

Growth and yield attributes of Black pepper var Panniyur -1 as influenced by bacterial and fungal endophytes



TEENU PAUL & K.N. ANITH

Department of Agricultural Microbiology, Kerala Agricultural University (KAU)
College of Agriculture, Vellayani, Trivandrum 695522, Kerala, India
Email: teenupaul13@gmail.com Phone no: 9337216528



Introduction

Black pepper is one of the earliest spices known and is a native to the Malabar Coast of India. Major portion in the Indian spice scenario is contributed by black pepper. It is the “King” among spices. The beneficial effects of endophytes on plant includes disease resistance, nitrogen fixation, solubilization of immobilized phosphorus, nutrient cycling, stress tolerance and production of plant hormones, siderophores and volatile organic compounds.

Objective

To test the compatibility of fungal and bacterial endophytes and to access their effects on growth promotion on bush pepper

Materials and Methods

Experimental site-College of agriculture, Vellayani

Design- CRD

Treatments- 6

Replication- 3

Variety- Panniyur 1

T₁: *Piriformospora indica*

T₂: *Bacillus velezensis* PCSE 10

T₃: *Rhizobium radiobacter* PCRE 10

T₄: Control

T₅: Combination of *P. indica* and *B. velezensis* PCSE 10

T₆: Combination of *P. indica* and *R. radiobacter* PCRE10

A sharp slanting cut was made at the basal portion stem cutting and dipped in bacterial cell suspension for 20 minutes with intermittent shaking in the case of treatments involving endophytic bacteria. Fungal inoculum mixed on sterile vermiculite(1% w/v) was applied in the planting holes. Same treatments were given during transplanting to earthen pots(Anith *et al.*, 2018)

Results and Discussion

A significantly increasing trend was observed in number of leaves per plant and leaf area per plant on the plants treated with treated with combined application of *P. indica* and *Rhizobium radiobacter* PCRE 10.

Observation on number of spikes harvested was taken eight months after transplanting. The highest value was recorded in the treatment with combination of *P. indica* and *R. radiobacter* PCRE 10.

