LITERATURE ON ANTIMICROBIAL POTENTIAL OF PLANTS (*Pterocarpus santalinus* AND *Aloe barbadensis* MILLER)

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ABSTRACT:

The importance cited in literature is enforcing to worker that they give a lot of attention on their traditional flora to catalogue their antimicrobial or anti-infectious properties. In this series Rajasthan also have its endemic flora, which have a lot of interest for ethnopharmacology.Over 50% of all modern clinical drugs are of natural product origin (Stuffne and Douros 2003) and natural products play an important role in drug development programs in the pharmaceutical industry (Baker et. al., 1995). For these reasons, medicinal plants are important substances for the study of their traditional uses through the verification of pharmacological effects and can be natural composite sources that act as new anti- infectious agents (Ushimaru et. al., 2007). There has been a revival of interest in herbal medicines. This is due to increased awareness of the limited ability of synthetic pharmaceutical products to control major diseases and the need to discover new molecular structures as lead compounds from the plant kingdom. Plants are the basic source of knowledge of modern medicine. The basic molecular and active structures for synthetic fields are provided by rich natural sources. This burgeoning worldwide interest in medicinal plants reflects recognition of the validity of many traditional claims regarding the value of natural products in health care (Nair et. al., 2005).

Key words: **REVIEW OF LITERATURE, PHYTOCHEMICAL ANALYSIS, ANTIMICROBIAL POTENTIAL, *Pterocarpus santalinus* AND *Aloe barbadensis* MILLER PLANTS**

INTRODUCTION

Medicinal plants are the major sources of numerous valuable chemicals or drugs. In European countries, over 1300 medicinal plants are used. Out of them, 90% are from wild sources. About 50,000 to 80,000 of flowering plants are used due to thier medicinal values according to the International Union for Conservation of Nature and the World Wildlife Fund. The National Medicinal Plant Board India has estimated 17,000 to 18,000 species of flowering plants, out of which 6000 to 7000 are known to have medicinal application in ancient medicinal systems such as ayurveda, unani and homeopathy(Poonam Gusain et al., 2019).The use of medicinal plants in traditional medicine has been described in literature dating back several 1000 years (Chang et al., 2016).

Medicinal plants have been used against various diseases for thousands of years. About 80% of the worldwide population still depends on herbal medicines. Many medicinal plants have been effectively used against skin diseases, such as Astemisia nilagirica, Hypericum perforatum and Curcuma longa .These plants provide us bioactive molecules, such as artemetin, hypericin hydroquinone and curcumine, which are used against acne, atopic dermatitis, skin cancer, and skin pigmentation disorders(A. Paraeimehr et al., 2017). Much of medicinal plants are described in ancient texts like the Vedas and the Bible has been traced to the occurrence of natural products with medicinal properties. In fact, plants produce a diverse range of bioactive molecules, making them a rich source of different types of medicines. Higher plants, as sources of medicinal compounds, have continued to play a dominant role in the maintenance of human health since ancient times (Farombi 2003).The development of research on natural products is increasing the knowledge about the close relationship between the chemical structure of a certain compound and its biological properties, and to the understanding of the animal/insect-plant interrelation (Viegas and Bolzani, 2006).

Medicinal plants are rich source of antimicrobial agents plants are used medicinally in different countries and are the sources of potential and powerful drugs.The substances that can either inhabits the growth of pathogens or kill them and have no or least toxicity to host cells are considered candidates for developed new antibacterial drugs. In recent years antimicrobial properties of medicinal plants are being increasingly reports from different parts of world .Many

efforts have been made to discover new antimicrobial compounds from various kinds of sources such as microorganism . one such resources is folk medicines. Systematic screening of them may result in the discovery of novel effective compounds. India processes a rich biodiversity of the medicinal plants that were still not explored completetly. The need for the novel pharmaceutical products out from the plant has attained great interest in the presence biomedical researches due to potent source of natural antioxidant Morinda citrifolia , Euphorbia hirta , Gymnema sylvestre , Pterocarpus santalinus is the medicinal plants that shown different type of pharmacological activity like antimicrobial ,antioxidant ,anticancer.The aim of this study was to evaluvate the wound healing activity of extracts from the leaves in normal The four different plants was found to possess a large number of phytochemicals. Alkaloids are found in higher percentage due to that is secure wound healing and antidiabetic properties (Anurag singh and Pramod kumar singh, 2014).

