The genetic characteristic of salt tolerance at the stage of seed germination in lucerne

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Keywords: Lucerne, genetic characteristic, Superweak luminescence, Salt resistance,

Introduction Superweak luminescence exists in all animal and plants; it shows important genetic information. We report the relationship between superweak luminescence and genetic characteristics to salt resistant in lucerne (*Medicago sativa*). The method can quickly and exactly evaluate the salt-resistance of plants.

Materials and methods Superweak luminescence of germinating lucerne seed was measured in distilled water and in NaCl using BACKMAN-5801 in constant temperature, avoiding light.

Results The physiological action of the salt-stressed germinating lucerne seeds was restricted to some extent. The luminescence value of lucerne seed in NaCl solution was lower than that in distilled water. Its luminescence characteristic peak value appeared 24h later than it did in the others treatments. There was a concordant luminescence tendency but large differences in luminescence intensity among the different cultivars of lucerne. The tolerant cultivar Duoye had a little change both in germinating metabolism and growth rate under the salt stress. The luminescence value of germinating seed in0.5%and 1% NaCl solution was similar to that in distilled water. But for a sensitive cultivar such as Yongji, 0.5%and 1% NaCl solution had serious effects. The peak value at 96h had respectively decreased 26% for 0.5% NaCl solution and 65% for 1% NaCl solution. Thus, there was a significant difference between two cultivars Yongji and Duoye.

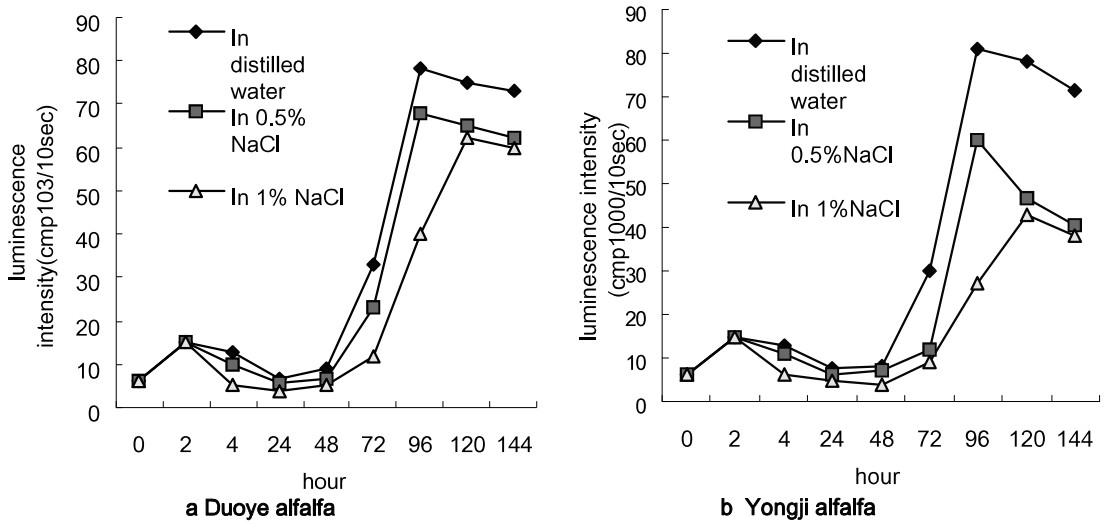

Figure 1 Comparison of luminescence among two varieties of alfalfa in the distilled water and in NaCl solution

Conclusions There was a significantly greater lag in the luminescence curve of germinating seed in 1% NaCl solution than that in distilled water and 0.5% NaCl solution. Under the same salt stress, the different cultivars of lucerne emitted different levels of superweak luminescence. On the basis of this difference we can determine the salt tolerance degree of lucerne.