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Review On Antimicrobial And Wound Healing Pharmacological Evaluation Of Mallotus Philippinensis

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Abstract

Mallotus philippensis is one of the endangered medicinally important plants used in indigenous system of medicine for cultivation prospects. It is an important medicinal shrub of Ayurvedic system; whole parts of the plants are rich in secondary metabolites. Various parts of the plant are used in the treatment of skin problem, bronchitis, abdominal disease, jaundice, malaria, antifungal, tape-worm, eye-disease, cancer, diabetes, diarrhea, urinogenital infection etc. It also possesses various pharmacological activities like anti-oxidant, Antimicrobial Activity, Antifilarial Activity, Anti-Leukaemic Activity, Antitumor Activity, anti-HIV Activity, Anti-tuberculosis Activity Hepatoprotective Activity. This review underlines the miracle activities of the Mallotus philippensis.

Keywords – Mallotus Philippinensis, Antimicrobial, Microorganisms, Antifilarial Activity.

1. INTRODUCTION

Clinical experiences, observations, or accessible data form a beginning point in Ayurvedic medicine research, while it arrives at the end of conventional medication development. As a result, "reverse pharmacology" is used in the drug development process based on Ayurveda. However, all essential pharmacopoeial tests, including those for heavy metals, pesticides, and microbiological contamination, must adhere to international standards. Making ensuring that all Ayurvedic medications are made in compliance with current good manufacturing practises for herbal products is crucial. Concerns have been raised concerning the safety and quality standards of herbal medications.

Due to their extensive biological activity, better safety margin than synthetic pharmaceuticals, lower prices, and strong demand, herbal medicines are found in both developed and developing nations. Herbal medications are susceptible to contamination, degradation, and composition fluctuation since they are made from ingredients with a plant origin. This results in herbal products of lower quality and little to no medicinal benefit. In the Indian medical system, a variety of herbal medicines are used to treat a variety of chronic conditions that are caused by a person's way of life, including arthritis, wound and inflammation, analgesic usage, and associated consequences. These preparations' multi-targeted action is due to the phytomolecules that are included in them. This is one of their modes of action since free radicals have been linked to various chronic illnesses and these plant compounds have been linked to free radical scavenging activities.

In comparison to contemporary synthetic pharmaceuticals, traditional herbal medicines have shown to be a superior option. These medications are said to be safer than others since they have minimal or no

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negative effects. There is a wealth of expertise and information about herbal medicines in our old Ayurvedic medical books. One of these ancient texts, the Charaka Samhita (1000 B.C.), offers information on 2000 herbal medicines. These plants have been used to make some extremely significant life-saving medications. The traditional therapeutic claim is the basis for the choice of the plants for this investigation. The patient feels quite at ease in the company of these practitioners since herbal medications are freely accessible in the local market and are recommended by local doctors who are active members of the community. Many of the contemporary medications we use have direct or indirect ancestry in higher plants. Although there has undoubtedly been significant progress in the area of modern medicine, herbal remedies are still used by practitioners in this day and age. India has a long history of using medicinal plants to cure a variety of illnesses. One of the biggest plant families in the world, with around 300 genera and 7,500 species, the family Euphorbiaceae is mostly composed of monoecious herbs, shrubs, and trees, sometimes succulent and cactus-like. Many of them are domesticated species with significant economic value, and many of them have nutritional and medicinal value. A broad genus of trees and shrubs with around 20 species in India belongs to the family Euphorbiaceae and is mostly found in the tropical and subtropical parts of the Old World. Mallotus philippinensis Muell is a fairly widespread perennial shrub or small tree found in the outer Himalayas reaching to 1500 metres. It is also known locally as Shendri and goes by the popular names Kamala, Kampillaka, and Kapila. The glandular hairs that are accumulated as fine, floatable powder in mature fruits are reddish brown, dull red, or madder red in hue. This plant has historically been used for its anti-tuberculosis, anti-tubercular, anti-inflammatory, immune-regulatory, antioxidant, antiradical, anti-leukaemic, anti-tumor, purgative, and anthelmintic properties, among other properties. Ayurveda claims that leaves are cooling, bitter, and a good appetiser. The glands and hairs from the capsules or fruits are used as purgative, heating, vulnerary, anthelmintic, maturant, detergent,alexiteric, carminative, and useful in the treatment of bronchitis, abdominal diseases, spleen enlargement, and useful in the removal of tapeworms when taken with milk or curd (yoghurt). Another oral contraceptive is kamala or kampillakah. In addition, Kamala powder and a few other elements are used externally to aid in the healing of wounds and ulcers. Scabies, ringworm, and herpes are just a few examples of the parasite skin conditions they are used to treat.

2. LITERATURE REVIEW

Traditional Indian medical systems such as Siddha, Ayurveda, Naturopathy, and others have employed many Indian plants for centuries to treat a wide range of illnesses and infections (Shekhawat and Prasad 1971, Khanna and Chandra 1972). The ability of plants to treat a wide range of illnesses is well-documented, and a substantial amount of study has been conducted in this area both in India and elsewhere. A variety of solvents are used in the traditional extraction of these Indian herbs (Ganesan and Krishnaraju 1995). Doubts remain about the best solvent to utilise to extract the active elements from a certain plant in the treatment of a particular ailment, despite the fact that numerous solvents have been tried.

India is blessed with an abundance of medicinal plants. Indirectly or directly, these plants are employed by all segments of society as traditional cures or as pharmaceutical ingredients in contemporary medicine. With each passing year, the conventional western diet appears to include more and more processed fats and less whole meals from plants. Degenerative disorders including cancer, heart disease and stroke are on the rise as a consequence of this troubling trend. Additionally, people aren't getting enough of the many health advantages that plants have to offer, such as fibre and anti-inflammatory compounds like vitamins and minerals. In addition to providing essential fibre, vitamins, and minerals, eating plant-based meals also provides a wealth of phytochemicals, which have several health advantages. Many phytochemicals may be found in the plant kingdom, such as phenols and lignans as well as carotenoids, isoflavones, steroids, lignans, gums and resins.

