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## Different priming treatments to influence the germination of *Atriplex L.*

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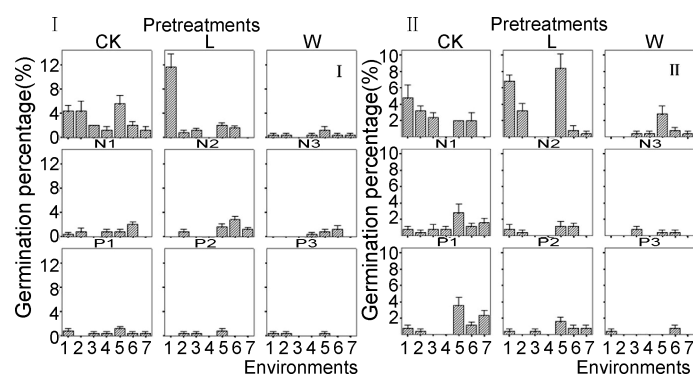
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**Key words:** *Atriplex L.*, seed priming, germination, pretreatment, stress

**Introduction** Seed priming can increase the germination rate, seedling emergence and enhance tolerance to drought and stress. *Atriplex L.* plants are common in arid and semi-arid regions of the world and are proved to have high level of salt-tolerance. However, many *Atriplex* species are difficult to germinate. For a wide use of *Atriplex* in degraded regions, especially in degraded grassland and desert, it is necessary to improve the germination of *Atriplex*.

**Materials and methods** Two *Atriplex* species were used, i.e. *Atriplex canescens* ssp. *Aptera* and *Atriplex canescens* (Pursh) Nutt. Some seeds of each plant were subjected to a cold treatment at 5°C for 5 days. The effects of NaCl solutions at 0%, 0.4%, 0.8% and 1.2%, as well as PEG solutions at 10%, 15% and 20% were also evaluated. At priming stage, seeds were placed in different beakers containing different concentrations of NaCl or PEG in an incubator at 25°C without light for 48h, then places the seeds in a blowing box at 25°C for 48h. After that, places primed seeds in NaCl solutions at 0%, 0.4%, 0.8% and 1.2% as well as PEG solutions at 10%, 15% and 20% to germination test. There were 5 reiterations for each treatment and each reiteration contains 50 seeds.

**Results** Compared with the original seed, seeds pretreated by low-temperature had higher germination rate in distilled water environment (Figure 1-I). However, under the stress of either NaCl or PEG, the priming seeds of *A. canescens* ssp. *Aptera* had a lower germination rate than the original seeds. The seeds of *A. canescens* (Pursh) Nutt basically share the same trend with *A. canescens* ssp. *Aptera*, and for each pretreatment, it had a higher germination rate under PEG stress than under NaCl stress (Figure 1-II).



**Figure 1** The influence of different pretreatments on germination percentage of two *Atriplex L.* plants.

In Figure 1, environment 1-7 means germinating beakers with at 0%, 0.4%, 0.8% and 1.2% NaCl solution and 10%, 15% and 20% PEG solution; pretreatments L means cold treatment, W, N1, N2, N3, P1, P2, P3 means priming solutions is 0%, 0.4%, 0.8% and 1.2% NaCl solution and 10%, 15% and 20% PEG solution.

**Conclusions** Priming treatments almost restrained germination of two *Atriplex* plants. Positive effects of priming have been reported on the germination of *Lactuca sativa L.* (Hu and Tylkowska 2005). However, priming can also inhibit seed germination (Subedi and Ma., 2005). Therefore, the priming concentration and priming times need a further research.

### Reference

Hu J and Tylkowska K (2005). Effects of priming in combination with fungicides on germination and infestation of lettuce (*Lactuca sativa L.*). *Agricultural Sciences in China*, 4: 449-454.