



Abstract

Phenotypic Characterization of Lentil Genotypes for P Uptake and Utilization Efficiency at Seedling Stage [†]

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Abstract: Phosphorus (P) is an essential, non-renewable nutrient for crop productivity worldwide. P is immobilized in the soil, which limits its uptake and utilization by the plants. Breeding for P uptake and utilization efficiency is the most sustainable strategy to employ available resources in the best possible way. The present study was carried out to identify P uptake and utilization efficient lines under low P condition at seedling stage in lentil. A set of diverse lentil genotypes (85) belonging to six different *Lens* species was screened under normal and low P condition in hydroponics under controlled environment. Significant reduction in root dry weight (RDW), shoot dry weight (SDW) and total dry weight (TDW) was evident under low P condition. TDW, SDW and RDW were significantly correlated to P uptake efficiency (PupE) and P utilization efficiency (PutiE) in lentil. PupE ranged from 19.50 to 266.49 mg plant⁻¹ under low P and PutiE ranged from 30.53% to 97.50%. Based on TDW under low P, EC718309, EC718348, and EC718332 were found promising for PupE while PL06 and EC718332 exhibited better PutiE. EC718332 was observed as efficient and responsive genotype for both P uptake and utilization. These identified genotypes can be used as trait donor for breeding lentil varieties for low P environment.

Keywords: *Lens* species; total dry weight; P uptake efficiency; P utilization efficiency