

# A Comprehensive Study on Extraction and Characterization of Bioactive Pesticidal and Insecticidal Compound from *Azadirachta Indica* (Neem)

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**Abstract:** Research into the insecticidal effects of azadirachtin, a limonoid from the Neem (*Azadirachta indica*) has been ongoing for some 30 years. Its strong antifeedant, insect growth regulatory and reproductive effects are now well understood and documented. Antifeedancy varies markedly between species with mosquitoes being particularly sensitive to azadirachtin. The mode of action of azadirachtin lies in (i) effects on deterrent and other chemoreceptors resulting in antifeedancy and (ii) direct effects on most other tissues studied resulting in an overall loss of fitness of the insect. The complexity of the molecular structure of azadirachtin has precluded its synthesis for pesticide use although novel synthesis of the parent molecule is now almost complete and research into simpler mimetic substances is ongoing. Neem (*Azadirachta indica*) is perhaps the most useful traditional medicinal plant in India. Each part of the neem tree has huge insecticidal property and is thus commercially exploited. During the last two decades, apart from the chemistry of the neem compounds, considerable progress has been achieved regarding the biological activity and insecticidal applications of neem. It is now considered as a valuable source of unique natural products for botanical insecticides against various pests. This review gives a bird's eye view mainly on the biological activities of some of the neem compounds isolated, insecticidal actions of the neem extracts, applications of neem has an eco-friendly botanical insecticide in pest management along with their safety evaluation.

**Keywords:** Azadirachtin indica; Neem leaves; Green Chemistry, Synthetic Insecticide, Limonoid; triterpene; Pest control; Antifeedancy; reproduction; Beta sitosterol Mode of action.

