Article

Rapid Authentication and Detection of Olive Oil Adulteration using Laser-Induced Breakdown Spectroscopy

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Table S1. Confusion matrices obtained via external validation by the SVMs/LR/GB algorithms.

SVMs/LR/GB algorithms							
Geographical origin			**Predicted classes**				
			EVOOs	**Corn oil**	**Pomace oil**	**Soybean oil**	**Sunflower oil**
All regions	**Actual classes**	**EVOOs**	**240/240/238**	0/0/0	0/0/2	0/0/0	0/0/0
		Corn oil	0/0/0	**218/199/211**	21/31/17	1/7/8	0/3/4
		Pomace oil	0/0/0	12/20/19	**214/206/203**	8/11/7	6/3/11
		Soybean oil	0/0/1	4/8/1	11/16/15	**218/200/205**	7/16/18
		Sunflower oil	0/0/0	5/1/3	2/1/7	17/14/30	**216/224/200**
Crete	**Actual classes**	**EVOOs**	**60/60/56**	0/0/0	0/0/0	0/0/3	0/0/1
		Corn oil	0/0/0	**60/60/53**	0/0/0	0/0/0	0/0/7
		Pomace oil	0/0/0	0/0/5	**59/59/52**	0/0/1	1/1/2
		Soybean oil	0/0/0	0/0/0	0/0/0	**60/60**	0/0/0
		Sunflower oil	0/0/0	0/0/3	3/1/0	0/0/a	**57/59/53**
Lesvos	**Actual classes**	**EVOOs**	**60/60/59**	0/0/1	0/0/0	0/0/0	0/0/0
		Corn oil	1/0/0	**57/57/52**	2/3/8	0/0/0	0/0/0
		Pomace oil	0/0/0	1/1/4	**59/59/56**	0/0/0	0/0/0
		Soybean oil	0/0/0	0/0/0	0/0/0	**59/60/59**	1/0/1
		Sunflower oil	0/0/0	0/0/0	0/0/0	7/4/4	**53/56/56**
Kalamata	**Actual classes**	**EVOOs**	**60/60/57**	0/0/3	0/0/0	0/0/0	0/0/0
		Corn oil	0/0/0	**56/56/54**	4/3/6	0/0/0	0/1/0
		Pomace oil	0/0/0	5/0/4	**55/59/52**	0/1/1	0/0/3

		Soybean oil	0/0/0	0/0/0	0/0/2	**58/56/54**	2/4/4
		Sunflower oil	0/0/0	0/0/3	1/0/1	3/7/8	**56/53/48**
Achaia	**Actual classes**	**EVOOs**	**60/60/59**	0/0/0	0/0/0	0/0/0	0/0/1
		Corn oil	0/0/1	**60/60/55**	0/0/4	0/0/0	0/0/0
		Pomace oil	0/0/0	0/0/0	**55/53/51**	5/7/9	0/0/0
		Soybean oil	0/0/2	0/0/1	2/3/9	**55/55/43**	3/2/5
		Sunflower oil	0/0/0	0/0/0	1/0/0	1/2/2	**58/58/58**

Table S2. Number of EVOOs per geographical region and mixtures with lower quality oils.

Geographical origin	EVOOs	Adulterant	No. of Adulteration samples	Total No. of samples
Crete	10	Corn	9	46
		Pomace	9	
		Soybean	9	
		Sunflower	9	
Lesvos	10	Corn	9	46
		Pomace	9	
		Soybean	9	
		Sunflower	9	
Kalamata	10	Corn	9	46
		Pomace	9	
		Soybean	9	
		Sunflower	9	
Achaia	10	Corn	9	46
		Pomace	9	
		Soybean	9	
		Sunflower	9	
All regions	40	Corn, Pomace, Soybean, Sunflower	144	184

Table S3. Number of samples/spectra used for training and testing, per geographical region and mixtures.

Geographical origin	Classes	Training Samples	Measurements	Training Spectra	Testing Samples	Measurements	Testing Spectra
Crete	EVOOs	8	30	240	2	30	60
	Corn	7	30	210	2	30	60
	Pomace	7	30	210	2	30	60
	Soybean	7	30	210	2	30	60
	Sunflower	7	30	210	2	30	60
Lesvos	EVOOs	8	30	240	2	30	60
	Corn	7	30	210	2	30	60
	Pomace	7	30	210	2	30	60
	Soybean	7	30	210	2	30	60
	Sunflower	7	30	210	2	30	60
Kalamata	EVOOs	8	30	240	2	30	60
	Corn	7	30	210	2	30	60
	Pomace	7	30	210	2	30	60
	Soybean	7	30	210	2	30	60
	Sunflower	7	30	210	2	30	60
Achaia	EVOOs	8	30	240	2	30	60
	Corn	7	30	210	2	30	60
	Pomace	7	30	210	2	30	60
	Soybean	7	30	210	2	30	60
	Sunflower	7	30	210	2	30	60
All regions	EVOOs	32	30	960	8	30	240
	Corn	28	30	840	8	30	240
	Pomace	28	30	840	8	30	240
	Soybean	28	30	840	8	30	240
	Sunflower	28	30	840	8	30	240