

# ORGANOLEPTIC CHARACTERIZATION OF MONO CULTIVAR EXTRA-VIRGIN OLIVE OILS IN ALBANIA

Fatmira Allmuça<sup>1\*</sup>, Xhevaire Dulja<sup>2</sup>, Aulona Veizi<sup>3</sup>

<sup>1</sup>Ministry of Agriculture, Food and Consumer Protection, Skenderbej Square, No 2,  
1001 Tirana, Albania

<sup>2</sup>Faculty of Economy and Agro-busyness, Agricultural University of Tirana, Kamez,  
1000 Tirana, Albania

<sup>3</sup>Center of Agricultural Technology Transfer, "Shamogjin", Komuna Novosele, 9401 Vlora, Albania

\* e-mail: miraallmuca@gmail.com

## Abstract

The quality food is one of the fundamental aspects of market research, spurred by the growing concern and awareness of consumers regarding health and environmental issues. Food quality issues are considered as a result of socio-economic changes to be implemented according to policy and regulatory needs of the market. In particular, with the ever-increasing globalization of trade, issues of quality standards and control have become a central concern to be addressed. In that regard this paper has addressing this subject in the characterization of the extra virgin olive oil out of autochthon cultivars, being aware that the composition of olive oil results from an interaction of genotype, environment and agronomic factors.

This research was conducted in Tirana and Vlora regions for the organoleptic characterization of the three virgin olive oil samples obtained from three olive cultivars (cv): the Ulliri i Bardhë i Tiranës and Kushan (Preza), Tirana cv-s and Kalinjot cv in Vlora.

Organoleptic evaluation of oil is made from the official Panel test. Characteristics have been identified for fruitiness, bitterness and pungency. There is evidence that Albanian oils are sweet and balanced, with fruit flavor. Timing period of harvesting based on olive fruit fly (*Bactrocera olea* GMEL) monitoring has been taken into consideration in Kalinjot cultivar in Vlora in 2010 - 2011. The infection rate by olive fruit fly and the use of Neobordolez (new biopreparate), integrated with olive traps, didn't influence the quality of the extra virgin olive oil.

**Key words:** *Extra virgin olive oil, Organoleptic characterization, Mono cultivar olive oil, Autochthonic cultivars, Albania.*

## 1. Introduction

Table olives and olive oil are amongst the most well- and earliest-known products of Albania. Olive still retains a notable share in agricultural products. Recently, olive and olive oil production has witnessed continuous growth in both quantitative and qualitative terms, regarding to the national olive development program. Currently, total number of olive trees is about 8 million; in production are about 5 million trees with the total production of 125 thousand tons. Total production of olive oil is 13,500 tons. (Statistical data from 2012 - MAFCP).

Albania has established official olive oil Panel test. This test is performed by elected tasting committee members who are setting out the positive and negative attributes of olive oil through sensory organoleptic evaluation.

The study of sensory perception of qualities is a strategic tool of sensory profiles "ad hoc" recognition (ideal output). This paper also establishes the possibility of knowing the characteristics of monocultivar extra virgin olive oil for the strategic marketing development of this product.

## 2. Materials and Methods

The study was conducted in collaboration of the official panel test with Agricultural Technology Transfer Center (ATTC) - Vlora for three olive oils obtained from following autochthonic cultivars: Ulliri i Bardhë i Tiranës, Kushan and Kalinjot. The three monocultivar oils were analyzed for physico-chemical parameters - in the laboratory of the University "G. D'Annunzio" Chieti

in Pescara, Italy and the sensory profiling was done by Albanian official panel of experts. For the first time, monocultivar extra virgin olive oils have been analyzed and their profiles were characterized for: fruitiness, bitterness and pungency.

In addition, it was evaluated how the quality of olive oil from the Kalinjot cultivar has been influenced by the treatment against *Bactrocera oleae* GMEL and its level of infection. In this case, the quality of olive oil has been evaluated as comparison between combined effects derived from olive trap use and application of biopreparate Neobordolez (mixture of Bordo with kalin-not yet produced at industrial level) and the control (untreated plot). Olives were taken before ripening.

The olives were taken out of autochthonic cultivars into native cultivar population level. Ulliri i Bardhë i Tiranës cultivar was collected in Tufina, Tirana, Kushan cultivar was collected in Preza, Tirana and Kalinjot cultivar was collected from the collection plots of the ATTC Vlora. Sampling was made according Bendini *et al.* [2], or according the importance of genetic variety, geographical origin and brand). The olives were harvested in the period November - December 2012. From each cultivar were taken samples of 20 kg, and the processing was done within 24 hours in two-phase processors with capacity 30 - 50 kg/hour.

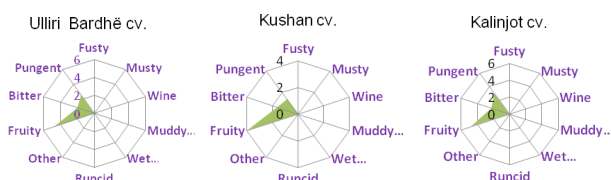
Monocultivar oils were analyzed by method COI/T.20/Doc. N. 15/Rev 2; COI/T.20/Doc.5/Rev 1; COI/T.20/Doc.6/Rev 1; COI/T.20/Doc. 15/Rev. 4. The data were statistically processed by method COI/T.20/Doc. N° 22 Annex 3. The EU Regulation (CE) N° 2568/91 on oil certification was also been taken into consideration.

