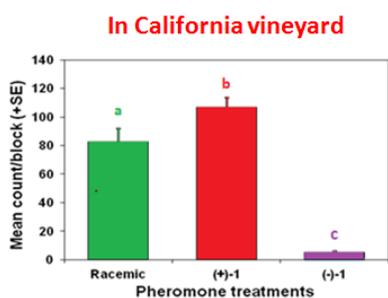


NCL Research Give Hope to End Mealybug Problems of the Crops

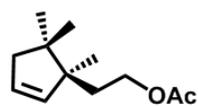
The longtailed mealybug is a small insect that feeds on agricultural crops and ornamental plants. They cause serious damage to the plant by feeding the plant sap, and by secreting a sticky liquid called honeydew on which fungi grows. Mealybugs also act as vectors for the transmission of plant pathogens.

Female mealybugs secrete volatile compounds called sex pheromones to attract the males. Pheromones synthesized in the laboratory can be kept in traps placed in fields to attract these mealybugs which can be killed later. Pheromones are highly sensitive and some of them have been commercialized for use in pest management. The sex pheromone of the longtailed mealybug was identified after collecting headspace odors produced by thousands of live unmated females over many weeks. The synthetic pheromone proved to be biologically active for several months under field conditions.

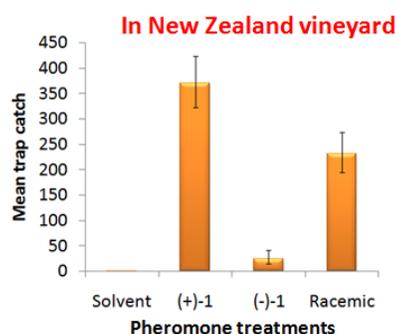
The pheromone has a monoterpene structure and can exist in two possible enantiomeric forms. Dr. Reddy from CSIR-National Chemical Laboratory in his group synthesized both the enantiomers of the longtailed mealybug pheromone. The biological activities of these enantiomers were tested in California fields. The results showed that one of the enantiomer, (S)-pheromone was attractive to male mealybugs and the other enantiomer was inactive. The same material was also tested in New Zealand vineyards and similar results were obtained. Having seen successful field trials in two geographically different locations, Dr. Reddy's group at NCL is currently working on scale-up by a new route, towards field trials. If the large field trials are successful, it is expected to result in commercialization of this technology in pest control. Currently, Dr. Reddy's group is also exploring the activity of the pheromone in Indian fields.



D.S. Reddy, WO/2014/115172
R. Ramesh *et al.* *J. Org. Chem.* 2013, 78, 6281



(S)-(+)- pheromone
Synthesized at NCL



R. Ramesh *et al.* *J. Org. Chem.* 2015, 80, 7785

References:

1. [Syntheses and Determination of Absolute Configurations and Biological Activities of the Enantiomers of the Longtailed Mealybug Pheromone, Remya Ramesh, Pandrangi Siva Swaroop, Rajesh G. Gonnade, Choppari Thirupathi, Rebecca A. Waterworth, Jocelyn G. Millar, and D. Srinivasa Reddy, *J. Org. Chem.* 2013, 78, 6281.](#)

2. [Enantiospecific Synthesis of Both Enantiomers of the LongtailedMealybug Pheromone and their Evaluation in a New Zealand Vineyard, Remya Ramesh, Vaughn Bell, Andrew MaltbyTwidle, Rajesh Gonnade, and D. Srinivasa Reddy, *J. Org. Chem.*, 2015, 80, 7785.](#)