

To Study Effect of Endophytes on Ethanol Exposed Rats

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Abstract: Adolescent alcohol exposure poses significant risks to brain development. This study investigated the potential neuroprotective effects of a *Lactobacillus* endophyte isolated from *Azadirachta indica* (neem) against ethanol-induced neurobehavioral and histopathological alterations in adolescent Sprague-Dawley rats. Rats were exposed to ethanol (5 g/kg) for 31 days and subsequently treated with low and high doses of the *Lactobacillus* endophyte or Disulfiram (100 mg/kg) for the same duration. Behavioral assessments using the Elevated Plus Maze, Light and Dark Box, and Morris Water Maze revealed that ethanol exposure induced anxiety-like behavior and impaired learning and memory. Treatment with the *Lactobacillus* endophyte significantly attenuated these behavioral deficits. Histopathological analysis of brain tissue from ethanol-exposed rats showed neuronal shrinkage, pyknotic nuclei, cytoplasmic eosinophilia, and edema, indicative of neurodegeneration. Both the *Lactobacillus* endophyte and Disulfiram treatment groups exhibited significantly improved neuronal architecture and reduced neurodegenerative markers. These findings suggest that a *Lactobacillus* endophyte from neem possesses neuroprotective properties against ethanol-induced brain damage in adolescent rats, potentially offering a natural therapeutic strategy

Keywords: Adolescent Alcohol Exposure, *Azadirachta indica*, Endophytes, *Lactobacillus*, Neuroprotection, Neurobehavioral Deficits, Histopathology, Rat Model

