Journal of Multidisciplinary Engineering Science and Technology (JMEST)
ISSN: 2458-9403
Vol. 3 Issue 10, October - 2016

Influence of harvesting time in chemical and organoleptic qualities of extra virgin olive oil

Aulona Veizi [1,*], Elisa Peçi [2], Lida Lazaj[1]

[1] Agricultural Technology Transfer Centre Of Vlore, Shamogjin, Vlore, Albania.
[2] Institute of Food And Veterinary, Tirane, Albania

I. ENTRY

Have been taken to study 5 olive tree cultivar like UlliHolleHimare, Kalinjot, VajsPeqini, Kallmet, Arbequina, 4 cv native and a foreign cultivar. It is taken to study the impact of harvest time in the capacity of oil (Marone, 2004) provided that to be competitive in the marketing of oil and increase consumer. The first year of study is 2015/2016 in which are taken into consideration these oils chemical analysis: Acidity: No peroxide, ΔK and organoleptic analysis, bitterness, burner, and smell.

Harvest time depends on several factors: cultivar; environment; Meteorological conditions; Factor consumer taste and pathologic characteristics. For determine the harvest time we refer to certain parameters: The color of epidermis; Degree of crumb mitigation; Resistance of separation of fruit. Collections of ATTC in Vlore**.**

Overall olives harvested at the time that are green in color consisting of oils with organoleptic characteristics of bitter and spicy. We can confirm that the same cultivar can produce VUEV (extra virgin olive oil) different depending on the time of harvest. The olives were collected by hand and extracted the mini mill to Tuscany Enologica C30 Spremiolive Mori 30-50 kg extraction capacity. The olives are harvested by hand are sent immediately to the extraction process under the Protocol and the Rules of COI. Given that for some days the olives are left without being extracted, fermentation process occurs so minor components begin to collapse (Montedoro, 1994) and why these components make up 1.5-2% of the total they play a very important role in the quality of oil.

When talking about the food product, in particular the concept of olive oil quality is associated with organoleptic characteristics. For consumers these characteristics are very important (EccherZerbini, 1996).

There are studied 3 time of harvesting 10/20/2015- 10/31/2015- 11/ 20/2015.

After extracting the oil samples were sent for chemical analysis in the laboratory of quality of oil our ISUV reference laboratory that is depending on MARDWA- how for analysis and sensory organ of the tasting group near ISUV Test Panel.

II. MATERIALS AND METHODS

Chemical and organoleptic characteristics VUEV are an essential feature both agronomic variables, cultivar and harvest time. It is very wrong if we talk about improving the quality of oil without caring for agronomic techniques where the most important is the harvest. Timing and method of harvesting together ¼ influence the overall quality of the olive oil.

- Photo of cultivars taken into study

Fig.1 Cultivar Ulli i Holle Himare

Fig.2Collection of ATTC Vlore

Fig.3 Arbequina cultivar

Fig.4 Cultivar Kallmet

- *Chemical indicators of oil CVKalinjot produced in ATTC Vlore 2015/2016.*

Cultivar	Date of harvest	Storage time	Acidity	No Peroxide (meq O/Kg)	K 232	K270
Kalinjot	10/20/2015	0	0,4	3,99	1.6478	0.1462
Kalinjot	10/31/2015	0	0,21	3,37	1.6698	0.1485
Kalinjot	11/20/2015	0	0.2	5	1.9878	0.15

- *Organoleptic indicators of oil cv Kalinjot produced in ATTC Vlore 2015/2016.*

Cultivar	Date of harvest	Smell	Acrimony	Burner	Defects
Kalinjot	10/20/2015	5.5	5	4.5	0
Kalinjot	10/31/2015	5	4	4	0
Kalinjot	11/20/2015	5	4	3.5	0

- *Chemical indicators of oil cv Arbequina produced in ATTC Vlore 2015/2016.*

Cultivar	Date of harvest	Storage time	Acidity	No Peroxide (meq O/Kg)	K 232	K270
Arbequina	10/20/2015	0	0.19	4.58	1.7885	0.1569
Arbequina	10/31/2015	0	0.16	4	1.7965	0.1563
Arbequina	11/20/2015	0	0,16	6.1	1.8666	0,1332

