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## AN ANALYSIS OF SEVERAL MEDICAL PROPERTIES OF NEEM

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### ABSTRACT

*Neem tree (Azadirachta indica) is very vital. benefits of neem have been shown in a number of studies. Its usage in a variety of diseases has been described in Ayurveda. Because public's knowledge of herbal goods is growing, demand for neem products is rising day by day. Neem is a plant whose components may be used in a variety of ways. Many therapeutic advantages of neem have been documented by researchers. Neem has anti-diabetic, anti-inflammatory, & anti-cancer properties. Many Hindu ceremonies include usage of neem. Neem has grown more significant in global context as a result of its ability to address some of humanity's most pressing problems. Azadirachta indica is rapid-growing, evergreen tree native to India, Africa, & North America. This review focuses on biological activity of neem, as well as its preventive & therapeutic medicinal uses & applications. It explains how "neem is solution to thousand problems," such as, antifungal, anti-inflammatory, antidiabetic, antiscabic, diuretic, antipruritic, insecticidal, larvicidal, anti-allergenic, spermicidal. This review work depicts a variety of neem applications, providing individuals with valuable information & educating them about wonders of neem.*

**KEYWORDS:** Azadirachta indica, Health, Medicine, Neem, Tree.

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### 1. INTRODUCTION

For ages, neem tree (Azadirachta indica) has been thought to be having miraculous health-promoting qualities. Truth be told, there is evidence that neem was being used for therapeutic purposes as far back as 4,500 years ago. Its usage may be traced back to early India and neighbouring nations, where it's long been regarded to be one of the major valuable plants on the planet. Because all portions of the neem tree are acknowledged to have distinct therapeutic potential, it is still acknowledged as the "Village Dispensary" (1). The neem tree is a quickly growing, annual plant that is well-acknowledged for its drought resistance. It belongs to the meliaceae family, which contains the mahogany family. A big shade tree with a broad, circular canopy, the neem tree may live for 150-200 years. Despite the fact that neem has a strong, disagreeable stink, its flowers have a delectable nectar-like scent that can be smelled for miles. Because it is a fast-growing tree that requires little water, neem is an infinite resource. In Ayurveda, neem is utilised to regulate pitta and kapha. Its chilly, light, & dry qualities will exacerbate vata in general. As a result, neem is often recommended in combination with other herbs that help to suppress its vata-inducing properties (2).

### *1.1 Benefits of Neem :*

#### *1.1.1 Antioxidant Activity:*

Free radicals, acknowledged as responsive oxygen species, are a major contributor to enlargement of many diseases. Nonetheless, nullification of free radical activity is vital step in disease's anti-inflammatory strategy. Antioxidants aid in the stabilization/deactivation of free radicals before they assault targets in biological cells, as well as the activation of anti-oxidative proteins, which help to reduce free radical/receptive oxygen species cell damage. Antioxidant activity has been discovered in rapeutic plants (3). Plant natural products, including as leaves roots seeds, oil, , bark, &, play an vital role in prevention of diseases due to their high antioxidant content. antioxidant activity of leaf & bark concentrations of *A. indica* has been investigated, & results clearly indicate that leaf & bark extracts/fractions of neem produced in lower areas have substantial antioxidant capabilities(4). Anor rigorous investigation was conducted based on flowers leavesstem, fruits, , & bark extracts from Siamese neem tree for assessing antioxidant activity, & findings recommend that extricates from leaf, blossom, & stem bark have high antioxidant potential.

#### *1.1.2 Anti-cancerous Activity:*

Malignant growth is a multi factorial disease that affects people all over globe. enhancement& progression of malignant development is aided by alteration of molecular/genetic pathways. On one h&, allopathic treatment module is appealing, but it shows a negative impact on typical cell. Plants &ir components have previously been shown to have inhibitory effects on development of cells which are malignant through regulation of cell expansion, apoptosis, tumor suppressor gene, & or molecular pathways (4). Flavanoids& or chemicals found in neem have an vital role in preventing progression of malignant development. A large no. of epidemiological studies indicate that increased flavonoid intake is linked to a lower risk of cancer (5).

