Processing of Industrial Wine Lees for Squalene Recovery

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The exploitation of wastes and by-products produced by the winery industry seems to be a cost-effective and an environmental friendly investment. A number of valuable components can be recovered from yeast lees (1, 2), whereas up to now, there is no literature data concerning recovery of squalene. Squalene is a bioactive compound of great importance, finding application to food, pharmaceutical and cosmetic industry. Nowadays, increasing is the interest in establishing novel squalene sources as the conventional ones are rather limited (3, 4). The aim of the present study was the selective ultrasound assisted extraction of the non-polar lipids of lees, obtaining, thus, a lipid fraction enriched in squalene, using the food-grade solvent, *n*-hexane. Processing of wine lees by freeze-drying up to a_w = 0.4 was preceded to speed up extraction process. A central composite design was applied to select ultrasound operational conditions. The potential influence of the two independent factors, namely duration (1-29 min) and duty cycles (active intervals 0.3-1.0 s) of sonication to the squalene yield (SQY) (mg/Kg of lipid extract) and the lipid yield (LY) (%, w/w of dry lees) were examined. Chromatographic methods were applied to monitor squalene content and to characterize composition of the lipid extracts. Under the optimum operational conditions, SQY and LY were found to be 20390 ± 1335 mg SQ/Kg lipid extract (or 0.6 g/Kg dry lees) and 2.5 ± 0.2 % dry lees, respectively. The examined lipid fraction contained 0.6 g SQ/Kg dry biomass, which was comparable to those of recently examined wastes and by-products as potential sources (e.g. 0.2-0.35 g SQ/Kg of dry olive pomace and 0.06 g SQ/Kg olive leaves) (5,6).

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