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Characterization and expression profiles of *MaACS* and *MaACO* genes from mulberry (*Morus alba* L.)

Key words: Mulberry fruit, MaACS, MaACO, Gene expression, ABA, Ethephon

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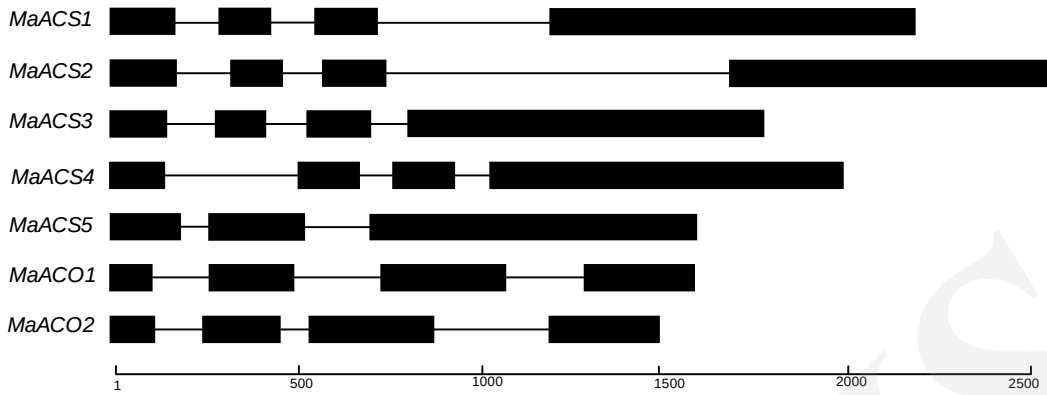
Introduction

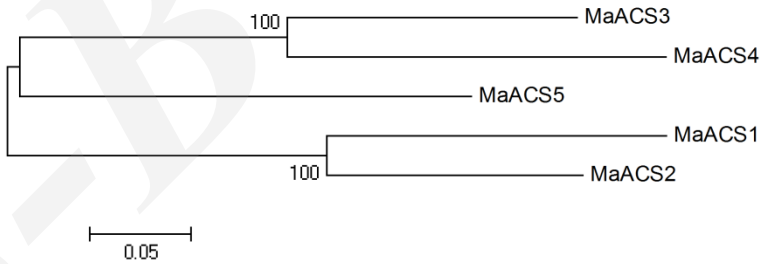
• Ethylene is involved in many aspects of the plant life cycle and one of the most important factors regulating softening, senescence and abscission of fruit, and the concentration of ethylene increases gradually during the development of climacteric fruit.

• ACS and ACO are the key enzymes producing ethylene, and are typically encoded by multiple *ACS* genes and *ACO* genes. ACS and ACO act as accelerators in fruit ripening by catalyzing the production of ethylene at the late fruit ripening stage, leading to irreversible senescence. It has been shown that once the expression levels of *ACS* and *ACO* genes were suppressed or mutated, the production of ethylene was down-regulated and the shelf life of fruit was also prolonged.

• Mulberry fruit is one of the most popular fruits worldwide with short maturity stages and shelf-life. There are no reports on *ACS* and *ACO* genes in mulberry, and never know which how to regulate the development and senescence of mulberry fruit.

