

# Salinity stress decreased toxin protein content in detached leaf of Bt cotton



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## Introduction & Objectives

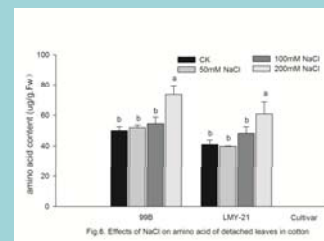
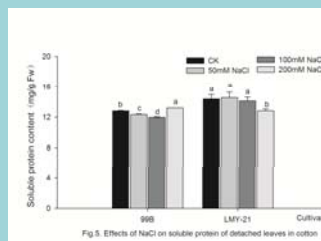
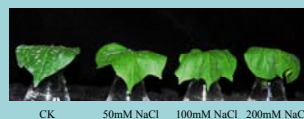
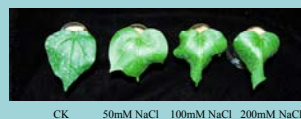
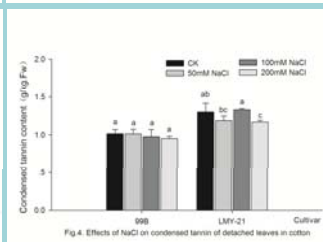
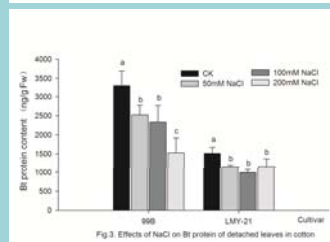
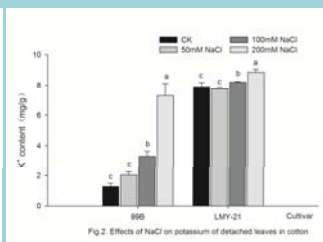
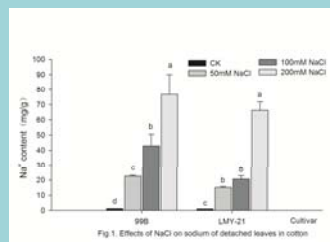
Transgenic Bt cotton provided highly effective control of cotton bollworm. However, due to limited rainfall, irrigation with saline water, soil salinity is one of the most important constraints responsible for low cotton yield. Previous researchers have noted that environmental factors can influence Bt gene expression. In this research, two transgenic Bt cotton cultivars were treated with different NaCl levels in the detached seedling leaves. The objectives were to determine the effects of NaCl salinity stress on the detached seedling leaves of Bt transgenic cotton.

## Materials and methods

The research was conducted in a growth chamber under 28/20° C, 14/10 h day/night, and 450  $\mu\text{mol m}^{-2} \text{s}^{-1}$  light conditions. Seeds of two transgenic cotton cultivars, 99B and lumianyan21(LMY-21) which contains the Cry1A toxic protein gene, were surface sterilized and germinated. And seedlings were individually transplanted into 35 × 27 × 12 cm pots filled with a modified Hoagland solution. The seedlings were cultured for 24 days, and three leaf-stage leaves were cut at the base of petiole, the leaves were subjected to salt stress by adding NaCl to the Hoagland solution.

## Result

All the content of potassium, sodium, soluble protein and free amino acid in the detached seedling leaves of two cultivars were increased with NaCl concentration increasing. Under 200mM NaCl, the contents of potassium, sodium, were increased by 474.5%, 5996.8% in leaves of 99B, and were increased by 11.9%, 6819.5% in leaves of LMY-21, the contents of Bt toxin protein were significantly decreased by salinity stress in two cultivars. In leaves of 99B and LMY-21, toxin protein was decreased by 26.5% and 13.3 % under 50mM NaCl, 38.2% and 20.0 % under 100mM NaCl, 52.9 % and 16.7% under 200mM NaCl. Condensed tannin content was increased by 100 mM NaCl, but decreased by 50 and 200 mM NaCl in leaves. The total N contents in leaves were decrease by NaCl treatment too.



## Discussion

Many studies have indicated a close association between Bt protein level and the control efficacy. Our results showed that Bt protein of detached leaves were reduced by NaCl salinity. There existed a significantly positive correlation between the control efficacy and the Bt protein or total soluble protein in Bt cotton seedlings, which is closely associated to nitrogen metabolism in plants. However, induced secondary compounds like condensed tannin may be involved in compensation for moderate reduction of Bt protein under salinity.

## Acknowledgement

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## References

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