

## PROJECT PROFILE

- Title:** **Incorporating resistance in Eucalyptus to *Leptocybe invasa* Fisher & La Salle (Hymenoptera: Eulophidae) through expression of insect specific dsRNA**
- Principal Investigator:** Dr. Mathish Nambiar-Veetil, Sci- F
- Co Investigator:** Dr. John Prasanth Jacob, Scientist- F  
Dr. V. Sivakumar, Scientist- F  
Dr. Shanthi Arunachalam, Scientist- D
- Associates:** Dr. A. Balasubramanian, Research Officer-II  
Mr. Rathish Prabhakaran, SRF (13.09.2013 till 15.04.2015)  
Ms. Arunima C Rajan, JRF (01.08.2016 till 31.07.2017)  
Ms. Shamile Krishnaraj, JRF (10.08.2017 till 31.03.2018)
- Start and Completion dates:** 6 Years (2012- 2018)
- Objectives:**
1. To develop RNAi constructs for insect-specific genes involved in the growth and development of *L. invasa*.
  2. To evaluate the effect of *Eucalyptus*-expressed dsRNA cognate for the genes involved in growth and development of *L. invasa*.
- Funding Agency:** Indian Council of Forestry Research and Education (ICFRE)
- Total Budget :** Rs. 24.306 lakhs

### Summary

Last decade saw the emergence of *Leptocybe invasa* as the most serious pest of Eucalyptus. Introduction of parasitoids, replacement and avoidance of susceptible clonal selections resulted in control of this insect. The avoidance of planting susceptible clonal selection meant that several

high yielding clones became unfit for plantation or breeding programs. As the insect feeds within the gall tissues for 4 months of its life cycle, expressing dsRNA molecules cognate for insect genes in plant tissues could potentially incorporate tolerance to this pest in eucalyptus. In this direction, the key achievements include refinement of *Agrobacterium tumefaciens* mediated transformation, identification of a potential miRNA that regulates multiple gene targets in the insect *L. invasa* thereby identifying it as a potential target for control of *L. invasa*, devising an *in silico* strategy to identify sequences specific to *L. invasa*, development of a multigene targeting hairpin RNAi construct that was used for transformation of Eucalyptus. Seventy two putative transgenic Eucalyptus plantlets were generated under hygromycin selection. The leads of the project are being taken up in the All India Coordinated Research Project on Eucalyptus.