



Article

Salt and Water Stress Tolerance in *Ipomoea purpurea* and *Ipomoea tricolor*, Two Ornamentals with Invasive Potential

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Abstract: Invasive plants pose a significant threat to biodiversity, especially under the current unstable climatic conditions. This study aimed to test the salt and drought tolerance of two ornamental species of the genus *Ipomoea* during germination and vegetative growth. Germination tests were performed in the presence of increasing NaCl concentrations or iso-osmotic PEG concentrations—to mimic the osmotic stress caused by drought. Both species showed great invasive potential because of their high seed germination percentages and rapid germination under control (distilled water) and salt stress conditions, up to 200 mM NaCl. Germination and early seedling development were more affected in the presence of PEG. Subsequently, water stress (complete withholding of irrigation) and salt stress (watering with 100 mM and 200 mM NaCl) treatments were applied to young plants for three weeks, when all plants were harvested, to determine several morphological and biochemical parameters. Both species were sensitive to water deficit but relatively resistant to salt stress. Their salt stress responses were similar, based mainly on the inhibition of Ca^{2+} and the activation of K^{+} transport from roots to leaves and the uptake and accumulation of Ca^{2+} ; however, *I. tricolor* showed a slightly higher tolerance to salt stress than *I. purpurea*. Although *I. tricolor* has only been locally reported as invasive and is generally considered a “low-risk” species, our results indicate that it may have an invasive potential even higher than *I. purpurea*, a recognised invasive weed, spread into areas with moderate salinity, affecting agricultural land or natural habitats of ecological interest.

Keywords: ornamental plants; invasive potential; seed germination; vegetative growth; photosynthetic pigments; compatible solutes; ion concentrations



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1. Introduction

One of the most significant risks for biodiversity on a global scale is represented by the spread of invasive species, which is exacerbated by globalisation and climate change. They are often the result of intentional or accidental introductions of alien species into new territories, followed by their naturalisation and spread, which provokes a detriment to native species and ecosystems. Invasive species have been recognised for several decades as one of the main threats to endangered plants, exceeded only by habitat loss [1]. At the beginning of this century, 57% of threatened species were reported to be negatively affected by non-native competitors [2]. Invasive alien species compete with native species, alter food webs, nitrogen [3] and hydrological [4] cycles, and thus, disrupt the functioning

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