

The Evaluation of Nodulation Capacity of Some Location Specific *Rhizobia* on Soybean from Maharashtra, India.

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Rhizobia's role in N₂ fixation is unchallenged but the genetic diversity of this organism based on geographical locations can have influence on nodulation capacity of a species. In the present work certain location specific strains of *Rhizobia* were used to find out their effect on nodulation in Soybean which is recently being introduced in Marathwada region of Maharashtra State. The strain SR₅ was from Chudawa, district Parbhani seen to be promising.

Key words : Location specific *Rhizobia*, Marathwada, Nodulation performance on Soybean.

The *Rhizobia* plays a great role in nature as they are greatest N₂ fixers, particularly in leguminous plants and legumes are the predominant source of supplying protein to the population of developing countries like India. (Patil *et. al.*, 2002; Randhawa, 2003).

Rhizobia as like other bacteria is having a tendency to develop mutations which may be useful or harmful from the symbiotic point of association. However, the genetic biodiversity of *Rhizobia* varies from location to location. Selection of efficient strains to Nodulate and provide adequate N₂ supply to the plant is the basic criteria for total yielding capacity of N₂ fixing species. In the present work an attempt has been made to correlate the N₂ fixing capacity of some location specific *Rhizobia* from Maharashtra State by

considering the nodulation criteria, as Soybean is now being propagated in Maharashtra State on large scale.

MATERIAL AND METHODS

The root nodules were collected in kharif season from various locations in 2000 – 2002 from three districts of Marathwada i.e. Nanded, Hingoli and Parbhani. They are given different names as per Table 1.

The nodules having pink colour were chosen for further study. The bacteria were isolated from these selected nodules as per routine methods. The bacterial colonies appeared after 5 – 6 days on YEMA. The isolates were used for further studies.

To find out the most effective strains from different isolates a pot culture experiment was conducted using a soybean cultivar PK-472. The evaluation was made in terms of number of nodulations per plant.

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The number of nodules were counted after 40 days of sowing the results are presented in Fig. 1.

Table 1. Location wise isolates of *Rhizobium* obtained from Soybean

| S. No. | Isolate No. | Location | Revenue Dist. |
|--------|------------------|-----------|---------------|
| 1 | SR | Degaon | Nanded |
| 2 | SR ₂ | Dhamdhari | Nanded |
| 3 | SR ₃ | Daur | Nanded |
| 4 | SR ₄ | Kharbi | Nanded |
| 5 | SR ₅ | Chudawa | Parbhani |
| 6. | SR ₆ | Wanegaon | Nanded |
| 7. | SR ₇ | Hingoli | Hingoli |
| 8. | SR ₈ | Chitgiri | Nanded |
| 9. | SR ₉ | Gour | Parbhani |
| 10. | SR ₁₀ | Limbgaon | Nanded |

RESULTS AND DISCUSSION

The results clearly indicate that strain SR₅ produces highest number of nodules in Soybean variety PK-472. This strain was obtained from Chudawa village Dist. Parbhani, compared to uninoculated in nodulation plant increase is highly significant.

Competition for nodulation of legumes is usually measured by comparing the ability of an introduced *Rhizobium* strain to form nodules on chosen plant. This implies that the competition is limited to even external conditions of the host as well to the growing season of the crop along with genetic variability of *Rhizobia*.

The strain SR₅ collected and isolated from Chudawa (Dist. Parbhani) from Soybean plant has shown excellent performance for all parameters. It has increased the average nodule formation from 4.64 – 11.50 nearly three time over the control. Similar studies have been conducted by Streeter (1980). They have used the similar parameters to assess the yield of Soybean by introduce strains of *Rhizobia*.

Besides this the biodiversity in the species of *Rhizobia* is vast and the genetic

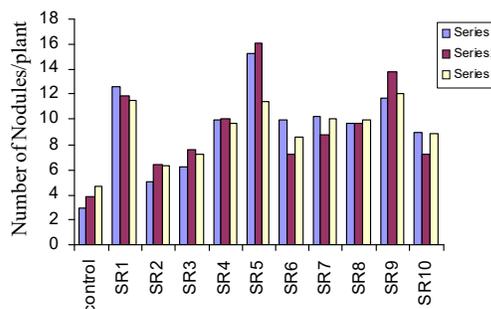


Fig. 1. Effect of isolates of *Rhizobium* on number of nodules per plant of soybean

variability differs from place to place and there exists a more diversifying mutation rate in bacteria than the other organisms. Darmola *et. al.*, (1994) reported that highest N₂ fixation by inoculation of the *Bradyrhizobium japonicum* strains in to soil. Patil *et. al.*, (2002) emphasized that bio-fertilizers have a key role in the productivity of Soybean. Randhawa *et. al.*, (2003) have recently summarized the advances in *Rhizobium* legume as Soybean is now recently introduced in the Marathwada region of Maharashtra State, the attention on location specific *Rhizobia* is needs a deeper attention.

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