#### *1.1.3 Neem's Anti-Inflammatory Effect:*

Plant or secluded derivatives of plants are used to act in form of anti-inflammatory medicines. In a cotton pellet granuloma test in rats, a concentrate of *A. indica* leaves at dosage of 200mg/kg, was shown to have significant anti-inflammatory action (5). Or research findings revealed that neem leaf extricates have a substantial anti-inflammatory effect, albeit it is less efficient compared to dexamethasone, & that nimbidinstifles components of macrophages & neutrophils that are involved in inflammation. Previous research has shown that bark & leaf concentrates have immune-modulating & anti-inflammatory properties, as well as antipyretic & anti-inflammatory properties in oil seeds. pain relieving action of oil of neem seed was tested on albino rats, & results revealed that oil of neem seed had a substantial pain alleviating effect in doses of 1 & 2 mL/kg, & that oil had a dose-dependent pain relieving effect. Anor study looked at anti-inflammatory effects of oil of neem seed (NSO) on albino rats with carrageen an-induced rear paw edema, & findings exposed that NSO presentedamplified paw edema hindrance with dynamic dosage rise from 0.25mL to 2 mL/kg body weight. During dose of 2 mL/kg body weight, NSO disclosed greatest (53.14 percent) edema inhibition at fourth hour after carrageen injection.

#### *1.1.4 Hepatoprotective Effect:*

Therapeutic plants &their constituents have a strong hepatoprotective effect with no antagonistic effects. use of azadirachtin-An as a hepatoprotective agent in carbon tetrachloride (CCl<sub>4</sub>)-induced hepatotoxicity in rats was investigated, & histology & ultrastructure findings ensured that pretreatment with azadirachtin-A dose-dependently abridged hepatocellular corruption. Aside from side effects, results show that pretreatment with azadirachtin-An at higher dosage levels returns rat liver to normal function.

#### *1.1.5 Wound Healing Effect:*

Various plants & their constituents perform vital role in damage recovery process. damage patching activity of concentrates of leaves of *A. indica* & *T. cordifolia* was evaluated in Sprague Dawley rodents using extraction & cut injury models, & results revealed that concentrates of two plants essentially propelled damage mending activity in both extraction & entry point damage models. Furrmore, stiffness of recovering tissue of two plants treated groups was discovered to be substantially greater when compared to control groups in section point wounds. Unique findings revealed that *Azadirachta indica* leaf concentrates promote damage retouching activity by increasing provocative response neovascularization. An investigation was carried out to assess 70 percent alcoholic extract of neem root bark (NRE) in diabetes, & findings revealed neem root bark extract provided demonstrably vital effects in 800mg/kg portion. Another study looked at pharmacological hypoglycemic action of *Azadirachta indica* in diabetic rodents, & results indicated that in glucose versatility test with extract of neem 250mg/kg, levels of glucose were fundamentally lower when matched to control group, & *Azadirachta indica* essentially decrease levels of glucose at finite levels.

#### *1.1.6 Antibacterial Activity:*

Leaf concentrates & grape seed extricates were tested for antimicrobial sufficiency as endodontic irrigants & were compared to standard irrigant sodium hypochlorite. Results ensured that leaf concentrates & grape seed extricates indicated zones of restriction prescribing that y had antimicrobial properties. Furrmore, leaf extract revealed significantly more inhibitory zones than 3 percent sodium hypochlorite. antibacterial development of guava & neem isolates against 21 strains of food borne pathogens was assessed, & delayed result of investigation recommended that guava & neem extracts contain compounds with antibacterial properties that could be useful in controlling food borne pathogens & deteriorating life forms.

#### *1.1.7 Antiviral Activity:*

Results indicated that removing neem bark (NBE) from cells effectively inhibited HSV-1 entrance at concentrations stretching from 50 to 100 g/mL. Furrmore, when concentrate was preincubated with illness but not with target cells, NBE formation was blocked, indicating that neem bark has a fast enemy of HSV-1 property. As recommended by techniques for disease inactivation & yield reduction look at or than interfering at early event of its duplication cycle, neem (*Azadirachta indica* A. Juss.) leaves concentrate (NCL-11) has validated virucidal development against coxsackievirus contamination B-4.

#### *1.1.8 Antifungal Activity:*

Researchers looked at effectiveness of numerous neem leaf concentrates on seed-borne parasites *Aspergillus* & *Rhizopus*, & found that both alcoholic & water extracts effectively suppressed & controlled growth of both infectious species. Furrmore, alcoholic neem leaf concentration was finest(6).

#### *1.1.9 Dentistry:*

Study was conducted to evaluate efficacy of mouthwash which is neem-based in terms of its anti-gingivitis effect, & results revealed that *A. indica* mouthwash is effective in plummeting periodontal records as chlorhexidine (7). Anor study looked at antimicrobial activities of natural neem concentrates against three bacterial strains that cause dental cavities, & findings indicated that oil er& chloroform extract had solid antibacterial activity against *S. mutans*. *Streptococcus salivarius* was successfully treated with chloroform, while third strain, *Fusobacterium nucleatum*, was extremely sensitive to both ethanol & water extraction. When compared to *S. salivarius*, *S. mitis*, & *S. sanguis*, dried chewing sticks of neem had most potent antibacterial activity against *S.*

mutans. According to preliminary study, using a gel containing neem leaf concentrate to teeth & gums twice daily for approximately a month & a half may reduce plaque levels on teeth. It has potential to reduce number of bacteria in mouth that produce plaque. It's unclear if using a mouthwash containing neem reduces plaque. Some study recommends that using a neem mouthwash is beneficial, but other studies show that it isn't.

