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A REVIEW ON AZADIRACHTA INDICA (NEEM) AND NEEM HERBAL CREAM

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ABSTRACT

Neem is essential for the humans because it is the major concerns facing humankind. *Azadirtachta indica* is a popular fast growing tree found commonly in India, America and Africa. In this review we are going to see the see the overview on neem and neem herbal cream. We also describe how neem could be the solution to various health problems humans facing nowadays. We also discuss on the active ingredients and their mechanism of its activity.

KEYWORDS: *Azadirachta indica*, Herbal cream, Antibacterial activity and Active compounds.

INTRODUCTION

Azadirtachta indica is a popular fast growing tree found in India, America and Africa. In Sanskrit Neem is called ‘arista’ means perfect, complete and imperishable. In Sanskrit Arishtha is the name of the Neem tree. The tree is considered as a village dispensary in India. The meaning of the neem tree was recognized by the US National Academy of Sciences, which published in 1992 report entitled "Neem - A Tree to Solve Global Problems". It grows throughout much of Southeast Asia and West Africa; a few trees have recently been planted in the Caribbean and several central ones American countries, including Mexico. The people of India have worshiped the neem tree; for centuries millions have cleaned their teeth with neem sprigs, skin diseases smeared with neem leaf juice, took neem tea as a tonic and put neem leaves in their beds, keeping books, grain baskets and closets. The number of benefits of neem is listed in ancient times documents such as "*Charak-Samhita*" and "*Susruta-Samhita"*. It is commonly referred to as "Indian Lily" or "Margosa", belongs to the family

Meliaceae, subfamily *Meloideae* and tribe *Melieae.* Neem is the most versatile, most diverse trees of the tropics, with immense potential. It possesses maximum useful non-wood products (leaves, bark, flowers, fruits, seeds, gum, oil and neem cake) than any other tree species. Known to be anti- allergenic, anti-dermatic, anti-feedent, antifungal, anti-inflammatory, antipyorrheic, antiscabic, cardiac, diuretic, insecticide, larvicide, nematicide, spermicide and other biological activities. Because of these activities neem found tremendous uses that make it a green treasure. Neem has become important in the global context today because it offers answers to the great problems of mankind. Neem (*Azadirachta indica*) is considered harmless to humans, animals, birds, beneficial insects and earthworms and has been approved by US Environmental protection agency for use on food crops Neem (*Azadirachta indica*) of the *Meliaceae* family is an evergreen tree potential medicinal value found in most tropical countries. Biologically active principles isolated from different parts of the Plants include: Azadirachtin, Meliacin, Gedunin, Salanin, Nimbin, Valassin and many other derivatives of these principles. Meliacin forms the bitter substances of the neem seed oil, which is also contained in the seeds. Tignic acid (5-methyl-2-butanoic acid) responsible for the distinctiveness smell of the oil. These compounds belong to the so-called natural products Triterpenoids (limonoids). The active ingredients are light hydrophilic but freely lipophilic and readily soluble in organic solvents such as hydrophiles, alcohols, ketones and esters. Two species of Azadirachta have been reported, *Azadirachta indica* A. Juss - Native to the Indian subcontinent and *Azadirachta excelsa* poop- limited to the Philippines and Indonesia. Neem is a member of the mahogany family. *Azadirachta indica* A. Juss *(Meliaceae*) is a fast-growing, small to medium-sized evergreen tree (5 to 20 m tall) that deciduous most of its leaves in the dry season and then blooms in full bloom Leaves. Two thirds of the height can be reached after 3 to 5 Years. The first fruits can be harvested after 5 years and the first Timber harvest after 5 to 7 years (Kundu, 2000; Sacande, 2000).

The tree has adaptability to a variety of climatic and topographical conditions. It thrives well on dry, rocky, flat soil and even on soils with hard limestone or clay pan. Neem tree requires little water and plenty of sunlight (Anonymous, 2006; Ogbuewu, et al. 2010). In recent years, attention has been focused on breeding and improvement of agroforestry and multipurpose species, especially tree species in the dry zone. Among these species there are special interest for neem (*Azadirachta indica* A. Juss). Neem can be used for a number of purposes such as the production of Wood and firewood, shade and for a number of medical purposes, and a biological insecticide. Azarachterin in particular can be extracted from leaves, fruits and more

other plant tissues (Khan et al., 2004). The products are used both locally, on a small scale, by farmers and for the household, but also on a large scale in industrial production.

