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HERBALS USED AS A MEDICINES

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Abstract : Herbal medicines or phytomedicine refers to the particle using plant material for medicinal purpose. India has a rich tradition of a plant based knowledge in health care. Herbal medicines are now in great demand in the developing world for primary health care not because they are inexpensive but also for better cultural acceptability, better compatibility with the human body and minimal side effects. This article reviews the medicinal properties of herbs including Moringa oleifera, Tridax procumbens and Lantana camara.

KEY WORD: Medicinal plant, Moringa Oleifera, Tridax Procumbens, Lantana Camara, Medicinal Property.

INTRODUCTION

The World Health Organization (WHO) defines herbal medicines as a practice which includes herbs, herbal material, herbal preparations and finished herbal product, that contain as active ingredients parts of plant or other plant materials or combinations [1]. Medicinal plants are now the main source of medicine [2]. Herbal medicine is also called as botanical medicine or phytomedicine and it also refers to the use of any plant's parts like seeds, berries, roots, leaves, bark or flowers for medicinal purpose. Herbalism is becoming main stream and research show value of herbs in the treatment and prevention of disease. Scientific data on such plant derivatives could be of clinical use [3].

Herbal drug

The term "Herbal Drug "denoted by means of plant or part of plant that have been converted into phytopharmaceuticals by simply means of process involving collection or harvesting, drying and storage [4]. Herbal drugs are of two type former is Single /crude drug while the later is multiple herbal formulations.

1) Single /crude drugs

All mainly whole, fragment or cut plant, plant parts usually dried forms, but sometimes fresh. It also includes algae, fungi and lichen.

2) Multiple herbal formulations

Formulations are obtained by subjecting herbal ingredients to various manufacturing process such as, extraction, distillation, expression, fractions, portion, chromatography and formulations [5].

Advantages of herbal drugs:

1. They may have fewer side effects
2. Effective with chronic condition.
3. Wide spread availability.

Disadvantages of herbal drugs:

1. Lack of dosage instruction.
2. Poison risk associated with wild herbs.
3. Can interact with other drugs.
4. Inappropriate for many condition [6].

Herbal Medicine:

The use of plants and products from its parts to treat diseases and enhance general wealth and wellbeing is known as herbal medicine. The advantage of this type of medicine is it can interact with other pharmaceutical medications and should be taken with care. It has two types of importance, like health and its trade and value. The major use of herbal medicine is for health promotion and therapy for chronic conditions [7].

History of Herbal Medicine

The use of herbals in Indian, Chinese, Egyptian, Greek, and Roman and Serian texts dates back to about 5000 years. The classical Indian texts include Rig-Veda, Atharvaveda, Charak and Sushrut Samhita. The traditional medicaments have been derived from rich traditions of ancient civilization and scientific heritage.The ancient literature mentions herbal medicines for age related disease like memory loss, osteoporosis and others like diabetic wound, immune and liver disorders etc. Ayurveda remains one of the most ancient and yet living traditions practiced widely in India, Srilanka and other countries and has a sound philosophical and experimental basis. Atharvaveda (around 1200 BC), Charak samhita and Sushrut samhita (1000-500BC) are the main classics that give a detailed description of over 700 herbs [8].

MORINGA OLEIFERA

Moringa oleifera L. comes from the moringaeceae family and it's commonly known as kelor in Indonesia, sahajan in India, horseradish tree and drumstick tree in English [9]. Which is a small deciduous tree, is about 8m high with pale gray bark and softwood. It originated from India and is being grown widespread, either from cuttings or seeds, in all tropical regions. It produces fruits and flowers once in a year, but in some regions twice in a year [10].

Fig. 1 Moringa Plant

TAXONOMIC CLASSIFICATION

It is being grown for arrange of purpose including human consumption livestock/aqua feed and industrial application. The taxonomic classification of M. Oleifera is as follows:

Domain: Eukaryota

Kingdom: Plantae

Phylum: Spermatophyta

Subphylum: Angiospermae

Class: Dicotyledonae

Order: Capparidales

Family: Moringaceae

Genus: Moringa

Species: Moringa Oleifera [11].

