

Original Article

# Neuroprotective Activity of *Santalum Album* Seeds in Sepsis Encephalopathy

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## Abstract

Septic encephalopathy is a systemic inflammatory disease and is characterized by change in neurotransmitter release, dysregulated production of cytokines, organ dysfunction and long-term cognitive and emotional impairments. In the present study, it was investigated whether administration of ethanolic extract and chloroform fraction of *Santalum album* can affect the behavioural, oxidative stress parameters and brain oedema in sepsis-surviving mice. Septic encephalopathy was induced in albino mice of either sex (20-30 gm body weight) by cecal ligation and puncture technique. Ethanolic extract of *Santalum album* was prepared by microwave assisted extraction and various fractions were prepared. Behavioural parameters like neurological examination and exploratory behaviour were studied after 3 hours and 24 hours of sepsis induction. *Santalum album* extract showed significant ( $p < 0.001$ ) improvement in depression, memory, neurological severity score and exploratory behaviour in surviving animals. Further glutathione level and catalase level was found to be elevated with ethanolic extract and chloroform fraction at 200mg/kg body weight whereas level of malondialdehyde (MDA) was found to decrease in chloroform fraction, at a dose of 200 mg/kg body weight. Brain oedema was found to be increased approximately 20% in diseased group, which was reduced after treatment. Thus, based on the results, it may be concluded that *Santalum album* shows neuroprotective effect against septic encephalopathy *via* reduction of oxidative stress and improvement in learning and memory, neurological severity score and exploratory behaviour.

**Keywords:** Septic encephalopathy, *Santalum album*, ethanolic extract, brain oedema

## INTRODUCTION

Sepsis is an infectious disease. Its sequelae are among the most frequent causes of mortality and morbidity in intensive care units (ICU). During sepsis development, several neurological abnormalities may be observed, such as disorientation, confusion, agitation, lethargy, and coma. Recent treatments for sepsis have focused on decreasing mortality through aggressive resuscitation.