The Composition of Volatiles and the Role of Non-Traditional LOX on Target Metabolites in Virgin Olive Oil from   
Autochthonous Dalmatian Cultivars

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**SUPPLEMENTARY MATERIAL**

Table S1. Quality parameters of virgin olive oils of the Oblica cultivar

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Harvest time  (HT) | FFA  (% oleic acid) | PV  (meq O2 kg-1) | K232 | K270 | ΔK |
| Ob-13 | 1 | 0.26 ± 0.01 | 7.26 ± 0.02 | 1.95 ± 0.07 | 0.15 ± 0.01 | -0.01 |
| 2 | 0.19 ± 0.01 | 6.20 ± 0.04 | 1.72 ± 0.01 | 0.16 ± 0.04 | -0.01 |
| 3 | 0.23 ± 0.01 | 4.96 ± 0.08 | 1.51 ± 0.01 | 0.10 ± 0.01 | 0 |
| 4 | 0.24 ± 0.01 | 8.68 ± 0.07 | 1.58 ± 0.08 | 0.13 ± 0.01 | 0 |
| 5 | 0.33 ± 0.02 | 6.40 ± 0.02 | 2.03 ± 0.02 | 0.11 ± 0.01 | 0 |
| 6 | 1.51 ± 0.08 | 12.64 ± 0.08 | 1.77 ± 0.10 | 0.15 ± 0.02 | 0 |
| Ob-14 | 1 | 0.24 ± 0.01 | 12.20 ± 0.14 | 2.15 ± 0.08 | 0.15 ± 0.01 | 0 |
| 2 | 0.29 ± 0.01 | 16.02 ± 0.08 | 2.00 ± 0.09 | 0.13 ± 0.03 | 0 |
| 3 | 0.63 ± 0.01 | 14.22 ± 0.28 | 2.05 ± 0.04 | 0.13 ± 0.02 | 0 |
| Ob-15 | 1 | 0.19 ± 0.01 | 4.44 ± 0.08 | 1.90 ± 0.02 | 0.16 ± 0.02 | 0 |
| 2 | 0.21 ± 0.02 | 3.94 ± 0.12 | 1.63 ± 0.07 | 0.15 ± 0.02 | 0 |
| 3 | 0.31 ± 0.01 | 8.26 ± 0.12 | 1.85 ± 0.01 | 0.12 ± 0.01 | 0.01 |
| 4 | 0.47 ± 0.02 | 10.82 ± 0.28 | 2.15 ± 0.02 | 0.12 ± 0.01 | 0.01 |
| 5 | 0.65 ± 0.04 | 13.38 ± 0.34 | 1.75 ± 0.05 | 0.17 ± 0.01 | 0 |

Identification; Ob-Oblica; year of study is represented by the last two numbers (13-2013; 14-2014 i 15-2015), HT- harvest time (1-6); FFA- free fatty acid, PV-peroxide value, UV spectrophotometric indices (K232 and K270, ∆K). Results are expressed as mean values of three repetitions ± standard deviation.

