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REVIEW PAPER

A Review Article on Standardization of Neem Leaves

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ABSTRACT

Azadirachta indica A. Juss. (Meliaceae) commonly called Neem in India and is nature's drugstore due to thousands of medicinal properties associated with it. It is one of two species in the genus *Azadirachta*, and is native to India and Burma, growing in tropical and semi-tropical regions. Present investigation highlights the standardization of *Azadirachta indica* leaf from Garhwal Himalayas. The various parameters applied (WHO Guideline) were ash value, acid insoluble ash, water & alcohol extractive values, loss on drying, pH, volatile matter, heavy metal content, phytochemical investigation, chromatographic profile, spectroscopic profile, heavy metal content and microscopic and macroscopic description. The quantitative determination of marker component was also done by HPTLC study using azadirachtin as standard.

Keywords: - *Plant profile, Neem extract, standardization, Nutritional component, Systematic Disease.*

INTRODUCTION

The neem tree (*Azadirachta indica* A.Juss.) is a tropical evergreen tree (deciduous in drier areas) native to Indian sub-continent [1,2]. It has been used in Ayurvedic medicine for more than 4000 years due to its medicinal properties. Neem is called 'arista' in Sanskrit a word that means 'perfect, complete and imperishable'. Most of the plant parts such as fruits, seeds, leaves, bark and roots contain compounds with proven antiseptic, antiviral, antipyretic, anti-inflammatory, antiulcer and antifungal uses. The Sanskrit name 'nimba' comes from the term 'nimbatī swasthyamdadati' which means 'to give good health'. The benefits of neem are listed in ancient documents 'Charak-Samhita'

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and 'Susruta-Samhita', which form the foundation of the Indian system of natural treatment, Ayurveda. It is commonly called 'Indian lilac' or 'Margosa' and belongs to the family Meliaceae. The Persian name of neem is 'Azad- Darakth- E- Hind' which means 'Free tree of India'. Neem is considered to be a part of India's genetic diversity [3,4]. Neem tree is the most researched tree in the world [5] and is said

to be the most promising tree of 21st century. It has great potential in the fields of pest management, environment protection and medicine. Neem is a natural source of insecticides, pesticides and agrochemicals [6]. Neem is a large tree growing about 25 m in height with semi- straight to straight trunk, 3 m in girth and spreading branches forming a broad crown (Figure 1). A neem tree normally starts fruiting after 3-5 years. In about 10 years it becomes fully productive.

From the tenth year onwards it can produce up to 50 Kg of fruits annually [7]. The plant is reported to live up to two centuries. The tree has adaptability to a wide range of climatic, topographic and edaphic factors. It thrives well in dry, stony shallow soils and even on soils having hard calcareous or clay pan, at a shallow depth. Neem tree requires little water and plenty of sunlight [3,4]. The tree grows naturally in areas where the rainfall is in the range of 450 to 1200 mm. However, it has been introduced successfully even in areas where the rainfall is as low as 150 to 250 mm. Neem grows on altitudes up to 1500 m [8, 9,10]. It can grow well in wide temperature range of 0oC to 49oC [11]. It cannot withstand water-logged areas and poorly drained soils. The pH range for the growth of neem tree lies in between 4 to 10. It grows on almost all types of soil including clayey, saline and alkaline soil, but does well on black cotton soils and deep well drained soil with good sub-soil water. Neem trees have the ability to neutralize acidic soils by a unique property of calcium mining [11].

Botanical Name:

Azadirachta Indica

Scientific Classification:

Kingdom: Plantae Division: Magnoliophata Class: Magnoliopsida Order: Rurales

Family: Meliaceae Genus: Azadirachta Species: A. Indica

Synonyms: Nimba, Vepa, Vembu, Indian lilac.

Biological Source: Neem consists of the fresh or dried leaves and seeds of Azadirachta Indica.

Medicinal Uses:

- Neem used as Anti-inflammatory, Analgesic, and Antipyretic activities.
- Neem is beneficial for Immunostimulant activity.
- Neem used for treat Antiulcer effect, Antifertility.
- Neem commonly used as Antifungal and Antiviral activity.

NEED OF STUDY:

The use of herbal products is global importance because of their low side effects, accessibility and affordability when compared with conventional medicine. (22) Azadirachta Indica is popular in indigenous system of folk medicine and it is known to contain bioactive compounds such as alkaloid, resins, saponins, glycosides, tannins, flavinoids, cardiac glycosides, steroidal terpenes, anthraquinones, and carbohydrates and other phytochemicals.

As per the previous research articles published it has been studied that comparative microbiological, pharmacognostical and phytochemical evaluation has not done. That's why present investigation into parts of *Azadirachta Indica* was taken to understand the antibacterial pharmacognostical profile of different parts of *Azadirachta Indica* which will help further for gathering information about the *Azadirachta Indica*(19.25).

Organoleptic evaluation:

The refers to drug evaluation by means of organs of sense and include other sensory organs like colour, Odour, Taste, Size, shape and texture.

Microscopic evaluation:

This can be done by powdering, cutting thin sections of the drugs or preparations a macerate.

- Stomatal number
- Stomatal Index
- Vein-islet number

Physical evaluation:

Physical contents such as elasticity in fibres, viscosity of drugs containing swelling factor for mucilage containing materials, froth number of saponin drugs, congealing point of volatile and fixed oils, melting and boiling points and water content are some important parameters used in the evaluation of drugs.(17)

Physical contents are extensively applied to the active principles of drugs, such as alkaloids, volatile oils, fixed oils etc.

A few of them are

- Moisture content
- Viscosity
- Solubility
- Ash Value
- Extractive Value
- Foreign organic matter
- Swelling factor

Future Prospective:

The use of different parts of several medicinal plants to cure specific ailments has been in vogue form. The green medicine has been popular since ancient times being safe and multiple benefits. Neem is rich source of different compounds having medicinal properties, so drug development programme should be started utilizing the biological and medicinal properties of neem. (10) The hepatoprotective effect of *Azadirachta indica* is encouraging for the researchers to undertake further

preclinical studies in details. However, there should be scientific trials for validation of different medicinal properties of neem so that this plant can better be utilized. In modern era, emphasis should be on control of diseases of human, animals and environment using non-toxic herbal products. By making quantum of research on biological and medicinal properties of neem, some of the herbal products have been prepared but still there is lot of scope in this field for better utilization of this wonder plant.(15)

Conclusion:

In the present study, analysis of the free radical scavenging activity and total phenol content showed that mainly the butanol and methanol crude extracts of the selected plant are potent sources of natural antioxidants. Therefore, the selected crude extracts can be used as a natural antioxidant instead of a synthetic antioxidant. Further studies are designed for the isolation and identification of individual phenolic compounds; also, in vivo studies are needed to better understand their mechanism of action as an antioxidant.

It was concluded that.

- Neem leaf extract has a significant antimicrobial effect against various pathogenic bacteria. Microbial inhibition potential of neem leaf extract observed in this study opens perspective for its use in treating various infections.
- There is possible potentiating of antibacterial effects of some antibiotics against different bacterial infection when co administered with neem extract. Extensive research and standardization of techniques and controlled predetermined combinations of neem extract and these antibiotics could find clinical applications in the treatment of bacterial infections and in prevention of resistance in bacterias.
- However, preclinical and clinical trials are needed to evaluate biocompatibility and safety before neem can be conclusively recommended as irrigating solution, but invitro observation of neem effectiveness appears promising.
- As the global scenario is now changing towards the use of non toxic plant products that have traditional medicinal use, extensive research and development work therefore should be undertaken on neem and its products for their better economic and therapeutic utilization.

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