

## Project Profile

<b>Title:</b>	<b>Anti – insect secondary metabolites from fungal endophytes of selected tree species.</b>
<b>Principle Investigator:</b>	Dr.N.Senthilkumar
<b>Co Investigators:</b>	Dr.S.Murugesan Dr. V. Mohan
<b>Duration:</b>	3 years 2011-2014
<b>Objectives:</b>	<ol style="list-style-type: none"> <li>1. Isolation and taxonomic confirmation of endophytes.</li> <li>2. Characterization and structural elucidation of bioactive compounds from endophytes.</li> <li>3. Anti-insect pest assay of bioactive compounds.</li> </ol>
<b>Funding Agency:</b>	ICFRE
<b>Summary/Achievements</b>	<p>Attempt has been made to isolate and identify endophytic fungi of entomopathogenic significance from native tree species viz., <i>T. grandis</i>, <i>Ailanthus excelsa</i> and <i>Gmelina arborea</i> and also to screen their secondary metabolites of anti-insect properties to develop novel insecticides. A sum of 18 species of entophytic fungi belong to 13 genera and 58 strains were isolated from young and mature leaves of teak, <i>T grandis</i>; ailanthus, <i>A. excelsa</i> and Gmelina, <i>G. arborea</i>. The genera, <i>Fusarium</i> and <i>Aspergillus</i> are dominant among the 13 genera isolated. Among them <i>A. flavus</i>, <i>N. sphaerica</i>, <i>B. theobromae</i>, <i>Phomopsis</i> sp., and <i>Phoma</i> sp., were found to have entomopathogenic significance. Mass multiplication and characterization of extracts of these fungi were made using GC/MS/MS analysis and compounds namely, Dodecanoic acid (Lauric acid) (18.02%), Tricyclo(4,3,1,1,(3,8) undecane 1- bromo (Adamantine derivative) (9.56%) in <i>A. flavus</i> extract and Benzoic acid -2(methylthio methyl ester (25.04%), 2,5,cyclohexadiena-1,4-dione, 2-(1,1-dimethyl) (Duroquinone) (17.81%), 2-(2-cyanoethyl) 3-isopropyl 4 and 5-cyanoisoxazolidine (9.19%) in <i>N. Sphaerica</i> extracts recorded as major compounds which are not reported in endohytic fungal extracts earlier, might have shown promise to use as a source of insecticide. Naphthelene was found to have 43% and Tetrahydroxymyrcenol constited 35%. Compounds such as Cycloheptasiloxane tetramethyl, Cyclobutanecarboxylic acid were found to be reported first time from endophytic fungus <i>B. theobromae</i>. The extracts of these fungi were evaluated against teak and ailanthus defoliators viz., <i>H. purea</i>, <i>E. narcissus indica</i> and <i>A. fabriciella</i> found to have 65-89% mortality. Hence endophytic fungi of entomopathogenic significance viz., <i>A. flavus</i>, <i>N. sphaerica</i>, <i>B. theobromae</i>, <i>Phomopsis</i> sp., and <i>Phoma</i> sp., may be considered as potential biocontrol agents against early developmental stages of insect pests of forestry importance since their extracts contain compounds of various anti-insect properties. A product, microbial insecticide, <b><i>Entofight Nasa</i></b> has been developed and released.</p>