

EVALUATION OF THE ACIDITY IN SAMPLES OF VIRGIN OLIVE OIL
FOR THE 1995-2005 PERIOD AND CORRELATION BETWEEN
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ABSTRACT

The acidity and organoleptic characteristics of virgin olive oil produced in Slovenian Istra were studied. The acidity of 4,871 samples of virgin olive oils was determined for the 1995-2005 period. 135 samples produced in crop year 2002/2003 with acidity below 0.2% (w/w) and 291 samples of crop year 2005/2006 were sensory evaluated. According to sensory evaluation in crop year 2002/2003, 128 out of 135 samples were classified as extra virgin olive oils, while 7 samples did not reach the specified requirements. In crop year 2005/2006, it was established that 71.5% of the analysed samples complied with extra virgin category, 24.4% with virgin and 4.1% with lampante. Time of harvest, storage conditions before processing and time from picking to processing all influenced the oil quality, whereas olive cultivars did not. Chemical and sensory analyses were performed according to the Commission Regulation (EEC) No 2568/91 and added annexes.

Key words: olive oil acidity, grading of oil, harvest, storage, processing, sensory analysis

VALUTAZIONE DELL'ACIDITÀ DEI CAMPIONI DI OLIO D'OLIVA VERGINE NEL PERIODO
1995-2005 E CORRELAZIONE FRA DATI RACCOLTI E ANALISI SENSORIALE

SINTESI

Gli autori hanno studiato l'acidità e le caratteristiche organolettiche dell'olio d'oliva vergine prodotto nell'Istria slovena. Hanno determinato l'acidità di 4871 campioni di olio d'oliva vergine del periodo 1995-2005. Centotrentacinque campioni prodotti nell'annata 2002/2003, con acidità al di sotto dello 0,2% (w/w) e 291 campioni dell'annata 2005/2006 sono stati valutati sensorialmente. Secondo la valutazione sensoriale 128 dei 135 campioni dell'annata 2002/2003, sono stati classificati come olii d'oliva extra-vergine, mentre 7 campioni non hanno soddisfatto tali criteri. Il 71,5% dei campioni dell'annata 2005/2006 sono risultati appartenenti alla categoria dell'olio d'oliva extra-vergine, il 24,4% a quella dell'olio d'oliva vergine e il 4,1% a quella dell'olio d'oliva lampante. Il periodo di raccolta, lo stoccaggio delle olive prima della lavorazione ed il tempo trascorso fra il raccolto e la lavorazione influenzano la qualità dell'olio, che non viene però intaccata dal tipo di cultivar. Le analisi chimiche e sensoriali sono state eseguite in conformità alla Regolazione della Commissione (EEC) No 2568/91 e degli allegati.

Parole chiave: acidità dell'olio d'oliva, classificazione degli oli, raccolto, stoccaggio, lavorazione, analisi sensoriale

INTRODUCTION

Virgin olive oils are the oils obtained from the fruit of the olive tree (*Olea europaea* L.) solely by mechanical or other physical means under conditions, particularly thermal conditions, that do not lead to alterations in the oil, and which have not undergone any treatment other than washing, decantation, centrifugation and filtration (Trade standard applying to olive oils and olive-pomace oils, 2003).

We show the results of acidity in crop years from 1995/1996 to 2005/2006. In this period, the free fatty acids were determined in 4,871 samples of oils from Slovenian Istra.

The quality evaluation of virgin olive oil is determined with chemical analyses and organoleptic assessment. Only the organoleptic assessment can determine the presence of the expected positive attributes of extra virgin olive oil and establish the eventual presence of defects.

We examined the results of the influence of the time of harvest, time from picking to processing, storage conditions before processing and production technology.

MATERIAL AND METHODS

We determined the free fatty acid amount and performed the sensory analysis in virgin olive oil samples produced in Slovenian Istra. The samples were collected in 11 oil mills operating in this area. In five oil mills, the oils are produced by the traditional non continuous production technology by presses and six oils mills adopted a modern continuous production technology. In this paper we consider the factors that influenced the acidity.

