Studies on Salt-tolerence of Halophyte Nitraria L.

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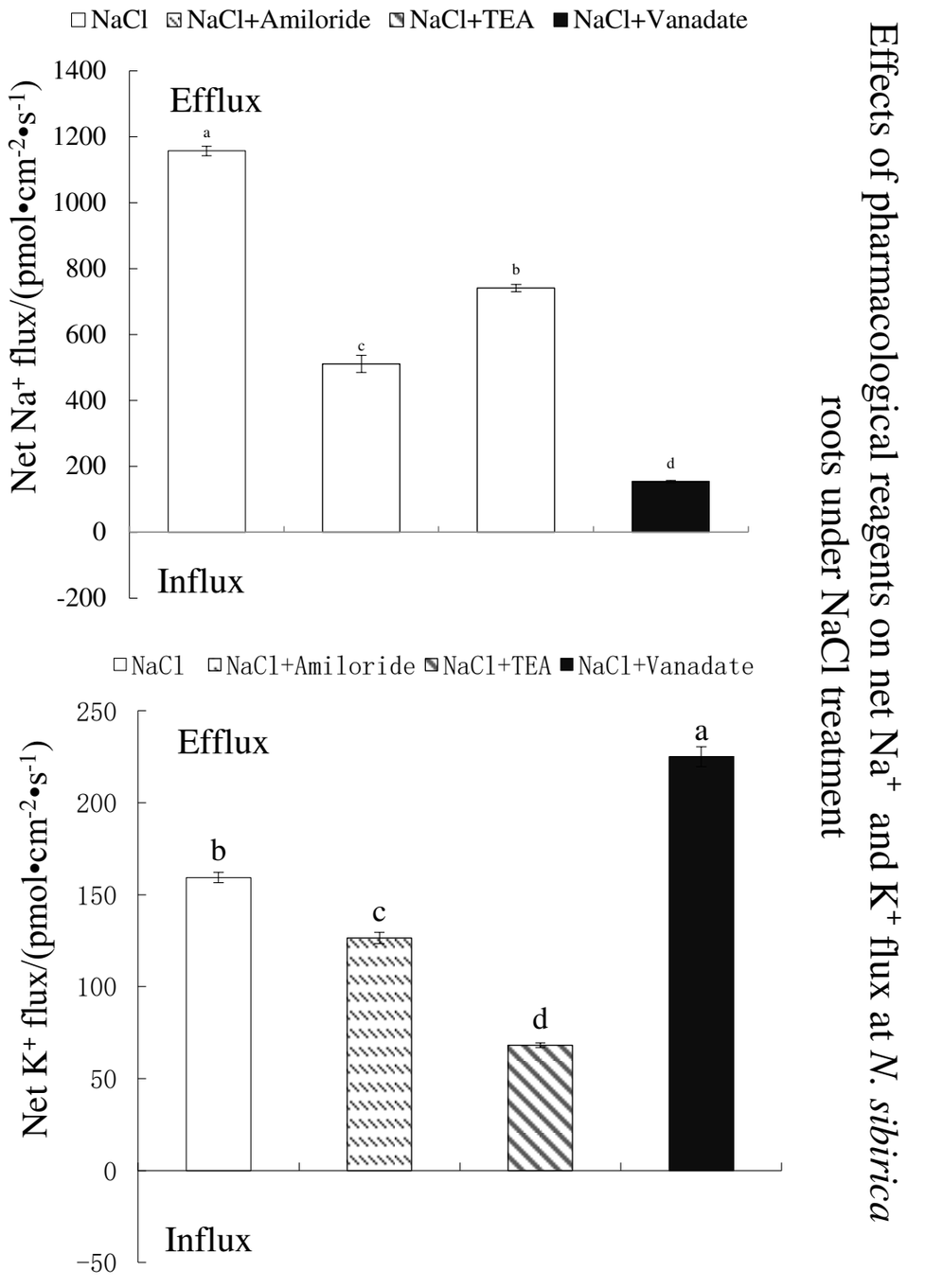
➢ Background and Material

