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A reclamation strategy to stabilize degraded riverbanks: prospective benefits of using plant growth-stimulating bacteria associated with the riparian plant *Salvia procurrens*

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INTRODUCTION & AIM

The riparian plant *Salvia procurrens* Benth (commonly named blue creeper) is a native species from South America that is commonly used to remediate degraded lands, and, in particular, to stabilize riverbanks due to its environmental adaptation.

This study proposes co-inoculating this plant species with two plant growth-promoting microorganisms, *Azospirillum brasilense* SP7 and *Bacillus subtilis* subsp. *spizizenii*, to enhance restoration effects on riversides.

METHODS

Single-node blue creeper cuttings were placed in forestry plug trays to produce rooting using sand as a substrate. After 20 days, the plants were transplanted into 3L pots and inoculated with the bacterial mixture, applying 5 mL of inoculum at the base of each plant's stem.

In the bioinoculant, the number of *B. subtilis* spores was quantified, reaching 1.6×10^5 CFU mL^{-1}.

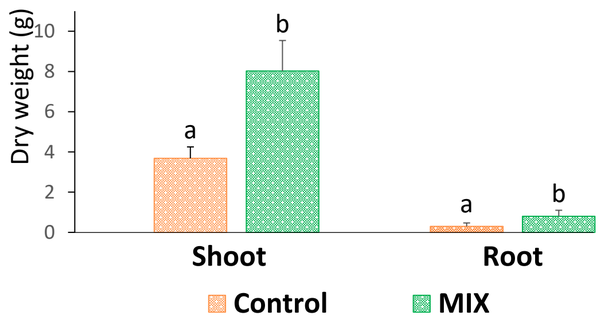
After six months, the plants were harvest and the following parameters were evaluated: plant height, root length, number of leaves and nodes, shoot and root biomass, and above- and belowground heavy metal concentrations.

RESULTS & DISCUSSION

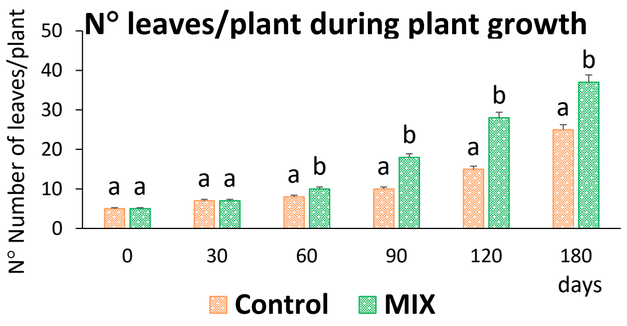
Bacterial compatibility

The bacterium did not interfere with each other's growth.