The data were acquired from the olive oil producers.

The acidity was determined in 4,871 olive oil samples collected from 1995 to 2005.

We performed the organoleptic assessment on 135 samples in crop year 2002/2003 with the acidity below 0.2% (w/w) and on 291 randomly chosen samples produced in crop year 2005/2006.

The acidity determination was performed using the SIST EN ISO 660 method. The acidity is a chemical parameter used to evaluate the quality of virgin olive oils and represents the free fatty acid amount expressed as percent content (w/w of oleic acid).

The sensory analysis was performed by the Slovene national panel for the organoleptic assessment of virgin olive oils according to the official method established in Commission regulation (EC) No 796/2002, Annex XII. The method can be used for grading virgin olive oils on the basis of fruitiness and intensity of defects.

Tasters must each smell and then taste the oil submitted for examination contained in the tasting glass, analysing their olfactory, gustatory, tactile and kinaesthetic perceptions and mark on the sheet the intensity of their perception of each negative and positive attribute.

RESULTS

The following paper shows the results of acidity of olive oil collected in the period from 1995 to 2005. In Table 1, we show the number on analysed samples of olive oil, the average acidity and the median acidity for the period from 1995 to 2005. In Table 2, the statistical data of acidity of olive oil for the period from 1995 to 2005 are presented.

Tab. 1: Number of analysed samples of olive oil, average and median acidity for the 1995–2005 period.
Tab.1: Število analiziranih vzorcev, povprečna kislost in mediana kislosti v obdobju 1995–2005.

Crop year	No. samples	Average acidity % (w/w)	Median acidity % (w/w)
1995/1996	382	0.81	0.35
1996/1997	303	0.62	0.40
1997/1998	113	1.02	0.77
1998/1999	267	0.27	0.21
1999/2000	366	0.44	0.31
2000/2001	389	0.59	0.41
2001/2002	477	0.29	0.19
2002/2003	596	0.61	0.38
2003/2004	412	0.18	0.15
2004/2005	664	0.28	0.17
2005/2006	902	0.18	0.15

Tab. 2: Statistical data of acidity of olive oil for the 1995–2005 period.**Tab. 2: Statistična obdelava podatkov za kislost v obdobju 1995–2005.**

Crop year	Min acidity % (w/w)	Max acidity % (w/w)	s	CV (%)
1995/1996	0.06	7.83	1.11	136.26
1996/1997	0.07	10.37	0.82	133.76
1997/1998	0.14	4.77	0.82	80.38
1998/1999	0.05	2.40	0.24	90.17
1999/2000	0.09	2.94	0.41	91.90
2000/2001	0.08	8.20	0.70	117.27
2001/2002	0.07	3.49	0.29	100.58
2002/2003	0.07	7.20	0.78	127.00
2003/2004	0.07	2.71	0.17	91.67
2004/2005	0.06	9.01	0.52	184.45
2005/2006	0.05	1.47	0.13	76.28

In the past 10 years, the number of analyzed samples increased from 382 in 1995 to 902 in 2005. The results show that the lowest average acidity 0.18% (w/w) was determined in crop years 2003/2004 and 2005/2006, the minimal acidity 0.5% (w/w) in crop years 1998/1999 and 2005/2006, while the highest acidity 10.37% (w/w) was determined in crop year 1996/1997. Minimal and maximal determined acidities in the last crop year (2005/2006) were the lowest in the 10 past years.

Comparison of crop years 1995/1996 and 2005/2006

In 1995, the acidity was determined in 382 samples of virgin olive oils, while in 2005, 902 samples were analysed. The number of samples increased proportionally to the production of olive oil. In 1995, 77% of samples complied with the request for extra virgin category, while in crop year 2005/2006, the number of samples

increased to 892 samples that represent 98.9% of the samples. As seen in Tables 1 and 2, the average and maximal acidity in crop year 2005/2006 comparing to crop year 1995/1996 decreased significantly.