- *Organoleptic indicators of oil cv Arbequina produced in ATTC Vlore 2015/2016.*

Cultivar	Date of harvest	Smell	Acrimony	Burner	Defects
Arbequina	10/20/2015	5	4	3	0
Arbeuina	10/31/2015	5	3	3	0
Arbequina	11/20/2015	3.5	3	3	0

- *Chemical indicators of oil cv Kallmet produced in ATTC Vlore 2015/2016*

Cultivar	Date of harvest	Storage time	Acidity	No Peroxide (meq O/Kg)	K 232	K270
Kallmet	10/20/2015	0	0.2	8.88	1.6766	0.1176
Kallmet	10/31/2015	0	0.22	9.23	1.9235	0.1768
Kallmet	11/20/2015	0	0,4	12.2	1.999	0,1654

- *Organoleptic indicators of oil cv Kallmet produced in ATTC Vlore 2015/2016*

Kultivar	Date of harvest	Smell	Acrimony	Burner	Defects
Kallmet	10/20/2015	5.5	5	4.5	0
Kallmet	10/31/2015	5	4	4	0
Kallmet	11/20/2015	5	4	3.5	0

- *Chemical indicators of oil cv Vajs i Peqinit produced in ATTC Vlore 2015/2016*

Cultivar	Date of harvest	Storage time	Acidity	No Peroxide (meq O/Kg)	K 232	K270
Vajs	10/20/2015	0	0.19	8.8	1.8674	0.1602
Vajs	10/31/2015	0	0,32	9.8	1.8921	0.1698
Vajs	11/20/2015	0	0,3	10.5	1.8999	0.1564

- *Organoleptic indicators of oil cv Vajs i Peqinit produced in ATTC Vlore 2015/2016*

Cultivar	Date of harvest	Smell	Acrimony	Burner	Defects
Vajs	10/20/2015	3	2	2	0
Vajs	10/31/2015	2	1	1	0
Vajs	11/20/2015	2	0	0	0

- *Chemical indicators of olive oil cv Ulli i Holle Himare produced in ATTC Vlore 2015/2016.*

Cultivar	Date of harvest	Storage time	Acidity	No Peroxide (meq O/Kg)	K 232	K270
UHH	10/20/2015	0	0.45	9	1.8309	0.1888
UHH	10/31/2015	0	0.47	9.51	1.8968	0.1958
UHH	11/20/2015	0	0,53	11	1.9899	2.1001

- *Organoleptic indicators of olive oil cv Ulli i Holle Himare produced in ATTC Vlore 2015/2016*

Cultivar	Date of harvest	Smell	Acrimony	Burner	Defects
UHH	10/20/2015	5.5	5	4.5	0
UHH	10/31/2015	5	4.5	4.1	0
UHH	11/20/2015	5	4	3.5	0

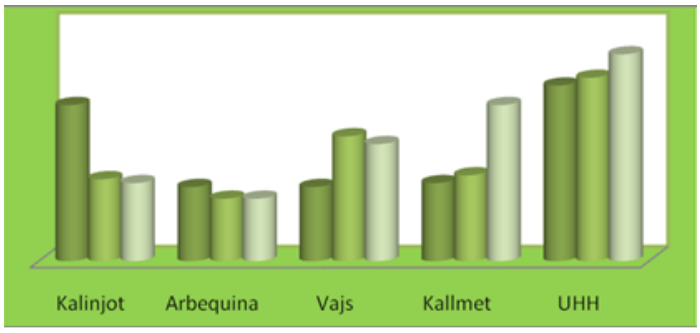

Fig.5 Acidity on three harvesting periods

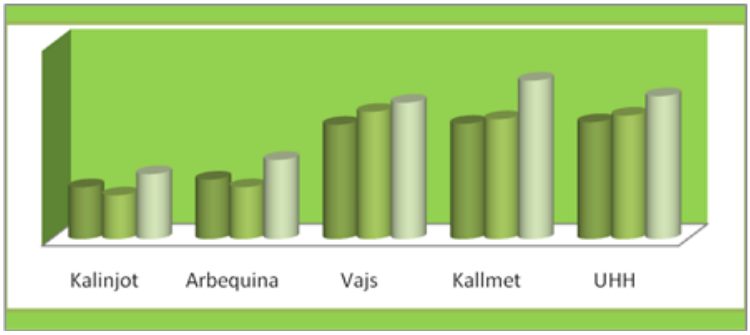

Fig.6 Peroxides on three harvesting periods

There is more variation in the values of acidity and peroxides of harvesting at different times.

