

SELECTION OF RHIZOBIAL STRAINS FOR  
COWPEA (Vigna unguiculata (L.) Walp)  
AND MUNGBEAN (Vigna radiata (L.) Wilczek)

By

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## ABSTRACT

Rhizobial strains were collected from nodules of cowpea and mungbean from various regions of Sri-lanka. These strains were purified and authenticated using siratro seedlings and preserved. Purity of the isolates of rhizobia together with two NifTAL strains were ensured by several tests. The growth characteristics of the isolates were also studied.

The authenticated isolates of rhizobia were evaluated for nitrogen fixation efficiency by pot experiments conducted in the greenhouse on both cowpea cv. MI 35 and mungbean cv. MI 5. The parameters observed in these experiments were nodulation, shoot and root dry weight, total nitrogen content and nitrogenase activity of nodules. The strains TAL 209, CP 30 and YC6 R2-1 (YC 6) were the most effective strains for cowpea and for mungbean TAL 209, CP 30 and MC6 R2-2 (MC 6) were the best strains.

These strains were further evaluated under field conditions for their effectivity of nitrogen fixation on both crops at three levels of phosphorus fertilizer. The treatments used were inoculations with TAL 209, CP 30 and YC 6 at 0, 60 and 180 kg/ha levels of phosphorus. Rhizobial inoculant MC 6 was used instead of YC 6 for mungbean. Data were collected at 20, 40 and 60 days after seeding of the crops and plant parameters measured were nodulation, shoot and root dry weight, total nitrogen content, nitrogenase activity of nodules and grain yield.

Incorporation of higher levels of phosphorus than the current recommended dosage (60 kg/ha) combined with inoculations of MC 6 gave

higher grain yields in mungbean (1639 kg/ha). In cowpea, TAL 209 was the best N fixer under lower levels of phosphorus including the recommended dosage and it fix maximum amount of nitrogen between 104 and 116 kg/ha of phosphorus.

The competitiveness with native rhizobia for nodulation and the survival ability of the inoculated rhizobia in the soil during the period where there is no host crop in the field were tested by soil core experiments. The competitive ability of all inoculated strains were satisfactory. The survival ability of TAL 209 was poor. The best survivor was YC 6. The strains CP 30 and MC 6 had lower survival ability compared to YC 6.