
Improvement of *Pisum sativum* salt stress tolerance by bio-priming their seeds using *Typha angustifolia* leaves aqueous extract

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Abstract

This study aimed to evaluate the seed bio-priming effect on the salinity tolerance of pea (*Pisum sativum* L.) variety Lincoln. The aqueous extract of *Typha angustifolia* L. dried leaves at 40 g/L, was used for the pretreatment. Preliminary experiments were conducted to eliminate possible effect of aqueous extract pH and osmotic potential. Conductivity and pH of the aqueous extract used at 40g/l were measured and solutions of PEG 4000 with same values of these two parameters were prepared and tested on pea. Results showed that PEG solutions had no affected neither germination index nor growth of the target plants. Indeed, all results were similar or improved relative to the control. The experiment was carried out in the presence of 0, 240, and 320 mM NaCl for germination and 0 and 120 mM for growth which was made hydroponically. Two seed lots were considered primed (P) and not primed (NP). Results revealed that salt stress adversely affected the germination, growth, membrane integrity, respiration, chlorophyll and carotenoid contents, mineral composition (K⁺ and P) of pea. However, it increased Na⁺, proline, total soluble sugars, and secondary metabolites (polyphenols, flavonoids, and alkaloids) accumulation. Seed priming reduced the negative impact of salt in all cases. Indeed, plants developed from primed seeds showed better response to salinity by the protection of membrane integrity, the maintenance of the highest values of osmotica (proline, total soluble sugars, K⁺, and P) and by the amelioration of chlorophyll and carotenoid content. Hence, bio-priming of pea seeds seems to be a reliable procedure to increase the pea salinity tolerance and to win more biomass which can probably have an important impact on seed yield. This work has been carried out thanks to the support of the A*MIDEX grant (no ANR-11-IDEX-0001-02) funded by the French Government " Investissements d'Avenir " program")

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