BnaBBX22 enhances the salt tolerance of rapeseed by regulating ROS homeostasis

Keqi Li

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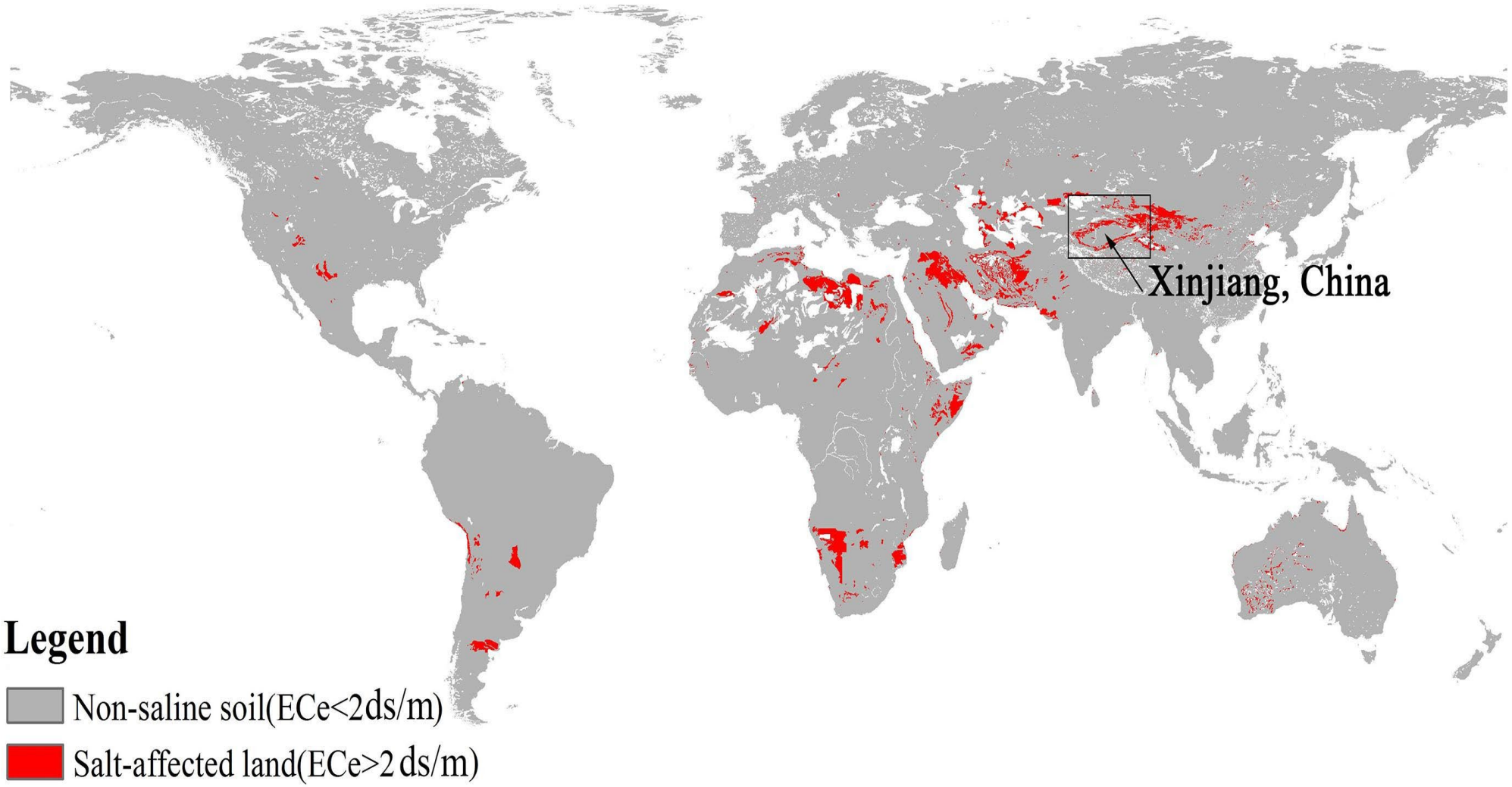
State Key Laboratory of Crop Stress Biology for Arid Areas, NWAFU

Research background



Screening of salt-tolerant germplasm

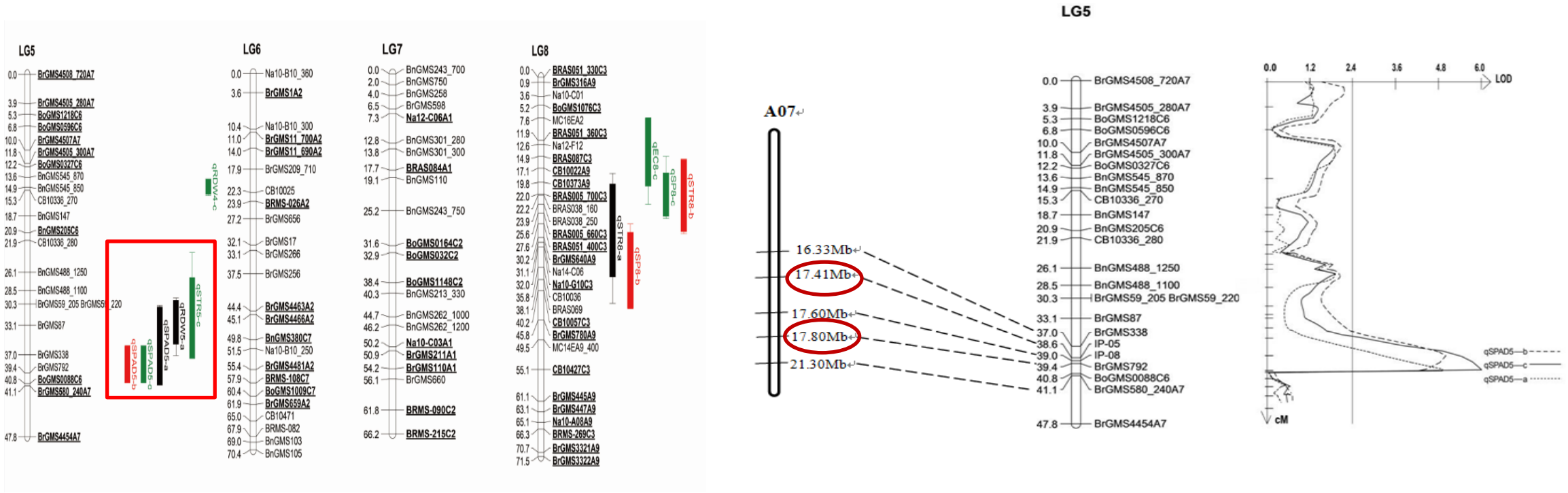
CK

75mM $NaCHO_3$ 15 day

200mM NaCl 10 day

2205 1423

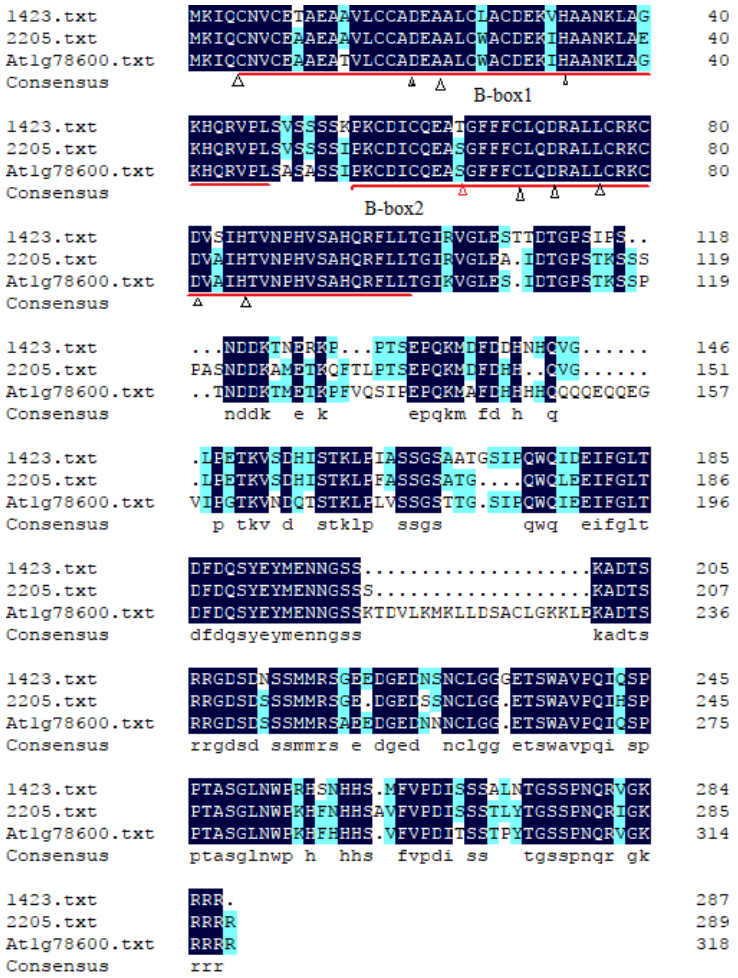
QTL scanning of 269 $F_{2:3}$ populations for salt-tolerant traits

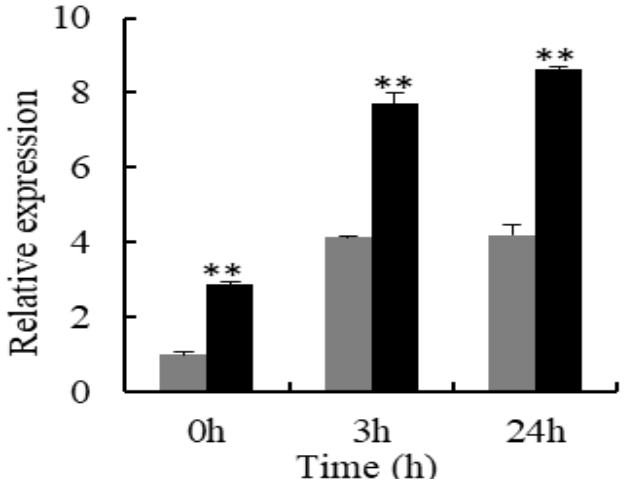


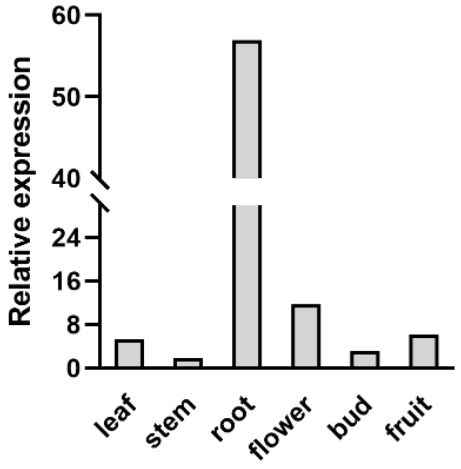
The dominant QTL *qSPAD5* (17.41-17.80 Mb) on chromosome A07 was detected by multiple salt-tolerant releated traits, accounting for 35% of the phenotypic variation.