#### *1.1.10 Antinephrotoxicity Effect:*

Impacts of a methanolic leaf extracts of *Azadirachta indica* (MLEN) on cisplatin-induced nephrotoxicity & oxidative stress in mice were studied, & results revealed that MLEN efficiently protects kidney from CP-induced oxidative stress. Furthermore, PCR results for caspase-3 & caspase-9, as well as Bax quality, revealed that MLEN-treated groups had decreased levels of caspase-3 and caspase-9.

#### *1.1.11 Neuroprotective Effects:*

Study was performed for investigating neuroprotective effects of *Azadirachta indica* leaves against cisplatin (CP-) induced neurotoxicity, & findings revealed that morphological observations of neem after CP infusion indicated overall preserved brain tissue. There were no alterations in biochemical indicators in neem-treated groups.

#### *1.2 Neem in Ayurveda:*

Neem has an astringent flavor, that gives it ground-breaking cooling vigor (virya). This chilling effect, along with capacity for supporting healthy blood, helping in regulate pitta, predominantly when raktadhatu is hot (blood). Additional pitta may appear in variety of methods, one of which is skin. Neem leaves & oils have long been used to soothe & moisturize skin, as well as to calm & soothe irritated & inflamed feelings, maintain relaxed body temperature, & promote healthy skin & nails. Because of its light & dry properties, neem may help to balance kapha. Neem promotes healthy digestion & arouses medadhatuagni (metabolic/stomach-related fire found within adipose tissue), allowing for proper digestion & maintaining levels of glucose that are now within normal limits. Usually given internally to promote a state of parity in liver, pancreas, & digestive system. Bitterness of neem enhances taste, which is essential for proper digestion. In pranavahasrotas, neem has a similar regulating effect on pitta & kapha (respiratory sections). On a larger scale, neem aids in regular purification of body's systems as well as regeneration of solid tissues. Because neem is vata-stimulating on its own, it is combined with other herbs to get best results(8).

#### *1.3 Different Parts of Neem in use:*

- *Flowers:* Except for its blooms, majority of neem tree's parts are very unpleasant. White & delicate, neem blossoms with its grey buds are much too beautiful for being eaten & incomparably soothing. During evening, flowers have a fragrant, almost magical jasmine-like fragrance & bloom once toward evening & again at night. A bunch of them dispersed appropriately beneath tree during downpour. These neem flowers, which are acknowledged as Vepampoo in Tamil, may be used fresh, dried, or powdered. They're often used in South to prepare a variety of meals, including bloom rice, pachadi, rasam, lentils, & so on. They're often dry simmered & then sprinkled on top of meal to add flair. Anorexia, nausea, belching, & intestinal worms may all be treated with neem blossoms.
- *Leaves:* Neem leaves have exceptional healing qualities. Aside from its use in pest & disease management, it may be fed to animals when mixed with other grains. Neem leaves are used as manure in rice fields in certain parts of India, especially in south Indian states. Neem leaves are used as a mulch in tobacco & tomato crops in certain countries. They may be effectively used

to eliminate weeds by spreading m over plant roots to retain moisture. Neem leaves may be used to keep creepy crawlies away from stored woolen& silk clothing.

- *Neem Cake:* Neem cake is versatile & may be used in a variety of ways. It has potential to be used as animal feed, compost, & a regular insecticide. When mixed with urea & applied to fields, it provides natural nitrogen while inhibiting nitrification process. use of neem-covered urea in a 90:10 ratio may save up to 30% of total syntic nitrogen need of crops, which would otherwise go to waste. Horticultural production costs are reduced as a result of this. In India, neem cake is often used as a compost for sugarcane, vegetable, & or cash crops.
- *Fruits:* Neem fruits are bitter, laxative, anti-hemorrhagic, & anlmintic (vermifuge) in nature.
- *Twigs & Bark:* If you were born in India, you would have seen someone chewing on a neem twig. For a long time, people have used a neem twig as a makeshift toothbrush. It destroys bacteria, maintains soluble dimensions in your salivation, keeps tiny organisms under control, heals sore gums, & whitens your teeth. twig shreds into strings, which function much like fibers, destroying & preventing plaque formation.
- *Neem Oil:* Neem oil, which is extracted from neem seeds, is high in medicinal qualities, which makes it a great ingredient in cleansers, hair oils, h& washes, & or cosmetics. It may be used to treat a variety of skin ailments & is considered to be an effective mosquito repellent. Neem may be mixed with coconut oil & applied to body. It is said that in India, little children are urged to use neem oil as a kind of all-purpose remedy. Apart from being an excellent Ayurvedic healer, neem oil may be used to protect various plants. It may be found in lotions, cleansers, & or restorative products.

