IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, February 2024

Antifungal Property of Neem

Pande Harshada Sandip, Wavhal Payal Rajendra, Labade Aishwarya Bhaskar, Walunj Nikita Kundan, Thorat Nikita Rajendra, Prof. Miss. Shivani Yendhe
Samarth Institute of Pharmacy, Belhe, Pune, Maharashtra, India

Abstract: *Dandruff due to fungus is extremely common, affecting close to 50% of the world's population and it also most prevalent between ages 15 and 50. Thus, this study has been conducted to come up with Neem leaves extract that has high antifungal properties. Neem is an attractive broad-leaved, evergreen tree that can grow up to 30m tall and 2.5m in girth. Its trunk usually straight is 30-80 cm in diameter. Neem (Azadirachta indica) is a member of the Meliaceae family and its role as health-promoting effect is attributed because it is rich source of antioxidant. It has been widely used in Chinese, Ayurvedic, and Unani medicines worldwide especially in Indian Subcontinent in the treatment and prevention of various diseases*

Keywords: dandruff, Azadirachta indica, Neem, health promoting effects

I. INTRODUCTION

Neem (Azadirachta indica) tree has attracted worldwide prominence owing to its wide range of medicinal properties. Neem leaf and its constituents have been demonstrated to exhibit immunomodulatory, anti-inflammatory, antihyperglycaemic, antiulcer, antimalarial, antifungal, antibacterial, antioxidant, antimutagenic and anticarcinogenic properties.

Neem seed oil is used to treat certain chronic skin diseases, ulcers, different types of metritis, leprosy, gum and dental troubles and the seed oil is said to be non-mutagenic. However, neem seed oil is toxigenic when given orally and further studies might throw light on the systemic toxicity of the solvent extracts of the neem seed.

Neem EO is commonly used as an antipyretic, natural insecticide, antimicrobial, antimalarial agent, antibacterial, antifungal, antiviral and for the treatment of leptospirosis .

Common name:-Indian-lilac (Canada), margosa, nimtree and margosier

biological sources:- Neem consists of the fresh or dried leaves and seed oil of Azadirachta indica J. Juss (Melia Indica or M. azadirachta Linn.

Uses:- treatment of inflammation ,infections, fever, skin diseases and dental disorders.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, February 2024

Neem is native of India, Pakistan, Thailand and Burma. Its actual origin is still debatable, but it is for sure that it originated in the Indian subcontinent and from there it spread to different parts of the world. As Neem is considered in India as a very important part of the household and is very much respected for its medicinal value, it spread with the migration of people. It is said that when people from India were taken as slave to the Fiji islands, with them they took the seeds, kernels of Neem. As Neem can grow in various temperatures, it flourished in tropical and warmer climates of Fiji and from there is spread to the south Pacific islands. Now Neem is cultivated in central and south America, West Indies and Australia.

Significance of the Study

Why use Neem?

The common treatment for the dandruff is antifungal and anti-inflammatory. A) The antifungal is treated with antifungal drugs. To treat the antifungal, the drug has to be specifically designed to treat the fungi. However the fungal and human cells are similar at the molecular level. This makes it more difficult to find or design drugs that target fungi without affecting human cells. Consequently, many antifungal drugs cause side-effects. Some of these side-effects can be life-threatening if the drugs are not used properly. B) The anti inflammatory is treated with cortisone which belongs to group of steroids. Excessive use of cortisone will help reduce excess inflammation however it may cause damage to the spine. Neem produces antifungal, antibacterial, pain-relieving, and anti- compounds that would treat dandruf.

Method:

