Evaluation of salinity tolerance of different clover species at germination and seedling stages

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Abstract

In order to study the effects of salinity stress on growth indices of three clover species including, *Trifolium resupinatum*, *T. alexandrinum*, and *T. incarnatum*, an experiment was conducted as factorial based on a completely randomized design arrangement with three replications. Factors included seven levels of salinity stress (0, 41, 82, 123, 164, 205, and 246 mM) and three clover species. Different performance was observed for germination and seedling parameters among the species. In addition, results indicated significant differences among the treatments in all traits and showed that the effects of salinity on all traits were the same at low-stress levels (0 and 41 mM), but differed at higher stress levels. The experimental results revealed that with an increase in salinity level, the greater reduction was observed in vigor index, seedling length, and root and shoot fresh and dry weight while MGT and GU increased. The highest levels of vigor index and root and shoot fresh and dry weight was related to *T. resupinatum* and *T. incarnatum*, respectively, while MGT and GU in *T. resupinatum* were higher than those of the other two species. In addition, *T. resupinatum* seedling length was higher than the other two species.

Keywords: clover; salinity; germination; seedling parameters


Introduction

The genus *Trifolium* contains about 300 species of plants in the leguminous family. Clover or trefoil is one of the most important forage crops in agriculture that grow in varied environments throughout the world, which differ markedly in their stature, perennially, architecture and pigmentation (Abberton and Marshall, 2005; Price et al., 1987).

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Agriculture has been influenced by different abiotic stresses such as temperature, drought, and salinity which reduce roughly half the yield of crops. Water stress that is caused by salinity and drought is a problem in agriculture in the world. Salinity is one of the most important environmental stress that influences nearly half of the irrigated lands and 20% of the worlds cultivated lands (Fallahi et al., 2013; Khayatnezhad et al., 2010). Salinity is also one of the most important factors in crop yield reduction in the