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GLUTATHIONE OXIDO-REDUCTIVE STATE INTO *BRASSICA RAPA* L. CV. *SYLVESTRIS* DURING POSTHARVEST STORAGE

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Leafy vegetables at harvest suffer a strong stress condition due to the block of water, nutrient and hormone flow. The cutting, in fact, leads to the production of ROS (reactive oxygen species) that activate programmed senescence and/or repair processes both locally and systemically. The control of the oxidative stress involves enzymes and metabolites with antioxidant activity such as superoxide dismutase and catalase, ascorbate, glutathione, tocopherols, carotenoids and phenol compounds.. A key role is played by glutathione (GSH) a sulphur compound that can react with ROS as antioxidant and as intermediate of the the ascorbate cycle. It regenerates ascorbate through the dehydro-ascorbate reductase. The oxidised glutathione (GSSG) is then reduced to glutathione (GSH) by the NADPH dependent glutathione reductase. Glutathione, on the other hand has a key role in the floem distribution of sulphur compounds and synthesis of sulphur secondary products. In this view the evaluation of glutathione and its redox state is essential to understand the plant organs physiological state.

In this study glutathione and its redox state (GSH/GSSG) as well as for other sulphur metabolites were determined during postharvest storage of the the edible part of Brassica rapa L. cv. Silvestris (friariello napoletano). The top parts of the plants were collected at crop maturity. placed in plastic trays and stored at different temperature (4 °C, 9 °C and 20 °C). Samplings, in triplicate, were made at harvest and during storage up to 20 d. In orgder to evaluate the effect of storage on different organs, the samples were separated in floret, leaf and stem, quickly frozen in liquid nitrogen and stored at -80 °C. The sulphur compounds were determined on acid extracts by derivatization with monobromobimane (MBB). Being the analysis of reduced sulphur compounds in tissue extracts very difficult because they are rapidly oxidized by molecular oxygen, leading to an underestimation of the reduced form and, therefore, of their redox state within the cell, the derivatization reaction with (MBB) was done by an automatic method assisted by the HPLC autosampler. The online separation and quantification of the fluorescent derivatives were done by HPLC. The results suggested that in plant tissues stored at 4 ° C glutathione was highly reduced at harvest. During postharvest it firstly decreased when the ascorbate level in the tissues was high and subsequently increased, evidencing that it could be highly involved in the oxidative stress control in the first period of storage. Such pattern occurred in leaf blade and stem, but not in the floret tissue that showed unchanged levels of glutathione up to 8 d of storage at 4°C.

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