

## **Diazotrophic endophytic bacteria associated to sugarcane genotypes with N fertilization**

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Sugarcane crop has a significant economic importance in Brazil and the state of São Paulo is the major producer. Despite of diazotrophic bacteria inoculation been an alternative to reduce N fertilization, there are few studies about this microorganism in sugarcane cultivated in São Paulo state. The aim of this study was to isolate, quantify and to do the phenotypic and genotypic characterization of diazotrophic endophytic bacteria associated to sugarcane. It was obtained 162 isolates from stem and root of four varieties of sugarcane (SP81-3250, RB5536, IAC5000 and SP80-3280), cultivated with and without N fertilization, in two places – Sales de Oliveira and Jaú, SP. The occurrence of diazotrophic bacteria was evaluated in three semi-specific growth media: JMV, JNFb and LGI-P. The amount of diazotrophic endophytic bacteria in roots and stems was not affected by nitrogen fertilization and sugarcane genotypes. However, the number of diazotrophic bacteria was higher in roots than in stems. The capacity to BNF was confirmed by the presence of *nifH* gene. Diazotrophic endophytic bacteria diversity was evaluated by 16S rRNA sequence analysis. The isolates were also tested for antifungal activity *in vitro* against the pathogens *Ceratocystis paradoxa* and *Bipolaris sacchari* and 38 isolates showed antagonistic activity. All isolates were tested for their ability to produce indoles in pure culture and 94 isolates showed positive response, which indicates the capacity to produce phytohormones. Twenty-one isolates showed both abilities that could be related to plant- growth promotion.

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