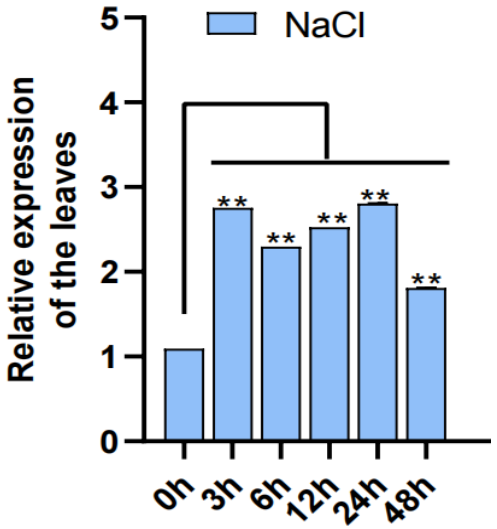
（Lang et al., 2017, Frontiers in plant science）

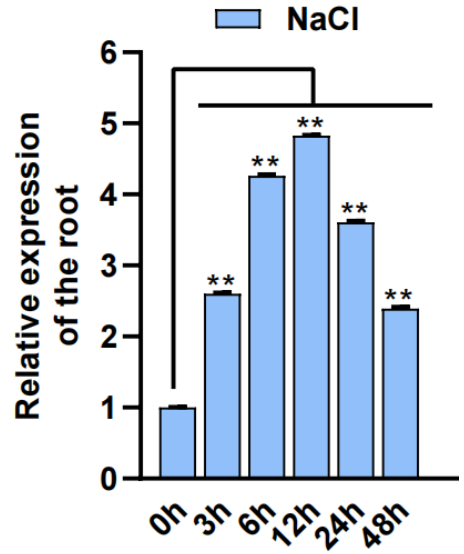
Structure and expression analysis of BnaA07g...50D（*BnaBBX22*）





