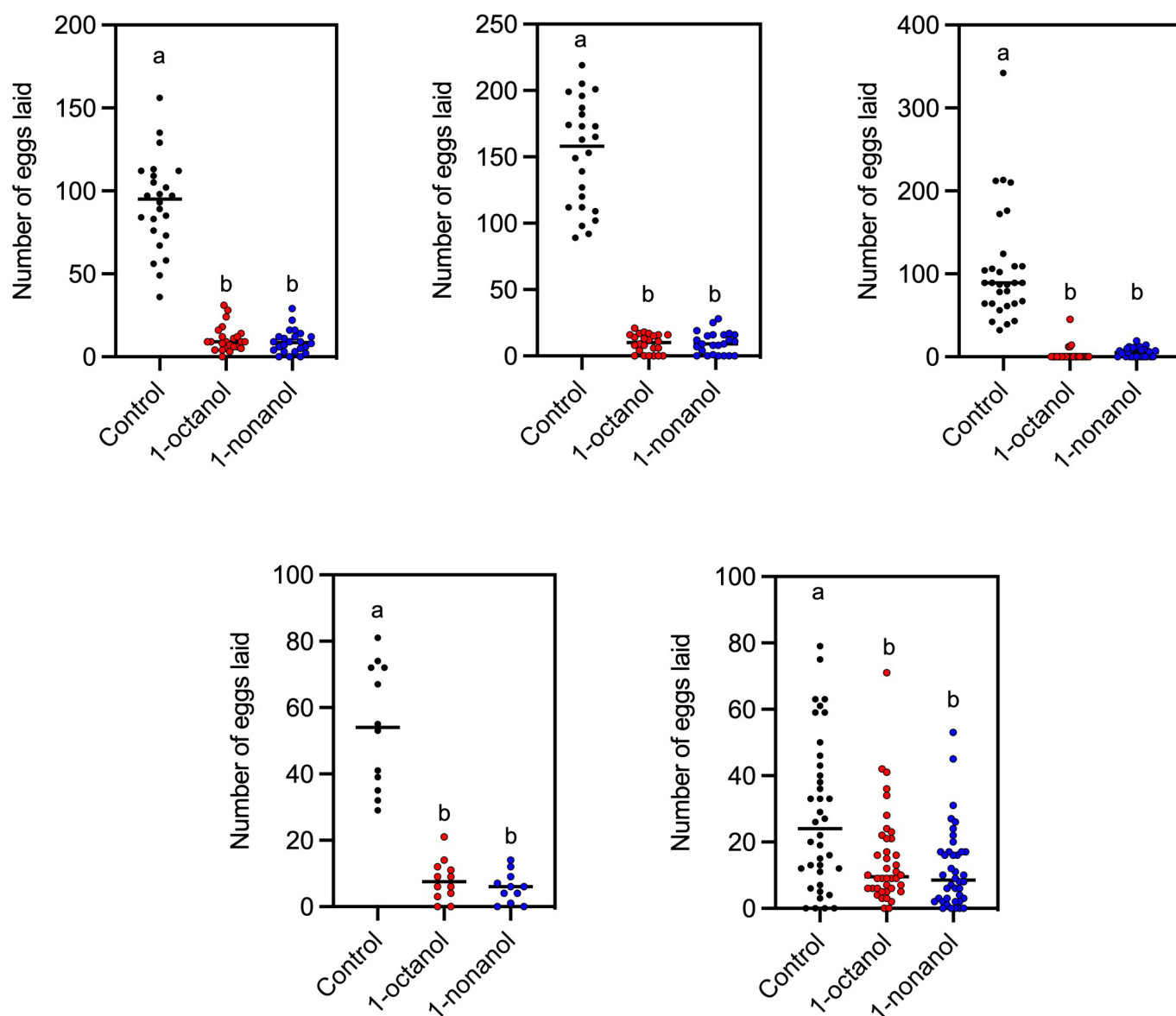
WOULD YOU LIKE TO KNOW MORE?

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LAB STUDIES





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FIELD STUDIES

Figure 1. Slow-release formulations of 1-octanol deterred oviposition as reflected by a) number of oviposition punctures and b) number of larvae in treated and control fruits. Difference across the set of treatments was analysed by repeated measures one-way ANOVA ($P < 0.0001$; see *Results*) followed by Tukey's multiple comparison test. Similar letters denote no significant difference.

