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Poster Abstract - D.24

NUTRIENT SOLUTIONS CAN INFLUENCE THE (POLY)PHENOLIC COMPOSITION OF TOMATO FRUITS?

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During recent years the contents of (poly)phenolic compounds in plant foods have received much attention because of their biological properties and potential human health benefits. Epidemiological studies have shown that consumption of fruits and vegetables rich in phenolic compounds is associated with lower risk of cardiovascular diseases and cancer mortality. Natural phenolic compounds occur as free compounds, in glycosidic linkage or in some instances as acylated derivatives.

The contents of (poly)phenolic compound in various tomato varieties were characterized as flavonoids (naringenin, rutin, quercetin and kaempferol) and hydroxycinnamic acids (chlorogenic, caffeic, ferulic and coumaric). The most abundant hydroxycinnamic acid was chlorogenic acid.

The (poly)phenolic compound contents of tomatoes depend on genetic, and environmental (temperature, light, water availability) factors, and on the agricultural techniques used (cultivars, plant growth regulators, date of harvest, etc).

In recent years increasing interest has been focused on the use of soilless cultivation systems using posidonia (*Posidonia oceanica* (L) Delile) as substrate and nutrient solution containing several salt types ($Ca(NO_3)_2 \cdot 4H_2O$, KNO_3, KH_2PO_4, $MgSO_4 \cdot 4H_2O$, K_2SO_4, HNO_3) at various concentration. This production method presents together with some disadvantage, such as high installation cost and dependence on the electricity automation of the system, several advantages. The main advantages are: 1) possibility of using areas not suitable for traditional agricultural systems, 2) greater productivity per area, 3) possibility of several harvests during the year, 4) less consumption of fertilizer and water, 5) greater hygiene an less possibility of contamination with microorganisms, nematodes, insects inherent to the soil, 6) less manpower needed, and 7) high quality control.

It has also been shown that the cultivation condition can be modified so as to increase the concentration of desiderable constituents. As example water or nutrient solutions containing moderate to high concentration of salts are frequently supplied to improve the taste of tomato fruits. Unlike growth and yield studies, few experiments have been conducted on the influence of NaCl salinity on nutraceutic properties of tomatoes such as the (poly)phenolic compound contents. The aim of this study was to investigate the influence of three levels of electric conductivity (by varying the NaCl concentration) of the nutrient solution on the (poly)phenolic compound contents of tomato fruits (cv. Kabiria) harvested at four ripening stages.

Three level of electric conductivity (EC) were investigated: low (L), high (H) and medium (M). Results show that the main phenols presents in Kabiria fruits in all the ripening stages and EC levels are

chlorogenic acid, rutin and naringenin. Caffeic and coumaric acid are present at very low concentration (< 1 mg/kg f.w.). The (poly)phenolic content seems to be related to the salinity and to the ripening stage.