MICRO BIOTEC 17

CONGRESS OF **MICROBIOLOGY** AND **BIOTECHNOLOGY** 2017

7th - 9th DECEMBER 2017
PORTO, PORTUGAL

CONFERENCE PROGRAMME

SPM
Sociedade Portuguesa de Microbiologia

spbt
sociedade portuguesa de biotecnologia

CATÓLICA
ESCOLA SUPERIOR DE BIOTECNOLOGIA
PORTO

www.esb.ucp.pt

P-095 - ENDOPHYTIC BACTERIA FROM AROMATIC PLANTS AND THEIR POTENTIAL FOR BIOINOCULATION ON GREEN ROOFS VEGETATION

Cristina M. Monteiro[1]; Sofia I. A. Pereira[1]; Alberto L. Vega[1]; Paula M. L. Castro[1]

1 - CBQF - Escola Superior de Biotecnologia - Universidade Católica Portuguesa

Background

Green roofs are a type of multilayer construction that uses vegetation on top of buildings. In the last decade, their use has become more frequent due to the environmental advantages they offer in impervious urban areas, regarding stormwater retention, removal of atmospheric pollutants, attenuation of the urban heat island effect, among others. Selection of vegetation able to growth on the harsh environment of a rooftop is of major importance for the successful establishment of a green roof. The use of plant growth promoting bacteria (PGPB) on green roofs is a sustainable alternative to aid plant establishment and growth.

Method

Endophytic bacteria were isolated from *Lavandula dentata* L. plants collected at random from "Cantinho das Aromáticas". These isolates were characterized for their *in vitro* growth promoting traits. Two green roofs pilot systems were further established, comprising inoculation with a selected mixture of four isolated endophytic bacteria. Four different aromatic plant species (*Santolina chamaecyparissus*, *Santolina Lemon Queen*, *Armeria maritima*, *Festuca glauca*) and a succulent species (*Sempervivum tectorum*) were used for experiments. Plant development is being followed.

Results & Conclusions

A total of 56 culturable endophytic bacteria were isolated from the plant tissues of *L. dentata* plants corresponding to 38 different bacterial strains. All endophytic strains exhibit growth promoting traits and 21% were found to produce more than 40 mg/L of IAA. The strains *Pseudomonas graminis* (LR 1-9), *P. congelans* (LS 2-1) and *Bacillus aryabhattai* (LS 1-2) were amongst those that exhibited higher IAA levels and were selected for inoculation. *Paenibacillus kribbensis* (LR 2-11) was selected due to its antifungal activity. The vegetation used presented in general successful establishment and growth. The potential of bacterial endophytes as bioinoculants in green roofs vegetation is under analysis.

References & Acknowledgments

Pereira, S.I.A., Monteiro, C., Vega, A.L., Castro, P.M.L. (2016) Endophytic culturable bacteria colonizing Lavandula dentata L. plants: Isolation, characterization and evaluation of their plant growth-promoting activities. Ecological Engineering 87, pp 91–97.

Cristina M. Monteiro (SFRH/BPD/80885/2011) thank the grant from Fundação para a Ciência e Tecnologia (FCT, Portugal) and Fundo Social Europeu through the program POPH – QREN. S.I.A. Pereira received an individual research contract within the project "Biological tools for adding and defending value in key agro-food chains (bio – n2 – value)", nº NORTE-01-0145-FEDER-000030, funded by FEDER, under Programa Operacional Regional do Norte - Norte2020. This work was supported by National Funds from FCT-Fundação para a Ciência e Tecnologia through project UID/Multi/50016/2013. Authors thanks to SIRO and LANDLAB for the materials supplied.

Keywords: green roofs, aromatic plants, endophytic bacteria, plant growth promoting bacteria