

Studies on effect of *Trigonella* root extract as kitchen waste on *Rhizobium* Colonies of *Cajanus cajan*



Agriculture

KEYWORDS : *Trigonella* roots, *Rhizobium*, Biofertilizer.

Aparna Gade Patkar-Varde College Goregaon –W, Mumbai 400062
Sachin S. Bhagat Patkar-Varde College Goregaon –W, Mumbai 400062
Anil Bhalerao Patkar-Varde College Goregaon –W, Mumbai 400062

ABSTRACT

Trigonella is a common leafy vegetable in kitchen. *Trigonella* roost always considered as a kitchen waste but it is good organic bio fertilizer. It contain large amount of *Rhizobium* in root nodules. In present investigation the efforts have been made to study the effect of these *Trigonella* roots as kitchen waste on the colonies of *Rhizobium* in *Cajanus cajan*. The highest no of *Rhizobium* colonies were found in 100% concentration of *Trigonella* root extract. These results will boost the utilization of *Trigonella* roots as a good biofertilizers.

Introduction

Trigonella foenum – graceum is rich in root nodules containing *Rhizobium* bacteria, (Brockwell, 1971 and Felix D. Dakora-February, 2012). *Trigonella* plant having symbiotic relationship with *Rhizobium* fixes the atmospheric nitrogen which helps the plant growth (Aarons SR, Graham PH 1991and Beck et.al.1983).. It has been observed that the deficiency of nitrogen results in stunted growth, low chlorophyll content and protein content (Aulakh et. al. 1984 and Brawand and Hossner, 1976). It is also noted that the *Trigonella* root extract was found effective to increase the amount of proteins, chlorophyll and various morphological characters

(Gade et.al.,2013)

Rhizobium is gram negative, aerobic, rod shaped bacterium.It is nif gene contains a refractive granule (Masterson RV,1982 and (W M Barbour, J N Mathis,1985). It is a soil bacterium present in large number in rhizosphere of legume plants.*Rhizobium* is in symbiotic relationship with root nodules (Wei GH et.al. 2003).. Different species of *Rhizobium* can fix 50-200 kg nitrogen/ha/year in leguminous crops. Therefore they have been recommended as nitrogen biofertilizers in agriculture (Merrick and Edwards 9519). Most of the Indian soils are deficient in nitrogen. The deficiency of nitrogen there is less absorption of macro & micro nutrients from the soil (Ali Ghorbanpour, Yaqvob Mami, Oct, 2011 and Fox, R.H., Kern, 1986).The bacteria helps in nitrogen fixation & growth (Glover, 2003 and Baljinder et. al. 2008). In the present study the effect of different concentrations of *Trigonella* root exact on the roots of *Cajanus cajan* were observed.

MATERIALS AND METHODS

Roots of *Trigonella* collected from kitchen waste and used for further study. The extract of roots prepared by taking 200gms of roots crush in 100ml of water and make final volume 200ml. The different concentrations of *Trigonella* extract like 25%, 50%, 75% and 100% were prepared. The extract of different concentrations was mixed with black soil and then seeds of *Cajanus cajan* were grown in it. After 30 days roots of these plants collect and by using different chemicals the internal *Rhizobium* colonies were observed. The method of isolation of VAM fungi was used and *Rhizobium* colonies was observed.

RESULTS AND CONCLUSION

From the forgoing work considerable results were obtained.

Rhizobium Colonies of *Cajanus cajan*.

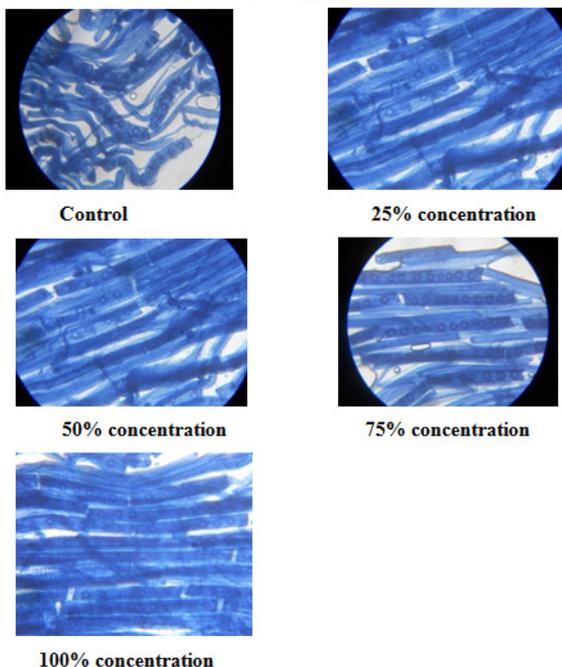
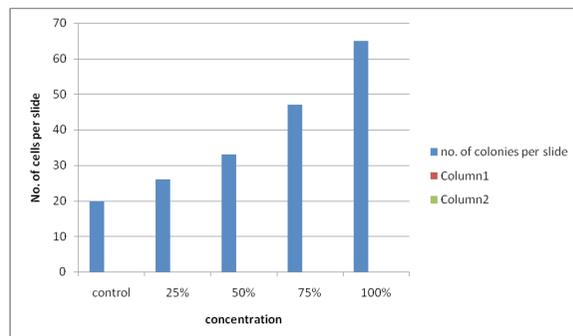


Table : 1 Rhizobium Colonies observed in treated *Cajanus cajan* roots

| Concentration | Control | 25% | 50% | 75% | 100% |
|---------------------------|---------|-----|-----|-----|------|
| No. of colonies per slide | 20 | 26 | 33 | 47 | 65 |



The isolation of *Rhizobium* is done by BaoLing H. Et.al. (2007). Felix D. Dakora- February, 2012. Characterisation of *Rhizobium*

done by Lijisha kamal, sunita kumari, December 2011.

The extract of *Trigonella* roots used in this work. The plants of *Cajanus cajan* grown in

black soil with different concentrations of root extract for 30 days period. Then no. of *Rhizobium* colonies of *Cajanus cajan* roots were observed by giving an appropriate treatment under

microscope and characteristic results were shown table 1. In 100% concentration of *Trigonella* root extract highest number of *Rhizobium* colonies was recorded. *Rhizobium* is a nitrogen fixing bacteria hence this study will help to boost the utilization of *Trigonella* roots as a good biofertilizers (G.S. Nagananda, et. al. 2010 and Mengel, et. al. 1982).

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