

**Title: GENETIC IDENTIFICATION OF AUTOCHTHONOUS RHIZOBIA FROM COAL MINING AREAS IN THE SOUTH OF SANTA CATARINA STATE, BRAZIL**

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**Abstract:**

The coal basin found in the state of Santa Catarina is the second most important coal resource in Brazil. In this region, coal mining activities have been performed in open pits, improperly developed, therefore, leading to soil degradation and water contamination. One low cost alternative for soil and landscape recovery lies on revegetation procedures using leguminous plants and nitrogen fixing rhizobia. Due mainly to low availability of nutrients in these areas, this group of bacteria are key in the revegetation cover in these places. Therefore, the aim of this study was to identify genetically autochthonous rhizobia of coal mining areas in the south of Santa Catarina, leading to subsequent approaches of inoculum production for revegetation programs in the coal mining impacted areas. The present work involved 16 bacterial isolates obtained from areas impacted by coal mining and deposited at the Soil Microbiology Laboratory of the Federal University of Santa Catarina. Soil samples were collected near the roots of three leguminous trees, acacia negra (*Acacia mearnsii* De Wild), maricá (*Mimosa bimucronata* (DC) Kuntze) and bracinga (*M. scabrella* Benth), and later authenticated for their nodulation capacity in feijão caupi (*Vigna unguiculata*). The molecular identification of the isolates was performed by sequencing the 16S rDNA gene via PCR using the primer pair PRBA63f and UN518r. Isolated bacteria were classified into the genera *Rhizobium* (68.75%), *Burkholderia* (18.75%) and *Gluconobacter* (12.5%). This is the first report on the nodulation of *Gluconobacter* sp. Further investigations related to the *nod* genes are necessary to confirm the nodulation ability of this isolate. The small size of the amplified fragments did not allow identification at species level and sequencing of larger fragments will be needed for more accurate taxonomic classification. The isolation and characterization steps are very important for the selection of autochthonous rhizobia to be used as growth promoters of legumes in reforestation programs in areas degraded by coal mining.

**Keywords:** Biological nitrogen fixation; recovering of degraded areas; 16S rDNA

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