Medicinal properties

M oleifera is often referred as a panacea and can be used to cure more than 300 diseases. Moringa has long been used in herbal medicine by Indians and Africans. The presence of phytochemicals makes it a good medicinal agent. In this section, the effect of moringa on diseases like diabetes and cancer are reviewed [12]. MO contain various phytoconstituents such as alkaoids, saponins, tannins, steroids, phenolic acid, flavonoids, glucosinolates, and terpenes. These compounds have been shown to be effective antioxidants, antimicrobial, anti-carcinogenic, anti-nflammatory, and antiproliferative [13].

Anti-diabetic

Moringa plays a significant role in diabetes suppression. Its leaf powder is highly effective in lowering lipid and glucose levels, as well as managing oxidative stress in diabetic individuals. This means it helps reduce blood sugar and cholesterol, enhancing protection against cellular damage. Moringa has been shown to be beneficial for both Type 1 and Type 2 diabetes patients who do not produce insulin, a hormone essential for maintaining blood glucose levels. Type 2 diabetes is associated with insulin resistance, a condition where the beta cells, responsible for producing insulin, do not function properly. In this condition, the beta cells are unable to recognize glucose levels, leading to a decrease in insulin signaling, which results in elevated blood glucose levels. Numerous studies have confirmed that Moringa has the potential to function as an antidiabetic agent [14].

Hepato and Kidney Protective Properties:

The methanol fraction of Moringa oleifera leaves extract showed Hepato protectives effects in rats [15]. Observed an increment alkaline phosphatase (ALP), blood urea nitrose (BUN), creatinine, aspartate aminotransferase (AST) and alanine aminotransferase

(ALT) in serum following an administration of the extract of Moringa oleifera leaves in mice [16]. Speculated that leaves might predispose to hepatic and kidney damage. In this mice, histopathological examinations did not reveal any histological lesions in the sinusoids or central vein the authors observed a reduction of serum ALT, AST, ALP and BUN and creatinine in animals treated with the extract of Moringa oleifera leaves [17, 18, and 19].

Antipyretic Activity

Due to the anti-inflammatory properties of the bioactive constituents present in Moringa, it is postulated that antipyretic activity may be observed. To investigate this hypothesis, a study was conducted to evaluate the antipyretic effects of various extracts derived from Moringa seeds, including ethanol, petroleum ether, solvent ether, and ethyl acetate, using a yeast-induced hyperpyrexia method. To ensure consistency, paracetamol was administered as a control throughout the study. It was found that the ethanol and ethyl acetate extracts of Moringa seeds exhibited significant antipyretic activity in rats, as expected [20].

PCOD

Polycystic Ovarian Syndrome (PCOD) is a complicated hormonal condition marked by the formation of numerous immature or partially developed eggs in the ovaries, which later turn into cysts. This disorder carries dangers such as resistance to insulin, irregularities in the growth of follicles, and high levels of pro-inflammatory molecules like TNF-a, IL-6, and IL-18. These molecules, in a domino effect, trigger the NF-KB (Nuclear Factor Kappa B). In research involving rats with PCOD, a group of Wistar female rats, and Norwegian rats, a treatment of 500 mg/kg of body weight of M. oleifera leaf extract, which is high in the bioactive compound quercetin, was given. In summary, the research by Siahaan and colleagues highlights the possibility of MO as a complete solution for dealing with the complex issues of PCOD [21].