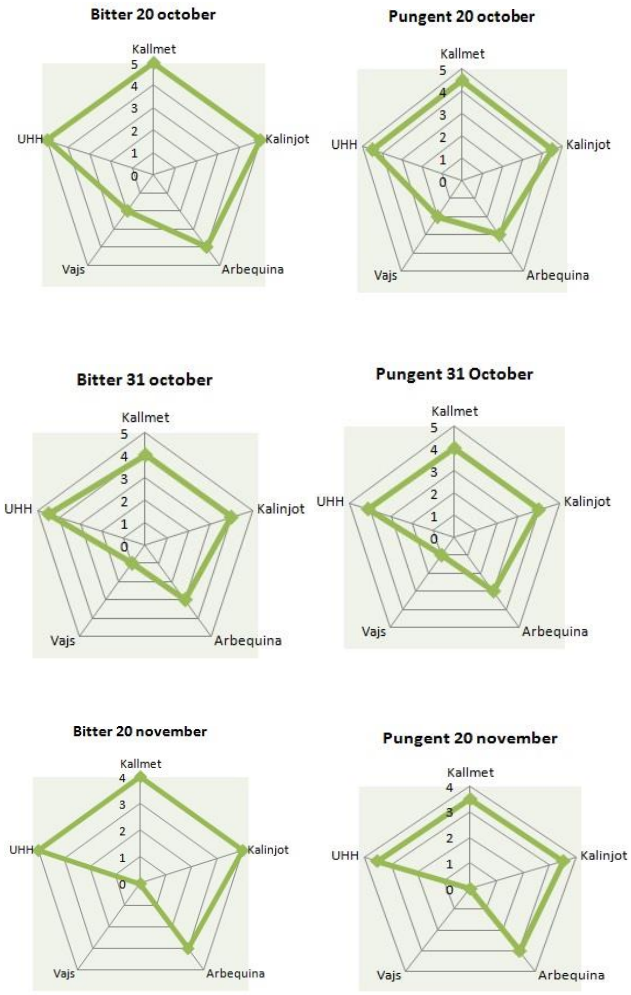

Fig.7 The olives harvested in the early periods produces oils with organoleptic features more bitter and spicy.

- **The methodologies of analysis of olive oil.**

a)Determination of acidity.

Determination of acidity in hot.

In a 150-200 ml conical flask weigh 5-10g fat and add 100 ml of alcohol neutralized. Heated water bath and stir well until the boil alcohol. Add 7-8 ml phenolphthalein indicator. Mixing titrated with NaOH or KOH 0.1N turning points and stirring constantly until the liquid get steady red.

If fatty acids are less soluble in alcohol, then add a large amount of alcohol (100-150ml), or weighed less amount of fat and treated with 50-60 ml alcohol.

The amount of solvent should be in a volume of fluid such that at the end of titration based not contain less than 40% solvent, in order to avoid hydrolysis of liquid soap.

Calculation of number of acidity, percentage of free fatty acids and the degree of acidity.

- Calculation of number of acidity is done by multiplying by 5.61 the number of milliliters of 0.1N KOH, which was needed during titration, by dividing the weight of fat weighted according to the formula: N.A = (n x 5.61) / p

- The percentage of free fatty acids found in greasy can be calculated from the number of acidity above gain, if this express in oleic acid with molar mass 282, then the formula is used:

% Acidity = (n x 0.0282 x 100) / p

- Expression of acidity in rank is determined by calculating the number of normal 0.1 ml of KOH needed to neutralize the acids in 100g fat free.To return the number of acidity in oleic acid percentage and degree of acidity, serving special table.

b) Determination of peroxides (number of peroxide)

Grease containing organic peroxide, which acting potassium iodide KJ, oxidizes and release of iodine. The amount of iodine that is released is determined by titrated with sodium thiosulphate. The number of peroxides is the amount of the substance present in the sample expressed in milli-equivalents of O2 which oxidizes potassium iodide (JK) in conditions that will be described.

