

STUDIES FOR THE IMPROVEMENT OF A CONSORTIUM WITH BIOSTIMULANT POTENTIAL IN EUCALYPTUS SEEDLINGS

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The forestry sector in Brazil has great economic and environmental importance. Despite the technological advances, the sector faces challenges in production, like in the growth and final use of seedlings, especially in plantation of *Eucalyptus*. To meet this challenge, we can use plant growth-promoting bacteria (PGPB). To this end, a bacterial consortium was developed for application in *Eucalyptus*, composed of 4 strains, of the genera *Paenibacillus*, *Paraburkholderia*, *Methylobacterium* and *Mesorhizobium*. The current work aims to optimize this consortium in order to increase its effectiveness and also understand the influence caused by the inoculation of the consortium in the endophytic microbiome of *Eucalyptus*. For this, experiments were carried out to i. evaluate the growth of strains in different culture medium ii. to evaluate the viability of the consortium over time, iii. to evaluate the best concentration of application of the consortium, iv. evaluate the effects of inoculation of each component isolation ally, v. evaluates the effects of the cooling of the intercropping before application, and vi. evaluate the performance of the intercropping against the alternative forms of application in the seedlings. In each experiment, the survival rate, height and biomass of the plants were used as performance parameters. The massive sequencing of the gene encoding the subunit 16S rRNA also was performed. The results indicated good growth performance in the TSB medium. The consortium viability was inconclusive, but showed little reduction in cell viability. There was variation in the response of the plants as a function of the inoculum concentration, with the concentration of 10^7 being the most promising. There were differences in development according to the inoculated strain. The refrigeration of the consortium did not influence the survival rate of the seedlings. The performance of the consortium was quite varied, at times presenting less than expected growth in relation to the control treatment. The inoculation format also did not seem to influence the parameters analyzed. The results obtained from the sequencing showed a strong tendency to reduce diversity, with changes in the bacterial community. The genus *Paraburkholderia* showed clear enrichment in the inoculated seedlings. The results generated in the current work can help in the improvement of future consortia composed of PGPB for the application in *Eucalyptus*.

Key-words: Planted Forests; *Eucalyptus*; Endophytic bacteria; Consortium; Biostimulant.

Development agency: Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPQ) and Fundação de Amparo à Pesquisa do Estado do Rio de Janeiro (FAPERJ).