ABSTRACT:

The possibility to improve the nutritional value of olive oil by enriching it in phenolic compounds from olive leaves (e.g., oleuropein) by ultrasonic maceration was studied. The experimental design used led to the following optimal extraction conditions: ultrasonic power of 60 W, temperature of 16°C and sonication duration of 45 min. The high total phenolic content (414.3 ± 3.2mg of oleuropein equivalent/kg of oil), oleuropein (111.0 ± 2.2mg/kg of oil) and α-tocopherol (55.0 ± 2.1g/kg of oil) concentrations obtained by optimized ultrasound-assisted extraction (UAE) proved the efficiency of this process when compared with the conventional solid-liquid extraction. Histochemical analyses showed that this efficiency is due to specific alteration of the phenol-containing leaf structures. Furthermore, the radical-scavenging activity of the processed oil (DPPH test) and its stability toward lipid autoxidation (heating test) confirmed its enrichment in antioxidants. Sensory evaluation of the enriched olive oil showed a slight increase in bitterness but an overall acceptability. Finally, the enriched olive oil was characterized by clear green color (L*, a*, b* parameters).