- Its action

In a small boat weighed with precision glass 1-2g greasy, which is inserted in an Erlenmeyer with glass stopper. Increase speed ac mix 30ml. acetic acid-chloroform and mixed to dissolve grease. Then add 1 ml saturated solution of KJ placed caps and mix again for 1 minute. Left at rest in a dark place for 5min. 75ml of distilled water added and titrated up to show a slight yellow color. After that shtohen0.5 ml starch solution and continue titration with sodium thiosulphate 0:01 or 0:02 N, stirring vigorously, in order to handle all of chloroform Jodi layer to the disappearance of the blue color.While white is made and evidence using jets above and distilled water instead of sample.

- Calculation of the number of peroxide (N.P) is carried out according to the formula

$$N.P = \frac{(a-b) \times 0.001269 \times 100}{p}$$

where in: a-solution-thiosulphate amount of sodium consumed in the test sample, in ml

b-thiosulphate amount of sodium solution, to spend on white test, in ml.

p-lipids obtained in the analysis, in grams.

There is a positive correlation organoleptic characteristics and nutritional aspects and characterization.

Organoleptic evaluation method implements Regulation COI (ConsiglioOleicoloInternazionale) COI / T.20 / Doc. no. 22 November 2005 "Resolution No. Res-2/93-IV / 05 Method For The organoleptic Assessment Of Extra Virgin Olive Oil Applying To Use A Designation Of Origin "and the EU law (Annex XII of EU Law 2568/91).

Fig.8 Images from Albanian Test Panel

III. Conclusions

Olive oil is the resultant of a number of complex factors such as factor: genetic, environmental, cultivation and technology which characterize as the development phase and baking as well as oil extraction and storage. Determination of genetic variability, environmental and cultural that determine the composition of the oil and organoleptic features during the development and maturation of the body also with the possibility of characterization and individualization of territorial origin object of scientific research today.

Generally oil extracted from green olives still conclude characteristic bitterness and burners with high compared with ripe olives.We note that the values of acidity and peroxides are within the parameters prescribed in the EU Regulation 2568/91.

The results correspond to those of several authors who have studied for many years the production in the same territory and have encountered chemical variability of parameters in relation to "seasons" of production (Alessandri et al., 1993).

The purpose isto be given to the farmers data on the time interval in which the harvest is more appropriate in which can obtain the best qualities as the qualitative and quantitative extraction process and product storage. In this way we can complete the Analytical Data Base values needed in the characterization, identification and typicality of the product.

IV. Bibliography

Alessandri S., Cimato A., Mattei A., Modi G., 1993. Harvesting Period And Variations In Tuscan Olive Oil Composition: A Multivariate Approach. Ii International Symposium On Olive Growing. Jerusalem, Israel, 6-10 Sept. *ActaHorticulturae*, 356, Pp. 233-238.

Alloggio V., Caponio F., 1997. Influenza DelleTecniche Di Preparazione Della Pasta Di Olive Sulla QualitàDell'olio.Nota Ii.EvoluzioneDelleSostanzeFenoliche E Di AlcuniParametri Di QualitàInFunzione Della MaturazioneDelle Drupe In Olio Di OlivaVergine Della Cv. *Coratina*. *Riv. It. Sost. Grasse*, Lxxiv, Pp. 443-447.

Angerosa F., Di Giacinto L., Basti C., Serraiocco A., 1996. Influenza Della Variabi-Le "Ambiente" Sulla ComposizioneDegliOliVergini Di Oliva.*Riv. It. Sost. Grasse*, Lxxiii, Pp. 461-467.

Angerosa F., Di Giovacchino L., 1996. Natural Antioxidants Of Virgin Olive Oil Optai-Ned By Two And Tri-Fase Centrifugal Decanters. *Grasas Y Aceites*, 47, Pp. 247-254.

Angerosa F., D'alessandro N., Basti C., Vito R., 1998. BiogenerationOf Volatile Compounds In Virgin Olive Oil: Their Evolution In Relation To Malaxation Time. *J. Agric.FoodChem*, 46, Pp. 2940-2944.

Angerosa F., 1998. La QualitàOrganoletticaDegliOliVergini Di Oliva. *Frutticoltura* N. 7/8 - 1998.

