

KOLAVIRON AMELIORATES COGNITIVE DEFICITS AND NEURONAL DEGENERATION INDUCED BY D-GALACTOSE IN MICE MODEL

Olufunto Omodele Adeleye^{1,2}, Oyindamola Munirat Adewale²

¹Eagles' Research Laboratory,

²Department of Anatomy, Faculty of Basic Medical Sciences, LAUTECH, Ogbomoso

Corresponding Author: Olufunto Omodele Adeleye

Email: ooadeleye@lautech.edu.ng

ORCID Number: 0000-0003-1398-9180

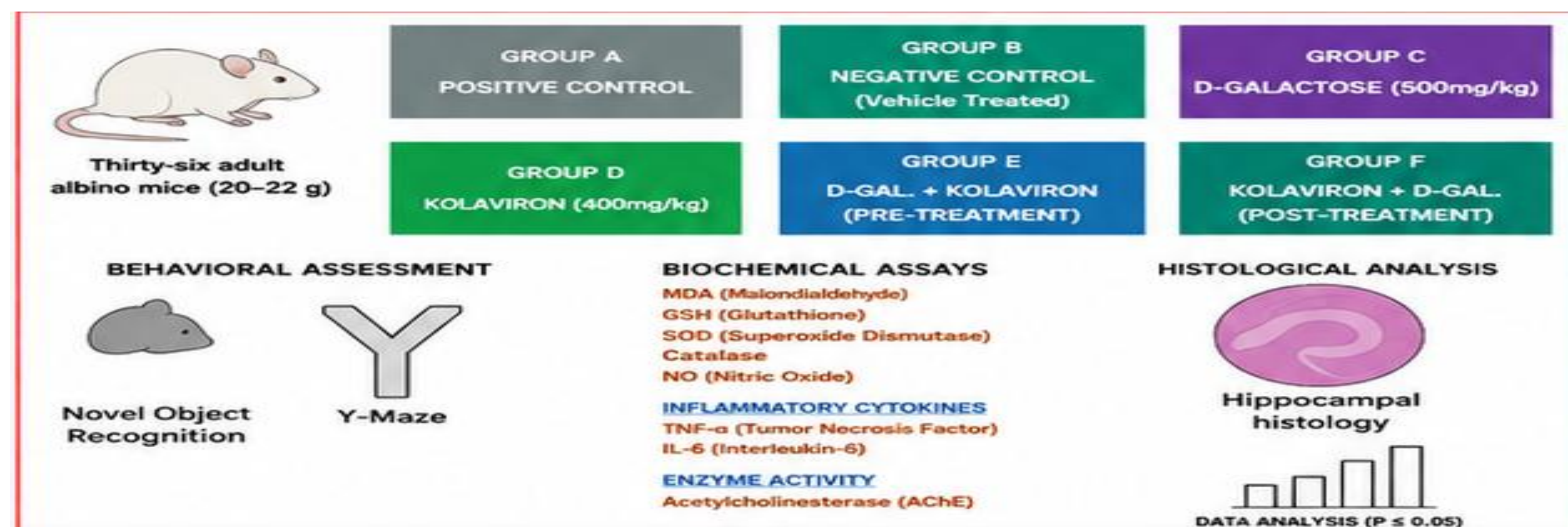
BACKGROUND

D-galactose, a naturally occurring monosaccharide, is widely used in experimental models to induce Alzheimer-like symptoms and aging. Prolonged exposure to D-galactose has been associated with oxidative stress, mitochondrial dysfunction, neuronal loss, and cognitive decline; hallmarks of neurodegenerative diseases. Kolaviron, a biflavonoid complex extracted from *Garcinia kola*, possesses documented antioxidant and anti-inflammatory properties that may offer neuroprotection. This study investigates the neuroprotective potential of kolaviron against D-galactose-induced hippocampal toxicity in mice.

AIM

To Evaluate the efficacy of kolaviron in mitigating D-galactose-induced cognitive deficits, oxidative stress, neuroinflammation, and histopathological damage in the hippocampus.

