

## TECHNOLOGY OFFER

# BIOPESTICIDE COMPOSITIONS AGAINST SWARMING LOCUSTS AND OTHER INSECTS

In recent years chemical pesticides have been discredited because of their negative effects on human health and harmful side effects on the ecosystem. Public awareness of the amount of residual chemicals in food, ground water and the environment has increased. Therefore, the need for alternative methods of pest control is high and has not been sufficiently met. Researchers at the University of Graz have developed efficient biopesticide compositions against insects, e.g. against locusts and invasive fruit flies. The portfolio of biopesticide compositions developed against problematic insects at the University of Graz is constantly growing.

### BACKGROUND

During locust outbreaks, enormous areas become devastated. As a possible alternative to chemical pesticides, application of specific fungi is proposed by the FAO and the WHO. Major drawbacks of using fungi are related to the laboratory equipment that is needed to control for the biological activity of the spores and the problems arising from the dilution of spores with diesel and kerosene for spray treatment. In addition, the effect on locusts of treatment with fungi is slow - about two weeks.

### TECHNOLOGY

This novel botanical pesticide consists of a carrier oil (e.g. linseed oil), an aqueous solution of hydrogencarbonate, and a plant essential oil component (e.g. caraway oil, orange peel oil and wintergreen oil). In the case of locusts, a single spray treatment was lethal for 100% of individuals (~80% died within 24 hours and the remaining ~20% within the next 6 hours). In comparison, mealworm beetles treated in the same way were unaffected even after a follow-up period of 18 days. Moderate toxic effects were observed when sprayed on ladybird adults and strong toxicity was evident after single spray treatment on fruit flies. Experiments with wheat grass seedlings revealed that this botanical pesticide did not substantially affect their growth, even when grass was exposed to natural sun light.

### ADVANTAGES

- This botanical pesticide is rather cheap and harmless for humans,
- can be easily manufactured in an inexpensive process,
- can be sprayed by standard spray devices,
- does not substantially affect grass growth, and
- has an immediate antifeedant effect in locusts.



Dead locusts after a single spray treatment.  
© Picture: Uni Graz/Abdelatti



Dead fruit flies after a single spray treatment.  
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#### KEYWORDS:

BIOLOGICAL PEST CONTROL  
LINSEED OIL  
HYDROGENCARBONATE  
PLANT ESSENTIAL OILS  
LOCUST CONTROL  
FRUIT FLY CONTROL  
INSECT CONTROL  
BIOPESTICIDE

#### INVENTORS:

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#### COOPERATION OPTIONS:

LICENSING AGREEMENT  
RESEARCH COOPERATION  
AGREEMENT

#### DEVELOPMENT STATUS:

LAB TESTS SUCCESSFUL

#### STATUS OF PATENTS:

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