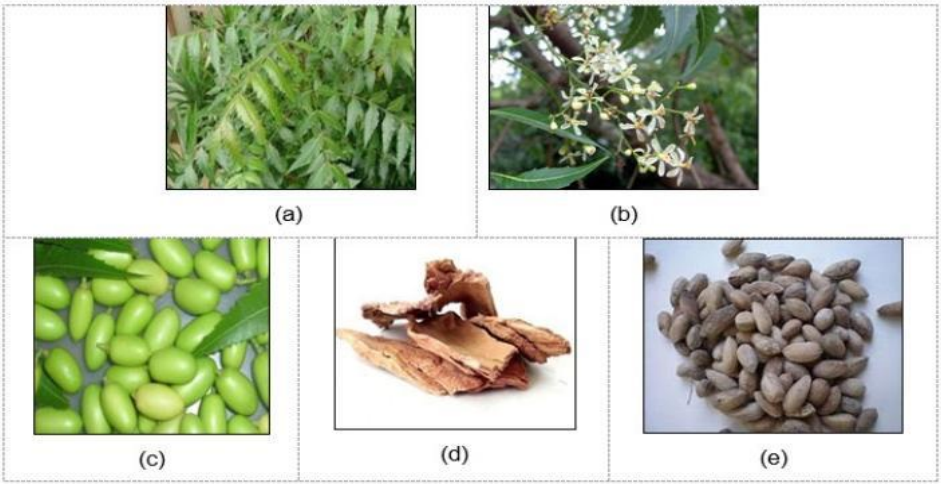
Extract preparation

Juss (neem) leaves were shade- dried for few days at room temperature and powdered with a grinder. Dried powder of A. indica leaves was mixed with 70% ethyl alcohol and kept at room temperature for 36 hr. The slurry was stirred intermittently for 2 hr and left overnight using mechanical stirrer.

In preparation of the herbal extracts, 25 g of fresh neem leaves were added to 50 mL of absolute ethanol. Mixture was macerated for 1-2 min and then the extract was filtered through muslin cloth for coarse residue.

This is our most intensive neem cream formula, containing neem leaf extract, organic neem oil and supercritical neem leaf extract, with enhanced anti-inflammatory (anti-histamine), antibacterial, anti-fungal and anti-viral action. Neem is soothing for dry, sensitive skin.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, February 2024



Neem Leaf's Active Compounds:

Indica (neem) contains several constituents with different therapeutics properties, whereby proteins, carbohydrates and fat derivatives are the main compounds. In contrast, A. Indica has secondary metabolites such as alkaloids, flavonoids, saponins, and steroids (Kumar et al., 2016). The active compounds of neem are divided into two major categories, isoprenoid and non-isoprenoid. Triterpenoid and diterpenoid are part of the isoprenoid group, named limonoid, gedunin, protomeliasin and azadiron. Non-isoprenoid compounds include sulfur, proteins, dihydrochalcone, carbohydrates, glycoside and polyphenols (Saleem et al., 2018). Azadirachtin is the essential constituent with Nimbin, nimbidol, nimbolinin, nimbidin, sodium nimbinate, salannin, quercetin and gedunin. The leaves also contain Nimbin, nimbandiol, 6-desacetylnimbine, nimbanene, nimbolide, n-hexacosanol, ascorbic acid, amino acid nimbiol, 17-hydroxyazadiradione, 7-desacetyl-7-benzoylgedunine and 7-desacetyl-7-benzoylazadiradione (Hossain et al., 2011). Quercetin and β-sitosterol, polyphenolic flavonoids, are purified from fresh neem leaves and possess antibacterial and antifungal effects.

Antifungal testing:

The results of antifungal activity revealed that The formulation containing methanolic extract of Nelumbo nucifera and ethanolic extract of Azadirachta indica leaves exhibited significant Antifungal activity. Both the standard sample and test sample were compared on the antifungal testing. The result Showed good antifungal activity of formulated Cream (Table 4). It was found that F1 Formulation (containing 2.5 gm extract of Nelumbo nucifera and Azadirachta indica)(Figure 2a, 2b) has better antifungal action Against C. albicans in comparision with F2 Formulation (containing 2.0 gm extract of N. Nucifera and A. indica).

Zone of inhibition (mm)	Standard (Griseofulvin)	F1 Formulation	F2 Formulation
	9.6 ± 0.5	9.3 ± 0.3	8.6 ± 0.3

