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SOME MORPHOLOGICAL AND PHYSIOLOGICAL ADJUSTMENTS IN THE ROOT SYSTEM OF *AEGOPODIUM PODOGRARIA* (UMBELLIFERAE) IN RESPONSE TO SPATIAL PATCHINESS OF NUTRIENTS

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In nature, nutrient patchiness in the soil is an important factor in determining the ecological distribution of plants and may broaden a species ecological range. In the recent past much attention has been given to understand how plants adjust morphologically and physiologically to compensate natural soil heterogeneity. This study examined how *A. podograria* responded to spatial nutrient patchiness by adjusting its physiology and morphology in the root system.

A split-root experiment was carried out with *A. podograria*, a comparatively fast-growing and a clonal perennial plant. Plants were exposed to a heterogeneous supply of nutrients (which was created within the same pot) and investigated its ability to adjust morphologically and physiologically and also whether these plastic responses could compensate the restricted supply of nutrients to the root system. A comparison was made with the controls where plants were exposed to a uniform supply of nutrients. During the experiment plants were harvested at 75 days after planting (dap) and at 165 dap. To achieve these objectives, the P uptake rates were measured using freshly harvested roots (following the ^{32}P Isotopic Method) taken from nutrient-rich 'soil' half and the nutrient-poor 'sandy' half of the pot. The allocation of biomass into shoot, root and the rhizome parts of the plant was also assessed by taking their dry weight measurements separately.

No significant difference was found in the mean total dry mass among treatments at the first harvest (75 days after planting), indicating that the growth of the plants was not limited by nutrients at least up to 75 days. However, in both harvests (75 and 165 dap.) *A. podograria* showed root proliferation into nutrient-rich half of the pots, indicating a positive response to higher nutrients. Results also showed that the P uptake rates are significantly higher (63% higher) in roots from the nutrient-poor 'sandy' half than in the nutrient-rich 'soil' half only when nutrients were spatially heterogeneous. These results suggest that plants have the ability to adjust their physiology only when the nutrient supply was localized but not when the supply of nutrients was uniform.