

Cite this as: Li-Jun JU, Chong ZHANG, Jing-Jing LIAO, Yue-Peng LI, Hong-Yan QI, 2018. An oriental melon 9-lipoxygenase gene *CmLOX09* response to stresses, hormones, and signal substances. *Journal of Zhejiang University-Science B (Biomedicine & Biotechnology)*, 19(8):596-609.
<https://doi.org/10.1631/jzus.B1700388>

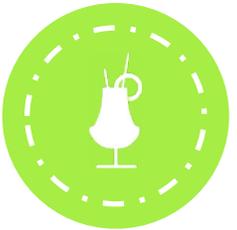
An oriental melon 9-lipoxygenase gene *CmLOX09* response to stresses, hormones, and signal substances

Key words: 9-Lipoxygenase (9-LOX), Hydroperoxide lyase (HPL), Allene oxide synthase (AOS), Green leaf volatile, Jasmonic acid

Research Summary



The expression of *CmLOX09* in the leaves of melon seedlings was regulated by stress, hormones and signal substances, which indicated that *CmLOX09* was able to participate in the defense response through HPL or AOS pathway.



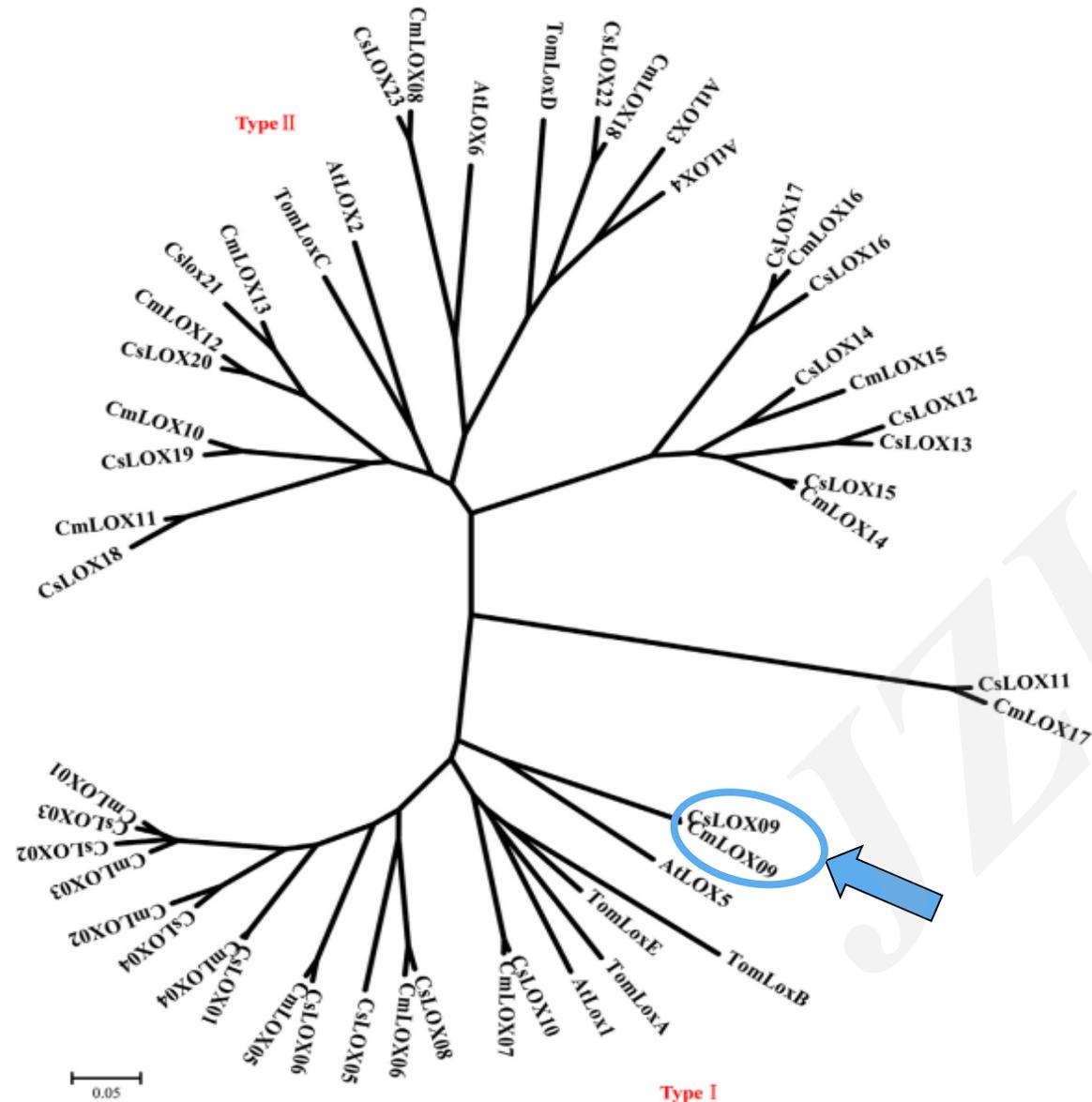
The content of 2-hexynol and 2-hexenal in leaves after MeJA treatment was significantly higher than in the control, these results implied that the *CmLOX09* response to MeJA might occur through the HPL pathway to produce C6 alcohols and aldehydes.



We analysed the content of JA in disease leaves after inoculated with *Podosphaera xanthii*, which suggested that the *CmLOX09* response to *Podosphaera xanthii* might occur through the AOS pathway to form JA.

Innovation points

The phylogenetic analysis of *CmLOX09* showed that it is closely related to cucumber *CsLOX09*, and *CsLOX09* reposed to low temperature and ACC (Yang *et al.*, 2012). In addition, the pepper 9-LOX gene *CaLOX1* also plays a role in osmotic, drought, high salinity and microbial pathogens stress response(Hwang and Hwang 2010; Hwang and Hwang 2015).



Accession number	The genome location	Predicted functionaltiy	No. of introns
MELO3C000268	Contig32354	13-LOX	2
MELO3C004244	Scaffold0003	13-LOX	8
MELO3C004247	Scaffold0003	13-LOX	9
MELO3C004249	Scaffold0003	13-LOX	8
MELO3C004250	Scaffold0003	13-LOX	8
MELO3C004252	Scaffold0003	13-LOX	8
MELO3C004253	Scaffold0003	9-LOX	8
MELO3C0011885	Scaffold00016	13-LOX	8
MELO3C0014482	Scaffold00022	9-LOX	8
MELO3C0014627	Scaffold00022	13-LOX	8

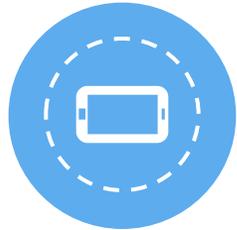
Phylogenetic analysis(Zhang *et al.*, 2014)

functionaltiy(Zhang *et al.*, 2014)

Innovation points



The promoter analysis revealed that the *CmLOX09* promoter has various cis-regulatory elements—shown in Supplementary Fig. S1



CmLOX09 and *CmHPL* exhibited a high-level expression under MeJA treatment. We analyzed the treatment times of 6h, 72h and 168h were selected to verify whether the accumulation of GLVs is induced by high level *CmHPL* expression.



The endogenous JA, after inoculation with *Podosphaera xanthii*, was determined to verify whether the 9-LOX gene *CmLOX09* was involved in the fungus-induced production of JA.

S Y A U 



Thanks You!