Result



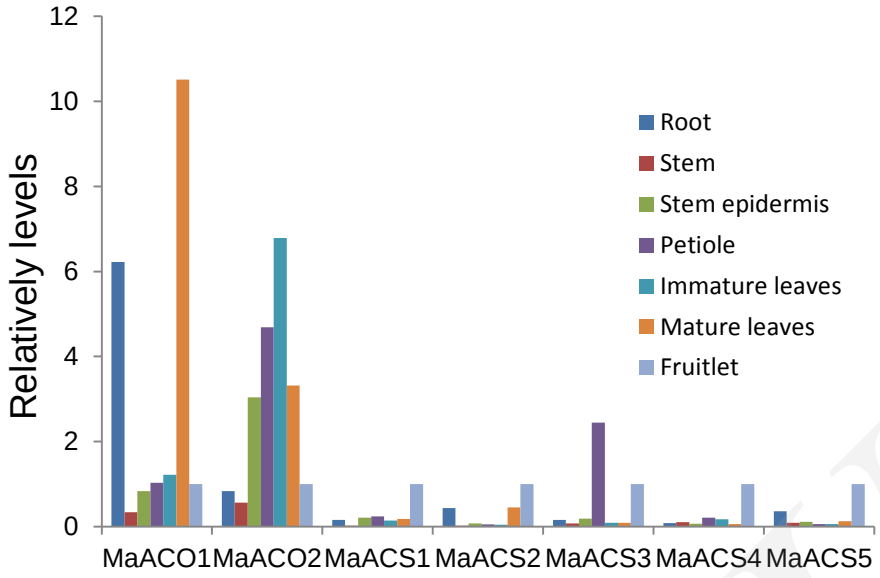


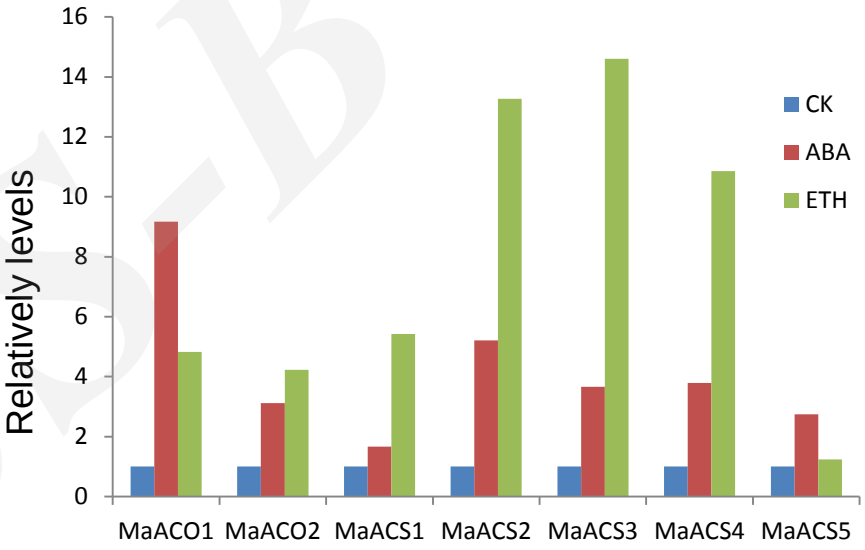

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MaACS1  413  VCIANMDDHTMEVALKRIRSFV-LQKKEPVVVP--NKKKCWQDH-NLRLSFSARRFD---
MaACS2  412  VCFANMEEETVNVALERIRSFVGKEAKQAAVPPVAKAKRNWRNNGNLRLSFNSRRHEQEG
MaACS3  408  VCFANMSEETLELAMQRLKSFVTEYNRINNSNKESSAKNSRRRSLTKWVFRLSFDGADRQ
MaACS4  406  MCFANMSEETLHVALQRLKAFAETLIKSKQ-QQQFGLSFSRTRSLTRWVFQLASDHDHRE
MaACS5  415  VCFANMSEKTLEVALKRIHNFTEKRETISSRN--------------------------

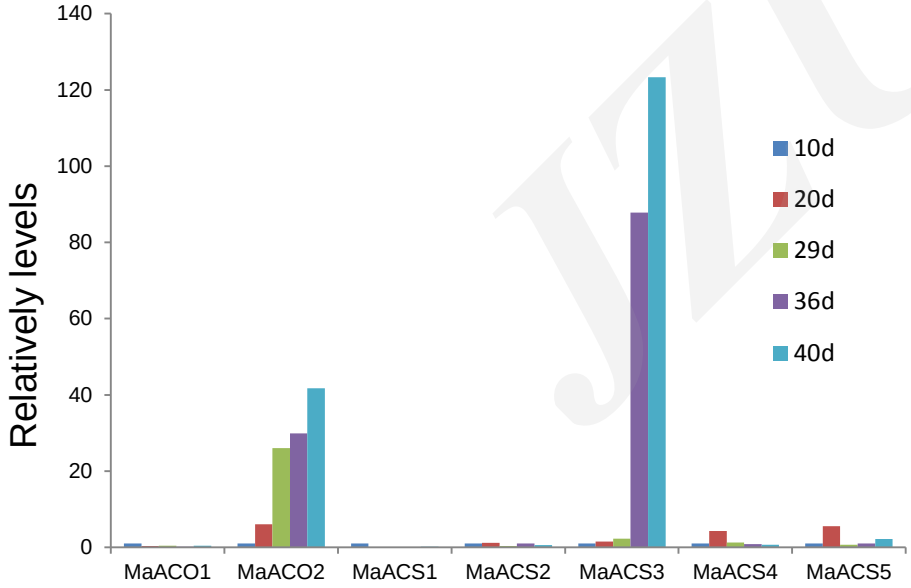
MaACS1  466  DFL----MASPHSPIPHSPLVQART
MaACS2  472  GFMSAAHMLSPHSPMPQSPLLRART
MaACS3  468  PEER--------------------
MaACS4  465  TDR--------------------
MaACS5  446  -------------------------
```

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Result







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Conclusion

• We are the first to report *ACS* and *ACO* genes from mulberry and demonstrate their expression profiles.

• Tissue-specific-expression analysis revealed that *MaACS* and *MaACO* genes showed different patterns in various mulberry tissues, and two patterns throughout the development of mulberry fruit. *MaACS* genes also tend to be expressed in fruit rather than in other tissues.

• Further, the transcription levels of *MaACS* and *MaACO* genes could be up-regulated by ABA and ethephon

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