Title: **Unveiling Annona Reticulata's Bioactive Arsenal for Enhanced Antibiotic Effects**

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Abstract: Objective: To study the antibacterial and phytochemical activities of bioactive elements in the leaves of Annona reticulata Linn, a historically used Bangladeshi medicinal plant.

Methods: Shade-dried and crushed plant leaves were soaked with various solvents to obtain samples for different chemical analyses. All extracts were selected for antimicrobial, physicochemical, and Pharmacological investigations. The antimicrobial activity was evaluated using disc diffusion assay, and broth microdilution methods determined potentiation of the activities of the antibiotic antibacterial activity of the plant extracts was investigated using either gram-positive or gram-negative pathogenic wild-type bacteria.

Results: From the initial phytochemical and pharmacological studies, it was clear that all extracts, methanol, chloroform, and ethyl acetate, of the leaves of A. reticulata, were proven to process potent bioactive constituents. While differential antimicrobial properties were found to be possessed by all extracts, methanolic extract was the most potent one against all tested microorganisms. It also has potentiated the activities of antibiotics in E. coli.

Conclusion: Bioactive constituents in the plant extracts were shown to possess phytochemical and antimicrobial activities. More investigation is needed to segregate the chemical components responsible for the respective phytochemical and antimicrobial activities.

Keywords: Annona reticulata Linn; activity; disc diffusion method; leaves; methanol and chloroform extracts.

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