***Azadirachta indica* (Neem) – An overview**

The global health and medical practice seeks to merge alternative medicine with evidence-based medicine to better understand the metabolic process and its effects in the human body. An example is the use of complementary medicine such as phytotherapy. *Azadirachta indica* (Neem), a tree native to India and Myanmar, nicknamed by many "The Village Pharmacy" or "Divine Tree" for its many health-promoting properties. Recently, extracts derived from neem have been shown to work in everything from insect repellents to dietary supplements to reduce inflammation, control diabetes and even fight cancer. Here we state the health benefits found in various compounds and extracts derived from neem, highlight the mechanisms and pathways by which neem compounds exert their effects, while cautioning that the improper and non-standardized conditions used to Preparation of extracts can lead to health problems, particularly when certain compounds can have damaging effects on the liver and kidneys. Bindu Ahlawat et al., (2019) for thousands of year's people have tried to strengthen their health and cure various diseases with herbal remedies. The search for a true panacea or panacea has been undertaken by virtually every civilization. While hundreds of substances have been tried and tested, few have stood up to modern scientific scrutiny. Perhaps no other botanical lives up to the true definition of a panacea better than neem, a tropical evergreen plant primarily native to India that is an Ayurvedic herbal product. The large number of diseases and treatments with neem are the result of decades of work by Indian herbalists and healers. They have been supported by modern scientific studies that continue to demonstrate the effectiveness of neem in preventing and treating diseases and diseases. The neem tree or margosa is a botanical cousin of mahogany and belongs to the Maliaceae family. Its botanical name is *Azadirachta Indica*, which literally means "the free tree of India." Neem is native to the Indo-Burma region and is distributed in South and Southeast Asia, India, Pakistan, Bangladesh, Sri Lanka, Burma, Thailand, Malaysia and Indonesia. Additionally, Neem is found in several other countries spread across continents and has now become a global tree.

Neem (*Azadirachta indica*) is of great importance. The usefulness of neem has already been mentioned in several references. Ayurveda has mentioned its use in many disease states. Now the public awareness of herbal products is increasing a lot so it has been noticed that the demand for neem products is increasing day by day. Neem is a plant whose parts can be used

multiple times. Researchers have reported many medicinal benefits of neem. Neem is known for its anti-diabetic, anti-inflammatory and anti-cancer properties. Neem is used in many Hindu rituals. This review paper presents several uses of neem that will give people great knowledge and let them know about the wonder of neem.

Neem is a very important medicinal plant used in traditional medicine to treat various diseases. The use of traditional medicine and medicinal plants in most developing countries to maintain health. The importance of the neem tree was recognized by the US National Academy of Sciences, which published a report in 1992 entitled "Neem - A Tree to Solve Global Problems". The scientific name of neem, *Azadirachta indica*, is derived from Persian, Azad meaning "free" dirakht meaning "tree" I-Hindi meaning "Indian origin". So literally means "The free tree of India". The chemical principle of neem is used to develop new medicines.

Neem (*Azadirachta indica*) is a member of the Meliaceae family and its role in health benefits is attributed to being a rich source of antioxidants. It has been used extensively in Chinese, Ayurvedic and Unani medicines around the world, especially in the Indian subcontinent, for the treatment and prevention of various diseases. Previous findings confirmed that neem and its components play a role in eliminating free radical formation and preventing disease pathogenesis. The animal model-based studies revealed that neem and its main components play a pivotal role in fighting cancer by modulating various molecular signaling pathways including p53, pTEN, NF-B, PI3K/Akt, Bcl-2 and VEGF. It is considered a safe medicinal plant and modulates the numerous biological processes without side effects. In this review we summarize the role of *Azadirachta indica* in the prevention and treatment of disease through the regulation of various biological and physiological pathways. *Azadirachta indica* is a fast growing evergreen popular tree commonly found in India, Africa and America. The overview gives a bird's-eye view, mainly of the biological activity and its preventive and promotional medicinal uses. "The neem is a single solution to thousands of problems" such as antiallergic, antifungal, antidermal, anti-inflammatory, antiscabic, diuretic and other biological activities.

