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عنوان البحث باللغة الإنجليزية

Investigating the phenotypic plasticity of the invasive weed Trianthema portulacastrum L.

Abstract

Phenotypic plasticity is frequently highlighted as a key factor in plant invasiveness, as it enables invasive species to adapt to diverse, complicated habitats. *Trianthema portulacastrum* is one of the most common aggressive species that threaten different crops around the world. Phenotypic plasticity in *T. portulacastrum* was investigated by comparing variation in germination, vegetative macromorphology, photosynthetic pigments, stomatal complexes, and seed micromorphological traits of 35 samples collected from 35 different localities. One-way cluster analysis and principal component analysis (PCA) were used to classify samples into homogeneous groups based on the measured traits. Pairwise statistical comparisons were conducted between the three resulting groups. The phenotypic plasticity index (PI) was calculated and compared among different groups of characters. Results showed that photosynthetic pigments and macromorphological characteristics had the highest PI, followed by seed micromorphology, and then stomatal complex traits, while germination parameters showed the lowest PI. We propose that soil moisture, salinity, and temperature are the most determinative and explanative variables of the variation between the three classified groups. We strongly believe that the phenotypic plasticity of *T. portulacastrum* will support species abundance and spread even under expected changes in climatic conditions, in contrast to the vulnerable traditional crops.