

RESEARCH NOTES

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Saprophytic Competence of Inoculated Strain of Groundnut *Rhizobium*

Several workers have stressed the use of efficient strains of rhizobia for fuller exploitation of the legumerhizobia symbiosis (Kandasamy and Prasad, 1971; Gasser *et al.*, 1972). Often the successful establishment of the inoculant rhizobia in soil is mitigated by the native rhizobia. Patil (1974 a and b) stated that the majority of rhizobial inoculant strains have failed as they did not possess the desired competitive ability to survive and spread in the presence of more aggressive naturally occurring strains of native rhizobia which are already well adapted to the given ecological situation. In the present study a penicillin resistant (1000 ppm) strain (Rh VI-Pr) of an efficient rhizobial isolate (Rh VI) of groundnut was used to study the competitive ability of the inoculated rhizobia for nodulation in the presence of native rhizobia. TMV. 2. groundnut variety was used in this study. Well powdered and sterilized lignite was used as carrier for *Rhizobium* inoculation (Kandasamy and Prasad, 1971).

Pot culture and field experiments were carried out. In field experiment, the plots were laid out in randomized block design with a plot size of 3m x 3m. Three replications were maintained for each treatment. Seeds inoculated with RhVI and RhVI-Pr cultures were sown separately. Seeds without *Rhizobium* treatment were sown in control plots.

At the end of the 50th day ten plants were removed at random from each treatment and the nodule number and total nitrogen content were recorded in both pot culture and field experiments. Differentiation of nodules due to RhVI-Pr strain from nodules due to native rhizobia was done by the following method: all the nodules from a single plant were removed and surface sterilized. Each nodule was crushed aseptically, and placed over congo-red agar medium (Allen, 1953) containing 1000 ppm concentration of penicillin in petri dishes, incubated for six days at room temperature and the number of nodules yielding penicillin resistant colonies counted.

The results on the competitive efficiency of inoculated rhizobia in the presence of native rhizobia to nodulate and to fix atmospheric nitrogen in groundnut are presented in Table 1. The nodule number and total nitrogen content were higher in plants raised with the seeds inoculated with Rh VI strain of groundnut *Rhizobium*, both in pot culture and field experiments as compared to the uninoculated controls. The saprophytic competence of this efficient *Rhizobium* strain in the presence of indigenous rhizobial strains was tested employing its penicillin resistant isolate (Rh VI - Pr) as a marker. Nodulation due to inoculated penicillin resistant strain was found to be 42.4 percent and 40.4 percent of the

total number of nodules, in pot culture and field experiments respectively. These results clearly indicated that the indigenous rhizobial strains occupied most of the nodules than the inoculated strain. Similar results were reported by Iswaran and Sen (1975). Ramani and Prasad (1976) have reported a wide variation in the efficiency of native rhizobia of groundnut in seven different soils studied. Therefore isolation of efficient rhizobial strains coupled with high saprophytic competence will be of immense value for the success of legume inoculation programmes.

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Competitive efficiency of inoculated and native rhizobia

Treatments	Total nitrogen content g/100 g	Nodules/Plant*		Nodules due to Penicillin resistant strain	
		Pink	White	Total	% of the total number of nodules
<i>Pot culture</i>					
Uninoculated control	3.80	10	12	—	—
Rh VI	5.03	20	19	—	—
Rh VI-Pr	4.63	16	17	14	42.4
<i>Field Experiment</i>					
Uninoculated control	5.61	15	18	—	—
Rh VI	6.70	24	26	—	—
Rh VI-Pr	5.92	22	25	19	40.4

*Mean of 10 Plants