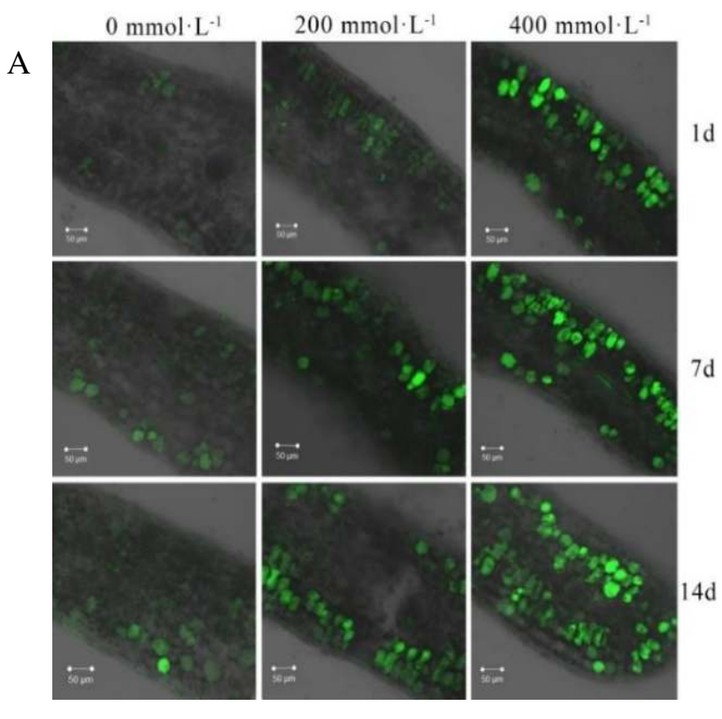
- Soil salinization is one of the important limiting factor affecting the sustainable development of forestry and the construction ecological environment in the world. The damage of salt stress to plants is mainly caused by the high concentration of salt ions in the soil, and excessive Na^+ enters plants results in ion imbalance and toxicity.
- Genus Nitraria are tertiary relict and widespread from Africa, Asia, Europe and Australia. *N. sibirica* Pall. has strong salt resistance ability. In this study, we focused on the mechanisms of salt-tolerence in *N. sibirica*.

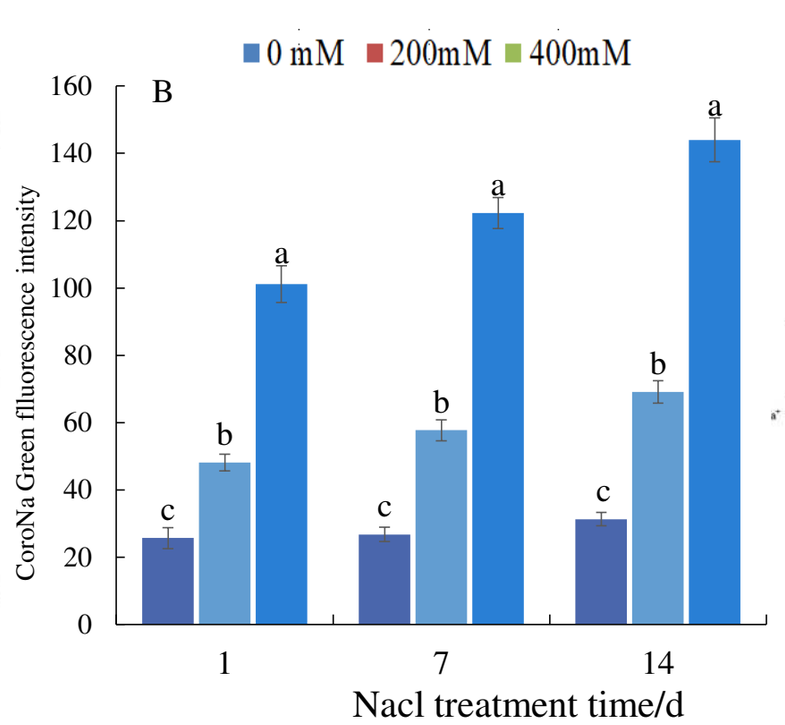
➢ Results and Conclusion

- Under NaCl stress, strong Na^+/H^+ exchanger activity and proton pump activity in the roots promoted Na^+ efflux in the roots of *N. Siberia*, modulated membrane depolarization, restricted the efflux of K^+ and Na^+ into the cells, thus maintain the relative balance of K^+/Na^+ in the roots;
- The Na^+ transport-related enzyme activity and the expression of ion transportation-related genes--tonoplast H^+-ATPase activity and Na^+/H^+ antiporter are the key factors determining the capacity for ion compartmentalization in leaves.
- The maintenance of cytosolic K^+/Na^+ homeostasis is one of key determinant of *N. Siberia* salinity tolerance.

