

Project Profile

Title of the Project	:	Efficacy of secondary plant derivatives of <i>Aegle marmelos</i> on important insect pests of teak
Principle Investigator	:	Dr. S. Murugesan
Co Investigators	:	Dr. N. Senthilkumar
Duration of Project	:	3 years (2007-2011)
Objectives		
<ol style="list-style-type: none"> 1. Biopesticidal properties of <i>A. marmelos</i> extracts (fresh half fruit, pulp, and seeds) against target insects <i>Hyblaea puera</i> and <i>Spodoptera litura</i>. 2. Analyse the variation of secondary metabolites of fresh half fruit, pulp and seeds. 3. To study the comparative efficacy of the bioactive extracts of <i>Aegle marmelos</i> with <i>Achoras sapota</i>, traditional insecticides and neem derivatives. 4. Developing suitable formulations for application at nursery level. 		
Funding agency	:	ICFRE
Summary/Achievements	:	<p>Plants have always been an exemplary source of botanicals and many of the currently available products have been derived directly or indirectly from them. The ethnobotanical information reports about 800 plants that may possess insecticidal, antimicrobial and other biological properties. The present study has examined <i>Aegle marmelos</i> (Bael) tissues, chosen for their insect control uses, for insecticidal and insect antifeedant properties. One of the traditional medicinal plants having a rich historical legacy in Indian mythology happens to be <i>A. marmelos</i> due to alkaloid, marmeline, lignan-glucosides and anthraquinone in the bark, heartwood and unripe fruits. The test insects are defoliators, <i>Hyblaea puera</i> and <i>Spodoptera litura</i> causing several damage to seedlings and younger plantations of teak. Using innovative methods, as well as classical bioassays, the researchers have studied feeding deterrence, larval growth inhibition, antifeedancy and larval mortality. The results of the study of bioactives, as well as phytochemical studies are presented. Tissue especially <i>A. marmelos</i> seed oil has proven to be interesting source of bioactive compounds, there also exists a large scope for exploiting the species through the evaluation of the secondary metabolites for their biopesticidal properties. Bioassay confirmation of 10 groups of 13 individual compounds (identified from 3 tissues of <i>A. marmelos</i>), were tested on the target pests, <i>Hyblaea puera</i> and <i>S. litura</i> at different concentrations (250 to 1000 to 10,000 ppm) in the laboratory. Field level biopesticidal applications & experiments were carried out in State forest nurseries at Nilambur and Kulathupuzha, Kerala to confirm the bioactivity of the crude extracts, formulated extracts and individual compounds on teak defoliator in nursery. A range between 40 and 80 percent larval mortality was observed in the final applications of preformulated <i>Aegle</i> seed oil. No further insect attack (teak larvae & nematode) was observed after application of <i>aegle</i> extracts and also observed as a growth promoter. Based on the above mentioned findings eight suitable preformulations were processed/analysed by chromatography techniques and tested at different doses in comparison with neem formulation and synthetic pesticide. With the promising results obtained both in lab and field trials, a new product "Vilvekam- <i>Aegle marmelos</i> seed oil based biopesticide was developed and released as" in "Tree growers Mela 2011" on 24th & 25th February 2011 at Institute of Forest Genetics and Tree Breeding, Coimbatore.</p>