PROJECT PROFILE

Title of the Project	**:**	**Bioformulations of *Micromonospora* for bio control and biofertilization activity in *Casuarinas***
Principle Investigator	:	Dr. A. Karthikeyan
Co Investigators	:	Nil
Duration of Project (Start & End)	:	4 years April 2018 to March 2022
Objectives		1. Identification and standardization of bio formulations of efficient strains of Micromonospora with suitable carrier materials 2. Screening of *Micromonospora* strains against root pathogens of Casuarinas in nursery and field. 3. Assessment of Bio fertilization activity of *Micromonospora* in Casuarinas under nursery and field conditions
Funding agency	:	NFRP
Summary/Achievements	:	A rapid spread of wilt disease in Casuarina clones was reported by Casuarina growers from Tindivanam, Cuddalore and Villupuram regions of Tamilnadu. The disease showed the symptom of chlorotic and sudden wilt of foliage particularly in young Casuarinas clonal plantations. The disease was identified as bacterial wilt caused by *Ralstonia solanacearum* in this project. Earlier reports said that this disease is difficult to control as caused by this soil borne pathogen. Hence to control this disease an actinomycete *Micromonospora* which is reported as biocontrol agent was applied in nursery and field conditions against *R. solanacearum* and other soil pathogen in this project. *Micromonospora* is an actinomycetous bacteria and recognized as a source of secondary metabolites for controlling pathogens. The *Micromonospora* was isolated from the root nodules of *Casuarina equisetifolia* and cultured in ISP -2 medium. The isolated strain was identified as *M. maritima* by 16s rRNA sequence and maintained in the refrigerated condition for mass multiplication. Besides, the pathogenecity test of *R. solanacearum* in *C. equisetifolia* seedlings and antibiosis test with *M. maritima* were conducted at laboratory conditions. In the pathogenecity test the

		infected *C. equisertiolia* showed chlorotic and wilting of cladophylls due to application of *R. solanacearum.* The antibiosis test results suppression of *R. solanacearum* by *M. maritima*. Based on these findings the *M. maritama* broth was applied in the root zone of infected Casuarina clones @ 10ml/plant. After 30 days of application the infected clones developed new foliage and new sprouts. The entire infected plantation was recovered up to 95% and showed improvement of growth too. Similarly in the nursery and field trials *M. maritima* + *Frankia* not only improve the growth of *C. equisetifolia* and *C. junghuhniana* but also suppressed the inoculated pathogens of *Fusarium oxysporum*, *Trichosporium vesiculosum* and *R. solancearum*. It was deduced from this study that *Micromonospora* is an effective biocontrol agent for controlling the bacterial wilt disease in Casuarinas. Further it was proven in this project that combined actinomycetes (*Frankia* + *M.maritma*) will improve the plant growth and health.