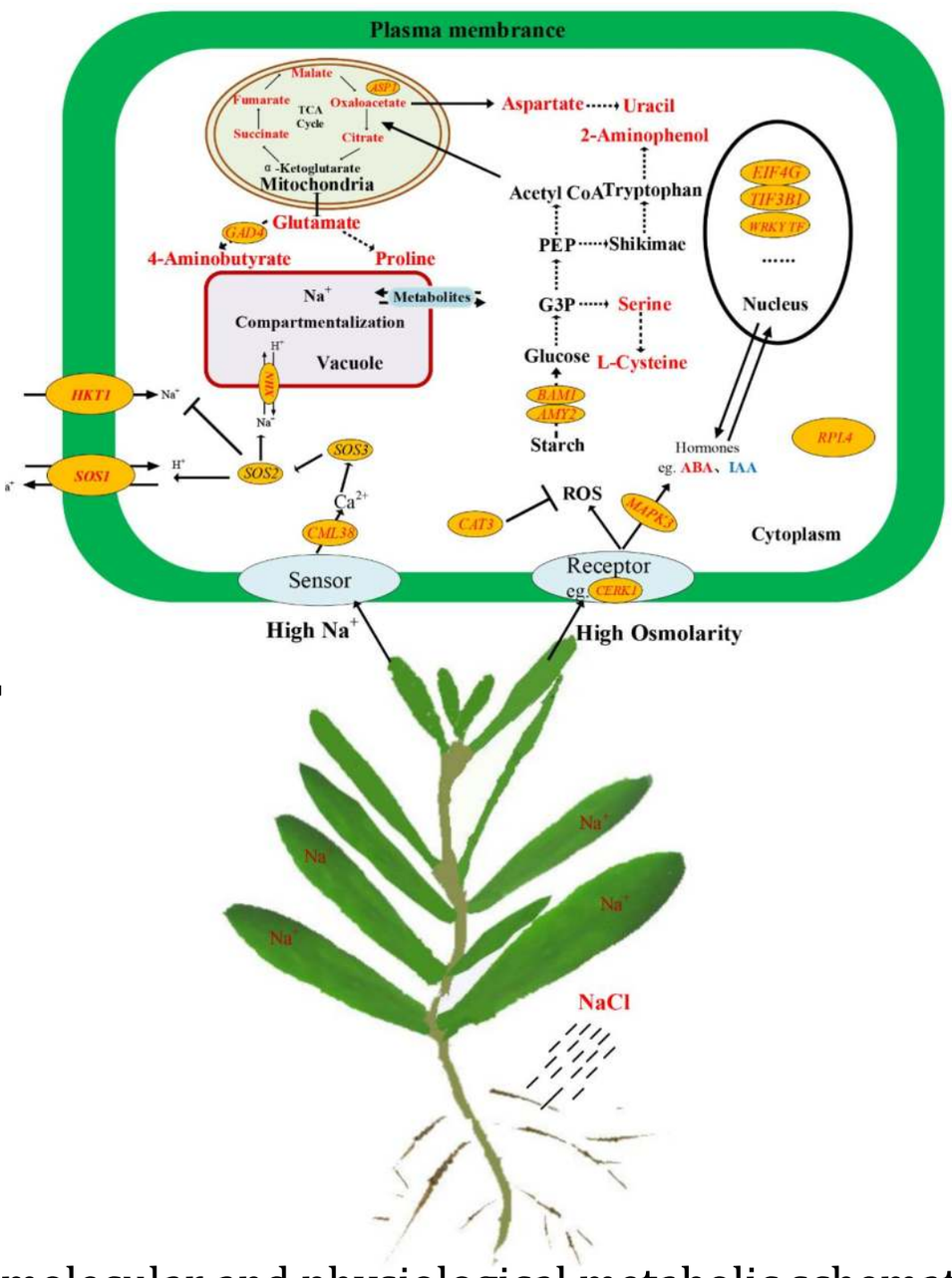


Effects of pharmacological reagents on net Na^+ and K^+ flux at *N. sibirica* roots under NaCl treatment





Effect of NaCl treatment on the segmentation of Na^+ in *N. sibirica* seedlings leaves. Comparison of the segmentation of Na^+ in the leaves treated with 0, 200 and 400 mM salt for 1d, 7 d, and 14 d. (A) Representative images of CoroNa Green fluorescence in the leaf of *N. sibirica*; (B) The column shows the average fluorescence intensity in vacuoles. All sections were observed at ×20 magnification. Scale bars=50 μm. For each treatment, at least 50~80 individual cells were quantified from three independent experiments. The error bars represent standard error (SE) of mean of three replications. Different small letters respresent significant difference between different NaCl concentration ($P < 0.05$).



A molecular and physiological metabolic schematic model response to salt stress in *N. sibirica*