Ecology

The neem tree is known for its drought resistance. Usually it thrives in areas with sub-humid conditions, with annual rainfall between 400 and 1200 mm. It can grow in regions with a year rainfall below 400 mm, but in such cases it depends greatly on the groundwater. Neem can

grow in many different soil types, however it thrives best in well-drained deep and sandy soils. It's a typical one tropical/subtropical tree and occurs at average annual temperatures between 21-32°C. It can tolerate temperatures below 40°C. In India neem grows in the plains and in areas that reach a altitude of about 1850m. In its introduced range, neem is grown from sea level up to 1500m altitude. Neem is tolerant for most soil types, including dry, rocky, shallow soils, lateritic crusts and heavily leached sands and clay (Schmutterer. 1995). It is well adapted to soils with a pH of 5 to 8.5. But it grows best to 8 m on deep and porous, well-drained soils with a pH of 6 to 6.5. It is moderately tolerant of highly alkaline soils with high levels of Sodium, carbonates and bicarbonates. It was successful established on both deep, heavily eroded and degraded sites, soils with near-surface calcareous hard pans. Neem growth is poor in seasonally flooded sites, saline sands, saline alluvial soils, flat and poorly drained clays and dry sands where they are dry seasonal ground water level is below 8 m in depth. On soils with a lack of zinc and potassium, the growth of neem seems tight depends on the availability of soil moisture. Growth is best on free drained sites where the water table varies between to approx. 3 to 5 m all year round (Schmutterer. 1995). Neem is a useful species for improving soil fertility on degraded soil dry locations due to the quality of the leaf litter and relatively quickly rate of leaf decomposition. Therefore iron on fallow clay Acrisol in Togo, the pH and calcium concentration of the top soil below 5 Year-old neem stocks increased faster than those in neighboring acacia stands (Schmutterer. 1995). The seeds of neem do not live long and are usually within three months. To help that Seeds live longer the pulp should be removed by hand and the shade-dried seeds to a moisture content of 15-20%.

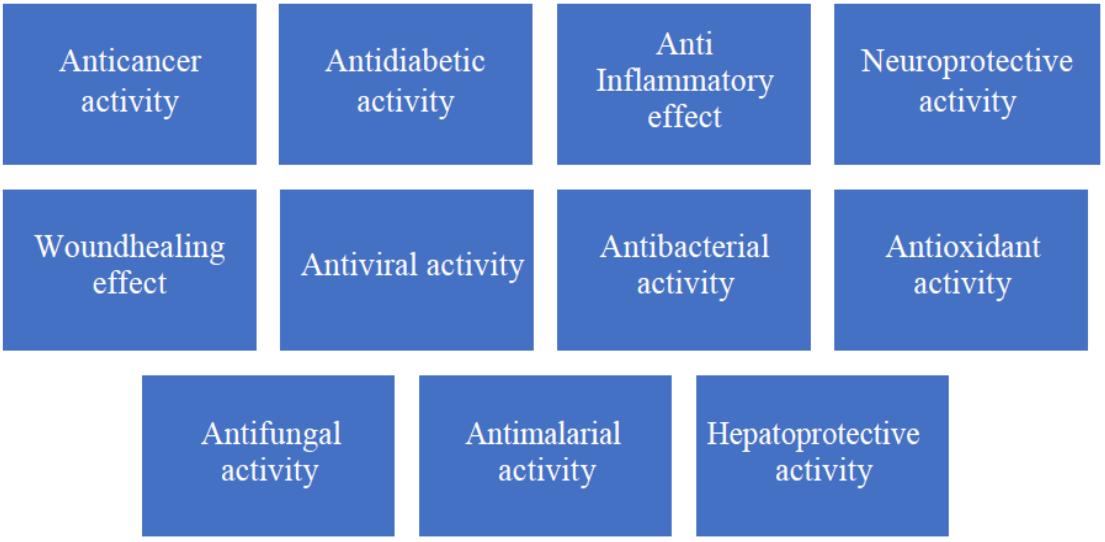
Active compounds of *azadirachta indica*