The results of the influence of the time of harvest, time from picking to processing, storage conditions before processing and production technology on the acidity are presented in Tables 3 to 6.

The collected data show that the main olive oil production in crop year 1995/1996 was carried out in December (61% of samples), while in 2005, 71.3% of samples were produced in November. The average acidity was lower in crop year 2005/2006.

In 1995, most of the samples were processed in more than 48 hours. At that time, the olive producers used to pick and store the olive fruit for two or three weeks and subsequently delivered it to olive mills. Consequently the acidity of such samples was high.

Tab. 3: Influence of the time of harvest.**Tab. 3: Vpliv obdobja predelave.**

Crop year	1995/1996		2005/2006	
	NOV	DEC	NOV	DEC
% of samples	34.8	61.8	71.3	27.5
Average acidity % (w/w)	0.31	0.67	0.15	0.27
Min. acidity % (w/w)	0.06	0.11	0.05	0.09
Max. acidity % (w/w)	3.09	7.83	0.48	1.47

Tab. 4: Influence of the time from picking to processing.**Tab. 4: Vpliv časa skladiščenja pred predelavo.**

Crop year	1995/1996		2005/2006	
	≤ 48 hrs	> 48 hrs	≤ 48 hrs	> 48 hrs
% of samples	15.7	82.7	45.9	50.2
Average acidity % (w/w)	0.14	0.95	0.14	0.17
Min. acidity % (w/w)	0.06	0.08	0.05	0.06
Max. acidity % (w/w)	0.77	7.83	1.03	1.47

Tab. 5: Influence of the storage conditions before processing.
Tab. 5: Vpliv načina shranjevanja.

Crop year	1995/1996				2005/2006			
	Boxes	Plateaus	Reticular sacks	Other storage	Boxes	Plateaus	Reticular sacks	Other storage
% of samples	8.6	9.2	19.9	62.3	34.1	14.6	26.1	25.1
Average acidity % (w/w)	0.70	1.01	0.88	0.78	0.17	0.16	0.20	0.19
Min. acidity % (w/w)	0.08	0.09	0.09	0.06	0.06	0.05	0.05	0.06
Max. acidity % (w/w)	3.08	5.32	7.83	6.55	1.41	0.61	1.34	1.47

Tab. 6: Influence of the production technology.
Tab. 6: Vpliv tehnologije predelave.

Crop year	1995/1996		2005/2006	
	Continuous system	Non-cont. system (presses)	Continuous system	Non-cont. system (presses)
% of samples	47.9	46.8	69.4	25.4
Average acidity % (w/w)	0.67	0.83	0.15	0.27
Min. acidity % (w/w)	0.06	0.10	0.05	0.09
Max. acidity % (w/w)	7.83	7.32	1.41	1.47

Tab. 7: Grading of virgin olive oil.
Tab. 7: Razvrščanje deviškega oljčnega olja.

Category	Median of defects	Median of "fruity"
Extra virgin olive oil	Me = 0	Me > 0
Virgin olive oil	0 < Me ≤ 2.5	Me > 0
Lampante olive oil	Me > 2.5*	-

* or if the median of defects is less than or equal to 2.5 and the median of fruity is 0.

In 1995, only 8.6% and 9.2% of samples were stored respectively in boxes and plateaus. For the majority of samples (62.3%), we do not have any information about them. Nowadays more than 1/3 of samples are stored in boxes. In this case we also established that the average acidity was lower in crop year 2005/2006.

In 1995, the olive oil production was equally divided between continuous and non-continuous production technologies. Nowadays, only 1/4 of the production is done on traditional systems with presses.

Grading of virgin olive oils

The quality evaluation of virgin olive oil is determined with chemical analyses and organoleptic assessment. Only the organoleptic assessment can determine the presence of the expected positive attributes of extra virgin olive oil and establish the eventual presence of defects.

