Abstract

In most part of Europe olives for processing are usually stored at room temperature before oil extraction with a strong negative impact on oil quality attributes, especially when storage exceeds few days, as in very often the case. Objective of the work was to verify the effect of cold storage, and controlled atmosphere on long term storage of olives in relation to quality parameters of oil. 'Coratina', 'Leccino', and 'Ogliarola' olives were stored in air at ambient temperature (approximately 15 to 20°C), air at 5°C, and 2% O_2 at 5°C, in two replicates for treatment. Initially, and after 15 and 30 days samples were taken, and oil extracted with a laboratory scale milling plant. Before milling, respiration rate was measured with the static system. On oil samples the following quality attributes were measured: acidity, peroxide value, coefficients of specific extinction at 232 and 270 mm, and stability (Rancimat test). Cold storage and controlled atmosphere had a significant effect on respiration rate of the drupes, with ambient-air-treatment presenting three time the respiration rate of the treatment in 2% O_2 at 5°C. Samples held in air at 5°C showed and intermediate pattern. Data were consistent for all the three cultivars. Results. Results on oil samples show a strong effect of low temperature storage on quality attributes. Low oxygen controlled atmosphere had only a limited additional effect. In particular, acidity resulted below the extra-virgin limit (0.8%) for all the duration of the experiment in 'Coratina' held at 5°C, both in air and controlled atmosphere. For the other varieties acidity resulted significantly lower for the refrigerated samples, but it only kept within the extra-virgin limit for 15 days. After 30 days of storage samples in low O_2 presented a significantly lower acidity than sample in air at 5°C. Peroxide value kept practically unchanged during the whole storage duration for samples held in cold storage, while it sharply increased for treatment held in air at ambient temperature, especially after 15 days of storage. Again results were consistent for all the 3 cultivars. Same results were obtained for the stability index. Specific extinction did not show significant differences among treatments, if not slightly for K_{232} in 'Leccino' variety. Results show a good potential for application in the olive oil industry in order to preserve quality of the product and lengthen the processing season, with the possibility of decreasing extraction costs.