METHODOLOGY



RESULTS

D-galactose exposure significantly impaired memory and locomotion, increased anxiety, elevated MDA and nitrite levels, and reduced antioxidant enzyme activity and AChE function. It also caused hippocampal pyramidal cell degeneration. Kolaviron, particularly in post-treatment, reversed these effects by improving behavioral performance, restoring antioxidant and anti-inflammatory balance, and ameliorating histological damage.

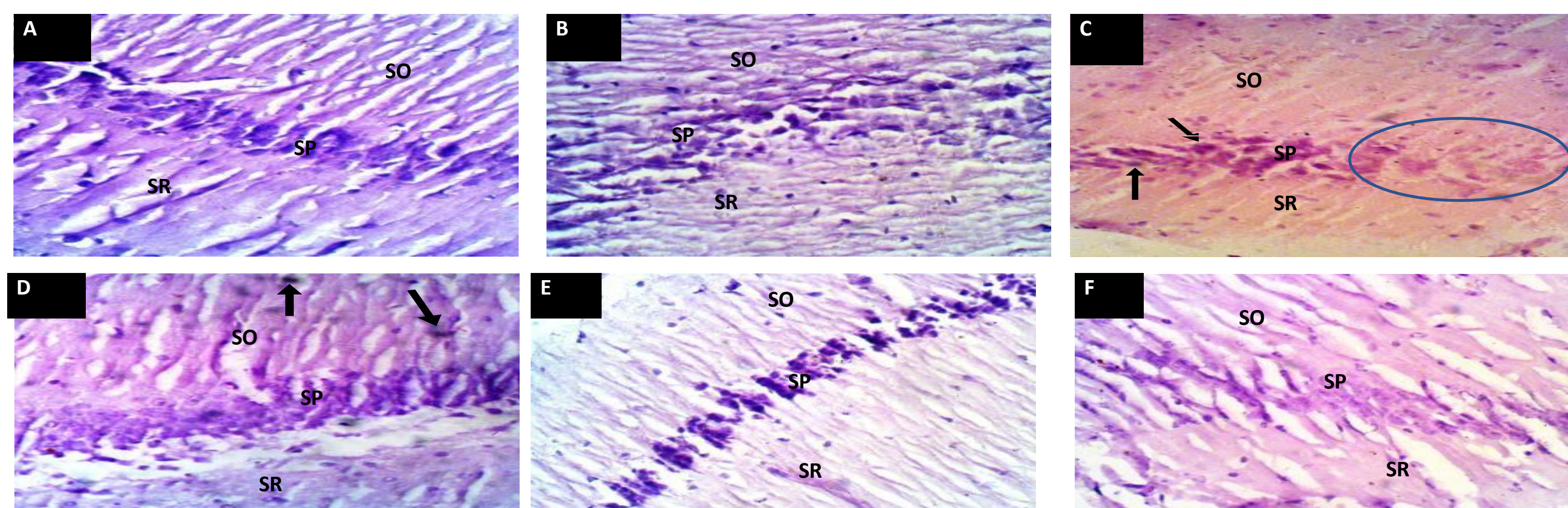


Figure 4.3. Histology (H&E) of mice hippocampus treated with D-galactose and kolaviron. Positive control (A); Negative control (B); D-Galactose (C); Kolaviron (D); D-Galactose + Kolaviron (E); and Kolaviron + D-Galactose. The positive and negative groups reflected evenly distributed and well-preserved cells and layers. Preserved cells layer is also observed in kolaviron treated group but more mild vacuoles and very few pyknotic cells (Black arrows). Pyramidal cells loss was observed in mice treated with D-galactose (Blue circle) as well as tissue rarefaction in the strata. However, Co-treatment with kolaviron restored the cell loss and it is more pronounced in the post-treated group. Magnification: X400. SO: Stratum Oriens; SP: Stratum Pyramidale; SR: Stratum Radiatum