Samples of olive oils are graded as follows (Tab. 7) in line with the median of defects and the median for "fruity". By this the median of the negative attribute per-

ceived with the greatest intensity (Commission regulation (EC) No 796/2002, Annex XII) is understood.

Organoleptic assessment

In 2002, the acidity was determined in 596 samples of virgin olive oils. The organoleptic assessment was performed in 135 samples with the acidity below 0.2% (w/w). In spite of lower acidity, seven samples did not comply with the request for extra virgin category. The determined defects were fusty, winy-vinegary and muddy sediment. Additionally, the results were statistically evaluated performing Duncan's test. There were no statistical significant differences between the data marked with the same index in the column in Tables 8 to 12.

The results of the influence of the time of harvest, time from picking to processing, storage conditions before processing, production technology and cultivars on the sensory attributes are presented in Tables 8 to 12.

Based on the statistical evaluation it results that the time of harvest did not influence the intensity of the

positive sensory attributes. It was observed that the sensory attributes of the oils produced in November were more intensive. Also, the negative attributes (the defects) did not depend on the time of harvest.

The results show that the time from picking to processing influenced the sensory attributes of virgin olive oils. The oils produced in 36 hours from picking were more bitter and pungent. There is a statistical significant difference between the samples.

The collected data show that 77 samples of olives were stored in boxes and plateaus. For 40 samples, we do not have any information about the storage condition before processing. In these samples, presence of the three observed defects (fusty, winy-vinegary and muddy

sediment) was determined at the same time. Statistically, the results are classified in the same group.

The results show that in crop year 2002/2003 the olive oil samples produced with a two-phase continuous system were more fruity, bitter and pungent if compared to the other production technology. The data were ranged in two groups (indexes ^{a, b}).

The statistical analysis shows that the production technology does not have any influence on the presence of defects fusty and winy-vinegary. The results are ranged in the same group. The negative attribute muddy sediment was determined in oils produced with the non-continuous system by presses.

Tab. 8: Influence of time of harvest.

Tab. 8: Vpliv obdobja predelave.

		Average intensity					
		Positive attributes			Defects		
Time of harvest	No.	Fruity	Bitter	Pungent	Fusty	Winy-vinegary	Muddy sediment
NOV	134	3.75 ^a	3.18 ^a	4.07 ^a	0.04 ^a	0.10 ^a	0.02 ^a
DEC	1	3.25 ^a	2.50 ^a	2.50 ^a	0.00 ^a	0.00 ^a	0.00 ^a

Tab. 9: Influence of the time from picking to processing.

Tab. 9: Vpliv časa skladiščenja pred predelavo.

		Average intensity					
		Positive attributes			Defects		
Time from picking to processing	No.	Fruity	Bitter	Pungent	Fusty	Winy-vinegary	Muddy sediment
≤ 36 hrs	100	3.84 ^a	3.39 ^a	4.31 ^a	0.05 ^a	0.09 ^a	0.03 ^a
> 36 hrs	35	3.47 ^a	2.55 ^b	3.34 ^b	0.00 ^a	0.11 ^a	0.00 ^a

Tab. 10: Influence of storage conditions before processing.

Tab. 10: Vpliv načina shranjevanja.

		Average intensity					
		Positive attributes			Defects		
Storage condition	No.	Fruity	Bitter	Pungent	Fusty	Winy-vinegary	Muddy sediment
Reticular sacks	16	3.73 ^a	3.05 ^a	3.98 ^a	0.06 ^a	0.09 ^a	0.00 ^a
Non-defined	40	3.96 ^a	3.45 ^a	3.99 ^a	0.10 ^a	0.05 ^a	0.08 ^a
On the ground	2	3.75 ^a	2.25 ^a	3.13 ^a	0.00 ^a	0.00 ^a	0.00 ^a
Boxes and plateaus	77	3.63 ^a	3.08 ^a	4.13 ^a	0.00 ^a	0.12 ^a	0.00 ^a

Tab. 11: Influence of the production technology.**Tab. 11: Vpliv tehnologije predelave.**

