



Article

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

Diana-Maria Mircea <sup>1,2</sup>, Riwen Li <sup>1</sup>, Lorena Blasco Giménez <sup>1</sup>, Oscar Vicente <sup>3</sup>, Adriana E. Sestras <sup>2</sup>, Radu E. Sestras <sup>4</sup>, Mónica Boscalu <sup>1,\*</sup> and Ricardo Mir <sup>2</sup>

- <sup>1</sup> Mediterranean Agroforestry Institute (IAM), Universitat Politècnica de València, Camino de Vera s/n, 46102 Valencia, Spain; dmircea@doctor.upv.es (D.-M.M.); rli7@posgrado.upv.es (R.L.); lb44ag@etsiamn.upv.es (L.B.G.)
- <sup>2</sup> Department of Forestry, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăștur Street, 400572 Cluj-Napoca, Romania; adriana.sestras@usamvcluj.ro
- <sup>3</sup> Institute for the Conservation and Improvement of Valencian Agrobiodiversity (COIMAN), Universitat Politècnica de València, Camino de Vera s/n, 46102 Valencia, Spain; ovicente@upvnet.upv.es (O.V.); rimiro@upvnet.upv.es (R.M.)
- <sup>4</sup> Department of Horticulture and Landscape, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3-5 Mănăștur Street, 400572 Cluj-Napoca, Romania; rsestras@usamvcluj.ro
- \* Correspondence: mboscalu@usamvcluj.ro

**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  $\text{Ca}^{2+}$  and the activation of  $\text{K}^{+}$  transport from roots to leaves and the uptake and accumulation of  $\text{Ca}^{2+}$ ; 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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## **Table of Contents Read Trmc R3 02198**

1. Understanding the eBook Read Trmc R3 02198
  - The Rise of Digital Reading Read Trmc R3 02198
  - Advantages of eBooks Over Traditional Books
2. Identifying Read Trmc R3 02198
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Read Trmc R3 02198
  - User-Friendly Interface
4. Exploring eBook Recommendations from Read Trmc R3 02198
  - Personalized Recommendations
  - Read Trmc R3 02198 User Reviews and Ratings
  - Read Trmc R3 02198 and Bestseller Lists
5. Accessing Read Trmc R3 02198 Free and Paid eBooks
  - Read Trmc R3 02198 Public Domain eBooks

- Read Trmc R3 02198 eBook Subscription Services
- Read Trmc R3 02198 Budget-Friendly Options
- 6. Navigating Read Trmc R3 02198 eBook Formats
  - ePub, PDF, MOBI, and More
  - Read Trmc R3 02198 Compatibility with Devices
  - Read Trmc R3 02198 Enhanced eBook Features
- 7. Enhancing Your Reading Experience
  - Adjustable Fonts and Text Sizes of Read Trmc R3 02198
  - Highlighting and Note-Taking Read Trmc R3 02198
  - Interactive Elements Read Trmc R3 02198
- 8. Staying Engaged with Read Trmc R3 02198
  - Joining Online Reading Communities
  - Participating in Virtual Book Clubs
  - Following Authors and Publishers Read Trmc R3 02198
- 9. Balancing eBooks and Physical Books Read Trmc R3 02198
  - Benefits of a Digital Library
  - Creating a Diverse Reading Collection Read Trmc R3 02198
- 10. Overcoming Reading Challenges
  - Dealing with Digital Eye Strain
  - Minimizing Distractions
  - Managing Screen Time
- 11. Cultivating a Reading Routine Read Trmc R3 02198
  - Setting Reading Goals Read Trmc R3 02198
  - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Read Trmc R3 02198
  - Fact-Checking eBook Content of Read Trmc R3 02198
  - Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
  - Utilizing eBooks for Skill Development
  - Exploring Educational eBooks

## 14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

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