REVIEW OF LITERATURE

Soares *et al* (2014) showed that limonoid extracted from Neem, can inhibit edema and fibrovascular tissue growth when tested on damage rat paws. Kausik et. al., (2002) has studied the medicinal values of traditional plant Neem, they analyzed the anti-inflammatory, immunostimulant, anti-ulceral, hypoglycaemic, anti-fertility, anti-malarial, anti-fungal, anti-bacterial, anti-viral, anti-carcinogenic, Hepatoprotective, anti- oxidant activities and effect on CNS.

The antimicrobial activities was done by using bacterial strains Staphylococcus aureus, Escherichia coli and fungal strain like Aspergillus niger ,Candida albicans .All the strains were collected from microbiology laboratory .The antimicrobial activity was determined by disc diffusion methods (Bauer et al.,1966) .Five different concentrationof 1000,µl,500µl,250µl,12.5µg,62.5µ, respectively were prepared .Each sterile disk was loaded 20µl of test extract and placed on incubated with respective micro organisms.The negative control 20µl DMSO and positive control streptomycin(10µg)and placed on MHA plates. Then the plates were kept for incubation at 37ºC for 24 hrs for bacteria and 48 hrs for fungi.At the of incubations zones around the discs were measured .The study was performed in triplicate .

Pterocarpus is based on the Greek words "pteran" meaning a wing and "karpus' meaning fruit (Osuagwu et al; 2007). Pterocarpus species belong to the family Papilonaceae and they occur throughout the tropics and the Nigerian species are tree with yellow flower and usually alternate leaflets Osuagwu et al; 2007).

Pterocarpus soyauxii known as African coralwood, African padouk, barwood, Gabon padouk, large frinted camwood or redwood in English and Oha in Igbo is a tree 27-34m tall; bole length up to 17m, girth up to 3.3m with an undivided stem. Bark reddish-grey detaching in flakes, slash white, exuding a red gum. Leaves compound, unarmed; leaflets 11-13, alternate, lateral leaflet veins crowded but disappearing before leaf margins. Flowers in pyramidal panicle; calyx turbinate; upper 2 teeth more or less connate; vexillum orbicular or broad-ovate; stamens connate; style curved round towards the base (Osuagwu et al; 2007). The fruit is flat and papery 6-9cm across, densely velvet with short hairs. It becomes finely hairy, when ripe. (Osuagwu et al; 2007) The tree is native to west Tropical Africa and occurs in mixed deciduous and evergreen forest. It requires much light and moist soil. Its biological limit is at the mean annual temperature of 23°C and mean annual rain fall between 1500-1700mm and soil type is a well drained soil. (Osuagwu et al; 2007) The leaves of P. soyauxii are eaten as vegetable and have a high ascorbic acid content even after cooking. The wood are commercially known as "African Padouk" and are known for its durability, termite resistivity, and hardness and are used for making material such as walking sticks, canoe construction, buildings (Osuagwu et al; 2007) Medicinally, the bark extracts are used in warding off animalskin parasites in ethnoveterinary practices. Antifungal properties are reported for this plant though the fungi Coniophora cerebella, Merulius lacrymans, Polystictus versicolor and Porin vaporaria have been reported on this tree (Osuagwu et al; 2007).

Gongrenema latifolium or Marsdenia latifolium is a climber from a tuberous base of deciduous and secondary forest from Guinea Bissau to west Cameroons, and widely dispersed elsewhere in tropical African. The stem are soft and pliable (Burkill, 1985).

They are used in Sierraleone as chew-sticks and cut up and boiled with lime juice or infused in water over three days, the liquor is taken as a purge for colic and stomach - pains, and symptoms connected with worm-infection. The infusion is taken as a cleansing purge by Mohammedians during Ramadan. It is given to a new born baby in the Joru area of Sierraleone to make it grow rapidly. In Ghana the leaves are rubbed on the joints of small children to help them to walk, and in southern NIGERIA the leaves serve as vegetable. The bark contains a quantity of latex and though it has been viewed with potential interest for its rubber, it has apparently never been exploited. A Closely species M .reichenbachii in Ecuador and Columbia is the source of cundurago bark containing glycosides cunduragin and candarite and from which cundaragon wine is prepared. This is used as an aromatic biter stimulant in treatment of dyspepsia. The bark of G. latifolium merits examination as an official dyspeptic. In Ghana the boiled fruits are put into soup as a laxative (Burkill, 1985). Generally, the leaf is used as food, stem as pain-killer; vermifuges in medicine and in the production of house-hold, domestic and personal items. The stem fruit is use in medicine as laxatives while the bark is use in the production of resin and exudation-gum (Burkill, 1985). The chemically composition of Gongronema latifolium leaves as determine using standard method by Eleyinmi (2007) is as follows; Crude protein, lipid extract, ash, crude fiber and nitrogen free extractives are 27.2%,6.07%,11.6%, 10.8% and 44.3% dry matter respectively. Potassium, sodium, calcium, phosphorus and cobalt content are 332,110,115,125, and 116 mg/kg respectively. Dominant essential amino acids are luecine, Valine and phenylalanine. Aspartic acids, glutamic acid and glycine are 13.8%, 11.9% and 10.3% respectively of total amino acid. Saturated and unsaturated fatty acids are 50.2% and 39.4% of the oil respectively. Palmitic acid makes up 36% of the total fatty acid.

