GROWTH PROMOTION IN MICROPROPAGATED BANANA BY RHIZOBACTERIA

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INTRODUCTION

Economic importance of Banana

» Brazil - 6.7 million tons
» Social importance - small growers

Vegetative Propagation

» Corms
INTRODUCTION

In vitro Propagation

- Shoot tip culture

ABSENCE OF BENEFICIAL MICRORGANISMS
OBJECTIVES

Select rhizobacteria strains able to promote growth of micropropagated banana plantlets.
MATERIAL AND METHODS

Isolation of banana rhizobacteria

SOIL SAMPLE
10 g

SHAKING / 30 min
0.85% NaCl
(90 mL)

1 mL

1 mL

1 mL

1 mL

100 μL

100 μL

100 μL

100 μL

Nutrient Agar (NA)

24 - 48 h
28 °C
MATERIAL AND METHODS

Rhizobacteria Preservation in glycerol

NBY Media + Glycerol 15% (Schaad 1998)

Shaking

24 h

-80°C

(ROMEIRO, 2001)
MATERIAL AND METHODS

Indole Acetic Acid synthesis (IAA)

RHIZOBACTERIA → L-tryptophan (1,021 g L⁻¹); → 28 °C 24 h → Nitrocellulose Membrane → Salkowski Solution
MATERIAL AND METHODS

Phosphatase synthesis

NA Media
CaHPO₄

28 °C
24 - 48 h
Siderophore synthesis

RHIZOBACTERIUM

TS MEDIA 1/10 (soy trypticasein)

28 °C
24 h

CENTRIFUGATION
12,000 g / 10 min

1 mL supernatant

Chrome Azurol
1 mL

Positive
Negative
MATERIAL AND METHODS

Growth promotion assay

50 mL
Bacterial suspension
$10^9$ ufc mL$^{-1}$
(5 min)

Rooting Media
30 Dias

60 Days

Control
GR = 300

ASSESSMENT *

* Plant height
  Shoot dry weight
  Root dry weight

CRD, 6 rep
MATERIALS AND METHODS
RESULTS

Total rhizobacteria - 302

» 164 Prata Anã
» 138 Prata Comum

Strain combinations

1- A035 + A137 + A024;
2- A130 + A140 + A137;
3- A155 + A036 + A158;
4- A158 + A024 + C170;
5- A130 + A024 + C233;
6- CONTROL (untreated explants).

◆ IAA
◆ Phosphatase
◆ Siderophore
**RESULTS**

Mutual antibiosis assay

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* Columns: inhibitors; lines: inhibited
RESULTS

Growth promotion of banana plantlets by rhizobacteria

Growth Rate

* A130 + A140 + A137
RESULTS
CONCLUSIONS

» *In vitro* assays were appropriate for selecting banana growth-promoting rhizobacteria;

» Rhizobacteria could be included in production process of *in vitro* propagated banana;

» Studies aiming different concentrations of bacteria and synthetic growth regulators should be conducted.
THANK YOU !!!

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