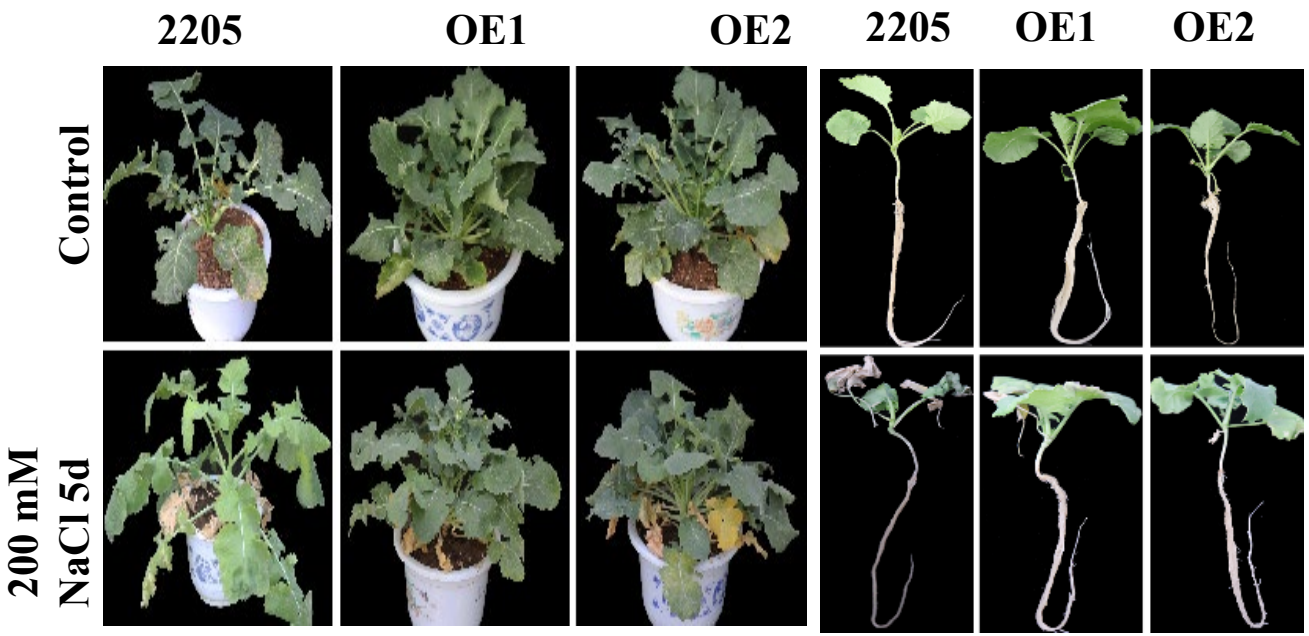


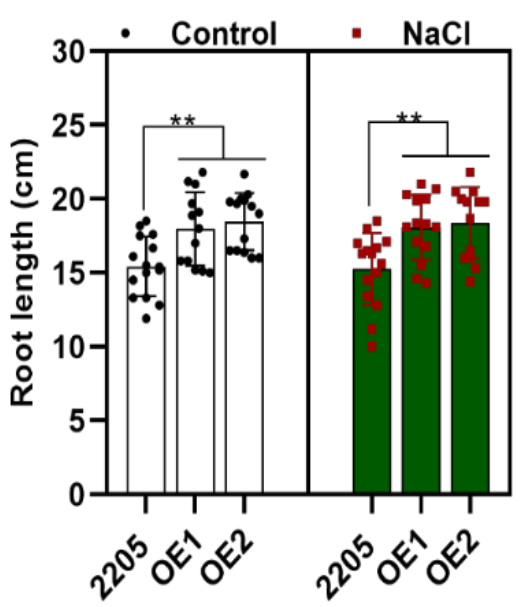


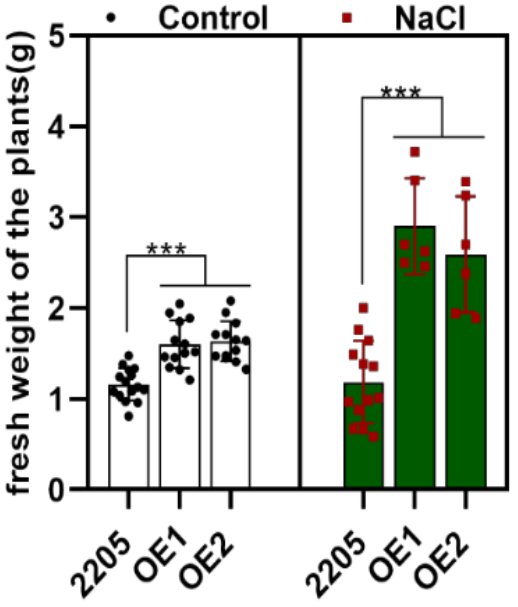


（Lang et al. 2017, Frontiers in plant science）

Overexpression of *BnaBBX22* enhanced the salt tolerance of rapeseed



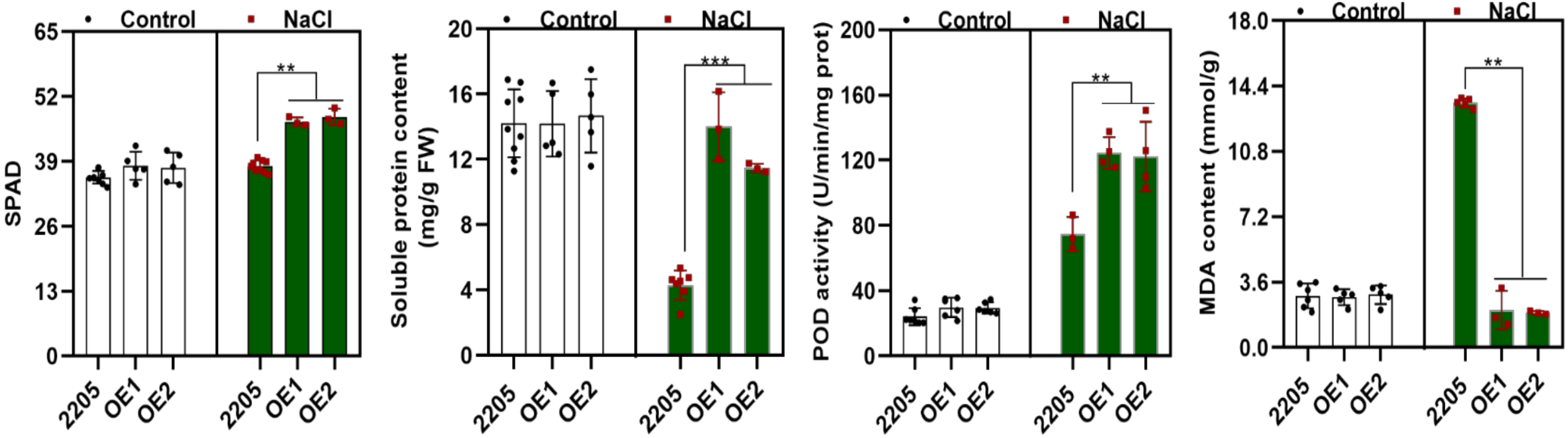




***BnBBX22* may positively mediate taproot elongation of rapeseed under NaCl stress and improve the salt tolerance.**

（unpublished）

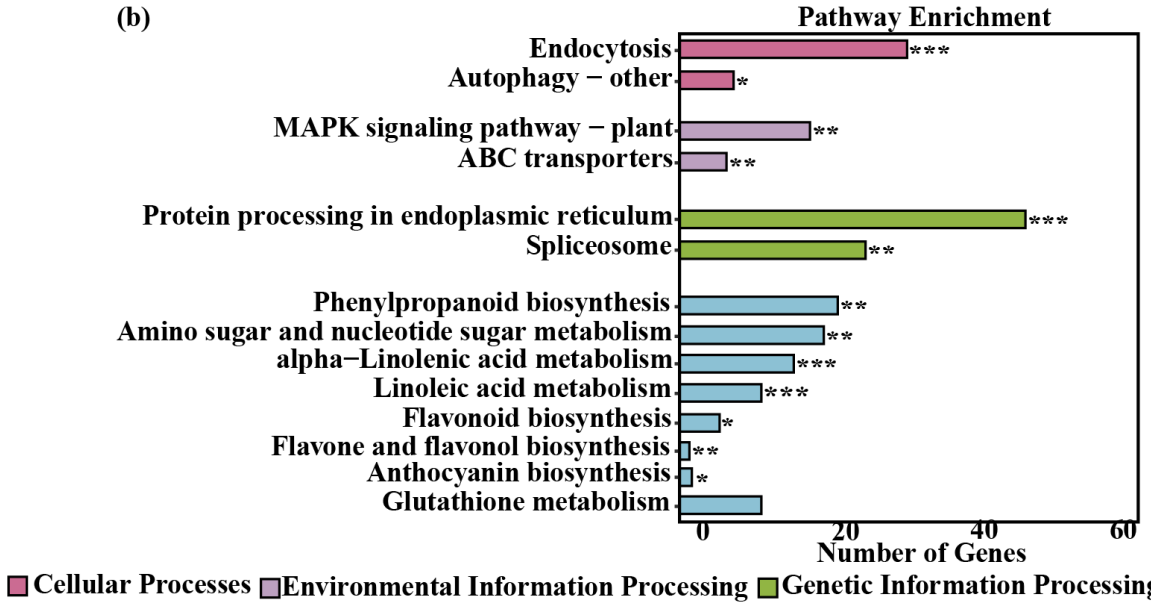
Overexpression of *BnaBBX22* enhanced the salt tolerance of rapeseed



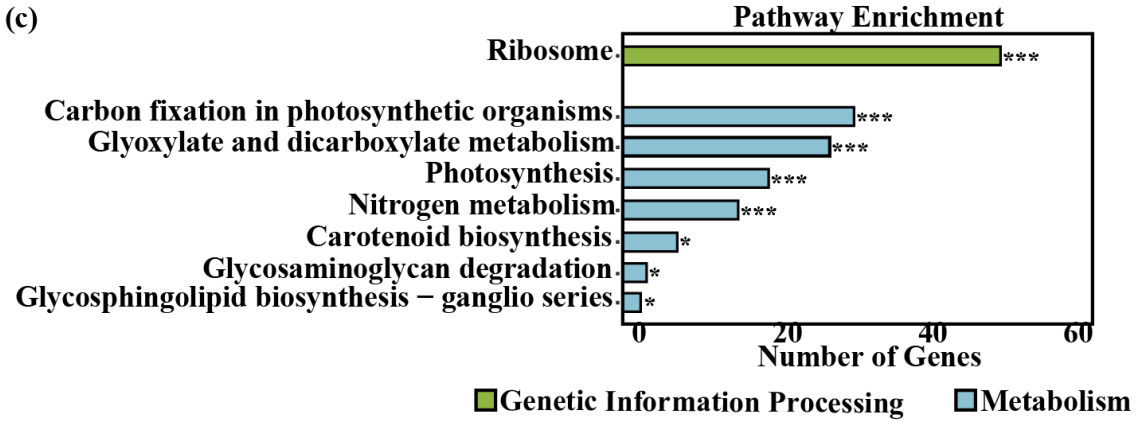
（unpublished）

BnaBBX22 mainly involved in the ROS and energy metabolism

KEGG enrichment analys of WT-6h vs. OE-6h up-regulated DEGs



