# Quantitative Analysis of Volatile Flavor Compounds in Two Transgenic Tomato Fruits using APCI-MS Technique

**Suthat Surawang[1*], Nithiya Rattanapanone[2] and Andy J. Taylor[3]**

*[1]Department of Product Development Technology, Faculty of Agro-Industry, Chiang Mai University, Chiang Mai 50100, Thailand.*
*[2]Department of Food Sciences and Technology, Faculty of Agro-Industry, Chiang Mai University, Chiang Mai 50100, Thailand.*
*[3]Division of Food Sciences, School of Biosciences, University of Nottingham, Sutton Bonington Campus, Loughborough, LE12 5RD, UK.*

**Corresponding author: E-mail: aiissrwn@chiangmai.ac.th*

## ABSTRACT

***The volatile flavor compounds of two transgenic tomato fruit (Lycopersicon esculentum Mill. cv. Ailsa Craig), transformed with either an ACC-oxidase (ACO1) antisense gene construct or a polygalacturonase (PG) sense suppression gene construct, were analyzed at various stages of tomato fruit ripening compared to non-transformed fruit. Nine key volatile flavor compounds released following maceration of the tomato tissue were measured, using Atmospheric Pressure Chemical Ionization-Mass Spectrometry (APCI-MS) in real-time analysis. ACO1 antisense fruits, which showed less activity of ethylene production, had lower levels of most volatiles measured throughout ripening compared to wild type and PG sense suppression fruits. PG sense suppression fruits, with low polygalacturonase activity, would be expected to have the same quality as wild-type fruits in terms of volatile components.***

**Keywords:** Flavor, Fruit ripening, Tomato, APCI-MS

## INTRODUCTION

The perceived flavor of fresh tomato fruits is a result of a complex interaction between sugars, organic acids, minerals, and aroma volatile compounds. The volatile composition during tomato fruit ripening has been studied extensively (Kazeniac and Hall, 1970; Buttery et al., 1971; Buttery et al., 1987; Buttery et al., 1988). Although over 400 compounds have been identified as volatile components of fresh tomatoes and tomato products (Petro-Turza, 1987), a small number of these compounds is involved in fresh tomato aroma. The following compounds are reported to contribute to fresh tomato aroma: hexanal, (*Z*)-3-hexenal, (*E*)-2-hexenal, 1-penten-3-one, 6-methyl-5-hepten-2-one, β-ionone, ethanol, methanol, (*Z*)-3-hexenol, 2- and 3-methylbutanal, and 2-isobuthylthiazole (Buttery et al., 1987; Baldwin et al., 1991). Some of these compounds are formed during fruit ripening by deamination and decarboxylation of amino acids, for example,