**Title** Controlled atmosphere storage of 3 Italian cultivars of olives for oil production

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**Keyword** olive oil; quality; low oxygen; pre-processing storage

**Abstract**

The objective of this work was to verify the effect of cold storage and controlled atmosphere (CA) on long term storage of olives in relation to quality parameters of the extracted oil. 'Coratina', 'Leccino' and 'Ogliarola leccese' olives were stored in air at ambient temperatures (approximately 15 to 20°C), air at 5°C, and 2% $O_2$ in nitrogen at 5°C, in two replicates for treatment. Initially, and after 15 and 30 day samples were taken, oil was extracted with a laboratory scale milling plant. Before milling, respiration rate was measured with the static system. The following quality attributes were measured on oil samples: acidity (related to the presence of free fatty acid), peroxide value (peroxides are the first products of oxidation), coefficients of specific extinction at 232 nm (related to the presence of products of primary oxidation) and 270 nm (related to the presence of products of secondary oxidation), and oil stability (Rancimat test). 'Leccino' and 'Ogliarola leccese' olives showed a high incidence of decay after 30 days of storage in room conditions. Cold storage and controlled atmosphere had a significant effect on slowing down the respiration rate, and therefore, the metabolic activity of the drupes for all cultivars. Results on oil samples show a strong effect of low temperature storage on quality attributes. Results show a good potential for application in the olive oil industry in order to preserve quality of the product and to lengthen the processing season, while not many additional benefits can be attributed to the use of low oxygen. The implementation of cold storage of the fruit in the olive oil industry may lead to a general increment of oil quality and to the decrease of the incidence of capital costs due to the extension of the extraction season.