Table 1: Different formulations of Moringa oleifera with their uses:

Sr.no	part use for Extract	Formulation	Biological role	Reference
1.	Leaves	Suspension	Hepato protection Against isoniazid	22
2.	Leaves	Silver nano Particles	Antimicrobial	23
3.	Leaves	Tablet	Anti-anemia	24
4.	Seed oil	Nano -micelle	Mitochondrial cancer cell apoptosis	25
5.	Leaves + Fruits	In-situ nasal gel	Allergic rhinitis	26

TRIDAX PROCUMBENS

T. procumbens is commonly called as ‘Jayanti-veda’ in Sanskrit, Tikki-kasa/'Ghamra' in Hindi and ‘Wild daisy’, ‘Mexican daisy’ and ‘Coat buttons’ in English based on the appearance of the flower. The scientific name is ‘*Tridax procumbens’* [27-31]. The generic name is derived from the Greek, meaning ‘summer eating', implying that it was a summer vegetable [32]. Traditionally Tridax plant has been use in India for wound healing and as an anticoagulant, antifungal, and insect repellent. The juice extracted from the leaves is directly applied on wounds. Its leaf extracts were used for infectious skin diseases in folk medicines [33]. The plant is native of tropical America and naturalized in tropical Africa, Asia, Australia and India. It is a wild herb distributed throughout India [34].

Fig.2 Tridax Plant

TAXONOMIC CLASSIFICATION

Kingdom -Plantae
Subkingdom -Tracheobionta
Division -Spermatophyta
Subdivision -Mangoliophyta
Class -Magnoliopsida
Subclass- Asteridae
Order- Asterales
Family- Asteraceae
Genus -Tridax
Species –procumbens [35-36].

Traditional Uses and Plant Preaparation

In Guatemala the Tridax Procumbens juice obtained from the leaves is uesd for the treatment of Anemia, colds, inflammation,vaginitis,stomach pain, dairrhea, skin infection.while in India the juice and dried herbs injested orally for the treatment of Daibetes, diarrhea, jaundice,wound healing.While in Africa the tridax plant are used for treatment of treating mastitis in livestock.

Pharmacological Properties

Prolongation of clotting time

T. procumbens extract 200 mg/µg IP injected to experimental rabbits, reduced normal heparin induced prolongation of clotting time [37].

Antidiabetic activity:

Madhumeha, also known as diabetes, is a condition where a person's urine is sweet and they have a sweet taste throughout their body, which is due to the presence of sugar in their sweat, mucus, urine, and blood. This condition has been recognized since ancient times, and various natural remedies were used to lower blood sugar levels, either directly or in the form of juices. The extracts of Tridax leaves, both water-based and alcohol-based, have been found to significantly reduce blood sugar levels in diabetic rats, as demonstrated by an experiment using alloxan-induced diabetes model [38].

Antioxidant Activity:

Antioxidants act as protectors against oxidation, a chemical reaction that could lead to the creation of free radicals (self-oxidation). This process can degrade organic substances, including living organisms, through self-oxidation. Oxidative stress can hinder the healing of wounds and disrupt normal cell functions due to an unequal balance between the body's antioxidant defenses and the production of reactive oxygen species (ROS). Several research studies have shown the potent antioxidant properties of Tridax procumbens. For instance, a research conducted by Singh et al. (2020) explored the antioxidant capabilities of an extract derived from the leaves of Tridax procumbens and discovered that it increased the activity of antioxidant enzymes and neutralized free radicals in a way that was dependent on the dose, indicating its potential in mitigating oxidative damage during the healing of wounds [39].

Anti-obesity activity:

In a study on an atherogenic diet-induced obesity model, rats treated with Tridax procumbens demonstrated a notable decrease in overall cholesterol, total triglycerides, total protein, and an increase in high-density lipoprotein cholesterol levels. Tridax procumbens was identified as having a significant effect in preventing obesity [40].

Table 2 : Different formulations of Tridax procumbens Linn with their uses

Sr.no.	Type of extract	Formulation	Biological role	Reference
1.	Leaves	Juice	Anemia,skin infection, bleeding	aceres et al., 1998;Taddei and Rosas-Romero,2000.
2.	Leaves	Dried	Diabetes,high blood pressure	Poll, 2005, Giovannini etal., 2016.