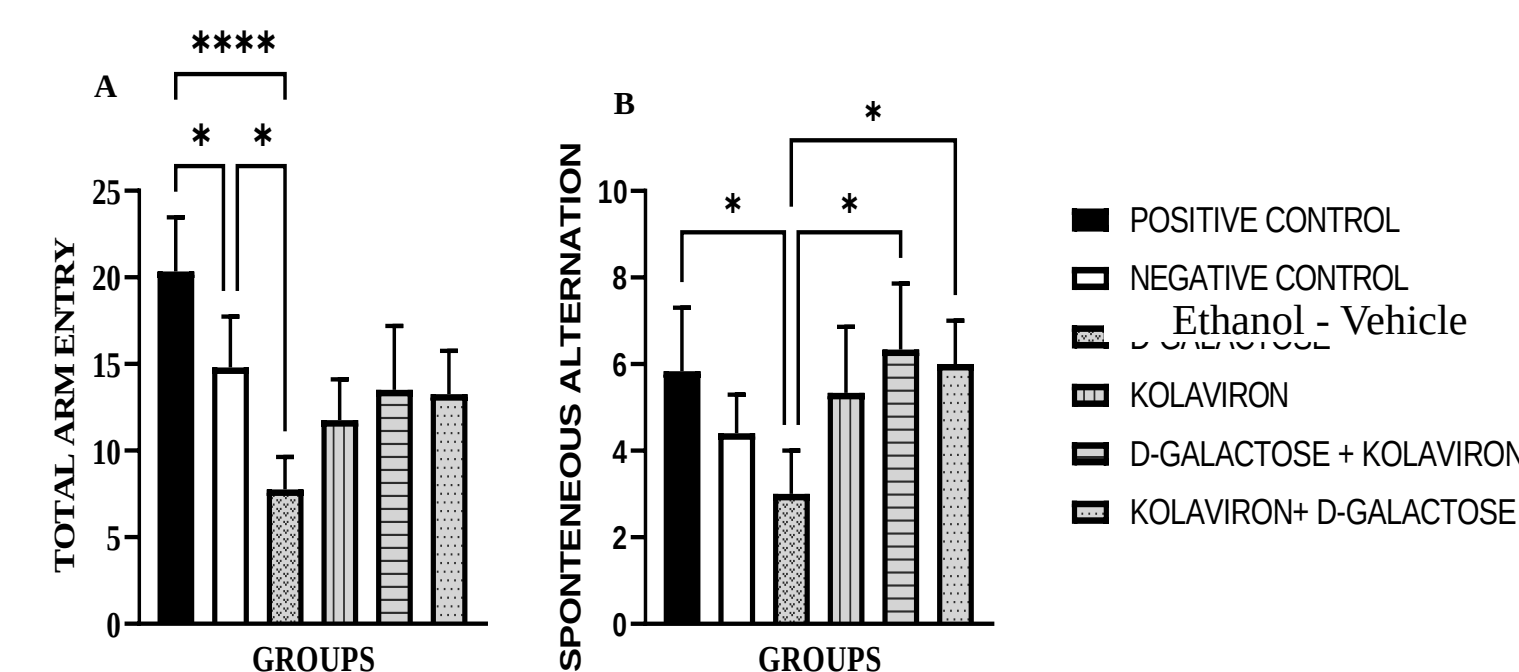


Figure 1: Y-Maze Test. Total number of arm entry (A) and spontaneous entry (B). Data are presented as Mean $\pm$ SEM of mice treated with D-galactose and Kolaviron. * Represent $p \leq 0.05$, ***represent $p \leq 0.0001$.