Production technology	No.	Average intensity					
		Positive attributes			Defects		
		Fruity	Bitter	Pungent	Fusty	Winy-vinegary	Muddy sediment
Presses	10	3.24 ^b	2.28 ^b	3.53 ^b	0.00 ^a	0.00 ^a	0.30 ^a
2-phase	25	4.65 ^a	3.98 ^a	5.01 ^a	0.08 ^a	0.14 ^a	0.00 ^b
2.5-phase	100	3.57 ^b	3.06 ^b	3.87 ^b	0.03 ^a	0.10 ^a	0.00 ^b

Tab. 12: Influence of the cultivars.**Tab. 12: Vpliv sorte.**

Cultivar	No.	Average intensity					
		Positive attributes			Defects		
		Fruity	Bitter	Pungent	Fusty	Winy-vinegary	Muddy sediment
Ascolana	1	4.00 ^a	1.00 ^a	1.00 ^b	0.00 ^a	0.00 ^a	0.00 ^a
Istrska belica	46	3.58 ^a	3.36 ^a	4.26 ^a	0.07 ^a	0.21 ^a	0.07 ^a
Istrska belica 20% Leccino 80%	5	4.60 ^a	3.70 ^a	4.30 ^a	0.00 ^a	0.00 ^a	0.00 ^a
Istrska belica 40% Leccino 60%	1	3.00 ^a	2.50 ^a	3.00 ^{a,b}	0.00 ^a	0.00 ^a	0.00 ^a
Istrska belica 50% Leccino 50%	29	3.86 ^a	3.28 ^a	4.03 ^a	0.00 ^a	0.00 ^a	0.00 ^a
Istrska belica 70% Leccino 30%	4	3.94 ^a	3.06 ^a	3.69 ^{a,b}	0.00 ^a	0.00 ^a	0.00 ^a
Istrska belica 90% Leccino 10%	2	2.75 ^a	2.75 ^a	3.75 ^{a,b}	0.00 ^a	0.00 ^a	0.00 ^a
Leccino	8	4.09 ^a	2.28 ^a	3.31 ^{a,b}	0.00 ^a	0.00 ^a	0.00 ^a
Mix of cultivars	38	3.72 ^a	3.15 ^a	4.18 ^a	0.05 ^a	0.09 ^a	0.00 ^a
Oblica	1	3.00 ^a	1.00 ^a	1.50 ^{a,b}	0.00 ^a	0.00 ^a	0.00 ^a

Tab. 13: Number of virgin and lampante olive oil samples in crop year 2005/2006.**Tab. 13: Razvrščanje vzorcev letnika 2005/2006 v kategorijo deviško olje in oljčno olje lampante.**

Category	Median of defects	Total samples	Fusty	Musty	Muddy sediment	Winy-vinegary	Rancid
			No. samples				
Virgin olive oil	$0 < Me \leq 2.5$	71	33	1	10	16	9
Lampante olive oil	$Me > 2.5$	12	3	2	4	2	5

Based on the statistical analysis of the results in crop year 2002/2003, the sensory attributes fruity and bitter do not depend on the olive cultivars. The most pungent samples were those produced from the mix of cultivars Istrska belica and Leccino in proportion 20% : 80%, followed by the sample produced from the cultivar Istrska belica. The two cultivars, Istrska belica and Leccino, differ in the amount of biophenols that influenced

the bitter and pungent sensation. The biophenols amount is higher in Istrska belica cultivar. Based on this consideration, we expected the sample Istrska belica to be more pungent.

