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Abstract

Supercritical Fluid Extraction and Pulsed Electric Field Assisted Extraction of *Ziziphus lotus* Fruits, Leaves and Roots †

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Abstract: Currently, the consumption of natural extracts from medicinal plants and fruits present in nature, and the discovery of the many benefits and positive impacts on the human body, connected to their intake have favored and promoted research in the field of extraction. For this purpose, in recent years, the extracts of plant parts (leaves, branches, seeds, stem, roots, fruits, etc.) of the genus of *Asteriscus*, *Atriplex*, *Haloxylon*, *Ruta*, *Ficus*, *Olea*, and *Zizyphus* have been investigated for their several biological properties and therapeutic activities including those as an antioxidant, antitumoral, antiproliferative, hepatoprotective, and antimicrobial. The shortcoming of using the conventional methods such as maceration, Soxhlet solvent extraction, and pressurized hot water have promoted the development of novel, efficient, economical, and safe extraction techniques to recover the bioactive compounds without losing their quality and properties. Innovative methodologies such as supercritical fluid technology and pulsed electric field-assisted extraction has been proposed as sustainable methodologies to isolate nutraceuticals and pharmaceuticals from natural matrices such as herbs, spices, aromatic and medicinal plants. The study aimed to obtain extracts from fruits, leaves, and roots of *Ziziphus lotus* by Supercritical Fluid Extraction (SFE) and Pulsed Electric Field (PEF) assisted extraction and characterize the extracts in terms of total antioxidant capacity (ORAC and TEAC), total phenolics, chlorophyll, and carotenoids content. PEF extracts presented an interesting content of phenolic compounds, Fruits: 14.8 ± 0.1; Leaves: 31.1 ± 1.8; Roots: 28.8 ± 1.7 mg GAE/g DW. On the other hand, the concentration of phenolics in SFE extracts was, Fruits: 5.91 ± 0.2; Leaves: 1.184 ± 0.2; Roots:5.72 ± 0.8 mg GAE/g DW.

Keywords: *Ziziphus lotus* fruits; supercritical fluid extraction; pulsed electric field; by-products; antioxidant

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