

Investigating the synergy between Neem (*Azadirachta indica*) and High-Performance Thin Layer Chromatography (HPTLC): Results, Applications and Applications

Abstract:

This article investigates the synergistic combination of Neem and High-Performance Thin Layer Chromatography (HPTLC). High performance thin layer chromatography (HPTLC). Neem, whose scientific name is *Azadirachta indica*, is a versatile plant known for its medicinal properties and ecological importance. HPTLC is a routine analytical technique used for qualitative and quantitative analysis of various compounds present in neem extract. This article reviews the benefits of neem in traditional medicine, agriculture and pest management, as well as the advantages of HPTLC in the identification of neem products.

Introduction:

Neem (*Azadirachta indica*) is a famous tree in the Indian subcontinent. It is famous for its many advantages and wide applications in many fields. With its rich traditions and many uses, neem has earned the title of "national pharmacy" in Indian medicine such as Ayurveda, Siddha and Unani. In addition, neem's versatility extends beyond medicine to include agriculture, environmental protection, and even cosmetics. In addition, the modern scientific community has confirmed the potential of neem as a source of bioactive compounds with promising healing properties. At the same time, high-performance thin layer chromatography (HPTLC) has become a powerful analytical technique in the field of natural product chemistry and pharmaceutical research. HPTLC has advantages in the separation, identification and quantification of chemical compounds in complex plant extracts such as neem extracts. By leveraging the high sensitivity, resolution, and versatility of HPTLC, scientists can unlock the full potential of neem and elucidate its pharmacological, agricultural, and environmental benefits.

This article aims to explore the synergy between neem and HPTLC and present the advantages, uses and applications of the two assets. Through a comprehensive review of Neem's medicinal properties, agricultural uses, environmental benefits, and cosmetic uses along with in-depth research on potential identification and advantages of HPTLC, this article is about the present-day importance of the dynamic partner. Research and practical applications. By delving into the interplay between traditional wisdom and modern analytical techniques, this article seeks to provide a better understanding of the potential of neem and HPTLC to solve these problems worldwide in healthcare, agriculture, environmental safety, and more.

Benefits of Neem:

Medical Properties: Neem has been used in medicine for centuries due to its antibacterial, antifungal, antiviral and anti-inflammatory properties. It is used in the treatment of many conditions such as skin diseases, diabetes, and gastrointestinal problems.

Agricultural Applications: Neem extract can be used as a natural pesticide, repellent and fertilizer, promoting permaculture and reducing dependence on synthetic chemicals.

Environmental benefits: Neem trees play an important role in protecting the environment by preventing soil erosion, increasing soil fertility and cleaning the air.

Cosmetics: Neem oil and extract are used for moisturizing, antibacterial and anti-aging properties in cosmetics and personal care products.

Advantages of HPTLC:

High Sensitivity and Resolution: HPTLC has high sensitivity and resolution to detect and separate the complex mixture of compounds present in neem extract.

Cost Effectiveness: Compared to other chromatographic methods, HPTLC is a cost-effective method for routine analysis and quality control.

Rapid Analysis: HPTLC has the ability to analyze multiple samples simultaneously, thus increasing the efficiency and effectiveness of research and quality control.

Versatility: HPTLC can be used for qualitative and quantitative analysis of many compounds in neem extracts, including alkaloids, flavonoids, terpenoids, and phenolics.

Uses and Applications Neem and HPTLC:

Pharmaceutical Industry: Neem extract is used as an ingredient in medicine to treat various diseases. HPTLC is used in the design and quality control of herbal medicines.

Agriculture: Neem pesticides and fertilizers are used in organic agriculture to control pests, increase yields and improve soil health. HPTLC was used to analyze the chemical composition of neem extract used in agriculture.

Cosmetics and Personal Care Industry: Neem oil and extracts are added to skin care products, shampoos, soaps and lotions for their therapeutic properties. HPTLC is used for quality control and certification of neem-derived ingredients in cosmetics.

Environmental Protection: Neem trees are planted for cultivation and recycling purposes to prevent deforestation and reduce climate change. HPTLC was used to analyze the phytochemical composition and ecological benefits of neem leaf extract.

Information: Neem and High Performance Thin Layer Chromatography (HPTLC) have many advantages and applications such as medicine, agriculture, cosmetics and food processing.

Environmental protection. Neem has medicinal properties and ecological importance and plays an important role in traditional medicine, permaculture and environmental conservation. HPTLC is an analytical tool that helps determine the quality and quantity of neem for quality control, design and research in various fields. Further research and development of neem products and HPTLC methods have the potential to solve global challenges in medicine, agriculture and environmental sustainability.

References

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This document provides information on the medicinal properties of neem, its traditional uses, and the analytical capabilities of HPTLC.