

## Effects of Graded Doses of Flaxseed (*Linum usitatissimum*) on Learning and Memory and the Possible Toxic Effects in Systemic Organs-An Experimental Study in Wistar Albino Rats

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### ABSTRACT

**Objectives:** (i) To study the effect of graded doses of Flaxseed on learning and memory (ii) To study the possible toxic effects (iii) To determine the effect of Flax seeds on brain acetyl cholinesterase, oxidative stress markers and on brain antioxidant enzyme level.

**Methods:** 30 Male Wistar Albino rats were divided into 3 groups of 10 each-Group 1: Control group, Group 2: Scopolamine group (positive control for learning & memory), Group 3: Scopolamine group pretreated with Flaxseed. Flaxseed was given orally in the graded doses of 20%, 40%, 60%, 80% in rat chow diet over a period of 40 weeks. Scopolamine which induces transient amnesia was given in the dose of 1 mg /kg IP.

Neuro behavioral tests were done using Pole climbing apparatus, Swim test apparatus, elevated plus Maze and Water Maze at the end of 6 weeks, 10 weeks, 14 weeks, 18 weeks, 22 weeks, 26 weeks, 30 weeks, 36 weeks and 40 weeks. Animals were sacrificed at the end of study and sent for histopathological examination and biochemical estimations. Euthanasia was done using Sodium pentothal overdose 100-200 mg IP. Approval from Institutional Animal Ethical Committee (IAEC) was taken before starting the study. The data collected were analyzed using ANOVA, test of significance.

**Results:** Neurobehavioral tests showed significant improvement in learning and memory of the rats and histopathological examination revealed a significant protection of organs like Liver, Kidney and Brain by Flaxseed. The biochemical estimations of this study confirmed the effects of Flaxseed on scopolamine induced oxidative stress.

**Conclusion:** Flaxseed can be taken as the food supplement of choice to improve learning and memory in Alzheimer's patients.

**Keywords:** *Linum usitatissimum*, Learning, Memory, Scopolamine, Antioxidant

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