Singh et al., 2010 has studied that the Ocimum tenuiflorum, also known as Ocimum sanctum, Tulsi or Holy basil from the family Lamiaceae has been described as the "Queen of plants" and the "mother medicine of nature" due to its perceived medicinal qualities.

Phulan Rani et. al., (2004) has reported antimicrobial activity against multidrug resistant Salmonella typhi through aqueous and methanolic extract of 54 Ayurvedic plants species of their studied area.

Rios et. al., (2005) has reported the past, present and future of medicinal plants both as potential antimicrobial crude drugs as well as a source for natural compounds that act as new anti – infection agents.

Farrukh Aqil et. al., (2005) has reported antimicrobial activity against Antimethicillin resistant Staphylococcus aureus (MRSA) through 4 different plant species of their studied area.

Nair et. al., (2005) have reported antimicrobial activity against the 5 microorganism's species through 9 different endemic plant species of their studied area. They also reported compare hot water extract and methanolic extract for their antimicrobial activity. They concluded that methanolic is more potential career for antimicrobial substances.

Naik et al., 2014 mentioned that phytochemical analysis of the Neem oil, confirmed triterpenes as the most important chemical compound found (anti-inflammatory effects).

Shilpa et al., 2017 showed that extracts of Neem could interfere in the IL-1 – COX2 stimulation and producing an antipyretic effect.

Pramanik et al. (2016) tested for the chemo protective of compounds found in Neem, like azadirachtin, nimbolide and limonoid enrich extracts, over models of buccal carcinogenesis in hamsters. They established, that Neem extracts gave positive such as the suppression of the NF-κβ pathway.

M.J.O'Neill et. al., (1986) has reported anti-malarial activity of some quassinoids (obtained from Simaroubaceous plants) against Plasmodium falciparum. They found the Simaroubaceous plants

are sources of malarial drugs.
Janovska et. al., (2003) have reported the antimicrobial activity against 5 microorganism species through 10 different endemic plant species of their studies area. Out of the 10 plants tested 5 showed antimicrobial activities against one or more species of Microorganisms.
Rupani and Chavez, 2018, Verma et al., 2019 stated that the use of several therapies using a complex of herbs and plants, like Turmeric, Amla, Tulsi, Guggul and Neem, Interestingly, these mixtures nowadays represent the basis for many commercial products used in cosmetics, soaps, toothpaste, and pest repellents.
Eid et al., 2017, Heyman et al., 2017, Joshi et al., 2010, Saleem et al., 2018 stated that the mixtures of turmeric , amla and neem continue as treatments for chickenpox, fever, headache, leprosy, jaundice, constipation, respiratory problems, rheumatism, and gastrointestinal disorders .
Alzohairy, 2016, Heyman et al., 2017, Nagini, 2014 proposed complexes of herbs and plants have been in more detail studied. Results have found that many of these herbs and plants contain several compounds mainly of the following families: flavonoids, catechins, anthocyanins, quercetins, saponins, tannins, limonoids, gallic acid and other minor polyphenols ; all known to have biological effects.
Sanago et. al., (1997) has reported antimicrobial activity against the bacterial strains Haemophillus influenzae (6 strains), Staphylococcus aureus (5 strains), Streptococcus pneumonia (3 strains), Streptococcus pyogens (8 strains) and Moraxella catarrahalis (5strains) through 13 plant species of their studied area (Mali). They concluded that the methanolic extract of these traditional plants is a potential carrier for antimicrobial substances.
Maragatharavlli et al., 2012 reported that the earlier studies on neem have showed that it contains active substances with multiple medicinal properties.
Mossadek and Rashid, 2008; Patil et al., 2013 stated that the aqueous extract of neem leaf has a good therapeutic potential as antihyperglycemic agrnt in IDDM and NIDDM.
Jiang et al., 2014, 2015; Mandave et al., 2014; Sun et al., 2014 stated that plants are the primary source of therapeutics and each part of the plant, including the seeds, root, leaves, and fruit, potentially contains bioactive components. The main bioactive components in medicinal plants are considered to be combinations of secondary metabolites.

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