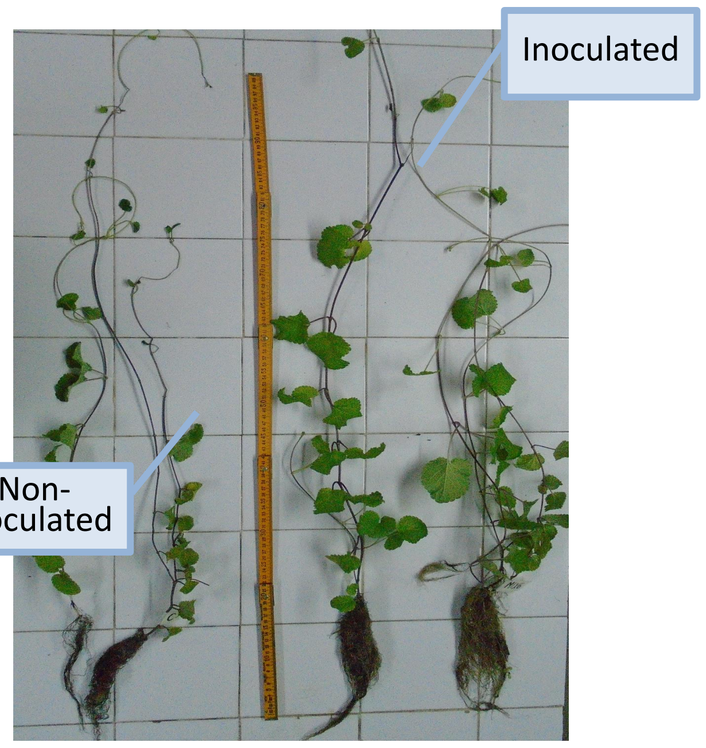
Shoot and root biomass



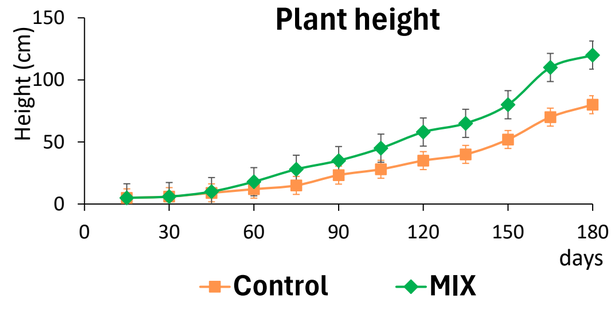
N° leaves/plant during plant growth



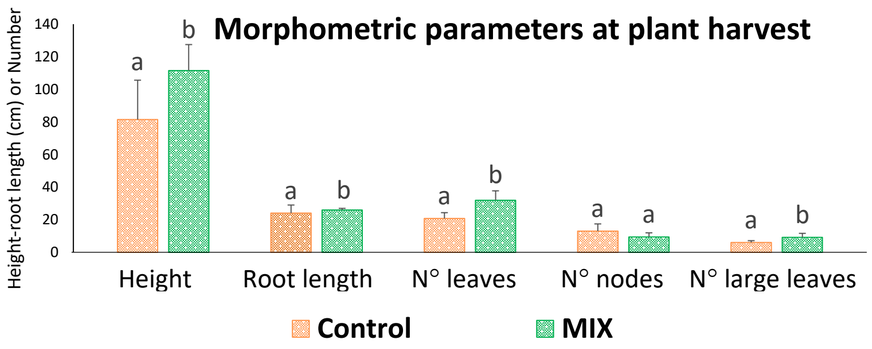
Bacterial co- inoculation had positive effects on *Salvia procurrens*



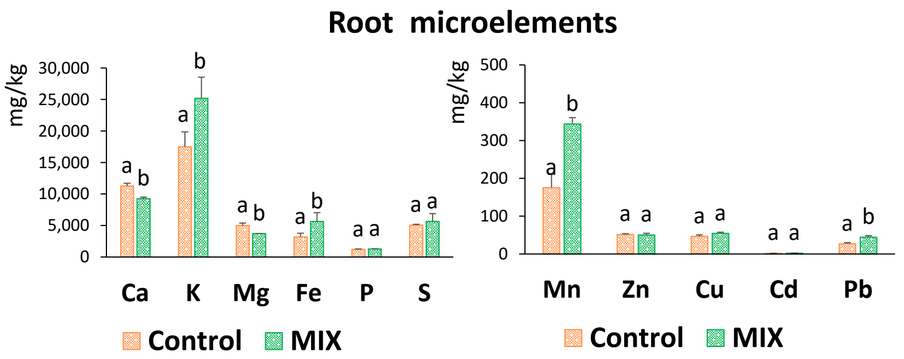
Plant height



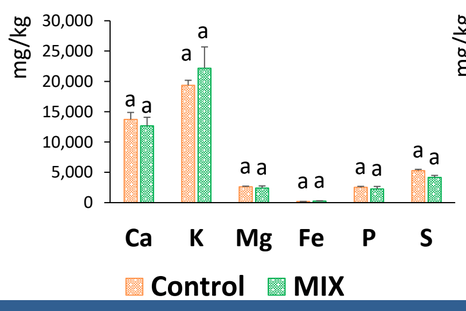
Morphometric parameters at plant harvest

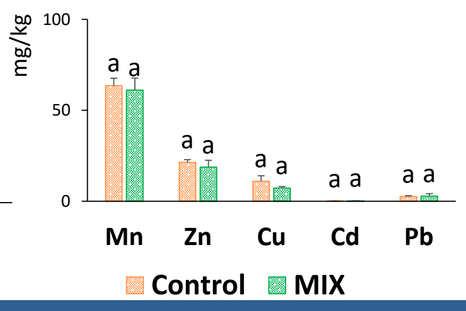


Root microelements



Shoot microelements





CONCLUSIONS

.- *Bacillus subtilis* subp. *spizizenii* and *Azospirillum brasilense* were able to grow together without interfering with each other.

.- Co-inoculation had a beneficial effect on the growth of *Salvia procurrens*.

.- The roots of the inoculated plants showed higher contents of the potentially toxic metals Fe, Cu, Mn, Cd, and Pb than those of the control plant.

For these reasons, the use of *Salvia procurrens* inoculated with the bacterial mixture presented in this study would be useful for revegetation in riparian areas.

FUTURE WORK / REFERENCES

Testing the field use of co-inoculated Salvia procurrens for revegetation of riparian areas