OLUTION DEPENDING ON GREE OF OLIVES FROM THE LTRE VARIETY

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INTRODUCTION

Olea europaea from the Empeltre variety is an olive tree variety commonly cultivated in the Mediterranean area and used for olive oil production. In the Balearic Islands, the oil from this variety is commercialized together with other varieties under the D.O.P. "Oli de Mallorca". The oils obtained from this variety are highly appreciated in the origin region.

The ripeness degree of the Empeltre olives can modify the sensory characteristics of the oil. Usually, a sweet type of oil is elaborated when mature olives are collected, whereas bitterness or piquant attributes are absent. On the other hand, a fruity type of olive oil is produced when oil is obtained from green olives, in this case, bitterness and piquant attributes are relevant parameters in the sensory profile. The main objective of this study was to determine the organoleptical and physiochemical characteristics of olive oil elaborated from olives of the Empeltre variety collected at different ripeness stages. In addition olives were collected from two different zones of the Island (Mancor and Sóller), which are representative of this particular crop. Physicochemical and organoleptical evaluation was carried out according to the official methods of analysis.

MATERIALS AND METHODS

Plant material

Oil quality from an organoleptical and physicochemical point of view might be affected by external factors which can be very variable. The particular climate of the Majorca Island determines the optimal period of olive crop, which differs from other regions. Therefore, a determinant factor on the composition and quality of the olive oil is the harvesting period. Olive fruits (*Olea europaea*) cv. Empeltre were harvested in different periods from October until January, and each cultivar was transported the same day to the experimental mill of the laboratory. The olives were distributed in four ripening groups. The ripening degree was obtained as a function of olive pulp and peel color, according to the classification described by Uceda & Frias (1975).

Oil extraction

The oils were extracted using a laboratory mill Abencor (Comercial Abengoa, S.A., Sevilla, Spain), at a kneading condicions of 45 min at 27 ºC. Finally, oil was left to decant and later filtred to carry out the analysis. The efficiency was calculated and expressed as g of oil/100 g of olives.

Physico-chemical analysis

In order to carry out a the assessment of Empeltre oil, the main quality indicators were evaluated at the four different ripening degrees and two different locations. Thus, tritartable acidity, peroxide index, ultraviolet absorption at 270 nm and 232 nm and Delta-K were determined in a certified laboratory (Lab. Agrifood, Granada, Spain). Methods were carried out according to the official methods of analysis provided by Regulation (EC) 2568/91 of the European Union.

Sensory analysis

The sensory characterization of the samples was carried out by a trained and certified tasting panel (Lab. Agrifood, Granada, Spain), according to the method described in Annexes II, III and IX of Regulation (EC) No 640/2008 of the Commission. The oil category is established from the scores obtained, the fruity attribute and the defects presence.

According to Annex I of Regulation (EC) No 1989/2003 and the results of the physicochemical and sensory analysis, the oil categories are: extra virgin, extra, refined, etc.

RESULTS AND DISCUSSION

Oil efficiency

The efficiency results from oil samples extracted at different ripening degrees are shown in table 1. The oil efficiency remained almost unchanged in the ripening stages and The different locations.

Table 1. Oil efficiency values

Efficiency	1	2	3	4
Mancor	17,00	13,23	19,61	17,16
Sóller	18,30	19,06	20,75	22,06

Physico-chemical analysis

The results obtained from different parameters are shown in table 2. As can be observed, tritartable acidity increases with the ripening degree for both locations. Peroxide index was higher when the maturation degree was 2, however at higher ripening degrees this parameter was reduced. Both specific extinction coefficient (K_{232} and K_{270}) were lower than the maximum values established in the legislation for extra virgin oil. The delta-K values were constant for all samples ($\Delta K<0.01$).

Table 2. Main quality parameters.

Mancor	1	2	3	4
Acidity	0,15 ± 0,07	0,15 ± 0,07	0,15 ± 0,07	0,2 ± 0,00
Perox. Index	7,5 ± 0,42	10,4 ± 2,55	6,8 ± 0,57	5,75 ± 1,63
K_{270}	0,14 ± 0,01	0,12 ± 0,00	0,12 ± 0,02	0,12 ± 0,01
K_{232}	1,66 ± 0,02	1,75 ± 0,10	1,55 ± 0,11	1,59 ± 0,12
Sóller	1	2	3	4
Acidity	0,15 ± 0,07	0,2 ± 0,00	0,2 ± 0,00	0,25 ± 0,07
Perox.Index	10,45 ± 0,21	17,73 ± 4,15	6,55 ± 0,21	6,2 ± 0,28
K_{270}	0,1 ± 0,01	0,11 ± 0,01	0,12 ± 0,01	0,11 ± 0,00
K_{232}	1,78 ± 0,04	1,94 ± 0,09	1,61 ± 0,03	1,60 ± 0,04

Sensory analysis

The organoleptical analysis showed than all oil samples were categorized as Extra Virgin oil. However the highest fruity attribute value was detected in olive oil samples with 1 ripening degree harvested in Sóller.

Table 3. Sensorial characterization.

Mancor	1	2	3	4
Fruity	5,80	6,25	6,25	5,90
Defect	0,00	0,00	0,00	0,00
Classification	Extra Virgin	Extra Virgin	Extra Virgin	Extra Virgin
Soller	1	2	3	4
Fruity	6,60	4,87	6,00	5,85
Defect	0,00	0,00	0,00	0,00
Classification	Extra Virgin	Extra Virgin	Extra Virgin	Extra Virgin

CONCLUSIONS

All the oils extracted from olives with different maturation degrees reached values within the limits established for extra virgin category, both from the physicochemical and organoleptic analysis. Depending on the results, although the ripening degree may influence the physicochemical and sensory parameters, all samples appear to have a good potential for production of quality olive oil extra virgin

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