

Optimization of methanol extraction and evaluation of anti-inflammatory and anti-Alzheimer activities in vitro of *Ammodaucus Leucotrichus*

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High added value product extraction is a topic of tremendous interest and relevance, particularly when it comes to newly discovered plants from understudied arid and semi-arid zones. *Ammodaucus leucotrichus*, a spontaneous endemic plant indigenous to north and tropical Africa's Saharan and sub-Saharan regions, is the plant species we have chosen for this goal. It is used as a condiment or flavoring agent in cuisine as well as in traditional medicine to cure heart disease, diabetes, allergy symptoms, and stomach ailments.

In vitro tests were performed to assess the anti-inflammatory and anti-neurodegenerative effects of lipoxygenase (LOX) inhibition and anticholinesterase (AChE). The findings demonstrated the strong anti-inflammatory and anti-Alzheimer, of *Ammodaucus leucotrichus*. A superior extraction solvent than ethanol was water, which was used to reach the ideal conditions at 180 °C. Temperature had a beneficial impact on extraction yield within a range of 15.55 to 44.45%. Moreover, the EC₅₀ values for antioxidant activity, acetylcholinesterase inhibition, and lipoxygenase inhibition were 85.51 ug/ml, 55.60 ug/mL, AChE, and LOX, respectively. In conclusion, *Ammodaucus leucotrichus* phenolics may be extracted using the new PLE process, which is an effective and environmentally friendly way. This allows for the production of extracts that have appealing antioxidant, anti-Alzheimer, and anti-inflammatory properties.

Keywords: anti-inflammatory, anti-Alzheimer, *Ammodaucus leucotrichus*, anticholinesterase