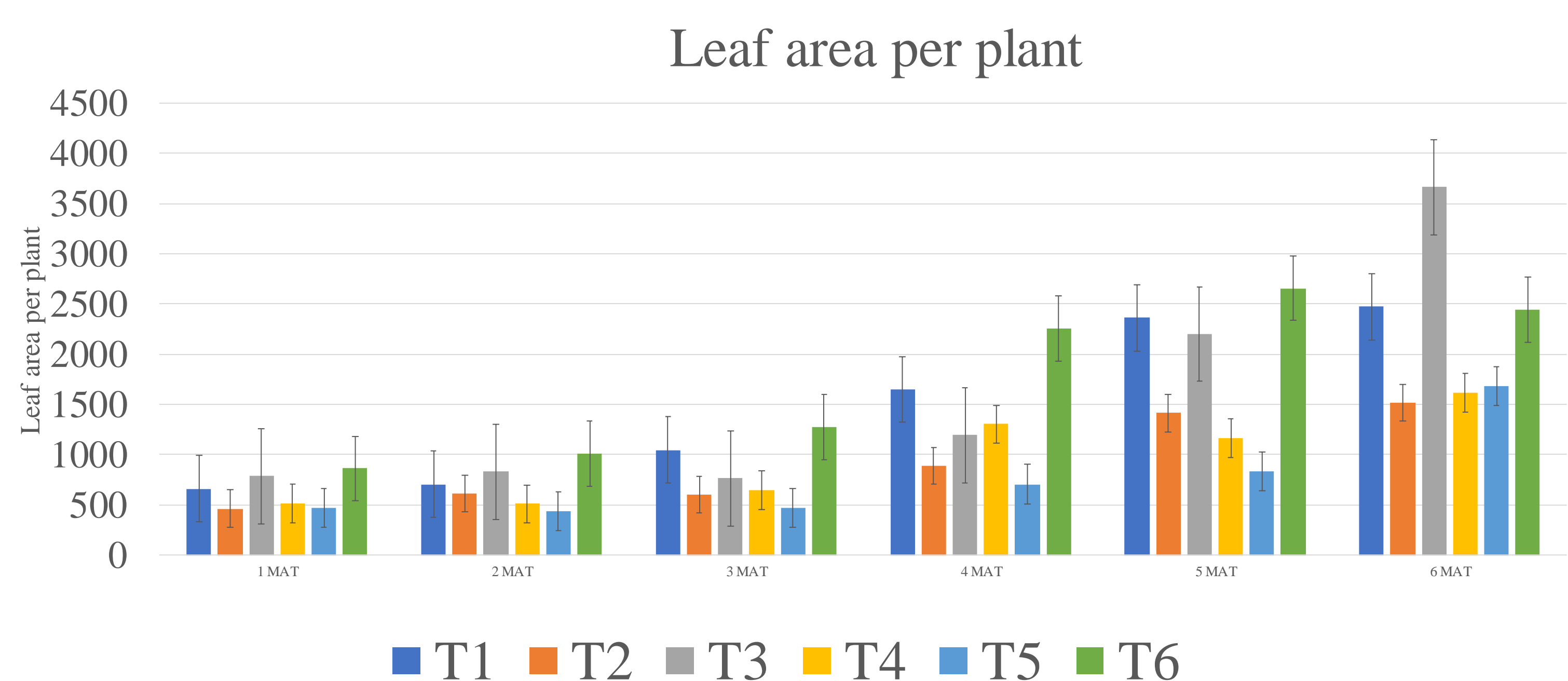
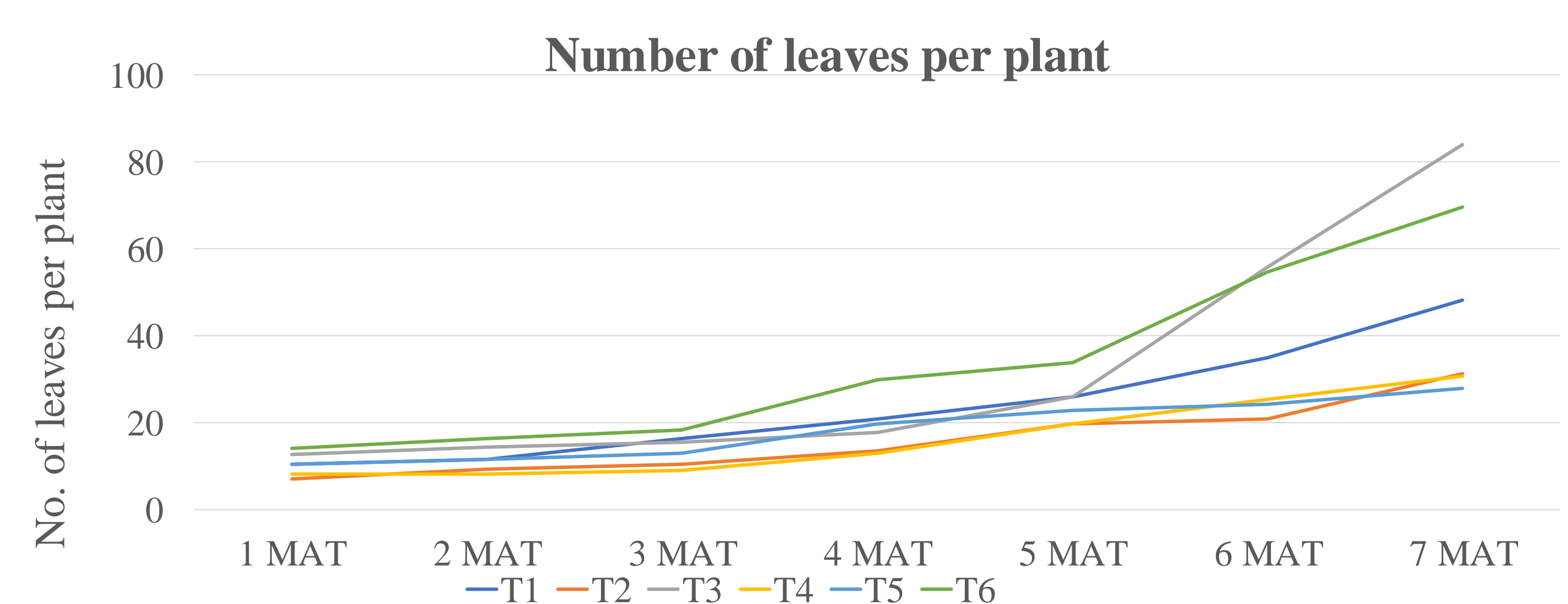
Mean spike length of harvested berries showed there was significant difference observed among the treatments

Table 1; Effect of endophytes on number of spikes per plant

Treatments	Number of spikes per plant
T1	5.33±0.66
T2	3.33±1.15
T3	5.00±0.66
T4	2.00±0.66
T5	4.66±1.20
T6	6.00±0.66
SEm (±)	1.81
CD (0.05)	NS

Table 2; Effect endophytes on mean spike length

Treatments	Mean spike length (cm)
T1	11.38 ± 0.66 ^a
T2	12.26 ± 0.43 ^a
T3	12.02 ± 0.81 ^a
T4	6.65 ± 0.27 ^c
T5	10.89 ± 1.15 ^{ab}
T6	8.44 ± 0.61 ^{bc}
SEm (±)	0.72
CD (0.05)	2.58



Conclusion

Bio inoculation with a combination of the endophytic fungus *Piriformospora indica* and the endophytic bacterial strains have beneficial effect on growth of bush pepper.

References

Anith, K.N., Aswini, S., Varkey, S., Radhakrishnan, N.V., and Nair, D.S. 2018. Root colonization by the endophytic fungus *Piriformospora indica* improves growth, yield and piperine content in black pepper (*Piper nigrum* L.). *Biocatalysis Agric. Biotechnol.* 14: 215-220.