### 3. Results and Discussion

#### 3.1 Monocultivars oil profiles

Physico-chemical analysis showed that the three oils belong in the "extra virgin olive oil" category.

The sensory analyses of the three oils from autochthonic cultivars have shown interest for their very good sensory-organoleptic quality, especially for aromatic flavor and their pungency (Figure 1).



**Figure 1. Sensory profiles of oils for their fruitiness, bitterness and pungency characteristics**

All three oils are aromatic and flavored with pungent tendency. They are balanced and well harmonized.

The full olive oils profiles evaluated by the panel test are as following:

#### 1. Kalinjot cv. taste:

Medium: green grassy

Light: apple, almond, green leaf with intensive green fruit flavour and in harmony with its attributes of bitterness and pungency.

#### 2. Ulliri i Bardhë i Tiranës cv. taste:

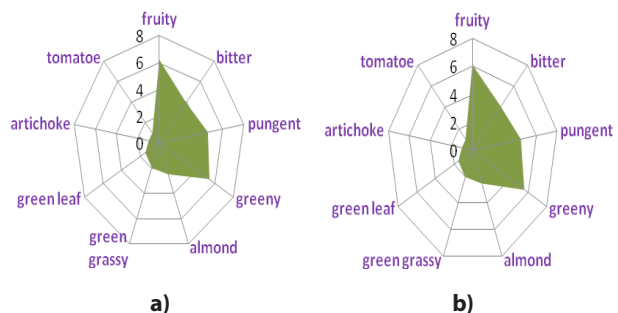
Light: apple, almond, green grassy, spices and aromatic herbs.

#### 3. Kushan cv. taste:

Light: apple, almond, green grassy.

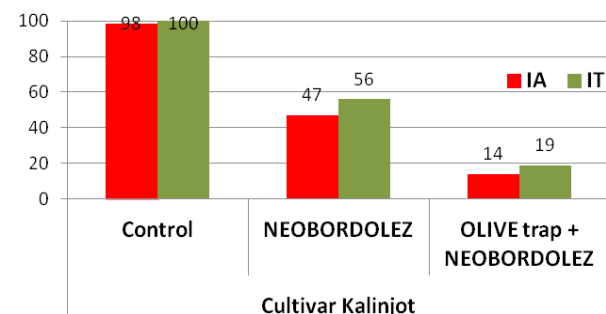
#### 3.2 Kalinjot cv.case

In ideal terms of harvesting and processing, olive oil obtained from Kalinjot cultivar (according Allmuça *et al.*) [1] has reached the fruitiness of 6.1, bitterness 4.1, pungent 4.6, greeny 5.6, almond 2.5, green grassy 2.0, green leaf 1.5, artichoke 1 and tomatoe 1 taste (in the system of evaluation from 1 to 10), as shown in Table 1 and Figure 2.



**Figure 2. The sensory profiling of Kalinjot olive oil: (a) control plot and (b) treated plot, ATTC Vlora**

Furthermore, Figure 2 also shows that the quality characteristics of Kalinjot olive oil were not been influenced by the infection rate of *Bactrocera oleae* GMEL and its treatment with Neobordolez combined with olive traps as shown in Figure 3.



**Figure 3. Active and total infestation by olive fruit fly (*Bactrocera oleae* GMEL) in "Kalinjot" cv, ATTC Vlora**

Table 1 shows that there is no any significant difference between control and treated plots for: Delta K, K 232, K 270, peroxide index and free acidity.

**Table 1. Olive oil quality parameters (Kalinjot cv. case in control and treated plots with biopesticides)**

Olive oil parameters	Neobordolez	Control
Delta K	- 0,001	- 0,002
K 232	1.451	1.462
K 270	0,071	0,089
Peroxide index	6	6
Free acidity	0.1	0.18

#### 4. Conclusions

- Autochthonic monocultivar olive oils are aromatic and flavored with pungent tendency. They are balanced and well harmonized.
- Early harvest, should present a key method in harvesting high quality olives, assuring the raw material for a high quality extra virgin olive oil. Although olive fruit fly (*Bactrocera oleae* GMEL) remains a serious problem in olive sector, if develops high population and the infestation rate that exceed 95% in control plot. Kalinjot cultivar has not shown significant differences in terms of infestation rate by pest (in proximity of the harvest moment) and the olive oil quality characteristics.

#### 5. References

- [1] Allmuça F., Dano S., Uka R. (2013). *Olive fly (Bactrocera oleae GMEL) management with new allowed formulations, satisfying the olive oil quality requirements*. International Refereed Journal of Engineering and Science, Vol. 2 (5), pp. 09 - 13.
- [2] Bendini A., Cerretani L., Carrasco-Pancorbo A., Gómez-Caravaca A. M., Segura-Carretero A., Fernández-Gutiérrez A., Lercker G. (2007). *Phenolic molecules in virgin olive oils: a survey of their sensory properties, health effects, antioxidant activity and analytical methods: An overview of the last decade*. Molecules, 12: pp. 1679 - 1719.