

Characterization of naturally debittered olives (cv. Throumbolia) at different harvesting periods and maturity levels on the tree: Endophyte microbiota and physicochemical characteristics

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Objective:

Throumbolia olives are very nutritious (high phenolic content) with desirable sensorial characteristics, nevertheless, their picking is of high concern since their maturity level (consequently debittered taste) is not the same for all olives in a tree, not allowing for massive picking. This results in increased costs for picking and in mature olives falling on the ground and getting rotten really quickly, thus fostering disease and olive fruit flies. The aim of this study was to characterize the endophyte microbiota and the nutritional value of Throumbolia olive Greek variety.

Methods:

Throumbolia (*Olea europaea* var. *media oblonga*) olive fruits variety from Crete Island were collected at three different maturity levels on the basis of their skin color (green, purple and black) for two different harvesting periods. The olives were analyzed in terms of their microbiological characteristics by isolating the endophyte microbiota. Their physicochemical characteristics including color, texture, maturity index, total phenolic compounds, total anthocyanin content, total antioxidant activity, polyphenol oxidase activity and total pigments analysis were also evaluated.

Results:

The results indicated the presence of various fungi and yeasts, with *Phoma oleae* fungus being the dominant and responsible for the loss of bitterness while ripening on the tree. Simultaneously, the water content of the olives was reduced vs maturity level leading to shrinkage of the olives (»40% reduction from the maturity level 1-green olives to the maturity level 3-black and shrunk olives). Their exposure to air improved their color (darker colour) through oxidation process. All the above lead to Throumbolia olives of desired taste and texture and in high total phenolic compounds (7.14 mgCA/g), total anthocyanin content (57.18 mg/L) and antioxidant activity (2.46 mg Trolox/g) as affected by the ripening stage of the picked olives. The fungi found in the olives were isolated applying appropriate techniques.

Conclusions:

This study monitored all the microbiological and physicochemical characteristics alterations that took place during maturation and natural debittering of Throumbolia olives. The isolated fungi will in future be used in laboratory scale inoculation of picked unripen Throumbolia olives, targeting to controlled maturation, thus minimization of picking cost and rotten fruits.