KEGG enrichment analys of WT-6h vs. OE-6h down-regulated DEGs

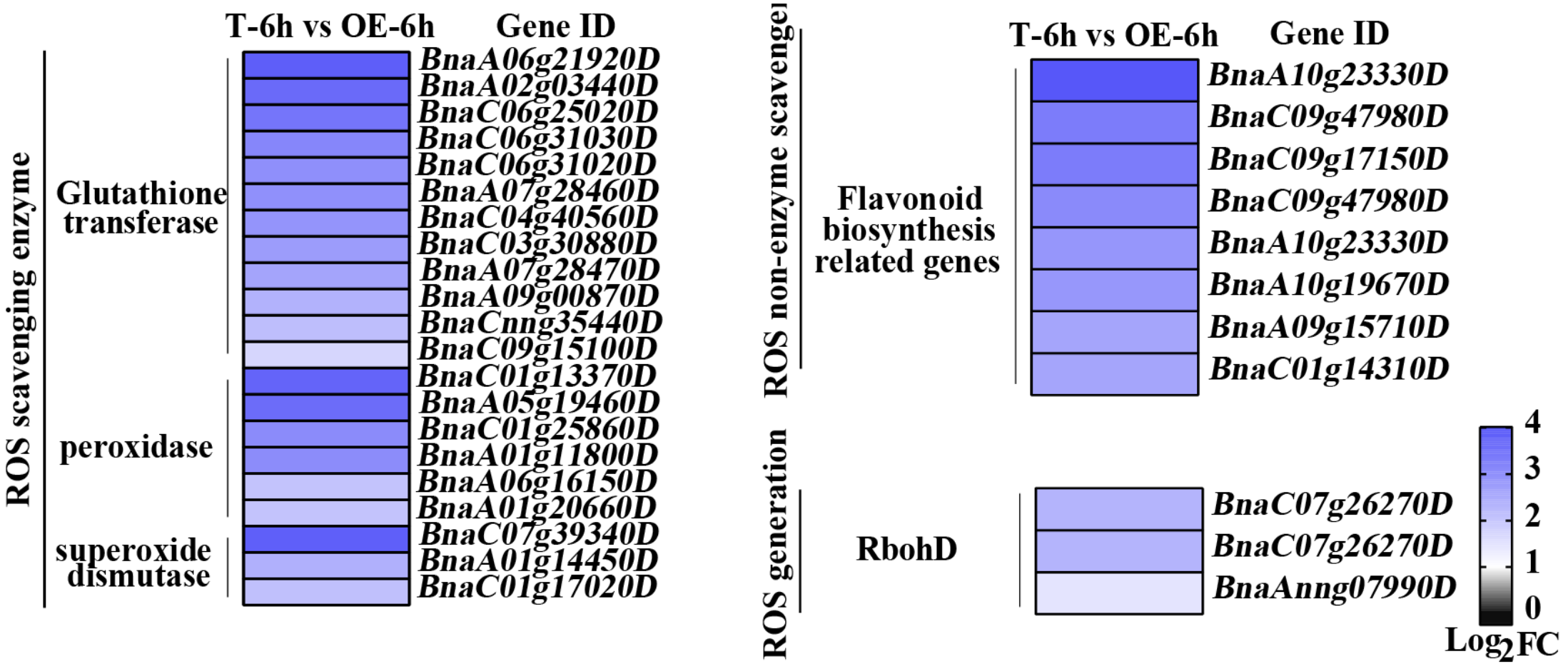


The up regulated DEGs were mainly enriched in active oxygen metabolism.

Down-regulated DEGs were mainly concentrated in energy metabolic pathways.

（unpublished）

BnaBBX22 affects the expression of ROS related genes under salt stress



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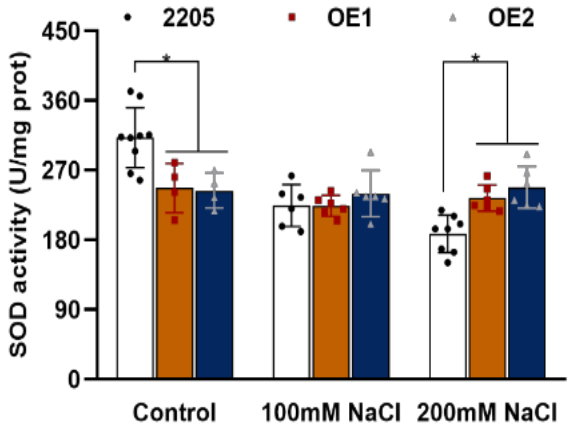
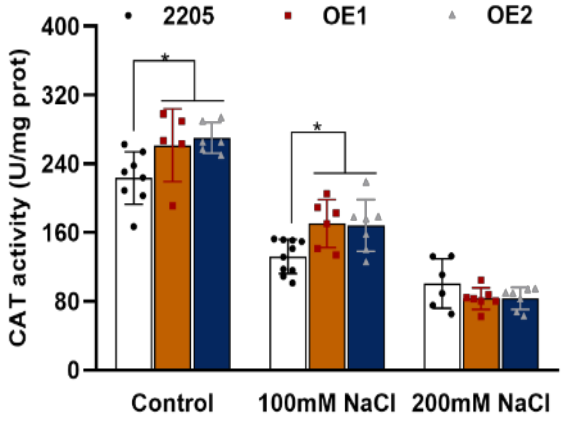
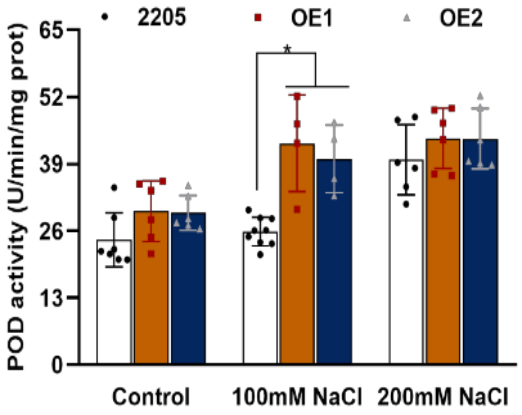
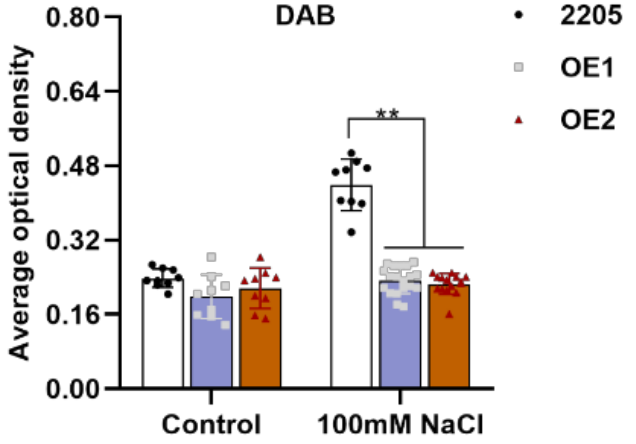
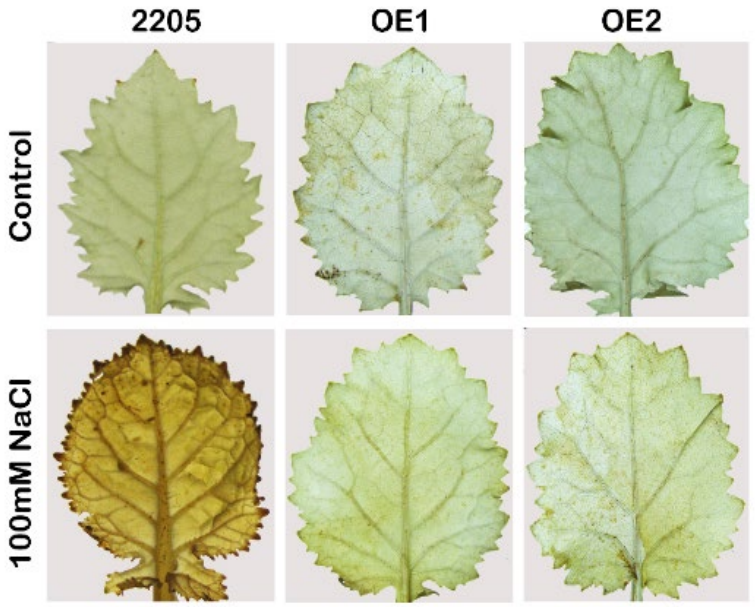
BnaBBX22 reduces the accumulation of ROS in rapeseed under salt stress



