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Glomus fasciculatum fungi as a bio-converter and bio-activator of inorganic and organic P in dual symbiosis

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This article describes mechanism of Phosphorus supply from the soil into plants under VAM fungal inoculation. It was already established that VAM fungi symbiosis helps in uptake of nutrients especially P which is not easily accessible under ordinary condition of soil. For this investigation, *Conocarpus erectus L* species and *Glomus fasciculatum* was identified and selected in four experimental set up including i) control (E_1), ii) VAM inoculated (E_2), iii) VAM and excess of CO_2 (E_3) and iv) VAM and drought (E_4). All Plants except E_3 were cultivated under natural condition and watered alternative day whereas E_4 was watered after regular interval of 4 days. Analysis of soil and plant's P were carried out after 12 months. Phosphorus in plants were analysed in roots, stem, and leaves separately and correlated with soil remaining phosphorus. Results showed that soil P was less in four experimental set up when compared with P of standard soil. It was found that P accumulation in plants was varied in all four experimental conditions based on VAM symbiosis. It was found that the roots of E_2 and E_3 plants showed highest P accumulation as compared to E_1 and E_4 which were linked with absence of VAM and drought conditions. P translocation into E_4 plants showed that movement of P based on availability of water condition due to which it was less in leaves too over E_1 , E_2 and E_3 plants. Experimental facts and nonstop growth of plants recommended that VAM fungi act as a bio-converter and bio-activator of soil nutrients especially of Phosphorus, and their hypal interaction absorb soil nutrients and convert inorganic P to organic one for plant development. Continuous growth of one year old *conocarpus* plant support the proposed idea that phosphorus cycle exists during VAM inoculations which strengthen the plant and activate photobiological activity that helps in increasing photosynthetic rate and stimulate all biological processes of plant including H^+ co-transporter couple with inorganic phosphorus and its ultimate supply to plants.

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