

Title: BIOPROSPECTING OF PLANT GROWTH PROMOTING BACTERIA IN OATS.

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Abstract:

The culture of oats, *Avena sativa* (white oat) and *A. strigosa* (black oat), has been widely used as an alternative to cultivation of pasture during the cold seasons in south of Brazil. The forage supply during this period is insufficient to meet the demand of forages for animals, both in qualitative and quantitative terms. Plant Growth Promoting Bacteria (PGPB) can produce plant-growth substances, suppression of deleterious organisms, promotion of the availability and uptake of mineral nutrients and act as nitrogen fixing bacteria, however this benefits may differ markedly according to growing conditions. Eleven PGPB were isolated from *Malus sp.* where showed ability to fix nitrogen and used here in testing with *A. sativa* and *A. strigosa*. The experiment was conducted in a completely randomized block design, with six replicates per treatment for each bacterial isolate (containing two doses, 0 and 75 mg of Ammonium Nitrate applied 10 mL weekly) and control treatments: with different doses of N (0, 75, 150, 200 and 400 mg of Ammonium Nitrate applied 10 mL weekly). Sarruge solution (Sarruge JR, 1975) was added, 40 mL, twice a week in all treatments. Comparing the differences between doses of N applied, all the variables (Shoot Length, Shoot Fresh Weight (SFW), Shoot Dry Weight, Root Volume, Root Length (RL), Fresh Root Weight, Root Dry Weight and Leaf Nitrogen) presented better results at 75 mg of N, except for RL. In the treatment without N added, white oat presented higher results for all variables. For black oat, the treatment with 75 mg of N, had significantly better results for SFW, while the other variables there was no significant difference. The variable RL had lower results in 75 mg of N comparing to the treatment without N, possibly due to the long time of the experiment and the pot volume which didn't allow the full root development, with significantly higher values for black oats in the treatment without N, and no statistical difference for white oat. This difference is, probably, due to seeds size, where white oat having more nutritional reserves in the seeds, comparing to black oat. In addition, no significant difference was observed for bacterial treatments. How the PGPB were originally isolates from a different host, they are, probably, host specific.

Keywords: nitrogen fixing bacteria, *Avena sativa*, *A. strigosa*

Agency of Foment: CNPq