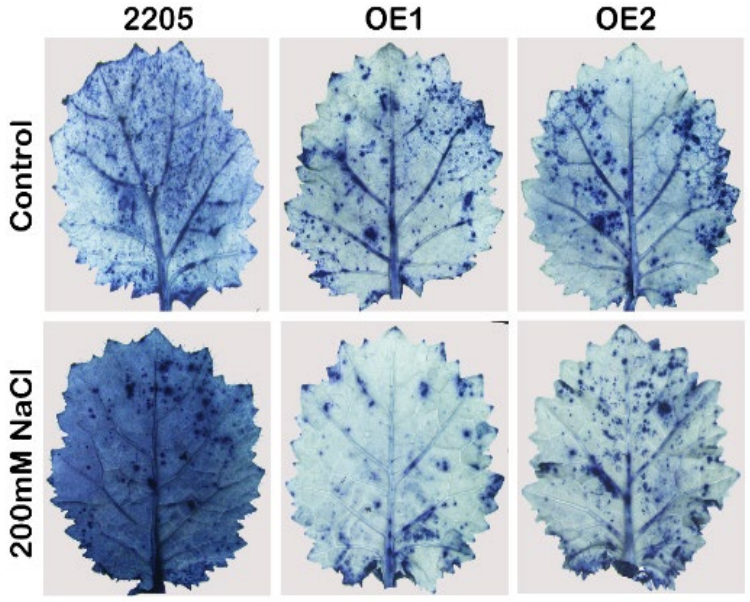




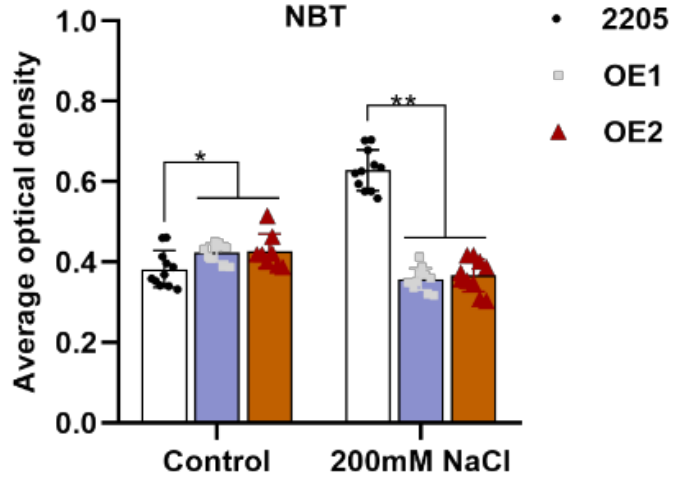




DAB stain

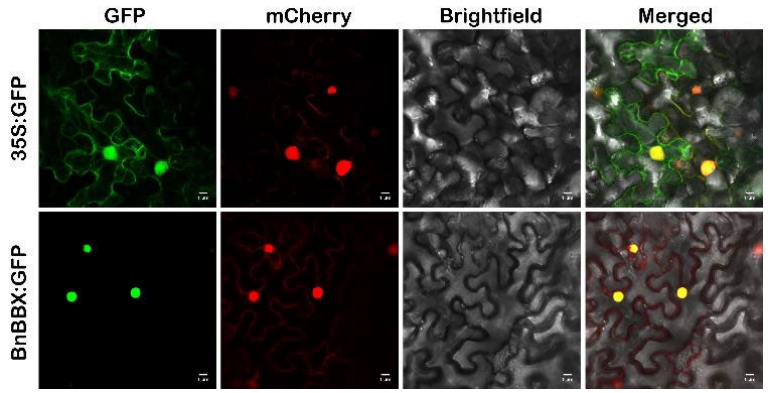


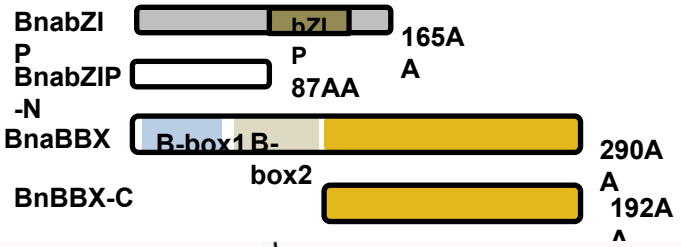
NBT stain

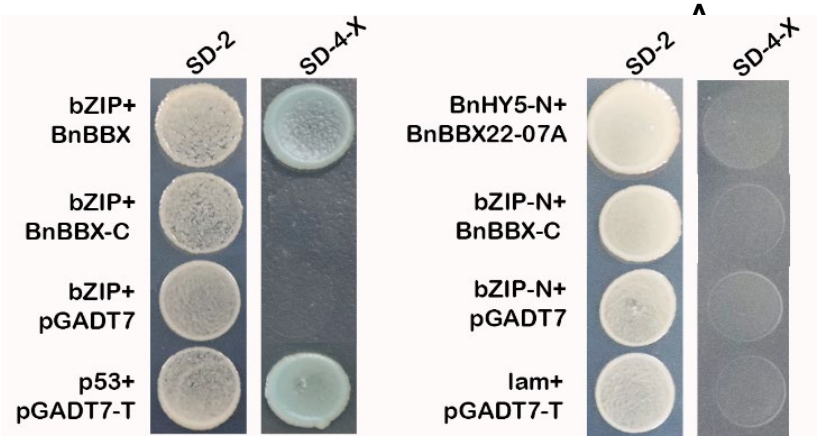


（unpublished）

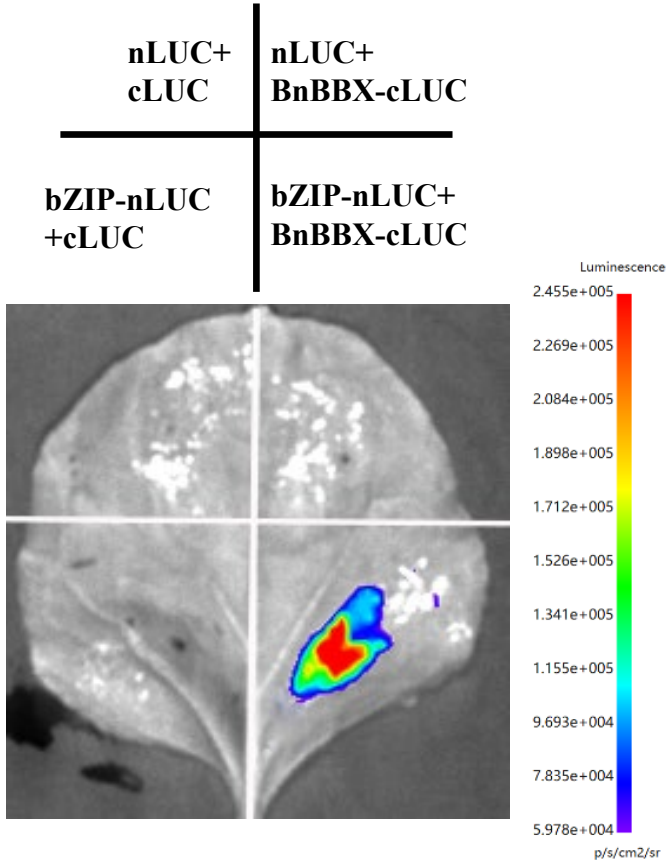
BnaBBX22 interacts with BnabZIP



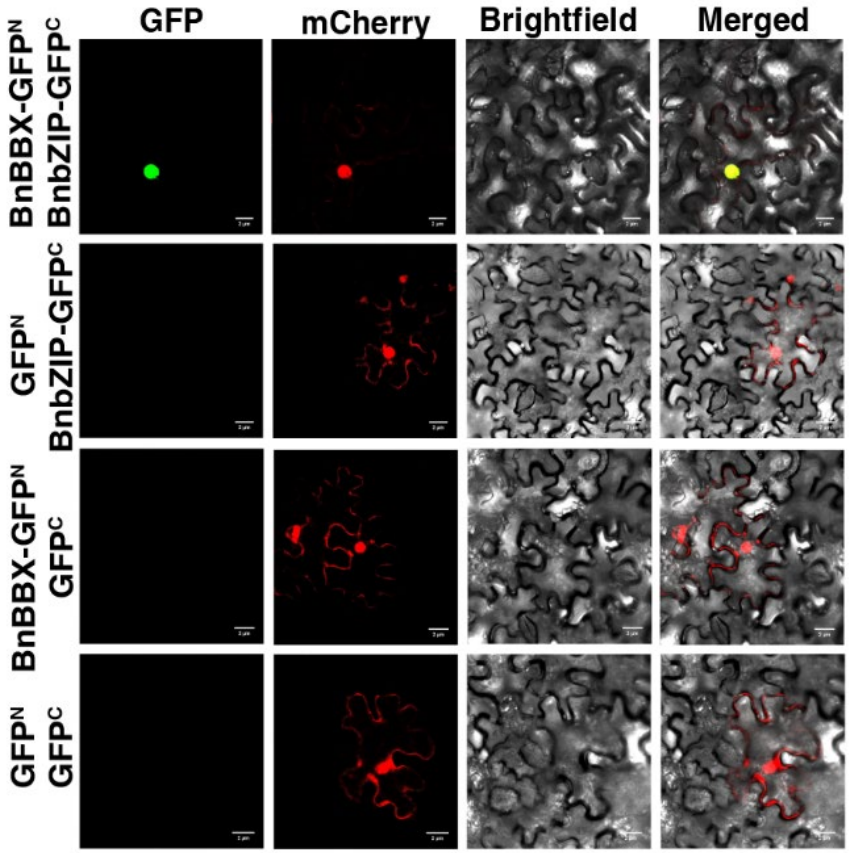




LCI



BiFC



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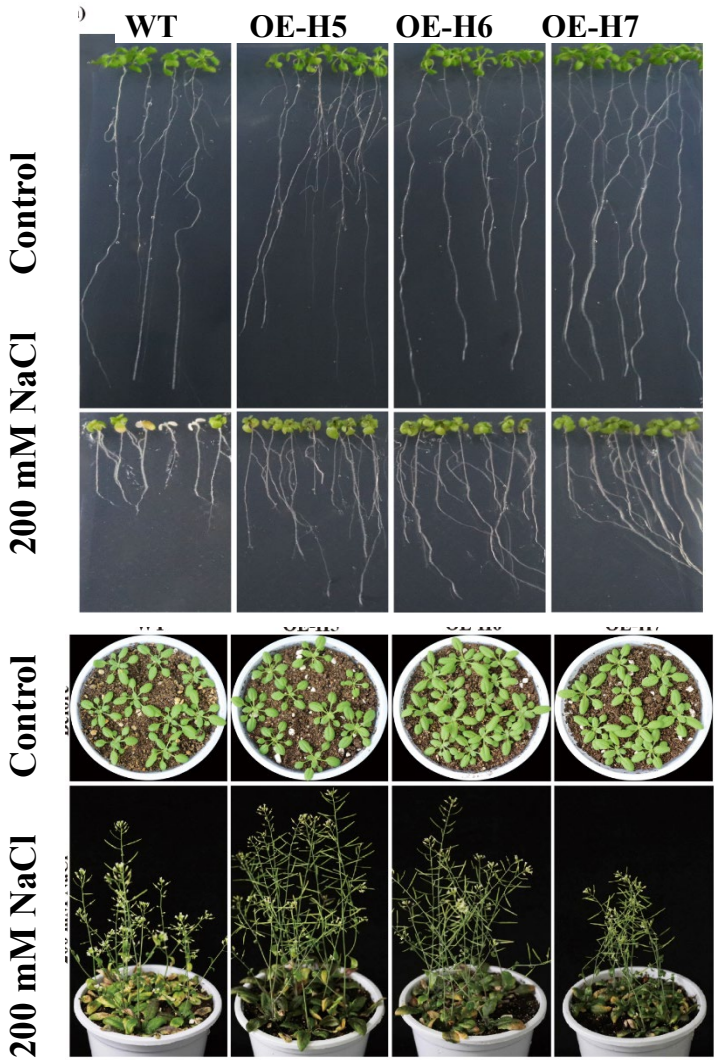
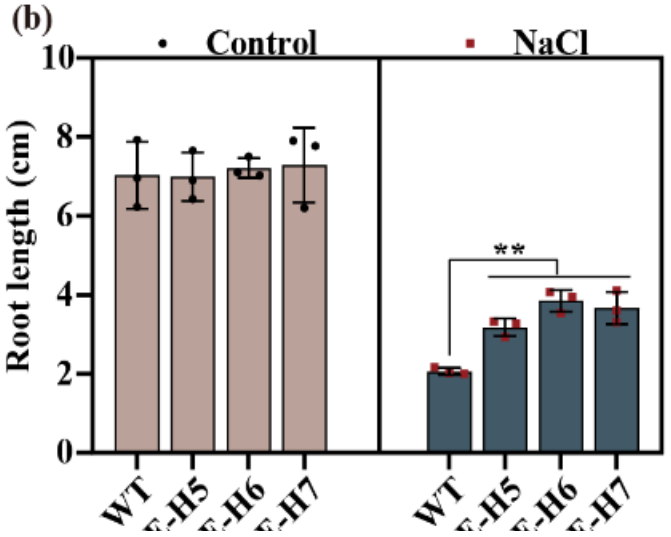
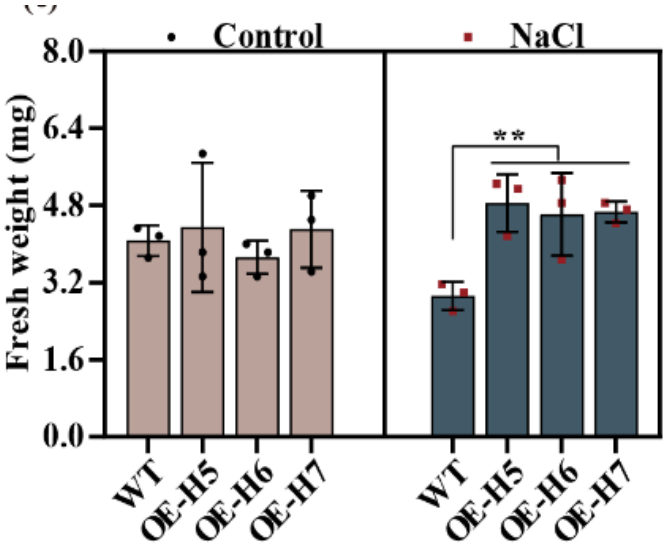
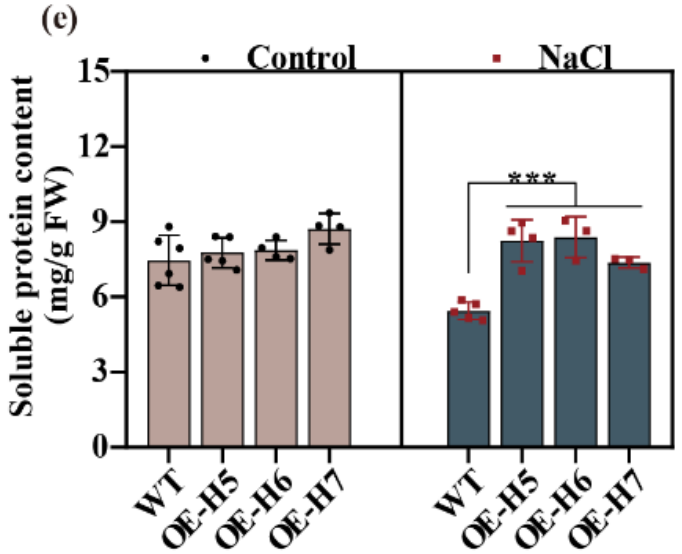
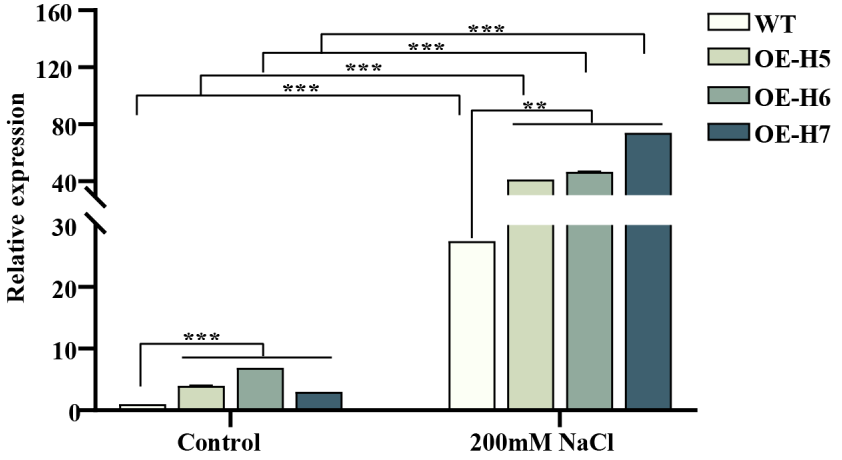
Overexpression of *BnabZIP* enhanced the salt tolerance of Arabidopsis











