

## عنوان مقاله:

Combined hydrogen peroxide and nitric oxide priming modulate salt stress tolerance in acclimated and non-acclimated oilseed rape (*Brassica napus* L.) plants

## محل انتشار:

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## خلاصه مقاله:

We examined the combined effects of hydrogen peroxide ( $H_2O_2$ ) and nitric oxide (NO) on the responses of oilseed rape (*Brassica napus* L.) plants to salt stress under acclimated and non-acclimated conditions. The results of the shoot and root dry weight traits together with the measurement of malondialdehyde (MDA) indicated that salt acclimation with a low concentration of NaCl (50 mM) could not alleviate the inhibitory effect of high salinity (200 mM NaCl). Under acclimated conditions, seed priming with  $H_2O_2$  or NO resulted in effective protection against salt stress, however, maximum amelioration of salt stress was found by the combined treatments of  $H_2O_2$  + NO. Interestingly, in the salt-exposed non-acclimated plants, only seed priming with  $H_2O_2$  + NO was effective in improving salt tolerance. Pretreatment with  $H_2O_2$  + NO tended to limit Na translocation into photosynthetic organs to prevent salt damages. Additionally, a large increase in salicylic acid content was correlated with phenylalanine ammonia lyase activation and flavonoid biosynthesis was observed when oilseed rape plants exposed to salinity in the presence of  $H_2O_2$ +NO. Interestingly, in this study, endogenous NO content of  $H_2O_2$ -primed plants exhibited a significant increase under non-saline conditions, indicating that  $H_2O_2$  influences NO accumulation. In addition, oilseed rape plants primed with  $H_2O_2$  + NO exhibited lower MDA and  $H_2O_2$  content, contributing to the better induction of antioxidative enzyme activities. Higher levels of antioxidant enzyme activities maintained the integrity of cell membranes, resulting in better plant growth under salt stress. Taken together, our results revealed that oilseed rape plants pretreated with  $H_2O_2$  + NO exhibited more effective tolerance to salt stress than plants that were pretreated with  $H_2O_2$  or NO alone.

## کلمات کلیدی:

Combined priming, Flavonoid, Ion homeostasis, Nitric oxide, Oilseed Rape, Salicylic acid, salinity

## لینک ثابت مقاله در پایگاه سیویلیکا:

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