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Isolation and Characterization of Bioactive Compounds from Plant Source (Neem)

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Abstract: *Azadirachta indica, also referred to as Neem, is a medicinal plant that has been used extensively in traditional Indian medicine because of its powerful therapeutic nature. Isolation and characterization of the active chemical compounds in Neem leaves responsible for its medicinal properties is the center of this project. Neem leaves were in this research collected, dried, and ground. The powdered leaves were extracted using appropriate solvents such as ethanol or methanol by using the Soxhlet extraction method. The crude extract was then treated with different purification methods such as column chromatography and thin layer chromatography (TLC) to purify individual bioactive compounds.*

The pure compounds were further identified with conventional chemical tests and instrumental methods such as UV-Visible spectroscopy, FTIR (Fourier Transform Infrared Spectroscopy), and may be NMR (Nuclear Magnetic Resonance), to determine their structure and composition. The research established the existence of significant phytochemicals such as flavonoids, terpenoids, alkaloids, and particularly azadirachtin, which is effective as an antibacterial, antifungal, antiviral, anti-inflammatory, as well as an insect-repellent compound. The project indicates that Neem is a good source of bioactive compounds and can be effectively applied in the formulation of natural drugs as well as in herbal preparations. The results validate the traditional applications of Neem and suggest further study of its potential in contemporary medicine.

Keywords: Neem

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