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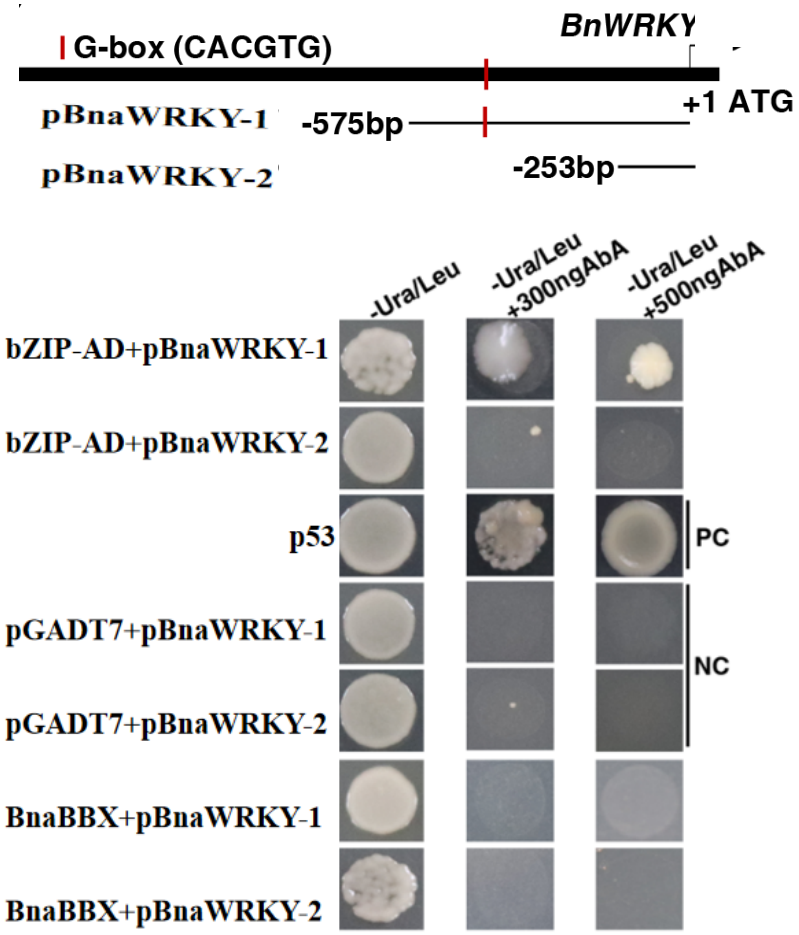
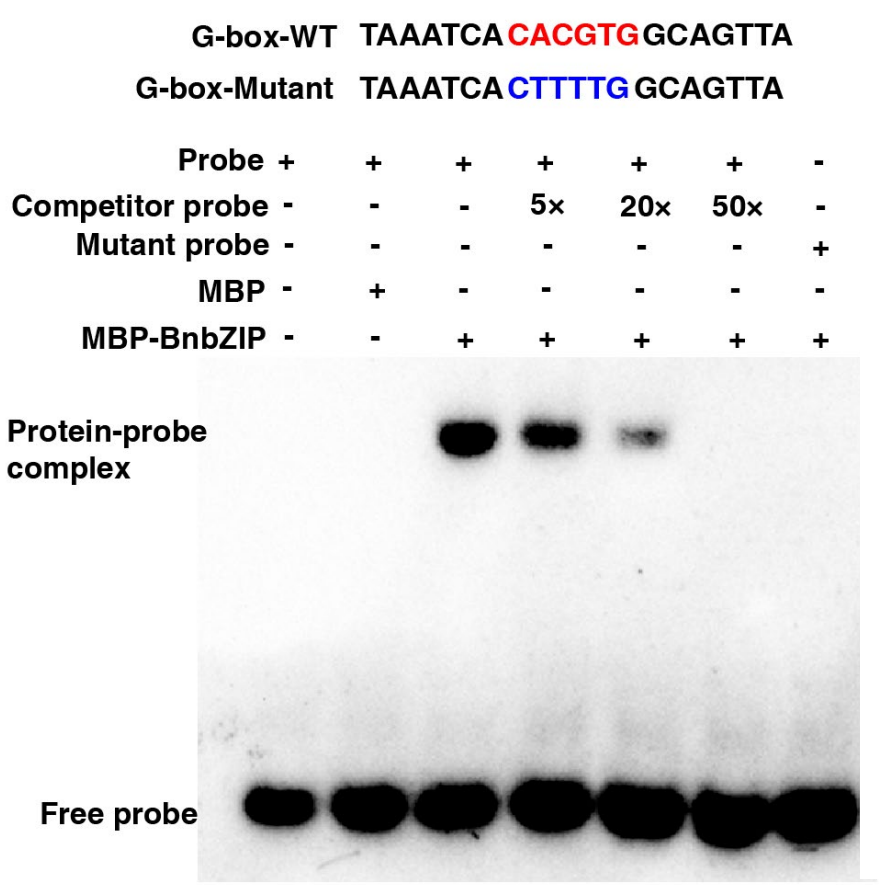
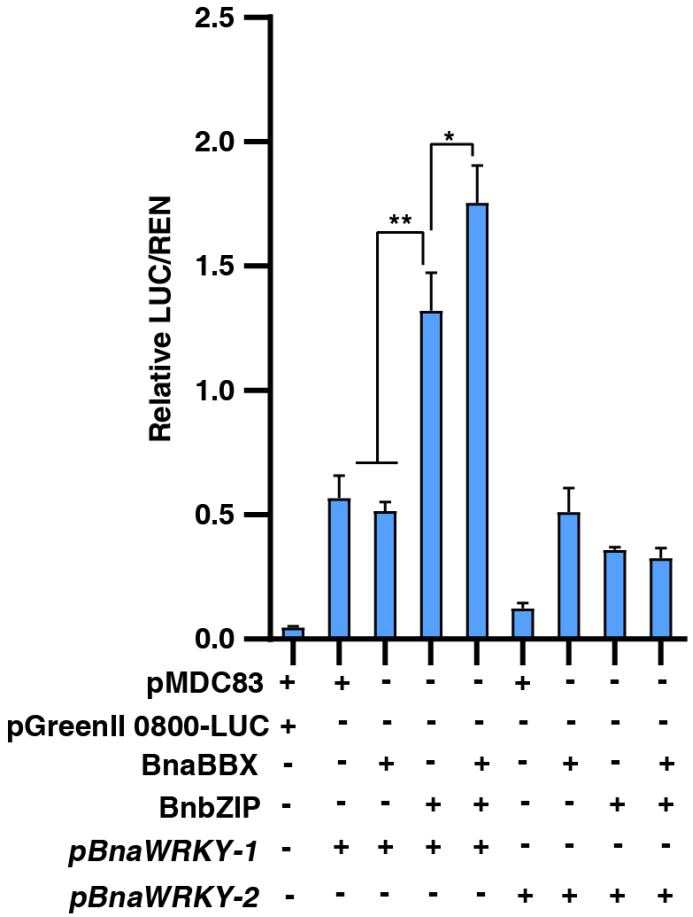
BnabZIP interates with *BnaWRKY* and activates its expression







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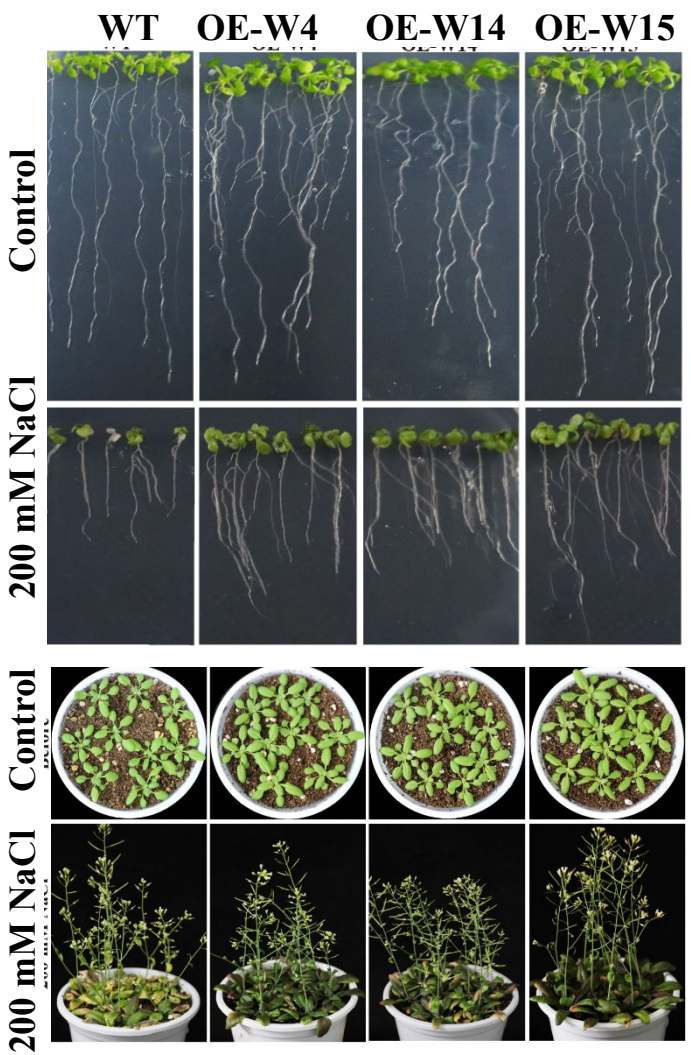
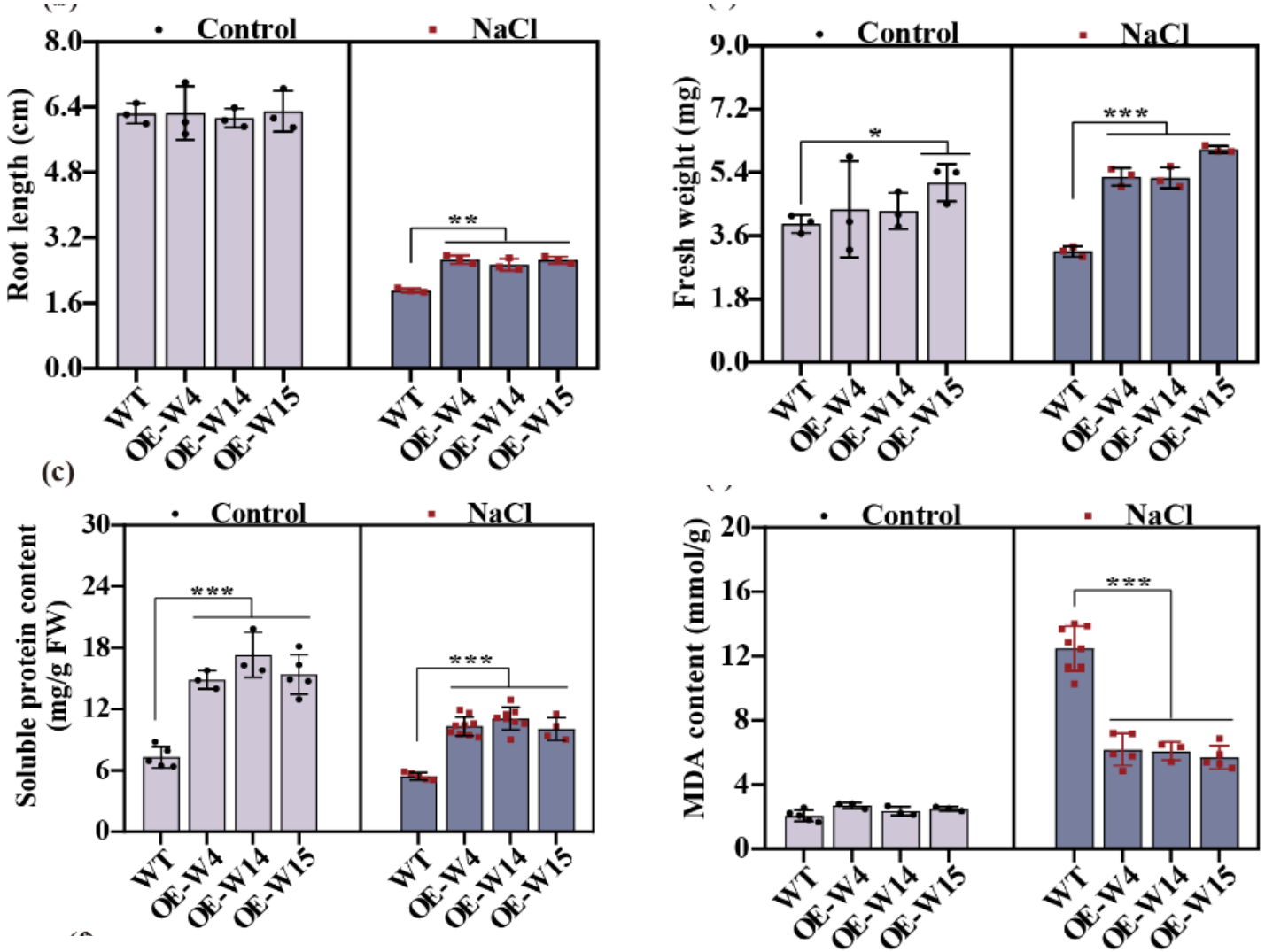
BnaWRKY positively regulates the salt tolerance of Arabidopsis





