

# Genome-wide identification and expression analysis of the B-box gene family in peach fruit during postharvest cold storage and subsequent shelf life

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Postharvest Biology and Technology, Volume 172, February 2021, 111387

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## Abstract

The B-box transcription factor plays an important role in plant growth and development processes. However, information is lacking on the B-box genes in peach (*Prunus persica* L. Batsch). Many studies have been published on the B-box genes' response to light, but far fewer on abiotic stress response, especially to low temperature. Here, we identified 22 members of the B-box gene family in peach, and provided an integrated overview of detailed information, phylogenetic analysis, exon-intron structures, conserved motifs, chromosomal distribution, synteny analysis, and *cis*-elements prediction of each member. Peach fruit were stored at 0 °C and 4 °C for 28 days and subsequent shelf life of three days to investigate the potential role of BBX genes in cold adaption and occurrence of chilling injury (CI) of postharvest peaches. *Cis*-elements analysis showed that the corresponding low-temperature responsive (LTR) were found in the promoters of peach B-box genes *PpBBX3, 6, 10, 12, 15, 19-2, 20, 22,* and *26*. The expression levels of *PpBBX3, 6, 12, 15, 20,* and *26* are remarkably increased in fruit without CI during cold storage and subsequent shelf life, but remained at low level in CI fruit. And significant negative correlation was observed between expression of the six genes and the occurrence of CI of peach fruit. These results revealed that *PpBBX3, 6, 12, 15, 20,* and *26* were related to cold adaption of peaches during storage. The findings established a foundation for functionally characterizing the B-box gene family members and obtained potential candidate genes against cold stress for postharvest peaches.