Fig. 2a. F1 Formulation

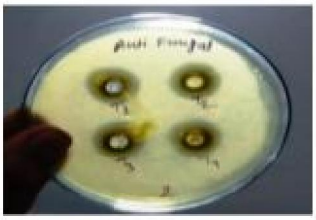


Fig. 2b. F2 Formulation

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, February 2024

REFERENCES

[1]. Ahmad S, Maqbool A, Srivastava A and Gogoi S. Biological detail and therapeutic effect of Azadirachta Indica (neem tree) products – a review. Journal of Evidence-Based Medicine, 2019; 6(22): 1607-1612.
[2]. Alzohairy M. A. Therapeutics Role of Azadirachta indica (Neem) and Their Active Constituents in Diseases Prevention and Treatment. Evidence-Based Complementary & Alternative Medicine, 2016; 11.
[3]. Barman P, Yadav M. C, Kumar H, Meur S. K and Rawat M. Antibacterial efficacy of neem oil fractions on clinical isolates of endometriotic cows. Indian Journal of Animal Sciences, 2009; 79(7): 665-668.
[4]. Bassey E. E, Mohammed G. A, Bala H. M, Ogonna U. S, Yawuri B. B and Maduchi O. C. Phytochemical Analysis and Antimicrobial Activity of Methanolic, Ethanolic and Acetonic Extracts of Stem Bark and Leaf of Neem Plant (Azadirachta indica). Journal of Diseases & Medicinal Plants, 2016; 2(3): 14-25.
[5]. Chhibber S and Sharma N. Medicinal and Therapeutical potential of Neem (Azadirachta Indica): A review. International Journal of Scientific & Research Publications, 2014; 4(5): 1-5
[6]. Dholi S. K, Raparla R, Mankala S. K and Nagappan K. Invivo Antidiabetic evaluation of Neem leaf extract in alloxan-induced rats. Journal of Applied Pharmaceutical Science, 2011; 1(4): 100-105.
[7]. Elavarasu S, Abinaya P, Elanchezhiyan S, Thangakumaran, Vennila K and Naziya K. B. Evaluation of antiplaque microbial activity of Azadirachta indica (neem oil) in vitro: A pilot study. Journal of Pharmacy Bioallied Sciences, 2012; 4(2): S394-S396.
[8]. Grover A, Bhandari B. S and Rai N. Antimicrobial activity of medicinal plants-Azadirachta indica A. Juss, Allium cepa L. and Aloe vera L. Journal of Pharm Tech Research, 2011; 3(2): 1059-1065.
[9]. Gupta R. C. Nutraceuticals: efficacy, safety and toxicity (1 ed.). Elsevier Academic Press, 2016
[10]. Gupta S. C, Prasad S, Tyagi A. K, Kunnumakkara A. B and Aggarwal B. B. Neem (Azadirachta indica): An Indian traditional panacea with modern molecular basis. Phytomedicine, 2017; 34: 14-20.
[11]. Hafiza M. A, Parveen B, Ahmad R and Hamid K. Phytochemical and Antifungal Screening of Medicago sativa and Zinnia elegans. Journal of Biological Sciences, 2002; 2(2): 130-132.
[12]. Harjai K, Bala A, Gupta R. K and Sharma R. Leaf Extract of Azadirachta Indica (Neem): A Potential Antibiofilm Agent for Pseudomonas Aeruginosa. Pathogens and Disease, 2013; 69(1): 62-65.
[13]. Hashmat I, Azad H and Ahmed A. Neem (Azadirachta indica A. Juss) – A Nature's Drugstore: An overview. International Research Journal of Biological Sciences, 2012; 1(6): 76-79.
[14]. Hla K. K, Aye M. M and Ngwe M. H. Some Chemical Analyses and Determination of Antioxidant Property of Neem Leaf (Azadirachta indica A.Juss). Universities Research Journal, 2011; 4(3): 1-9.
[15]. Hoque M. M, Bari M. L, Inatsu Y, Vijay K. J and Kawamoto S. Antibacterial Activity of Guava (Psidium guajava L.) and Neem (Azadirachta indica A. Juss.) Extracts Against Foodborne Pathogens and Spoilage Bacteria. Foodborne Pathogens and Disease, 2007; 4(4): 481-488.
[16]. https://www.researchgate.net/publication/333671637_ANTIFUNGAL_PROPERTIES_OF_NEEM_AZARDIRACHTA_INDICA_LEAVES_EXTRACT_TO_TREAT_HAIR_DANDRUFF
[17]. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3768785/
[18]. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4756573/
[19]. https://m.netmeds.com/health-library/post/neem-benefits-uses-formulation-ingredients-dosage-and-side-effects
[20]. https://journals.innovareacademics.in/index.php/ijcpr/article/view/38300/22576
[21]. https://www.scielo.br/j/bjos/a/BsQKRJP7gCBjrfFBw6jQksL/?lang=en