In 2005, the organoleptic assessment was performed on 291 samples. 208 of them were without defects and complied with the category extra virgin olive oil, 71 samples were ranged in the virgin category, while 12

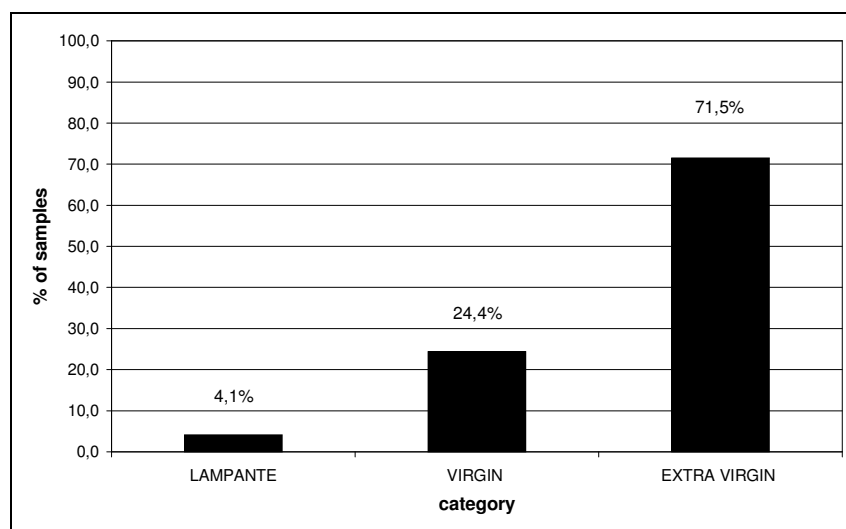


Fig. 1: Grading of samples in categories (% of samples) collected and analysed in crop year 2005/2006.

Sl. 1: Razvrščanje vzorcev letnika 2005/2006 v kategorije (% vzorcev).

samples were classified as lampante olive oil. Figure 1 shows the proportion of samples that was assigned to each category.

Extra virgin olive oil

The fruity intensity of extra virgin olive oil samples was medium, in the range from 2.5 to 6.5. The fruity of 49.5% of samples was 4–4.5. The bitter and the pungent sensations were of medium intensity (4–5) as well, in 47.8% and 34.1% of samples respectively. The bitter was in the range from 2 to 7, the pungent from 3 to 6.5.

Virgin olive oil

The negative attribute fusty was predominant in 33 samples, muddy sediment in 16 samples, 10 samples were winy-vinegary and 9 samples were rancid. The attribute musty was determined in one sample, in which the predominant defect was fusty. The results are given in Table 13.

Lampante olive oil

The median of defects was above 2.5. In 4 samples the defect "muddy sediment" was noted, "fusty" in 3 samples, "musty" in 2 samples, whereas in 2 samples the predominant defect was winy-vinegary. The assessors, however, also determined muddy sediment and fusty of low intensity. The defect rancid was also determined, but was not predominant. The results are given in Table 13.

DISCUSSION

It was established that in 1995 77% of samples complied with the request for extra virgin category. According to the legislation for extra virgin olive oil at that time (Commission Regulation (EEC) No 2568/91), max. 1% (w/w) of acidity was allowed. The average acidity of the samples was 0.81% (w/w). The minimal determined acidity was 0.06% (w/w), the maximum was 7.83% (w/w). In ten years, the average acidity has decreased and consequently the number of samples that comply with the criteria for extra virgin category has increased.

In the last crop year 2005/2006, we determined free fatty acids in 902 samples. The average acidity was 0.18% (w/w). The minimal determined acidity was 0.05% (w/w), the maximum was 1.47% (w/w).

892 samples that represent 98.9% of samples complied with the criteria for extra virgin category. According to the current legislation (Commission Regulation (EC) No 1989/2003), the maximum allowed acidity for this category is 0.8% (w/w).

The quality evaluation of virgin olive oil is determined with chemical analyses and organoleptic assessment. Only the organoleptic assessment can determine the presence of the expected positive attributes of extra virgin olive oil and establish the eventual presence of defects. Hypothetically, samples of oils with lower acidity are without any defects. Such samples stored in proper conditions can maintain an acceptable quality even after a year.

