Title: *Cakile maritima:* A Halophyte Model to Study Salt Tolerance Mechanisms and Potential Useful Crop for Sustainable Saline Agriculture in the Context of Climate Change

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Abstract. One of the most devastating effects of climate change on crop yields, together with drought, is due to the increasing salt accumulation in soils. Most plant species and all major crops can only tolerate low or, at best, moderate soil salinities. However, a small (<1%) proportion of angiosperm wild species – the halophytes – can survive and complete their life cycle in natural habitats with salinities equivalent to 200 mM NaCl or more. *Cakile maritima* is a glabrous, succulent annual halophyte belonging to the *Brassicaceae* family that naturally grows on East Asian, North African, and European foreshores; it is considered an invasive species in the East and West North American coasts. *Cakile maritima* slightly reduces its germination potential and root length and increases its biomass and seed production under relatively low (i.e., 100 mM) NaCl concentrations. Higher salt concentrations, up to 500 mM NaCl, significantly impact its growth but do not compromise its survival. Salt resistance mechanisms of *C. maritima* are mainly based on the increase of its succulence and its capability to limit oxidative damage by several biochemical mechanisms. This species is potentially useful as a "minor" cash crop for the so-called saline agriculture due to its production of secondary metabolites with medical and nutritional interest and the high oil accumulation in its seeds. Moreover, its small diploid genome and fast life cycle make this species a suitable model for genetic research. This will facilitate the design and implementation of breeding programmes to develop new genetic variants with better agronomical performance. In this communication, we will highlight the relevance of this species as a model for studying basic mechanisms of salt tolerance and for sustainable saline agriculture in the context of soil salination and climate change.

Keywords: climate change; soil salinisation; salt stress; salt tolerance; saline agriculture