

## Cloning of Strawberry's Malonyltransferase Genes and Characterisation of Their Enzymes

**Authors :** Xiran Wang, Johanna Trinkl, Thomas Hoffmann, Wilfried Schwab

**Abstract :** Malonyltransferases (MATs) are enzymes that play a key role in the biosynthesis of secondary metabolites in plants, such as flavonoids and anthocyanins. As a kind of flavonoid-rich fruit, strawberries are an ideal model to study MATs. From Goodberry metabolome data, in the hybrid generation of 2 strawberries various, *Fragaria × ananassa* cv. 'Senga Sengana' and 'Candongga', we found the malonylated flavonoid concentration is significantly higher in 'Senga Sengana' compared with 'Candongga'. Therefore, we aimed to identify and characterize the malonyltransferases responsible for the different malonylated flavonoid concentrations in two different strawberry cultivars. In this study, we have found 6 MATs via genome mapping, metabolome analysis, gene cloning, and enzyme assay from strawberries, which catalyzed the malonylation of flavonoid substrates: quercetin-3-glucoside, kaempferol-3-glucoside, pelargonidin-3-glucoside, and cyanidin-3-glucoside. All four compounds reacted with FaMATs to varying degrees. These MATs have important implication into strawberries' flavonoid biosynthesis, and also provide insights into insights into flavonoid biosynthesis, potential applications in agriculture, plant science, and pharmacy, and information on the regulation of secondary metabolism in plants.

**Keywords :** malonyltransferase, strawberry, flavonoid biosynthesis, enzyme assay

**Conference Title :** ICBBB 2023 : International Conference on Bioscience, Biotechnology, and Biochemistry

**Conference Location :** London, United Kingdom

**Conference Dates :** June 22-23, 2023