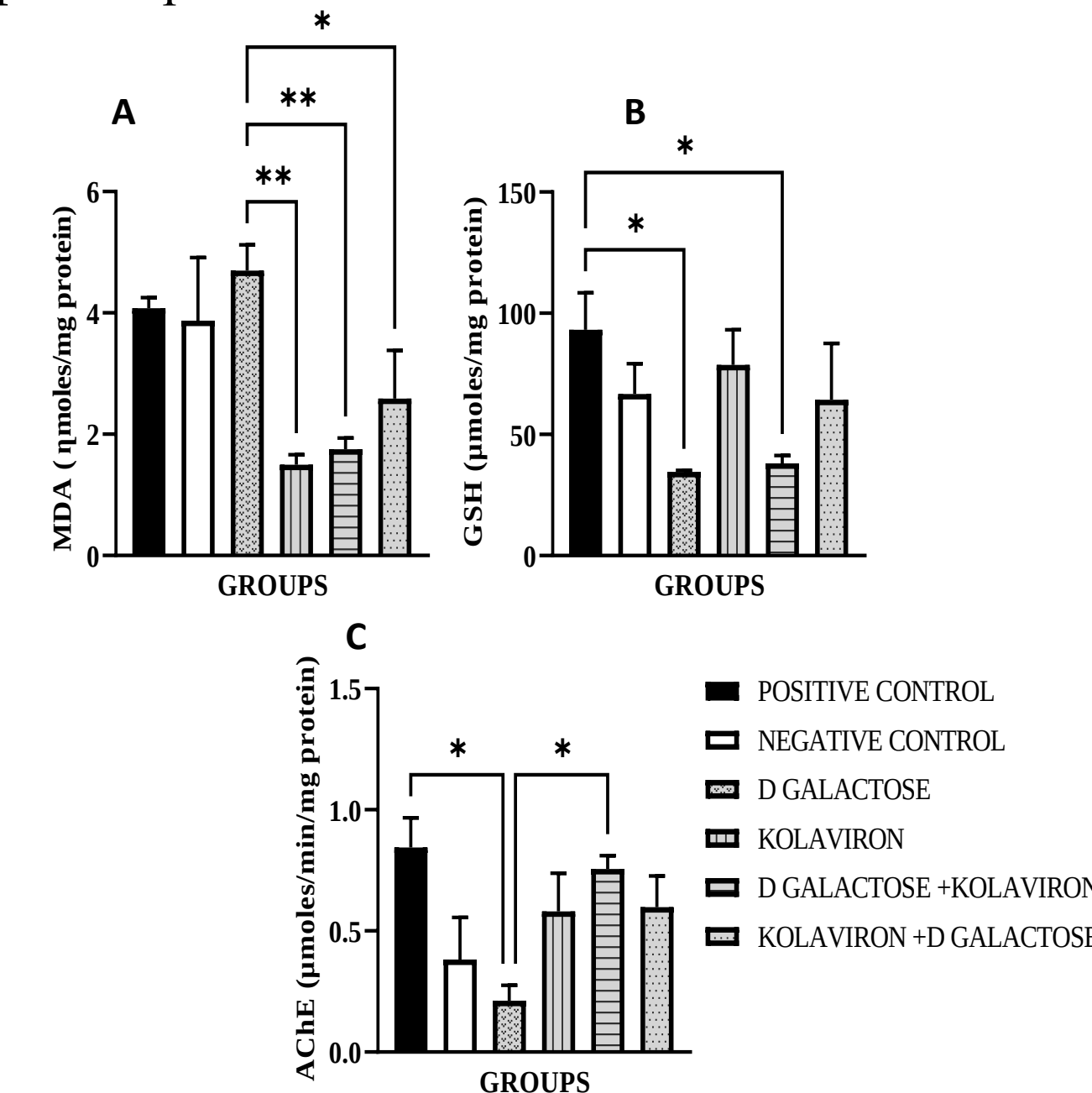


Figure 3: Oxidative stress marker: Malondialdehyde (A) and Antioxidant markers: Glutathione (B) & Acetylcholinesterase (C). Data are presented as Mean $\pm$ SEM of mice treated with D-galactose and Kolaviron. * Represent $p \leq 0.05$, ** represent $p \leq 0.01$.