Neem plays an important role in health management because it has a rich source of active ingredients. The most important active constituent is azadirachtin and the others are nimbolinin, nimbin, nimbidin, nimbidol, sodium nimbinate, gedunin, salannin, and quercetin. Leaves contain ingredients such as nimbin, nimbanene, 6-desacetylnimbinene, nimbandiol, nimbolide, ascorbic acid, n- hexacosanol and amino acid, 7-desacetyl-7-benzoylazadiradione, 7-desacetyl-7- benzoylgedunin, 17-hydroxyazadiradione, and nimbiol. Quercetin and ß-sitosterol, polyphenolic flavonoids were purified from neem fresh leaves and were known to have antibacterial and antifungal properties and seeds hold valuable constituents including gedunin and azadirachtin.

Mechanism of action of active compounds

Neem *(Azadirachta indica*) plant parts exhibit an antimicrobial role through inhibitory effects on microbial growth/possibility of cell wall degradation. Azadirachtin, a complex tetranortriterpenoid limonoid found in seeds, is the key component responsible for both antifeedant and toxic effects in insects. The results indicate that the neem leaf ethanol extract exhibited antibacterial activity *in vitro* against both *Staphylococcus aureus* and MRSA, with the greatest zones of inhibition being detected at a concentration of 100%.

Activities of *azadirachta indica*



Review on neem herbal cream

Herbal cream

Herbal cream is the preparation used to enhance the human appearance. The herbal cream formulations are for the purpose of nourishing, moistening, lightening & treatment of various diseases of the skin.

The Neem herbal cream have both antifungal and antibacterial activity. The prepared herbal cream of various concentration and alcoholic extract of *Azadirachta indica* leaves are exhibited for antimicrobial activity against various microorganism such as gram-negative bacteria, namely *Escherichia coli*, gram-positive bacteria *Staphylococcus aureus* and fungi, namely *Aspergillus niger* and *Candida albicans*. The degree of reaction of the test sample was different for various selected ones microbes. The zone of inhibition ranged from 20 to 32 (mm/ml).

Herbal preparation is better than synthetic with fewer side effects, natural treatments are more effective in terms of side effects for better healing of human body than allopathy via antioxidant effect of herbal extracts. The cream was formulated in different concentrations. They have various pharmacological activities such as antioxidant, antimicrobial and anti-inflammatory effects. Then the cream produced is evaluated with regard to the various parameters.

Herbal cosmetics are preparations for improving individual appearance. The present study was to prepare the herbal cream containing the alcoholic extract of Neem (*Azadirachta indica)* for use in moisturizing and curing skin diseases. The raw extract of neem is used to formulate the cream with various excipients. The choice of ingredients depends on the medicinal properties of the drug. After the cream is formulated, it is subjected to various evaluation parameters.

The aim of the study was to produce and evaluate the herbal cream for the purpose of moisturizing the skin. *Azadirachta indica* is used in the study to determine its pharmacological and clinical properties. The formulation of an oil-in-water (O/W) emulsion based cream was formulated with an extract of *Azadirachta indica.* The neem extract was obtained using ethanol as a solvent. The herbal formulation showed good consistency, homogeneity, pH, non- greasy, no signs of phase separation. The herbal creams serve the various skin problems and moisturize the skin. The evaluation is also carried out for the parameters.

The natural remedies are more acceptable and safer than synthetic ones. The present cream study was formulated based on the antioxidant properties of herbal extracts and their evaluation. The herbal cream contains alcoholic extract of neem (*Azadirachta indica*). The formulation was evaluated using various parameters such as pH, viscosity, spreadability and stability. The physical properties of the herbal cream do not change. The formulation showed good spreadability, no phase of separation, good consistency and sufficient cream viscosity.

In this study, creams were formulated based on the antioxidant potential of herbal extracts and its evaluation. The neem leaves are dried in the shade and extracted by cold maceration using ethanol as a solvent. In this study, the extract of neem is used to prepare and evaluate the cream. The cream is formulated with *Azadirachta Indica* extract and various excipients with different concentrations. From this it can be concluded that herbal creams with

antimicrobial properties can be used as a barrier to protect the skin and prevent skin aging without side effects.

CONCLUSION

Neem has created a significant place in pharmaceutical and herbal industry. It is helpful in creating various medicines because of its activity against the disease. Herbal cream has good antibacterial activity and helps in moisturizing skin. Neem also used in other pharmaceutical and herbal formulations.

