A FIELD ORIENTATED LABORATORY EVALUATION OF RHIZOPHERE NITROGEN FIXATION ASSOCIATED WITH WETLAND RICE AT DIFFERENT GROWTH STAGES

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The rhizophere of rice is known to have nitrogen fixing activity (Yoshida & Ancajas, 1973) although it is quantitatively less pronounced than the activity attributed to Cyanobacteria (Watanabe et. al., 1978). It is known that the nitrogen fixing activity associated with the rhizophere of wetland rice differs at the stage of heading and ripening (Watanabe et. al., 1979). However, the pattern of such a variation throughout the different growth stages of a rice plant has not been recorded. This paper deals with the measurement of rhizosphere nitrogen fixing activity at selected stages of a short age variety of rice, Bg 450, grown in the same locality with similar agronomic practices. The cut-plant soil technique (Barraquito et. al., 1986) was used for the estimation of rhizosphere nitrogenase activity. The samples were incubated for 6hr and the acetylene reduction activity (ARA) was measured by gas chromatography. The highest ARA was obtained at the nursery stage. There was a decline in activity at the stage of maximum tillering and an increase at the stage of maturity.

The high activity at the nursery stage is an interesting result which has not been reported earlier. This may be due to factors other than soil nitrogen depletion, such as high root biomass per unit area, root secretions favourable for nitrogen fixing bacteria etc. but we do not have any experimental evidence at present to specify these factors. High activity at maturity is most likely to be due to soil nitrogen depletion, in addition to root secretions.

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