Proceedings of the Joint Meeting AGI-SIBV-SIGA
Assisi, Italy – 19/22 September, 2011
ISBN **978-88-904570-2-9**

Poster Communication Abstract – 8.26

CHANGES ASCORBATE PEROXIDASE GENE EXPRESSION POST-HARVEST IN *BRASSICA RAPA* L.

PONTECORVO G., WOODROW P., MASSARO G., CARILLO P., KAFANTARIS I., FUGGI A.

Department of Life Science, Second University of Naples "SUN", Via Vivaldi 43, 81100 Caserta (Italy)

Ascorbate peroxidase, gene expression, semi-quantitative RT-PCR

Broccoli is a very good source of dietary fiber, vitamins A, C, K, and B6, folate, and manganese. Additionally, many studies indicate that a regular intake of broccoli has a strong correlation with cancer prevention and inhibition [1]. Broccoli is harvested at an immature stage before growth has ceased. Broccoli is known as an ascorbate rich vegetable, although rapid degradation of ascorbate has been seen to occur in florets at ambient temperatures after harvest decreasing the nutraceutical proprieties. It is well known that ascorbate plays essential roles as an antioxidant and a cofactor of many dioxygenases which determine many important steps of cell metabolism in plants and animals [2]. Harvesting can result in considerable damage due to the sudden disruption in water, energy, nutrient, and hormone supplies and can cause wounding stress in plants. In order to understand the regulation of the ascorbate level, it is important to determine the alteration of ascorbate related enzyme activities or gene expressions under harvest. A well recognized enzyme consuming ascorbate is ascorbate peroxidase (APX), which catalyzes the reduction of hydrogen peroxide to water with simultaneous oxidation of ascorbate with a high specificity. APX isoenzymes are distributed in at least four distinct cellular compartments: stromal APX (sAPX) and thylakoid membrane bound APX (tAPX) in chloroplasts, microbody (including glyoxysome and peroxisome) membrane-bound APX (mAPX), and cytosolic APX (cAPX). As a first step towards the study of the gene regulation of the members of the Apx gene family, chloroplastic (Br-chlApx) and cytosolic (Br-cApx) isoforms transcript were isolated by RT-PCR in *Brassica rapa.* To investigate the changes of BrApx expression level in harvested broccoli a semi-quantitative RT-PCR were performed in different tissues (layer, stalk and florets) at different days (0, 4 and 14 d). Overall, the layer was the tissue with a higher expression level of the all BrApx isoforms. Also at 0 d and after harvest (4 and 14 d) Br-chlApx transcript in the layer and floret did not change. Whereas, in the stalk all BrApx transcript, except stromal Apx isoform, decreased more after harvest. It is important quantify the ascorbate peroxidase activity in broccoli after harvest to asses the therm-life for a healthy diet.

This work has been supported by "Seconda Università degli Studi di Napoli", "Ministero dell'Università" e "Ministero della Ricerca Scientifica e tecnologica" of Italy (PRIN 2008S9T3KK_003), "Regione Campania, PSR 2007-2013 Misura 214 azione f2 progetto Agrigenet".

REFERENCES

[1] Moreno DA, Carvajal M, López-Berenguer C, García-Viguera C (2006) Chemical and biological characterization of nutraceutical compounds of broccoli. J Pharm Biomed Anal 41, 1508–1522.

[2] Nishikawa F, Kato M, Wang R, Hyodo H, Ikoma Y, Sugiura M, Yano M. (2003) Two ascorbate peroxidases from broccoli: identification, expression and characterization of their recombinant proteins. Postharvest Biology and Technology 27, 147-156.