REFERENCES

1. Jose Francisco Islas, Ezeiza Acosta, Zuca G-Buentello, Juan Luis Delgado Galegos, Maria Guadalupe Moreno-Trevino, Bruno Escalante, Jorge E.Moreno Cuevas. An overview of Neem (*Azadirachta indica*) and its potential impact on health, 2020.
2. Dr.Bindu Ahlawat and Dr. Jagdish Mohan Onkar. Medicinal uses of Neem: A Review Article. World Journal of Pharmaceutical and Medical Research, 2019; 5(6): 167-170.
3. Rudra Prasad Giri, Dr. Ajit. K. Gangawane, Dr. Sucheta Ghorai Giri. Neem the chapter 10: Bibliography formulation and evaluation of herbal cream of alcoholic extract of *Azadirachta indica* A.JUSS 53 Wonder Herb: A Short Review. *International journal of Trend in Scientific Research and Development*, 2019; 3(3): 962-967.
4. Haider Ali Quraishi, Naquibul Islam, Arsheed Iqbal, Shabir Ahmad Bhat, Jameel Ahmed, Syed Sabahat Ashraf, Qamar Alam Khan. Therapeutical and medicinal properties of Neem in context of Unani System of Medicine: A Review Study. *Journal of Drug Delivery and Therapeutics*, 2018; 8(6-s): 394- 399.
5. Mohammad A. Alzohairy. Therapeutics role of *Azadirachta indica* (Neem) and their active constituents in diseases prevention and treatment. Hindawi Publishing Corporation, 2016.
6. Sharma Pankaj, Tomar Lokeshwar, Bachwani Mukesh, Bansal Vishnu. Review on neem: thousand problems one solution. *International research journal of pharmacy*, 2011; 2(12): 97-102.
7. Puja Saha, JayaShree Bhawmick, Anupam Saha. Formulation and Organoleptic evaluation of Poly Herbal Cream of Punica, Neem, Carrot & Jamun as Active Ingredients.
8. Archana Dhyani, Vikas Chander, Dr. Nardev Singh. Fomulation and Evaluation of Multipurpose Herbal Cream. *Journal of Drug Delivery and Therapeutics*, 2019; 9(2): 341-343.

9. Himaja.N, Formulation and Evaluation of Herbal Cream from *Azadirachta Indica* ethanolic extract. *International Journal of Research in Drug & Pharmaceutical Science,* 2017; 1(1).
10. Manisha Yogesh Sonalkar and Sachin Annasaheb Nitave. Formulation and evaluation of Poly herbal Cosmetic Cream. *World Journal of Pharmacy and Pharmaceutical Sciences,* 2016; 5(2): 772-779.
11. Surya Prabha. Matangi, Santosh Aruna.Mamidi, Gulshan.MD, S.T.V.Raghavamma, Rama Rao Nadendla. Formuation and Evaluation of Anti Aging Poly Herbal Cream. *International Journal of Pharmaceutical Science Review and Research*, 2014; 24(2): 133-136.
12. Ali A. Textbook of Pharmacognosy. New Delhi, India: Publication and Information Directorate, 1993.
13. Govindachari T. R., Suresh G., Gopalakrishnan G., Banumathy B., Masilamani S. Identification of antifungal compounds from the seed oil of *Azadirachta indica*. Phytoparasitica, 1998; 26(2): 109–116. doi: 10.1007/bf02980677.
14. Mordue (Luntz) A. J., Nisbet A. J. Azadirachtin from the neem tree *Azadirachta indica:* its action against insects. Anais da Sociedade Entomológica do Brasil, 2000; 29(4): 615–632. doi: 10.1590/s0301-80592000000400001.
15. Sarmiento W. C., Maramba C. C., Gonzales M. L. M. An *in vitro* study on the antibacterial effect of neem (*Azadirachta indica*) leaf extracts on methicillin- sensitive and methicillin-resistant *Staphylococcus aureus*. PIDSP Journal, 2011; 12(1): 40–45.
16. http://repository.sustech.edu/bitstream/handle/123456789/11138/CHAPTER%20TWO.pdf?sequence=4.