

## News &amp; Comments

## ASSE: The Potential to Improve the Cognitive Deficit

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A serious metabolic condition with a worldwide pandemic is Diabetes Mellitus (DM). Globally, 382 M individuals were impacted in 2013, and by 2035, 592 M more people are anticipated to be affected. Type-2 diabetes is characterized by insulin resistance and insulin insufficiency. Long-term hyperglycaemia frequently results in increased oxidative stress associated with the inflammatory process, which further compromises vital physiological systems like the brain system, kidneys, and heart. An immunological response to injuries, infections, illnesses, and disorders causes inflammation.

The BBB is harmed by the long-term DM disease, which also causes vascular tissues in the brain. The DM condition causes astrocytes and pericytes to breathe at a high pace, which results in a significant amount of reactive oxygen species and oxidative stress being produced. This oxidative stress situation results in increased inflammatory cytokine production, which then activates the NF- $\kappa$  pathway and leads to BBB leaking. In Saudi Arabia, the date palm (*Phoenix dactylifera* L.) is a crucial fruit crop because of its numerous health benefits. In addition to being a great source of fibre and having very low cholesterol and fat content, date palm is beneficial for people with heart and digestive conditions. This study aims to explore the effects of ASSE on neuroinflammation induced by LPS in a mice model.

The study was carried out at the Pharmacology Research Laboratory, Department of Pharmacology and Toxicology, Qassim University, Saudi Arabia. Streptozotocin, nicotinamide, and metformin hydrochloride were purchased from Cayman Chemicals in the United States of America. The farms in the Al-Qassim region were where the sukkari dates were bought. The seeds were extracted from the fruit pulp, washed in water, and then left to dry for two to three days at room temperature. A coffee grinder was then used to grind the seeds into a coarse powder. The 30 male SD (Sprague Dawley) rats that were around 3 months old and weighed 200–250 g was utilized to evaluate the neuroprotective effects of ASSE. In a 0.9% saline solution, the ASSE, metformin hydrochloride, and nicotinamide were dissolved. The study's processes were carried out following the Organization for Economic Cooperation and Development's recommendations.

It was discovered that administering ASSE to type-2 diabetic rats greatly lowered COX-2 enzyme levels in the diabetic-induced brain and significantly reduced pro-inflammatory activities. Anti-inflammatory cytokines were also only mildly altered. The deterioration of cognitive health and memory problems have been connected in research reports to abnormal blood glucose levels, poor insulin activity, impaired cholinergic systems, and inflammation-associated damaged neurons. Deterioration in



cognitive function is frequently present in long-term hyperglycaemia. There is not a very clear explanation of the underlying mechanism for the loss in cognitive health brought on by long-term hyperglycaemia. However, it has been very well documented and confirmed that inflammation-related indicators are elevated in hyperglycaemic situations.

The findings also showed that ASSE reduced COX-2 enzyme activity in the diabetic-induced brain while inhibiting proinflammatory cytokines (TNF- and IL-6) and elevating an anti-inflammatory cytokine (IL-10). The findings demonstrate ASSE's anti-inflammatory effects, particularly when T2DM circumstances are present.

#### **JOURNAL REFERENCE**

Mani, V., M. Arfeen, S. Sajid and Y. Almogbel, 2022. Aqueous extract from Sukkari date seeds attenuates neuroinflammation induced by type-2 diabetic in rats. *Int. J. Pharmacol.*, 18: 570-577.

#### **KEYWORDS**

Sukkari dates, diabetes, neuroinflammation, cytokines, cyclooxygenase 2, cognitive impairment, neuroprotective

