

# Environmentally Friendly Larvicides

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## Background

In the absence of vaccines and appropriate medications, disease control is the consensus public health priority. Eradication of mosquito larvae is an important part of effective disease control. Unfortunately, all of the larvicides currently in wide use exhibit one or more of four disadvantages: (1) toxicity to humans and other non-target species, (2) degradation of the aquatic environment, (3) high annual cost, and (4) vulnerability to the evolution of target resistance.



## Technology Breakthrough

In this novel approach to larval eradication, Baker's yeast (*Saccharomyces cerevisiae*) is utilized as a delivery vehicle for essential oils. The efficacy of this approach is facilitated by a well-documented feature of larval biology: all mosquito larvae will preferentially consume and readily digest *S. cerevisiae*. In fact, the recommended food for rearing larvae in laboratory settings is *S. cerevisiae*.

Essential oils, such as lemongrass oil, are produced by plants to combat arthropods. They are lethal to mosquito larvae at low concentrations (50 ppm), but are not toxic to vertebrates. In utilizing a simple process, the entrapment of lemongrass oil into the yeast has been successfully achieved. Ingestion of the nonviable, lemongrass oil-containing yeast cells by both *Aedes* and *Culex* larvae resulted in **100% mortality**.

These results argue that yeast vehicle delivery of essential oils may have the potential to become a low-cost, environmentally friendly alternative to synthetic larvicides.

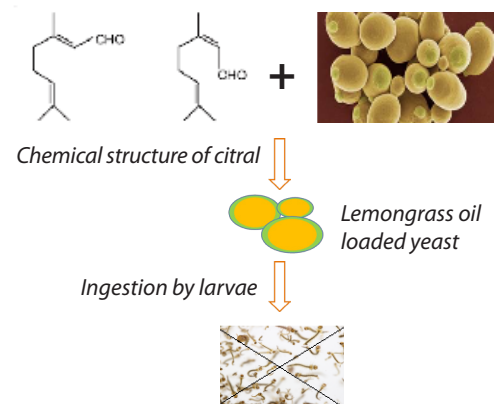
## Key Advantages

- Cheap and easy to synthesize
- Non-toxic to environment
- No GMOs involved
- Broad-spectrum of effects makes it difficult for the larvae to develop a resistance

## Contact

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