Table S2. Quality parameters of virgin olive oils of the Levantinka cultivar

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Harvest time  (HT) | FFA  (% oleic acid) | PV  (meq O2 kg-1) | K232 | K270 | ΔK |
| Le-13 | 1 | 0.34 ± 0.01 | 6.36 ± 0.16 | 1.92 ± 0.02 | 0.23 ± 0.02 | 0 |
| 2 | 0.23 ± 0.01 | 7.74 ± 0.24 | 2.06 ± 0.01 | 0.21 ± 0.06 | 0 |
| 3 | 0.22 ± 0.01 | 4.64 ± 0.08 | 1.67 ± 0.05 | 0.12 ± 0.01 | 0 |
| 4 | 0.33 ± 0.03 | 5.82 ± 0.20 | 1.64 ± 0.07 | 0.10 ± 0.02 | 0 |
| 5 | 0.30 ± 0.02 | 4.28 ± 0.08 | 1.96 ± 0.01 | 0.09 ± 0.01 | 0.01 |
| 6 | 0.27 ± 0.01 | 8.14 ± 0.08 | 2.06 ± 0.02 | 0.12 ± 0.01 | 0 |
| Le-14 | 1 | 0.16 ± 0.01 | 12.46 ± 0.04 | 1.64 ± 0.03 | 0.17 ± 0.02 | 0 |
| 2 | 0.25 ± 0.01 | 14.72 ± 0.06 | 1.67 ± 0.02 | 0.13 ± 0.01 | 0 |
| 3 | 0.25 ± 0.01 | 12.16 ± 0.18 | 1.77 ± 0.04 | 0.14 ± 0.02 | 0 |
| Le-15 | 1 | 0.15 ± 0.01 | 4.22 ± 0.02 | 1.77 ± 0.03 | 0.19 ± 0.02 | 0 |
| 2 | 0.18 ± 0.01 | 5.84 ± 0.08 | 1.63± 0.03 | 0.21 ± 0.05 | 0 |
| 3 | 0.24 ± 0.03 | 6.86 ± 0.06 | 2.04 ± 0.07 | 0.14 ± 0.01 | 0 |
| 4 | 0.38 ± 0.03 | 5.96 ± 0.16 | 2.13± 0.03 | 0.12 ± 0.01 | -0.01 |
| 5 | 0.26 ± 0.01 | 9.01 ± 0.07 | 2.19 ± 0.03 | 0.09 ± 0.01 | -0.01 |
| 6 | 0.40 ± 0.02 | 8.62 ± 0.12 | 2.02 ± 0.04 | 0.17 ± 0.02 | 0 |

Identification; Le-Levantinka; year of study is represented by the last two numbers (13-2013; 14-2014 i 15-2015), HT- harvest time (1-6); FFA- free fatty acid, PV-peroxide value, UV spectrophotometric indices (K232 and K270, ∆K). Results are expressed as mean values of three repetitions ± standard deviation.

Table S3. Quality parameters of virgin olive oils of the Lastovka cultivar

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Harvest time  (HT) | FFA  (% oleic acid) | PV  (meq O2 kg-1) | K232 | K270 | ΔK |
| La-13 | 1 | 0.19 ± 0.01 | 7.12 ± 0.24 | 1.73 ± 0.01 | 0.15 ± 0.02 | 0 |
| 2 | 0.18 ± 0.01 | 7.76 ± 0.12 | 1.88 ± 0.07 | 0.13 ± 0.01 | 0 |
| 3 | 0.19 ± 0.01 | 4.18 ± 0.10 | 1.49 ± 0.09 | 0.16 ± 0.02 | 0 |
| 4 | 0.21 ± 0.02 | 8.70 ± 0.24 | 2.00 ± 0.05 | 0.09 ± 0.01 | 0 |
| 5 | 0.30 ± 0.03 | 9.18 ± 0.66 | 2.01 ± 0.01 | 0.13 ± 0.01 | 0 |
| 6 | 0.31 ± 0.01 | 7.07 ± 0.12 | 1.82 ± 0.05 | 0.12 ± 0.01 | 0 |
| La-14 | 1 | 0.23 ± 0.01 | 5.06 ± 0.08 | 1.69 ± 0.03 | 0.18 ± 0.01 | 0 |
| 2 | 0.30 ± 0.01 | 5.28 ± 0.12 | 1.66 ± 0.01 | 0.13 ± 0.03 | 0 |
| 3 | 0.82 ± 0.02 | 5.68 ± 0.08 | 1.48 ± 0.12 | 0.13 ± 0.03 | 0 |
| La-15 | 1 | 0.19 ± 0.02 | 6.20 ± 0.04 | 1.88 ± 0.01 | 0.16 ± 0.02 | -0,01 |
| 2 | 0.22 ± 0.01 | 6.48 ± 0.02 | 1.97 ± 0.01 | 0.15 ± 0.01 | 0 |
| 3 | 0.20 ± 0.01 | 4.42 ± 0.22 | 1.85 ± 0.06 | 0.16 ± 0.01 | 0 |
| 4 | 0.32 ± 0.03 | 3.84 ± 0.08 | 2.00 ± 0.02 | 0.12 ± 0.01 | -0,01 |
| 5 | 0.36 ± 0.01 | 4.02 ± 0.24 | 2.08 ± 0.07 | 0.15 ± 0.02 | 0 |
| 6 | 0.32 ± 0.03 | 3.54 ± 0.16 | 1.87 ± 0.01 | 0.12 ± 0.01 | 0 |

Identification; La-Lastovka; year of study is represented by the last two numbers (13-2013; 14-2014 i 15-2015), HT- harvest time (1-6); FFA- free fatty acid, PV-peroxide value, UV spectrophotometric indices (K232 and K270, ∆K). Results are expressed as mean values of three repetitions ± standard deviation.