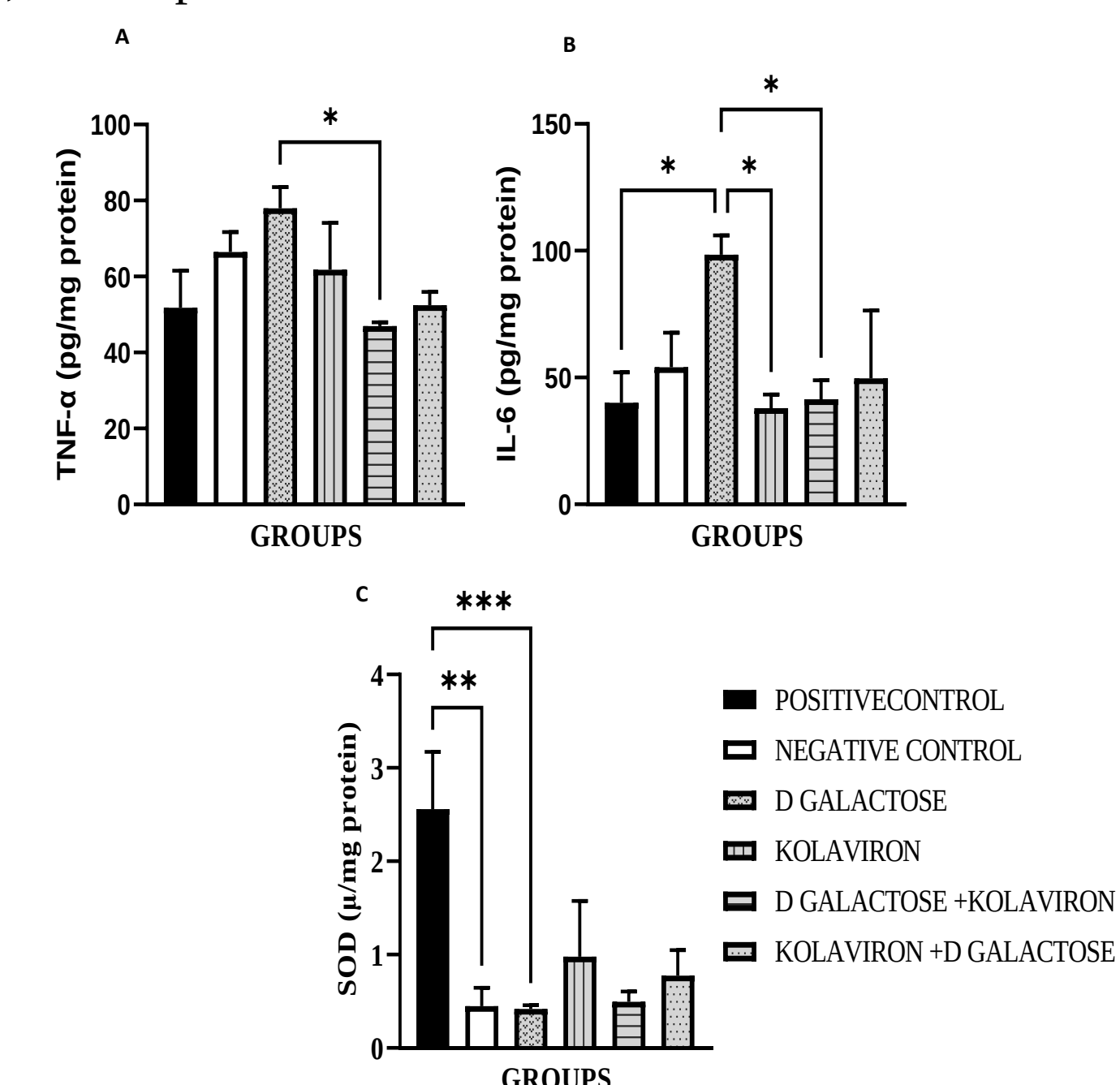


Figure 5: ELISA (Enzymes-link immunosorbent assays): TNF-α (A) & IL-6 (B) and Superoxide Dismutase (C). Data are presented as Mean $\pm$ SEM of mice treated with D-galactose and Kolaviron. * Represent $p \leq 0.05$, ** represent $p \leq 0.01$, *** represent $p \leq 0.001$.

CONCLUSION

Kolaviron confers significant neuroprotection against D-galactose-induced hippocampal toxicity, likely through anti-oxidative and anti-inflammatory pathways. These findings suggests its therapeutic potential for neurodegenerative disorders

Presented by: Dr. O.O. Adeyele

Department of Anatomy, Faculty of Basic Medical Sciences, LAUTECH, Ogbomoso

Email: ooadeleye@lautech.edu.ng