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## Response of activated oxygen metabolism to water stress in different drought-tolerant alfalfa (*Medicago sativa*) at seedling stage

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**Key words** : water stress ; alfalfa ; activated oxygen metabolism ; drought tolerance ; response

**Introduction** Plant growth and productivity are affected by various abiotic stresses such as heat, cold, drought and high salinity and so on. Water stress is considered to be the main environmental factor limiting plant growth and yield worldwide, especially in semi-arid areas (Boyer, 1982). Alfalfa (*Medicago sativa*) is an important legume forage with high drought resistance. However, drought stress is still the main adverse factor limiting alfalfa production. The aim of the present study was to assess response of activated oxygen metabolism to water stress in different drought-tolerant alfalfa at seedling stage in order to provide theoretical basis for drought-tolerance alfalfa breeding.

**Materials and methods** Two Alfalfas varying in their tolerance to drought were used, Longdong with high drought resistance and BL-02-329 with low drought resistance were grown in plastic pots (40 cm in diameter, 30 cm long). Each pot had eight plants and each material replicated six times. The plants were divided into two groups when the plants were in the ramification periods. One group was control and the other group was treatment. Control was watered normally and the treatment was not watered until the twelfth day when it was rewatered. The  $oz^-$  generation rate, MDA, AsA, Car, SOD activity and POD activity were tested on 0d, 4d, 8d, 12d and the fourth day after rewatering.

**Results** Under drought stress, the  $oz^-$  generation rate, MDA content and damage of cell membrane increased. Compared with weak drought-resistance alfalfa there were low  $oz^-$  generation rate, less accumulation of MDA content and lighter damage of cell membrane in the leaves of strong drought-resistance alfalfa when stressed by drought, and strong drought-resistance alfalfa can recover faster after rewatering. POD activity, SOD activity, AsA content and Car content enhanced in the leaves of two alfalfas under drought stress.

**Discussion** From the response of activated oxygen metabolism to water stress in different drought-tolerant alfalfa at seedling stage we can see that there is higher endogenous coordination of antioxidation enzyme system and nonenzyme system in strong drought-resistance alfalfa than that of low drought resistance alfalfa at seedling stage.

### References

Boyer, J. S., 1982. Plant productivity and environment. *Science* 218:443-448.

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