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Impact of different Fertilizers on Diazotrophic Community of Wheat Rhizosphere in The Semi-Arid Region, Jaipur, India

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Abstract: In terrestrial ecosystem, the nitrogen requirement is fulfilled by biological nitrogen fixation. The fixation of nitrogen on earth is done by diazotrophs. Agriculture practices like application of fertilizers influence the population of microbes in plant rhizosphere and in turn has impact on soil fertility. It is crucial to understand the effects of different fertilizers on diazotrophic diversity of the rhizosphere. Denaturing gradient gel electrophoresis (DGGE) was carried out to understand the bacterial community structure and real-time PCR was performed for *nif*H expression. Manure increased diazotrophic diversity and *nif*H expression in wheat rhizosphere, while urea fertilizer treatment decreased diazotrophic diversity and *nif*H expression. Compost manure in the rhizosphere could increase the availability of soil nutrients and might have positive impacts on soil fertility and crop productivity. The diversity of the *nif*H gene represents to be a suitable marker for predicting the capability of diazotrophs to fulfill the nitrogen demand of the ecosystem.

Keywords**:** Biological nitrogen fixation, Nitrogen-fixing bacteria, Rhizosphere, DGGE, *nif*H, Real-time PCR