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3. MATERIALS AND METHODOLOGY

EXPERIMENTAL ANIMALS

Inbred Charles-Foster albino rats (weighing 160-200g) and Swiss albino mice (Reg.no.542/02/ab/CPCSEA) were sent to the Institute of Medical Sciences' central animal house at Banaras Hindu University in Varanasi (20-25g). Before and throughout the testing, all healthy and pathogen-free animals were maintained in polypropylene cages under typical circumstances (26 2°C temperature, 44–56 percent relative humidity, 10 and 14-hour light and dark cycles, respectively) in a departmental animal house. An adequate diet of mouse pellets and water was provided for the animals. The "Principles of Laboratory Animal Care" were strictly adhered to (NIH publication no. 82-23, updated 1985) A notification number Dean/13-14/CAEC/331 dated November 20th, 2013 was used to get consent from an animal ethics committee prior to the experiment.

Healthy albino rats weighing 180–200 g were obtained from an animal house at Banaras Hindu University in Varanasi, India (Reg.no.542/02/ab/CPCSEA). In a departmental animal house with typical temperatures (26 2°C and 44–56 percent relative humidity), the six animals in each of their Plexiglas cages had full access to food and water. An Indian study in Varanasi provided food and water for the animals involved. On November 20, the Institutional Animal Ethical Committee approved NIH publication 82-23, updated 1985, to be utilised as the norm for the treatment of laboratory animals in accordance with its notification (Notification no. Dean/13-14/CAEC/331).

We received Charles-Foster albino rats (180-200 g) of either sexe from the Central Animal House (Reg.no. 542/02/ab/CPCSEA) at Banaras Hindu University in Varanasi, India. They were housed in a departmental animal house under regular circumstances (26°C, 44–56% relative humidity, 10-hour light/14-hour dark cycle) in Plexiglas cages in groups of six. The animals had access to food and water in the form of rat pellets. The NIH publication 82-23, amended 1985, must be followed once an experimental investigation has received approval from the Institutional Animal Ethical Committee (Notification no. Dean/13-14/CAEC/331 dated November 20, 2013). They spent 15 days getting acclimated to being in the lab before the experiment. During this time period, samples of animal faeces were often checked for intestinal worms.

Phosphoric acid, ferric chloride, trifluoroacetic acid, trichloroacetic acid, and trifluoroacetic acid were all supplied by POCh Company (Gliwice, Poland). Phenols utilised by Folin and Ciocalteau; Dragendorff; Hager; Mayer; Wagner; Fenton; and sodium picrate were given by Sigma Ltd. (Poznan). In addition to Gallic acid, Sigma Ltd. also supplied Quercetin (Poznan). DPPH and ABTS were acquired by Sigma Ltd. (Poznan). EDTA, nitro blue, and nitrogen blue triazines were all synthesised from Ascorbic acid, as was thiolactic acid (TBA), nitro blue, and sodium nitroprusside (SNP) (NBT). nucleoside diphosphate (NDP) decrease (NADH).

PLANT MATERIAL

The fruits of Mallotus philippinensis were collected at the Institute of Medical Sciences, Department of Microbiology, BHU, Varanasi, India. Plants gathered in the fruiting season between March and April were accurately identified and certified by Prof. R.K. Asthana of the Department of Botany at Banaras Hindu University in India. The botanical specimens were kept in the department of botany under reference voucher RKA/BOT/Sept.10–12. Fruit surfaces have red glandular hair powder adhering to them. They were preserved for later use after drying in the shade. Fruit glandular hairs, a 50% ethanol extract of fruit glandular hairs, and fruit glandular hairs that had been dried and powdered were also employed in the research. Mallotus philippinensis fruit glandular hairs were dried and ground

into a powder for the study's manufacture of a 50% ethanol extract (MPE).

COLLECTION OF CYSTS

Aseptically obtained E. granulosus hydatid cysts from the liver and lungs of experimental animal killed in an Indian slaughterhouse were identified. The undamaged cysts were sent to the Department of Microbiology at the Institute of Medical Sciences, BHU, Varanasi, India, within 3 hours after being put in an icebox. As previously mentioned by Smyth et al. in 1980, protoscoleces and hydatid fluid were collected. Washing the cysts in PBS (Phosphate Buffered Saline) was done several times using pH 7.2, sterilised PBS. Using 70% ethanol to sterilise the cysts surfaces, the metacestode tissue and host adventitia were isolated from the vesicle fluid containing protoscoleces. The cyst was sliced open after the vesicle fluid was removed, and the whole germinal layer was taken out. The germinal layer may cling to protoscoleces-rich fluid after many types of washing. Upon microscopic analysis of a wet-mount drop and the patient's unique muscle motions, cystic fluid was found to include free protoscoleces.

CONCLUSION

The findings of this study underscore the potential of *Mallotus philippinensis* as an effective antimicrobial and wound healing agent. The plant's bioactivity supports its traditional use in folk medicine and highlights its potential for inclusion in pharmaceutical formulations aimed at combating infections and promoting wound healing.

Future research should focus on in-vivo studies to validate the therapeutic efficacy of *Mallotus philippinensis* in animal models, as well as the clinical application of its extracts. Further investigation into the molecular mechanisms underlying its antimicrobial and wound healing properties will also be crucial in optimizing its use as a safe and effective therapeutic agent. Additionally, the standardization of its extracts and formulation development could lead to commercially viable products for clinical use.

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