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Wastewater of Table Olive Industry and its Pollution Effects

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Abstract

Table olive industry wastewaters constitute a critical environmental pollution problem. But there was limited number of project and study on treatment and reduction of this wastewater. So that this review was focused on produced amount and pollutant effect and content of this wastewater to attract the attention of environmentally conscious producers and consumers.

Introduction

Table olive industry (TOI) wastewaters constitute a critical environmental problem in Mediterranean countries, due to its elevated contaminant levels and to its seasonal nature [1]. Usually, this wastewater is disposed into the environment untreated, leading to the possibility of the pollution of surface waters and aquifers [2]. Olive oil is in the medina due to the pollutant property of wastewater, but the wastewater of the TOI is overlooked. Similarly, although there are many studies and projects on olive wastewater, there are few studies about table olives wastewater. So that this review was aimed to give brief information about wastewater generated by TOI and its pollutant properties (Table 1).

Table 1: Wastewaters from different table olive processing methods and plants.

Characteristics	Spanish-Style Green Olives[a]			Black Olives[b]	Spanish-Style Pickled Green Olive[c]	Natural Olives[d]	Commercial Table Olive Plants[e]
	Lye	Washing	Fermentation				
COD (g/l)	9.3	13.6	18.9	6.7–40	15-35	-	2.5-3.2
BOD_5 (g/l)	3.11	4.64	6.05	4.3	-	34.8-38.3	-
pH	12.99	11.52	4.3	4.5–13.6	9,5-12	3.6-4.4	5.9-6.5
Total phenols (mg/l)	80.39	117.23	76.41	112–360	25-40	3.2-5.1	73-93
Organic acids (mg/l)	27.38	27.2	157.23	–	20-35	-	117-157

Note: a: [3], b: [4,5], c: [6], d: [7], e: [8]

Amount and Characteristics of Table Olives Industry Wastewaters

World table olive production was about 2.5 million tons in the 2014/2015 season, according to recent International Olive Oil Council (IOOC) statistics [9]. The main commercial types of table olives are the Spanish-style green olives (~50% of total production), Californian-style black ripe olives (~25% of total production), and naturally black olives in brine (~25% of total production) [10], the manufacturing of which generates considerable quantities of different types of wastes [3,10]. Wastewaters from different table olive processing methods were given in (Table 1). Californian-style black-ripe olives has the highest pollutant potential with around 2–6 L/kg olives produced [11], followed by the Californian green ripe olives and Spanish table olives with an average of 1.5–3.5 L/kg olives produced and finally, the Naturally black olives and the untreated green and turning color olives with 1 L/kg olives produced [12,13]. Lye treatment followed by exhaustive washings for the elimination of lye had the most polluting effluents [11].

Conclusion

Currently used methods in TOI based on water, lye and salt which was the main responsible of the environmental pollution problem. From environmental perspective, it is understood that

the eco- friendly production methods to be developed for TOI has vital importance because of the high amount and polluting nature of wastewater are produced from this industry. Due to high pH, salt and phenol content it was difficult to treat. Also, the future market researches should be focus on determination of purchase behavior of consumers to the table olive product produced by eco-friendly techniques. Positive results of consumer purchase behavior will motivate TOI to develop and use eco- friendly production methods. Policy makers should carry out more stringent audits to ensure environmental safety and to encourage with supports producers to produce with eco-friendly methods.

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