

Project Profile

Title:	Biotransformation of some secondary metabolites by sporulate surface cultures of Frankia strains for nodulation capacity in <i>C. equisetifolia</i> and <i>C. junghuhniana</i>
Principle Investigator:	Dr.S.Murugesan
Co Investigators:	Dr. N. Senthilkumar Dr. A. Karthikeyan
Duration:	3 years 2010-2013
Objectives:	<ol style="list-style-type: none"> 1. Biotransformation of active constituents by sporulated surface cultures, submerged liquid cultures & with spore suspensions. 2. Analysis of the sample with chromatography methods. 3. Identified unique bioactive constituent to be tested for nodulation capacity in <i>C. equisetifolia</i> and <i>C. junghuhniana</i>
Funding Agency:	ICFRE
Summary/Achievements	<p>Lyophilized Frankia of 15, 25 and 30th day cultures were sequentially extracted with ethyl acetate and methanol/chloroform for lipid. The extracts of the lyophilized cultures were resolved in TLC using different solvents. The eluates were further fractionated in HPLC for mass spectral characterization in GC. The GC-MS-MS analysis and the spectral comparison revealed a total of 13, 23 and 14 components in 15, 25 & 30th day cultures respectively. Presence of some of the hopanoids and fatty acid derivatives and their variations were estimated in different day Frankia cultures. It was observed that some of them are very specific to nodulation/nitrogen fixation and to different day cultures. Better growth performance was observed at the mixtures of Frankia in combination with bioactive compounds inoculated to casuarina seedlings under nursery condition. Frankia with identified bioactive compounds were inoculated to casuarina seedlings under nursery condition and observations were made in terms of performance, nodulation and biomass. Casuarina seedlings inoculated with the identified bioactive compounds like catechin, epicatechin, phthalic acid and phenyl acetic acid under nursery condition after initial observations and revealed better performance, nodulation and biomass. The root nodules collected from 7 months old casuarina seedlings inoculated with bioactive biosignalling molecules were analysed for GC MS MS characterization. The chromatographic data was analysed and concluded the results for the identification of bioactive principles with biosignalling molecules for the enhancement of nodulation in casuarinas. Bioactive compounds of primary and secondary metabolites and enzymes responsible for elucidation of signaling molecules were identified. Effect of those molecules was assessed in terms of biomass on Casuarinas seedlings as well as nodulation activity.</p>