

TITLE: CHARACTERIZATION OF NITROGEN FIXING BACTERIA ASSOCIATED WITH AQUATIC PLANT *TYPHA DOMINGENSIS*

AUTHORS: BRAMUSSE, L.B.; BARROSO, L.M.; INTORNE, A.C.

INSTITUTION: UNIVERSIDADE ESTADUAL DO NORTE FLUMINENSE DARCY RIBEIRO, CAMPOS DOS GOYTACAZES, RJ (AVENIDA ALBERTO LAMEGO 2000, PARQUE CALIFORNIA, PRÉDIO CBB, SALA 209 CEP: 28013-602 CAMPOS DOS GOYTACAZES, BRAZIL)

ABSTRACT: Nitrogen (N) is the main nutrient used by plant in its growth, being used in fundamental processes such as photosynthesis, cellular respiration, development and root activity. However, N stored in the atmosphere (N₂) can not be directly absorbed by plants. Only some species of bacteria can fix N₂, transforming it into nitrogenous compounds easily absorbed by other organisms. *Typha domingensis* is an aquatic plant found in eutrophic areas, which has been used for phytoremediation. The hypothesis of this work is that its association with beneficial microorganisms favors the absorption of nutrients, promoting plant growth and increasing the ability to remove contaminants from the environment. Thus, the objective of the present study was to characterize bacteria isolated from *T. domingensis* capable of fixing atmospheric nitrogen. We selected 13 bacteria previously identified and characterized as phosphate solubilizers and producers of indole compounds. Bacteria were cultured in liquid DYGS medium until they reached growth stage, washed in 0.85% NaCl and centrifuged for 3 min at 5000 rpm three times. Then, 20 µl of the culture was added into glass tubes containing 5 mL of the semi-solid culture media JMV, NFb and JNFb (without addition of N and containing pH indicator - 5% bromothymol blue) in glass tubes. The tubes were kept at 30 ° C for 7 days in an oven to observe the aerobic film formation and transferred to new tubes with the respective media three times, validating the results. The diazotrophic bacterium *Gluconacetobacter diazotrophicus* was used as positive control and *Escherichia coli* as negative control. Of the 13 bacteria tested, six were able to fix nitrogen. They are: *Raoultella ornithinolytica*, *Klebsiella variicola*, *Pseudomonas oleovarans*, *Pseudomonas putida*, *Pseudomonas fulva* and *Pseudomonas mendocina*. The JMV and JNFb media were more efficient compared to the NFb medium, since they allowed the identification of a larger amount of N₂ fixing bacteria. Nitrogen fixing bacteria are large because of the importance of N, especially with terrestrial plants due to their agricultural potential and economic. However, a smaller number of studies report this interaction in aquatic plants and in the present study it was possible to observe a high diversity of isolated species with potential to promote plant growth and improve *T. domingensis* performance in the bioremediation of contaminated areas.

KEYWORDS: Diazotrophic bacteria, Plant growth promotion, Nutrient absorption

DEVELOPMENT AGENCY: CNPq, FAPERJ, UENF