The second part of the research was the sensory analysis of virgin olive oil samples. We performed the organoleptic assessment on 135 samples, which repre-

sent 22.5% of the analysed samples in crop year 2002/2003 with the acidity below 0.2% (w/w). In spite of the low acidity, seven samples had defects of fusty, winy-vinegary and muddy sediment. The perceived intensity of defects was low; therefore the samples were ranged in virgin olive oil category. The positive attributes fruity, bitter and pungent of extra virgin olive oils were medium intensive. The results of the sensory analysis of olive oils crop year 2002/2003 show that there are no significant differences between the samples. In spite of that, the influence of some factors was determined.

Olive oils produced in November were more bitter and pungent even if there were no statistical significant differences in the single sample produced in December.

The sensory analysis indicated that the time from picking to processing influenced the perceived intensity of the sensory attributes of the oils. Oils produced in 36 hours were more bitter and pungent, and differed from the oils produced in more than 36 hours.

The intensity of sensory attributes of the oils was not influenced by olive cultivars. We established that there were no significant differences in oils produced from olives stored in suitable conditions before processing.

In crop year 2002/2003, the sensory analysis indicated that oils produced by the two-phase continuous system were more fruity, bitter and pungent compared to other production technologies. Defects fusty and winy-vinegary were found in samples produced by the continuous system, while the defect muddy sediment was determined in the only olive oil sample produced by presses (non-continuous system).

The positive and eventually negative sensory attributes are influenced due to the prolonged contact of oil

and water by the malaxation of olive pasta (Lercker, 2003).

We performed a similar research on some samples of the crop year 2005/2006. 71.5% of the analysed samples complied with extra virgin category, 24.4% with virgin and 4.1% with lampante.

CONCLUSIONS

In 1995, 77% of samples complied with the request for extra virgin category, while in crop year 2005/2006 the number of samples increased to 892 samples that represent 98.9% of the samples.

Hypothetically, samples of oils with lower acidity are without any defects. Such samples stored in proper conditions can maintain an acceptable quality even after a year. Only the organoleptic assessment can determine the presence of expected positive attributes of extra virgin olive oil and establish the eventual presence of defects. We performed organoleptic assessment on 135 samples, which represent 22.5% of the analysed samples in crop year 2002/2003 with the acidity below 0.2% (w/w). In spite of the low acidity, seven samples had defects of fusty, winy-vinegary and muddy sediment. In crop year 2005/2006, we established that 71% of the analysed samples complied with extra virgin category, 24.4% with virgin and 4.1% with lampante. Time of harvest, time from picking to processing and storage conditions before processing all influenced the acidity and the sensory attributes of virgin olive oils. The intensity of sensory attributes of the oils was not influenced by olive cultivars.

PREGLED ANALIZE KISLOSTI VZORCEV DEVIŠKEGA OLJČNEGA OLJA V OBDOBJU 1995-2005 IN KORELACIJA TEH PODATKOV Z OPRAVLJENIMI SENZORIČNIMI ANALIZAMI

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POVZETEK

Raziskava obsega preučevanje kislosti in senzoričnih značilnosti deviškega oljčnega olja Slovenske Istre. Določili smo kislost 4871 vzorcev v obdobju 1995-2005. Senzorično je bilo ocenjenih 135 vzorcev letnika 2002/2003 s kislostjo pod 0,2 ut. % in 291 vzorcev letnika 2005/2006. 128 vzorcev letnika 2002/2003 je bilo ekstra deviške kakovosti, le pri sedmih vzorcih so bile ugotovljene napake. 71,5% vzorcev letnika 2005/2006 je bilo brez senzoričnih napak in razvrstili smo jih v kategorijo ekstra deviško oljčno olje, 24,4% v deviško oljčno olje in 4,1% v lampante oljčno olje. Ugotovili smo, da obdobje predelave, čas skladiščenja pred predelavo in način shranjevanja oljk vplivajo na kakovost olja, same sorte pa ne vplivajo. Kemijske analize in senzorično ocenjevanje smo opravili v skladu z Uredbo komisije (EGS) št. 2568/91 in dopolnilnimi aneksi.

Ključne besede: kislost oljčnega olja, razvrščanje olja, obiranje, shranjevanje, predelava, senzorična analiza

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