INTRODUCTION

Plant microbiome plays an essential role in the functioning of plants, especially rhizobiome are mainly influencing plant growth by direct and indirect mechanisms. *Pseudomonas* are common plant microbiome and provide effective protection against phytopathogens, highly influence the soil and plant health.

**Finger millet**
- It is one of the most nutritious millet and staple food in different states of India and Africa.
- It contains the highest amount of calcium, potassium, methionine and tryptophan; low glycemic index.

**Pyricularia grisea**
- Blast infection (*Pyricularia grisea*) is a major threat to millet productivity and results in economic loss to farmers.
- It infects all growth stages and aerial parts of the plant, causing 40 to 75% of yield loss.

**A novel* Pseudomonas* sp. MSSRFD41 with plant growth promoting prospects for sustainable agriculture**

Jegan Sekar and Prabavathy V.R

Microbiology Lab, M.S. Swaminathan Research Foundation
III Cross Road, Taramani Institutional Area, Taramani, Chennai-600 113, India.
E-mail ID – jeganmicro1@gmail.com; prabavathyvr@mssrf.res.in

**Pseudomonas sp. MSSRFD41**
- MSSRFD41 was isolated from finger millet rhizosphere soil samples. 16S rRNA gene sequence shows maximum 98.77% similarity and forms monophyletic clade with closely related species.
- It produces 2,4-DAPG, HCN, ARLs, IAA, solubilises phosphate and tolerates 1 M NaCl.
- Exhibits promising biocontrol activity against several fungal and bacterial phytopathogens.
- RFLP analysis of ph1D gene displayed unique patterns (G) with *HaeIII* and *TaqI* enzymes, which are polymorphic than earlier reported genotypes A-F.

**Effect of MSSRFD41 on the hyphal growth of *P. grisea***

- MSSRFD41 shows significantly inhibits hyphal growth of *P. grisea*.
- It reduces the hyphal growth by 90% compared to control.

**Viability of liquid formulated MSSRFD41 at different temperature and days**

- MSSRFD41 is a novel *Pseudomonas* sp. and a novel *ph1D* genotype (G), producing 40 µg/ml of DAPG.
- Liquid formulated product of MSSRFD41 with PVP/PEG/Glycerol shows an average shelf life of 7 log CFU ml-1 at 8 °C up to 150 days. SEM analysis shows MSSRFD41 damaged the hyphae of *P. grisea*.
- MSSRFD41 treated plots significantly reduces number of leaf lesions (10.69) and increases 1000 grain weight average of 3.23 (±0.12) g than other treatments. Field trial proves that isolate MSSRFD41 significantly controls blast disease incidence, increases seed weight, enhances shoot and root length.
- In combination with mycorrhiza, MSSRFD41 showed enhanced plant growth and yield in finger millet.
- Technology transfer and low cost production of MSSRFD41 through women self help groups.
- MSSRFD41 is a potential source for sustainable agriculture and improving rural livelihoods.

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