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Effect of Essential Oils of *Citrus sinensis* (L.) Osbeck on memory mediated by Acetylcholinesterase inhibition

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Introduction: Alzheimer's disease (AD) is a chronic neurodegenerative disorder characterized clinically by the progressive loss of cognitive function, neuropsychiatric and behavioral disorders. There are few studies on inhibition of enzymes linked with AD by plant essential oils (EO), despite its advantages, such as availability, few side effects or toxicity, and biodegradability.

Considering the potential of Citrus sinensis (L.) Osbeck to inhibit acetylcholinesterase (AChE), this research aims to evaluate the effect of its EO on memory.

Methodology: To assess spatial reference memory, male albino rats were tested on Morris water maze. The animals were divided into 5 groups: Control (N=7), EO 50mg/kg (n=6), EO 100mg/kg (n=6) and EO 200mg/kg (n=5). All animals received oral administration 24h before training. The latency to reach a hidden platform was recorded.

Results and Discussion: All doses of Citrus sinensis (L.) Osbeck EO significantly reduced the time to find the platform submerged in Morris's water maze test when comparing the control group. The inhibitory effect of the EO on AChE plays a role in memory mediation, as well as in cognitive and behavioral function. AChE inhibitors are currently an important and symptomatic intervention for AD. Their clinical benefit derive primarily from an increase in synaptic acetylcholine levels, leading to enhanced cholinergic neurotransmission which improves activities of daily living, behavior, and cognitive performance.

Conclusion: The Orange's EO increase acetylcholine levels and improve learning and memory impairments. Overall, these results highlighted essential oil of Citrus sinensis (L.) Osbeck as a promising and innovative tool in the therapeutic approach to AD.

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