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METABOLITES AND PEROXIDASE ACTIVITIES IN BRASSICA RAPA L. CV. SYLVESTRIS DURING POSTHARVEST STORAGE

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Leafy vegetables at harvest are subjected to considerable stress due to the sudden disruption in energy, nutrient and hormone supplies. They suffer an oxidative stress that activates senescence processes involving physiological biochemical and molecular events that affect also their nutritional, nutraceutical and organoleptic properties. In this work we studied the postharvest changes occurring in the edible part Brassica rapa L. subp. sylvestris (friariello napoletano) by studying the patterns of metabolites as carbohydrates (glucose, fructose, sucrose), protein, chlorophyll, tocopherols, ascorbic acid and glucosinolates as well as of peroxidase isoenzymes. The analyses were done in floret, stem and leaf blade in plants kept stored in different conditions. The experiments were done by collecting the top turnips at commercial maturity. At the harvest the broccoli were saved in plastic boxes at 20°C, 10°C, 4°C and at 4°C in modified atmosphere (O₂ 5%; CO₂ 2%; N₂ 93%) up to 20 days from the harvest. At sampling, the edible part were separated in florets, stem and leaf blade, freeze-dried and powdered in liquid nitrogen, and, subsequently, used for the analyses.

During storage a significant decrease of carbohydrates (glucose, fructose, sucrose), protein, chlorophyll, tocopherols, ascorbate and glucosinolates occurred even if at different extent in all organs considered. Ascorbate concentration higher in leaf blades than the florets at the harvest, rapidly decreased in all organs during storage. Protein degradation was also accompanied by an increase in free amino acids. The peroxidase activities were due to acid, neutral or basic isoforms differently distributed in the plant tissues. The neutral and basic isoforms were dominant in leaf blade and florets, whereas acid isoforms were dominant in the stem. The activities increased significantly in florets and leaf blades during storage, mainly basic and neutral isoforms. In the stem, instead the activity decreased mainly for the decrease of the acid isoforms.

The storage at 4 °C, as expected, slow down the changes even if ascorbate concentration stayed higher in the samples kept in modified atmosphere storage.

The overall detailed results were analysed and discussed.

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