Aparicio R. And Morales M.T., 1998. Characterization Of Olive Ripeness By Green Aroma Compounds Of Virgin Olive Oil. *J. Agric. Food Chem*., 46, Pp. 1116-1122.

Bertuccioli C., 1997. L'olioExtravergine Di Oliva Di Qualità.Produzione E ConsumoIn Emilia-Romagna. Ed. C.A.R.O.L., Pp. 21-24.

Bocci F., Frega N., Lercker G., 1992.Studio Preliminare Sui ComponentiVolatili Di Oli Di Oliva Extra Vergini.*La RivistaDelleSostanze Grasse*, Vol. Lxix - Dicembre.

Boschelle O., Giomo A., Conte L., Lercker G., 1994. CaratterizzazioneDelleCulti-Var Di Olivo Del Golfo Di Trieste MedianteMetodiChemiometriciApplicati Ai DatiChimico-Fisici.*Riv. It. Sost. Grasse*, 71, Pp. 57-65.

Cimato A., Marranci M., 1993. Ricerca Sulla CaratterizzazioneDell'olioExtravergi-Ne Di OlivaTipicoToscano.AttiRicerche I.V.O.T., Pp. 13-2

Cimato A., Baldini A., Caselli S., Marranci M., Marzi L., 1996. OsservazioniSulGermoplasmaOlivicoloToscano. CaratteristicheAnalitiche E Sensoriali Di Oli Di OlivaMonovarietali. *Olivae*, 62, Pp. 46-51.

Cimato A., 1996. L'olivicoltura Toscana E La SuaProduzione.Atti Vii International Course On Olive Growing, Scandicci, 6-11 Maggio, Pp. 295-302.

Servili M., Baldioli M., Miniati E., Montedoro G. F., 1995. Antioxidant Activity Of New Phenolic Compounds Extracted From Virgin Olive Oil And Their Interaction With A-Tocopherol And B -Carotene. *Riv. Ital. Sost. Grasse*, 72, Pp. 55-59.

Simonini G., 1992. Provincia Di Forlì: IlClima Del Territorio. *Aer*, Gennaio 1992, Pp. 10-23.

Sole Reira M.A., 1990. The Influence OfAuxillary Drip Irrigation, With Low Quanti-Ties Of Water In Olive Trees In Las Garrigas (Cv. Arbequina). International Symposium On Olive Growing, Cordoba, 26-29 Sept, *ActaHorticulturae*, 286, Pp. 307-310.

Solinas M., 1987. AnalisiHrgcDelleSostanzeFenoliche Di OliVergini Di OlivaInRelazione Al Grado Di Maturazione E AllaVarietàDelle Olive. *Riv. It. Sost. Grasse*, Lxiv, Pp. 255-262.

Solinas M., Marsilio V., Angerosa F., 1988. Evoluzione Di AlcuniComponenti Del-L'aromaDegliOliVergini Di OlivaInRelazione Al Grado Di MaturazioneDelle Olive.
Riv. It. Sost. Grasse, Lxiv, Pp. 475-480.

Southon S., 1995. Increased Vegetable And Fruit Consumption Within The Eu: Poten-Tial Health Benefits. Project Number Air2-Ct93-0888 (Dg 12 Ssma).
In:"AntiossidantiNaturaliNegliAlimentiApettiTecnologici E Qualitativi. UniversitàDegliStudi Di Udine – Dipartimento Di ScienzeDegliAlimenti.Udine, 5-6 Dicembre.

Tiscornia E, Forina M., Evangelisti F., 1982. ComposizioneChimicaDell'olio Di Oliva E Sue VariazioniIndotte Dal Processo Di Rettificazione.*Riv. Ital. Sost. Grasse*, 59, Pp. 519-555.

Uceda M., 1983. FactoresQueInfluyen En La Calidad Del Aceite De Oliva.SymposioExpoliva 1983, Jaén (Spagna).

Uceda M., Frias L., Ruano M.T., 1989. Olive Cultivars DifferentationBy Their Oil Fatty Acid Structure. *Olea*, 20, 38.

Vasquez Roncero A., Maestro Duran R., Della Valle M.L., 1970. Anthocyanin Pigments In Olive Fruits. Ii. Variations During Ripening. *Grasas Y Aceite*, 6, Pp. 337-341.