## 2. LITERATURE REVIEW

Sharma Pankaj et al. discussed neem in which y discussed how Neem has grown more significant in global context as a result of its ability to address some of humanity's most pressing problems. Azadirachtaindica is quick-growing, evergreen tree native to India, Africa, & North America. This paper focuses on biological activity of neem, as well as its preventive &rapeutic medicinal uses & applications. It explains how “neem is one solution to a thous& problems,” such as diureticantifungalantiallergenic, antipyorrhoeicnematicidalantifeedent, , anti-inflammatory, , antiscabic, spermicidalcardiac, , insecticidal, larvicidal, .Gupta S et al. discussed Neem (Azadirachtaindica) in which y discussed how Neem, acknowledged as Azadirachtaindica, is a plant that has been used for thous&s of years on Indian & African continents because it offers immunity to all illnesses. Flowers, leaves, seeds, & bark of plant have been used to treat both acute & chronic human illnesses, as well as as insecticides, antimicrobials, larvicidal, antimalarial, antibacterial, antiviral, & spermicidal agents(6).

Alzohairy M discussed rapeutics role of azadirachtaindica (Neem) &ir active constituents in diseases prevention & treatment in which he discussed how Neem (Azadirachtaindica) belongs to Meliaceae family & is acknowledged for its health-promoting properties due to its high antioxidant content. It has long been utilized in Chinese, Ayurvedic, & Unani medicine, particularly in Indian Subcontinent, to cure & prevent a variety of illnesses. An earlier discovery indicated that neem & its components have a function in free radical scavenging & disease etiology prevention. According to animal research, neem & its components have anvital role in anticancer control by modulating a number of molecular pathways, including p53, pTEN, NF-B, PI3K/Akt, Bcl-2, & VEGF. It is regarded as a safe rapeutic herb that regulates a variety of biological processes without causing harm. I outline function of Azadirachtaindica in illness prevention &rapy via control of different biochemical & physiological processes in this study(9).

Nagini S et al. discussed Medicinal properties of neem leaves in which y explained how Because of its broad variety of rapeutic qualities, Azadirachtaindica, often acknowledged as neem, has

gained global popularity in recent years. Neem is widely utilized in Ayurveda, Unani, & Homoeopathic treatment, & has become a contemporary medical cynosure. Neem produces a wide range of physiologically active chemicals that are both chemically & structurally varied. From various sections of neem plant, more than 140 chemicals have been identified. leaves, blossoms, seeds, fruits, roots, & bark of neem tree have historically been used to cure inflammation, infections, fever, skin illnesses, & dental problems. rapeutic properties of neem leaf have been discussed in detail. Immunomodulatory, anti-inflammatory, antihyperglycaemic, antiulcer, antimalarial, antifungal, antibacterial, antiviral, antioxidant, antimutagenic, & anticarcinogenic activities have been shown in neem leaf & its components. broad spectrum of pharmacological actions of neem leaf is summarized in this study(10).

### **3. DISCUSSION**

For improved knowledge about metabolic process & consequences in bodyof human, global wellbeing& medical practice strive to combine traditional medicine with proof-dependentmedication. Complementary medicine, such as phytorapy, is one example. Because of its many health benefits, Azadirachta indica (Neem), a tree native to India & Myanmar, has been dubbed " Village Pharmacy" or "Divine Tree" by many. Neem-derived extracts are recently proven to be effective in a variety of applications, including insect repellent, anti-inflammatory supplements, diabetic management, & even cancer prevention. We describe health benefits of various compounds & extracts derived from Neem, as well as mechanism&paths by which Neem compounds yieldirspecial effects. We warn that extracts produced under unsanitary &unst&ardized conditions can cause health problems, with certain compounds having potentially harmful effects on liver & kidneys. Several medical properties of neem has been discussed in this paper.

### **4. CONCLUSION**

Natural products or ir derivatives are becoming more popular in treatment& prevention of illnesses owing to ir lack of adverse effects. Neem & its constituents have been used for medicinal purposes all throughout globe, specifically in Indian Subcontinent, ever sinceearlier times. Clinical studies have shown that neem has an vital role in prevention of a variety of diseases. Dynamic fixes have been shown to have a chemopreventive effect in certain tumors by balancing multiple cell flagging mechanisms. To underst& precise mechanism of action in illness treatment, nitty gritty examination should be made reliant on creature.

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