LANTANA CAMARA

Lantana camara belonging to Linn. is a flowering ornamental plant belonging to family Verbenaceae. L. camara is also known as Lantana, Wild West Indian plant in Sage, Surinam Tea Plant, Spanish flag and lantana. L. camara is a well-known medicinal traditional medicinal system and recent scientific studies have emphasized the possible use of L. camara in modern medicine [41].Plants represent an important source of chemical products with biological activities [42]. L. camera is a native plant in tropical America, being commonly used for various medicinal purposes, as the whole plant has biological or pharmacological activity, such as antimicrobial, fungicidal, insecticidal, nematicidal, antioxidant, anti-inflammatory and diuretic activity [43].

Fig. 3 Lantana Plant

TAXONOMIC CLASSIFICATON

Family: Verbenaceae

Scientific name: Lantana camara

Kingdom: Plantae

Subkingdom: Tracheobionta

Division: Magnoliopsida

Genus: Lantana

Species: Camara

Order: Lamiales [44].

MEDICINAL PROPERTIES

Antibacterial activity

Ethanolic extracts of Lantana camara leaves and roots were reported for antibacterial activity. Microdilution method is performed for in-vitro antibacterial activity. The extracts exhibited antimicrobial activity against Staphylococcus aureus, Proteus vulgaris, Pseudomonas aeruginosa, Escherichia coli, Vibrio cholarene and two multiresistant strains E. coli and S. aureus.

Antifungal activity:

The extracts from Lantana camara, prepared using hot water and ethanol, were tested for their effectiveness against white and brown fungi that cause damage to wood. Both the hot water and ethanol extracts demonstrated effective activity against these fungi. However, the ethanol extract, even at a very low concentration of 0.01%, was found to possess a significant potential for inhibiting fungal growth [45, 46].

Antiulcerogenic activity:

The protective effect of the methanol extract derived from the leaves of L. camara against ulcers was observed in studies using asprin, ethanol, and cold stress-induced gastric ulcers in rats. Administering the extract to the affected rats (200 and 400 mg/kg body weight) demonstrated a significant protective role against ulcers caused by asprin, ethanol, and cold stress in rats. The extract exhibited a dose-dependent protective effect across all tested models.[47].

Anti-motility effect:

The study examined the ability of Lantana camara leaf extract in a liquid form to prevent diarrhea caused by castor oil in mice. To induce diarrhea, neostigmine was employed as a substance that increases movement. The charcoal meal test was conducted to evaluate the movement of the intestines. The findings supported the conclusion that the extract had an inhibitory effect on movement [48].

Table 3: Different formulations of lantana camara Linn. with their uses

Sr.no	Type of extract	Formultion	Biological role	Reference
1.	Leaves	Gel	Anti-inflammatory	Pawar DP et al. (2013)
2.	Leaves	Herbal hand wash	Washing and cleaning hands to removing soil, dirt, micro-organism	Bhor RJ et al. (2018)
3.	Leaves	Silver naon Particles	a wound healing activity, Anti-inflammatory	Muniraja Lakshmi K et al. (2021)
4.	Leaves	Gel	Topical therapy on acne vulgaris	Dange VN et al. (2020)
5.	Leaves	Cream	Topical application on skin infection, anti Bacterial activity.	Pandit D et al. (2017)

Abbreviations:

MO-Moringa Oleifera
TP-Tridax Procumbens
LC-Lantana Camara
WHO-World Health Organization
PCOD-Polysystic Ovarian Disorder
NF-KB-Nuclear Factor Kappa B
ROS-Reactive Oxygen Species
ALP-Alkaline phosphatase
BUN-Blood urea nitrose
AST-Creatinine,aspartate aminotransferase
ALT-Alanine aminotransferase

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