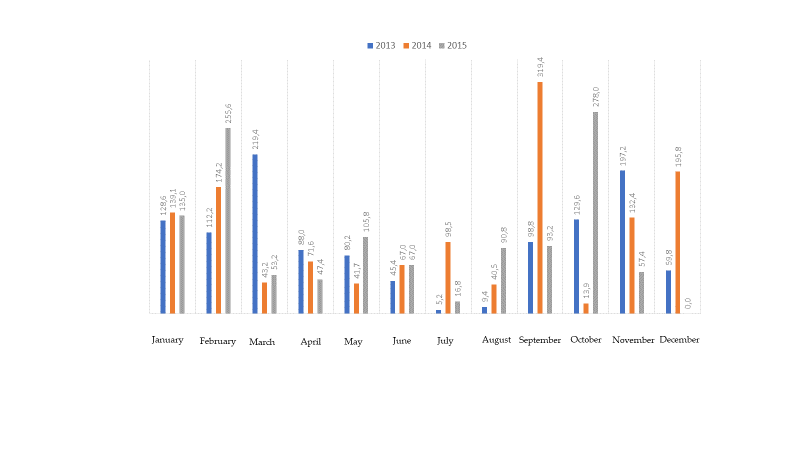


Figure S1. Average monthly precipitation (mm) measured for 2013, 2014 and 2015 at the Kaštela meteorological station. The data was provided by the State Hydrometrological Institute of the Republic of Croatia.

Table S4. One-way ANOVA p-values for each of the selected variables previously listed for different cultivars and study years in Tables 2, 3 and 4 as well as in Figures 1 and 2

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Variable/Cultivar&year | | Ob-13 | Ob-14 | Ob-15 | Le-13 | Le-14 | Le-15 | La-13 | La-14 | La-15 |
| heksanal | | <0.001 | 0.004 | <0.001 | 0.005 | 0.011 | <0.001 | <0.001 | 0.009 | <0.001 |
| heksanol | <0.001 | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | 0.004 |
| heksil acetat | <0.001 | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| LA C6 | <0.001 | | 0.002 | <0.001 | <0.001 | 0.007 | <0.001 | <0.001 | 0.006 | <0.001 |
| *E*-2-heksanal | <0.001 | | 0.002 | <0.001 | <0.001 | 0.004 | 0.007 | <0.001 | 0.012 | <0.001 |
| *E*-2-heksen-1-ol | <0.001 | | <0.001 | <0.001 | <0.001 | 0.012 | <0.001 | <0.001 | <0.001 | <0.001 |
| *Z*-3-heksen-1-ol | <0.001 | | <0.001 | <0.001 | <0.001 | 0.008 | <0.001 | <0.001 | 0.01 | <0.001 |
| LnA C6 | <0.001 | | <0.001 | <0.001 | <0.001 | 0.004 | 0.01 | <0.001 | 0.011 | <0.001 |
| pentanal | <0.001 | | 0.003 | <0.001 | <0.001 | 0.032 | <0.001 | <0.001 | 0.009 | <0.001 |
| 1-penten-3-ol | <0.001 | | 0.007 | <0.001 | <0.001 | 0.002 | <0.001 | <0.001 | **0.125** | <0.001 |
| C5 | <0.001 | | <0.001 | <0.001 | <0.001 | 0.003 | <0.001 | <0.001 | **0.595** | <0.001 |
| TVC | <0.001 | | <0.001 | <0.001 | <0.001 | 0.004 | 0.01 | <0.001 | 0.009 | <0.001 |
| TPC | <0.001 | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 13-HPOD | <0.001 | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| 9-HPOD | <0.001 | | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

Identification: Ob- Oblica, Le- Levantinka, La- Lastovka; year of study is represented by the last two numbers (13-2013; 14-2014 i 15-2015)