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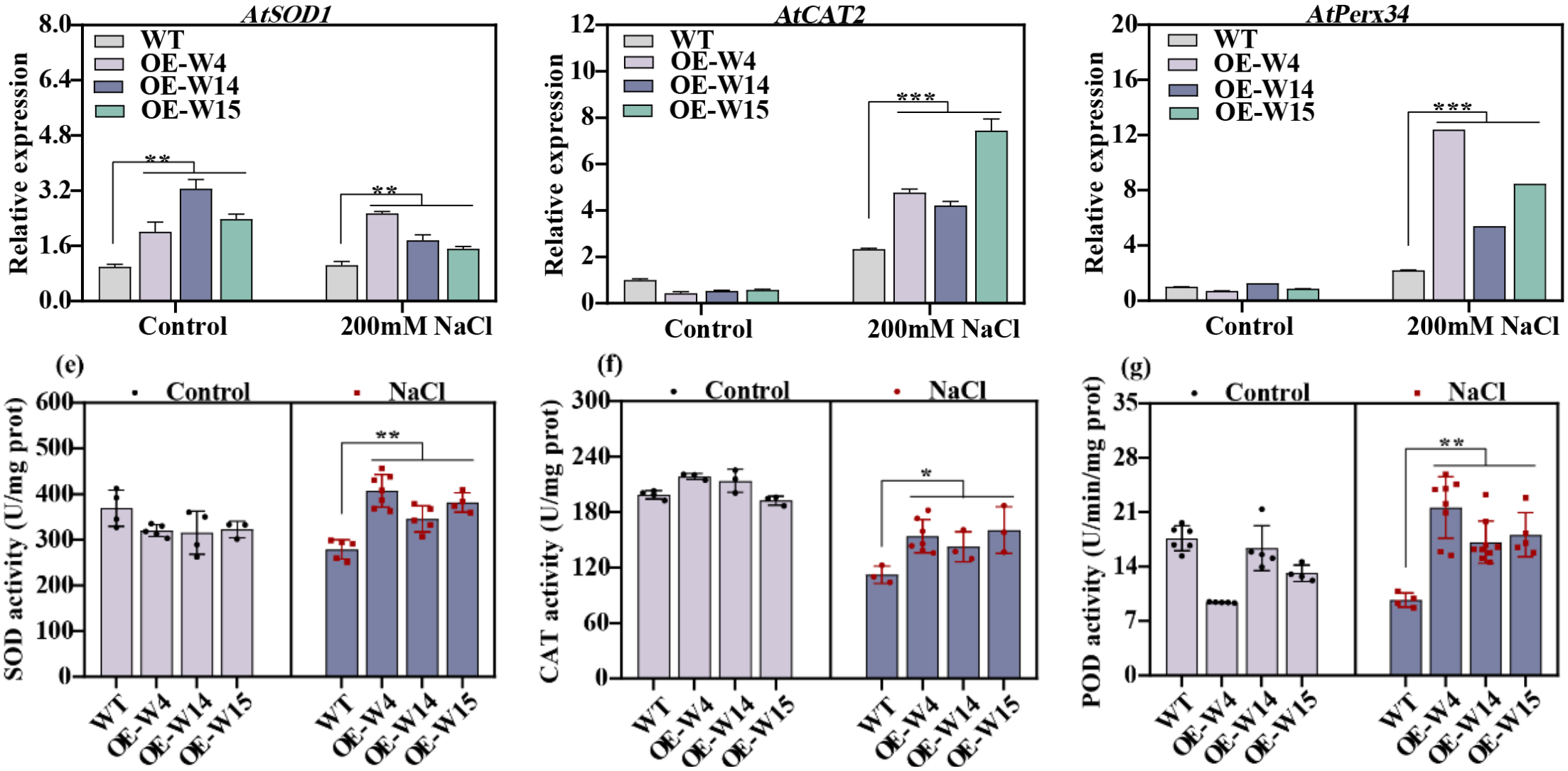
BnaWRKY enhances the activity of ROS scavenging enzyme under salt stress



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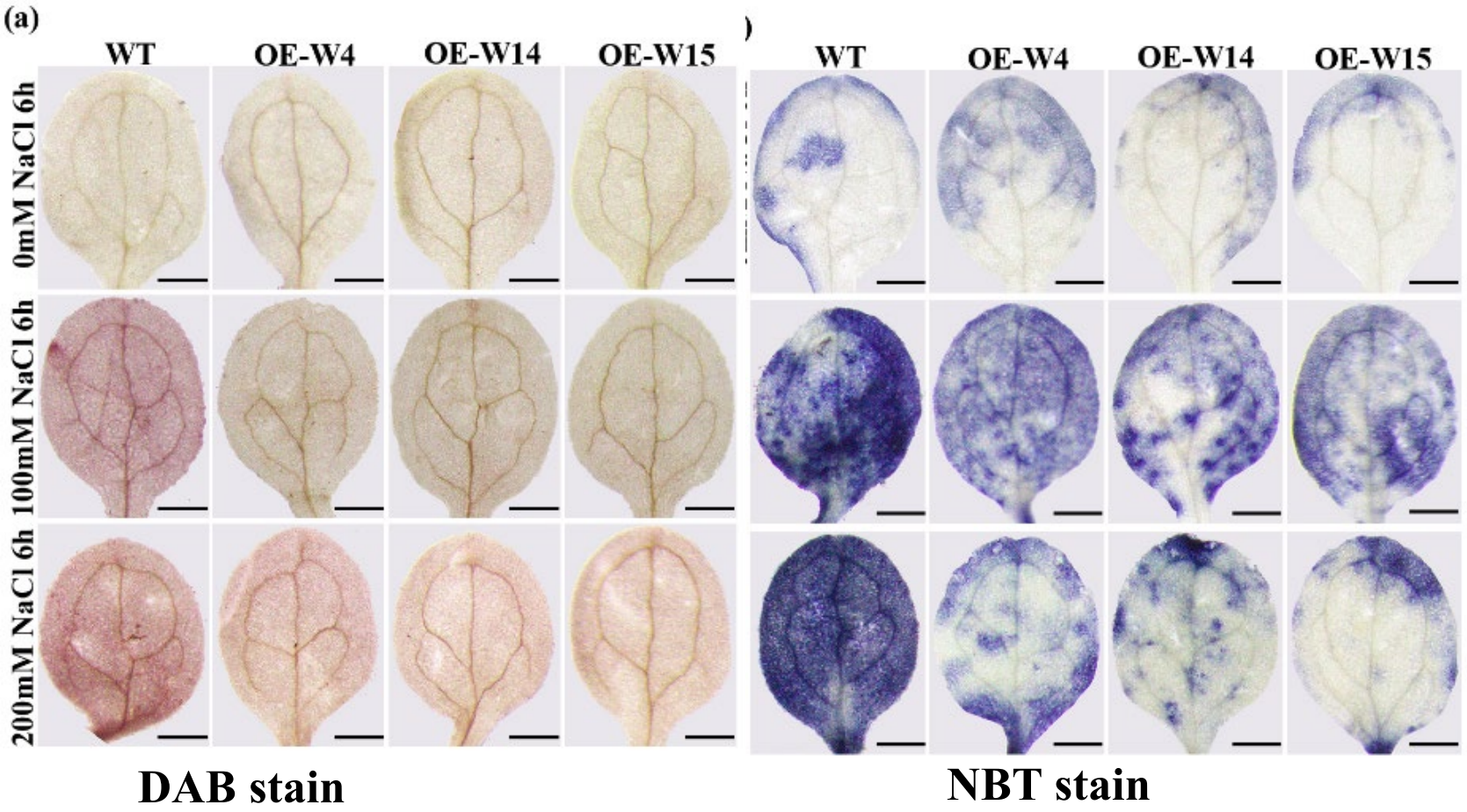
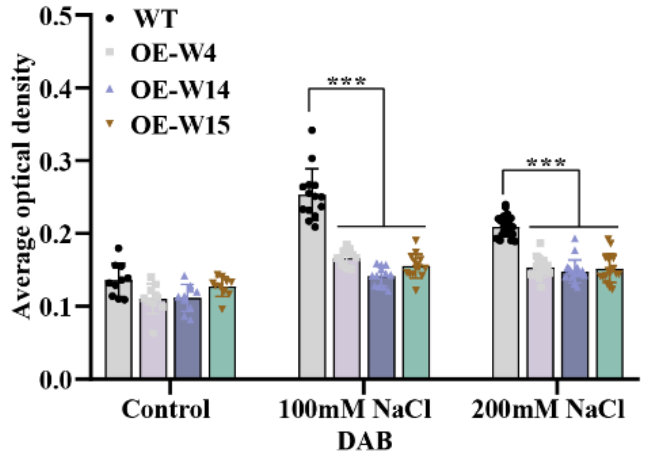
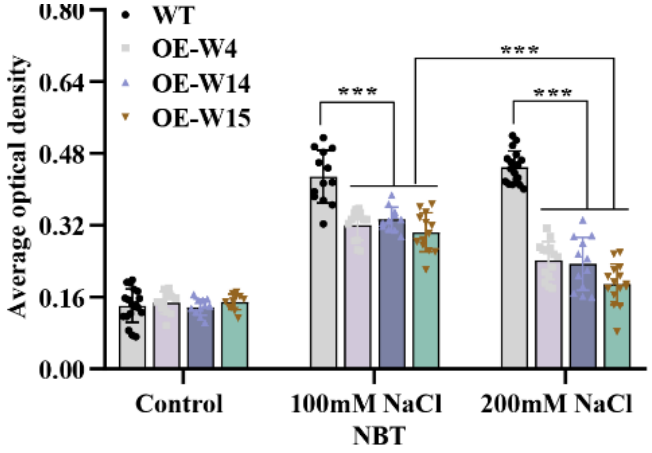
BnaWRKY decreases the accumulation of ROS in Arabidopsis under salt stress



DAB stain

NBT stain





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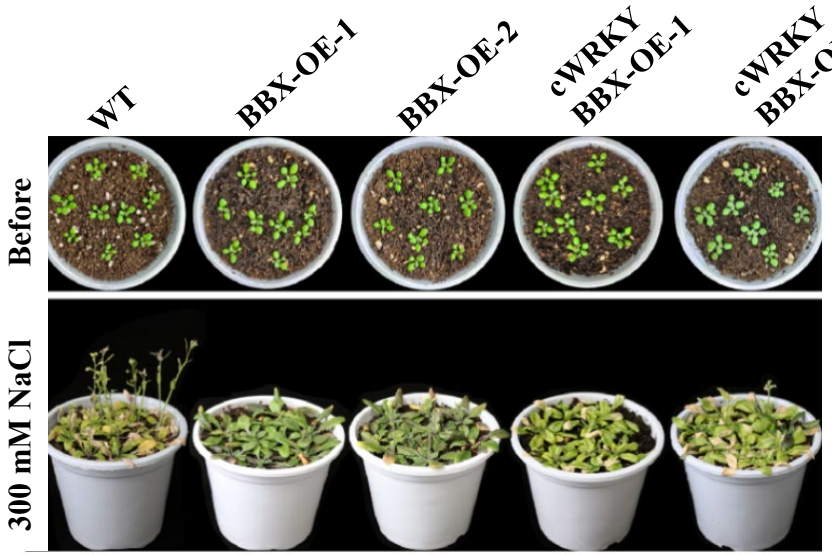
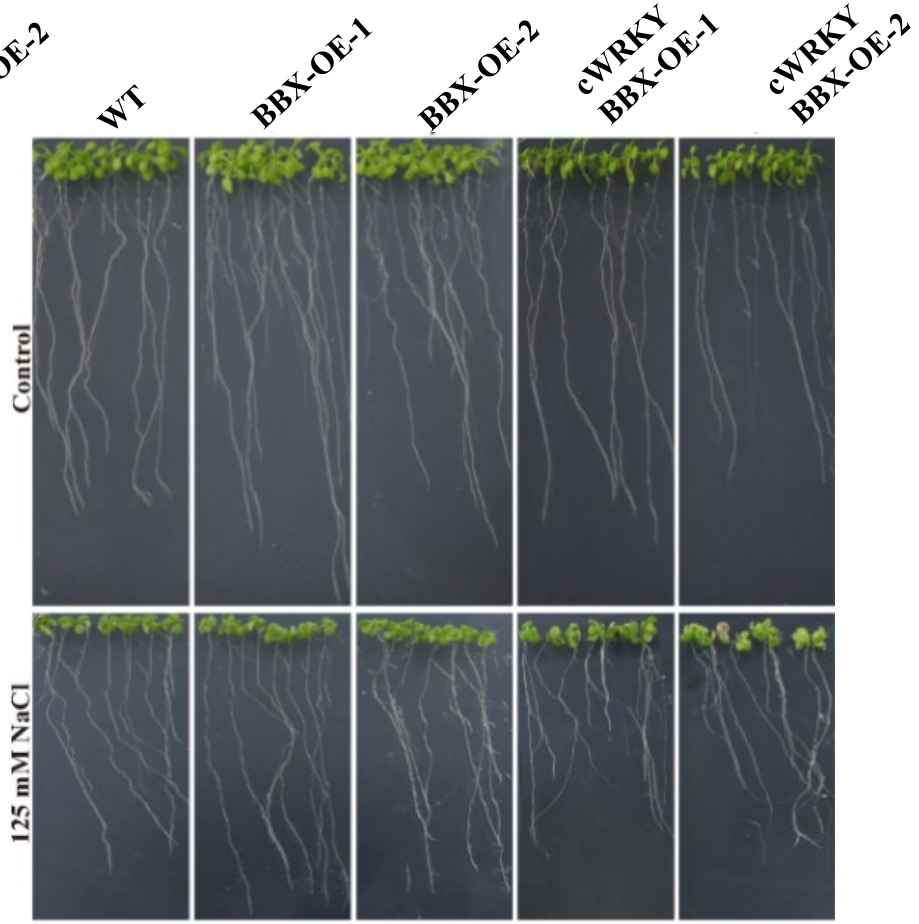
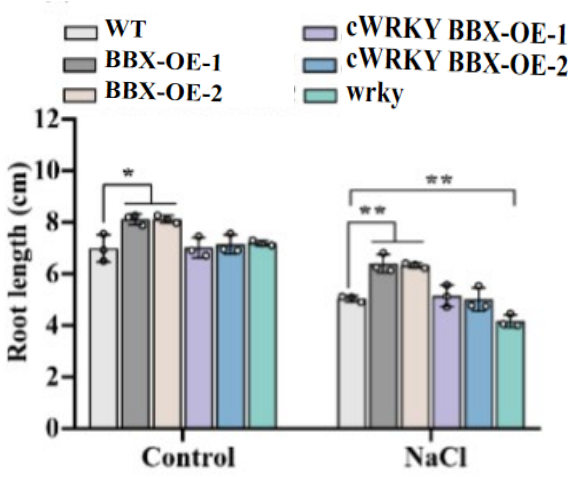
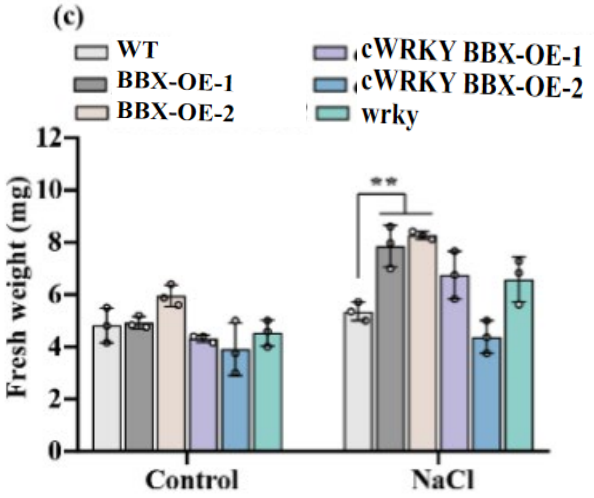
The salt tolerance of overexpression *BnaBBX22* lines with *WRKY* knocked out was significantly reduced





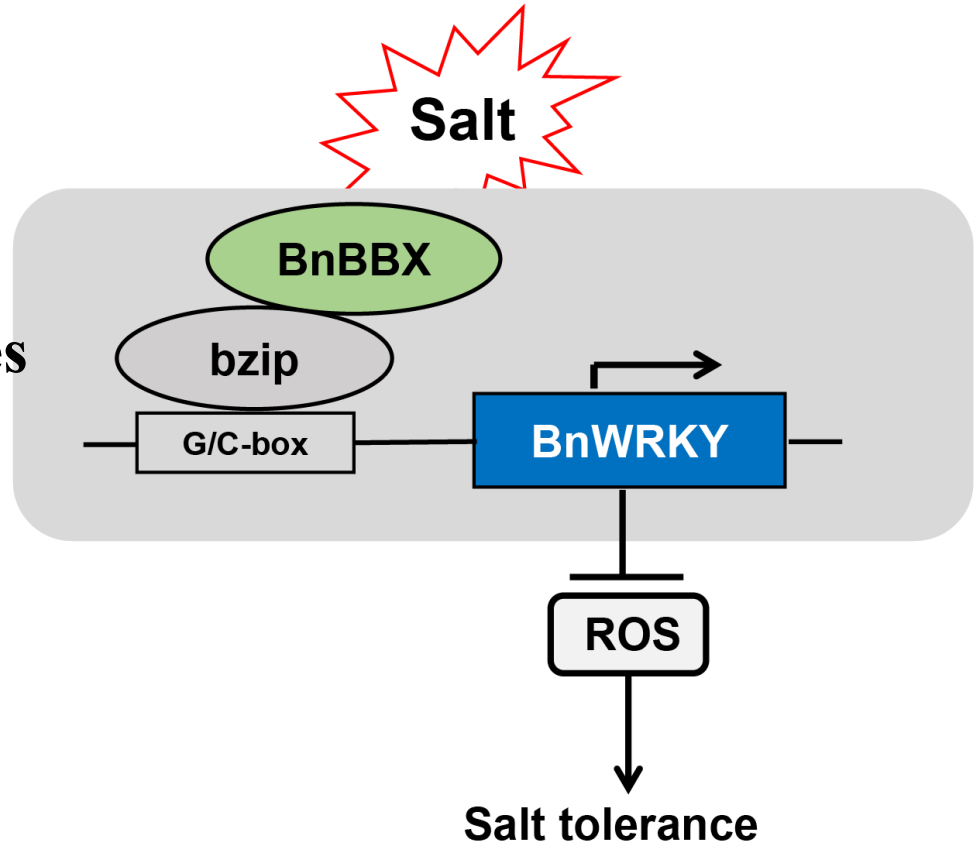




（unpublished）

BnaBBX22-BnabZIP-*BnaWRKY* module regulates salt tolerance in rapeseed

- Under NaCl stress, the expression of *BnaBBX22* was up-regulated.
- BnaBBX22 interacts with BnabZIP, and activates the expression of *BnaWRKY*.
- Then *BnaWRKY* regulates the ROS homeostasis in plants by regulating the expression and activity of genes related to ROS scavenging .
- Thereby enhance the salt tolerance of rapeseed.



（unpublished）

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- Aldiyar
- Haodong Li
- Juan Ding

Thank for your attention!