



INDIAN WEEDS HAVING MEDICINAL PROPERTIES-A REVIEW

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ABSTRACT

In recent years, the growing demand for Indian weeds has led to a new way in the field of plant materials traded within and across the countries. The medicinal properties of these plants have been investigated in the light of recent scientific developments, due to their potent pharmacological activities, less toxicity, and economic viability. Many of patients use medicinal weeds or seek the advice of their physician regarding their use. By the help of this review, we have explored the various pharmacological properties of weeds which will serve mankind and also the common people will be able to explore their knowledge regarding weeds and can also utilize them as their home remedy.

KEYWORDS: Weed, Pharmacological activity, Medicinal Property.

INTRODUCTION

Since the long time the natural products are being used for their curative properties and are the main source of therapeutic drugs. According to WHO, 80% of the total earth's population are anticipated to use some form of herbal medicine in their health care.^[1] There are about 45,000 plant species all over the India. The officially acknowledged plants with their medicinal potential are about 3000 but conventional practitioners use more than 6000 of the plant species. India is the largest producer of medicinal herbs in the world and is suitably known as the botanical garden of the world.^[2,3] In pastoral India, 70% of the total population is dependent on the conventional system of medicine, like the Ayurveda. Plants are reported to have various phytochemicals which are responsible for various biological activities like antioxidant, lipoprotective, antibacterial, anticancer and anti-HIV properties etc.^[4] It is expected that roughly around one- quarter of approved drugs consists of plant extracts or active compounds obtained from plants.^[5] A weed, in general, are referred as plants out of place which usually mean that weeds can grow where we either want some other plant to grow or where we do not want any plant to grow. In cropland and forests, weeds usually fight and compete with other plants and crops for space, light, water, soil moisture, mineral and other nutrients which result in low quality and low-value grain production. The factors like higher transpiration rate, stomata conductance, photosynthesis, and leaf temperature deficiency etc. make the weeds more proficient than crops which lead to crop-weed competition and thus crop production decreases. Thus weeds are considered to be unwanted and undesirable

plants which adversely affect human welfare by interfering with the utilization of lands and water resources. The undesirable and unwanted vegetation also grow in an aquatic system, forest, non-cropped areas like the industrial area, roadsides, railway lines, water ways etc. Thus, all undesired plants become weeds in particular situation. The term weed is useful to any plant which grows insistently, or it is invasive outside its native habitat. Occasionally the weeds are applied depreciative to species outside the plant kingdom, species that can stay alive in undesirable environments and quickly reproduce; and in this very sense, it has been applied to humans. In land and water resources management, weeds are considered to be an important factor but their impact of effectiveness is greatest on agriculture. There is no reliable study on worldwide damages caused by weeds. It is however known that the losses caused by weeds are more from the losses caused by agricultural pests like insects, nematodes, diseases, rodents, etc. Weeds also reduce human efficiency by causing various physical discomforts like allergy and poisoning.^[6] The weeds have such adaptations which permit them to grow in disturbed environments like dunes, shifting soils, alluvial flood plains, river banks/deltas, and areas that are frequently burned. They repeatedly grow and reproduce quickly, and have seeds which persist in the soil for many years. Many weeds move out of their natural geographic ranges and spread around the world in cycle with human migrations and trade.^[7]

Cannabis Sativa

Cannabis sativa is a species belong to family Cannabaceae (hemp) which grows tall with narrowing leaves. The different strains of *Cannabis sativa* mainly originate in the equatorial countries like Colombia, Mexico, Thailand, and South East Asia. The cannabis referred as dried flower tops of female plant of cannabis and flourish in warmer weather.

Common names- Marijuana, hemp, gallow grass, bhang.

Biological name- *Cannabis sativa* L.

Description

The fully grown cannabis plant can reach a height of up to 20 feet. Once the flowering period of cannabis plants begins, and to become fully mature it generally takes 10 to 16 weeks. The pure strains of *Cannabis sativa* require six months for its both growth and flowering. The flowers of the female Cannabis plant are placed in racemes and can produce up to 100 of seeds. In general, the male Cannabis plants shed their pollen and die more than a few weeks prior to seed ripening. Even though genetic factors organize a plant to turn out to be male or female, but also environmental factors with diurnal light cycle modifies sexual expression.^[8] In their vegetative phase, cannabis plant requires more than 12–13 hours of light per day to stay vegetative. When darkness equals at least 12 hours per day then only the flowering occurs. Depending on the strain and environmental conditions, the flowering cycle of Cannabis plants lasts between 9 and 15 weeks.

Common use

For many years, cannabis is been used for various medicinal purposes. It is commonly used as anti-microbial, anti-bacterial, anti-oxidant, analgesic^[9], anti-inflammatory^[10]. In the open study it was seen that the daily cannabis use lowers the plasma HIV viral load^[11]. It is recommended in the effective treatment of epilepsy^[12], and in Parkinson's disease as it reduces pain and improves movement^[13]. Treatment with dronabinol in the majority of pediatric palliative patients showed the promising effect in treating resistant spasticity.^[14] Phytocannabinoids are been recognized as the key substance which improves sleep disorder concerned in analgesia anti-inflammatory effects.^[15] The effect of cannabis and other cannabinoids on PTSD (Posttraumatic stress disorder) is limited.^[16] The finding from in-vivo test provides the sufficient evidence for the therapeutic property of cannabidiol (CBD) for Alzheimer's Disease.^[17] The THC reduces pain intensity and painful swallowing in mouth or esophagus (odynophagia)^[18], used in treating nausea and vomiting in end stage cancer^[19], improves post-traumatic stress disorder (PTSD)^[20,21], and also used in multiple sclerosis.^[22] Cannabis use is also effective in treating patients with Crohn's disease^[23], gastrointestinal disorder^[23], pain and inflammation^[23], reduces

anxiety^[24,25], improves driving ability^[26], and improves sleep quality.^[27] It is also seen in a controlled study that the use of cannabidiol is effective in treating psychosis^[28], schizophrenia^[28] and Alzheimer's disease.^[29] Treating with dronabinol is effective in reducing the symptoms of OCD.^[30]

Scientific classification

Kingdom : Plantae
Order : Rosales
Family : Cannabaceae
Genus : *Cannabis*
Species : *C. sativa*

Side-effects

Among the naïve users, cannabis smoking leads to various physical and psychiatric adverse effects such as increased heart rate, blood pressure, psychomotor retardation, impairment of cognition and memory^[31], euphoria and dizziness and among the decreases pulmonary function, causes chronic obstructive airway disorder and pulmonary infection.^[31] Safety concerns regarding cannabis include the increased risk of memory impairments.^[32] Strokes are probable problems of cannabinoids use.^[33] Even though the literature chains the assumption that adolescent cannabis use is associated with impaired cognition and mental health in adults, it does not convincingly reveal that cannabis use only is enough to ground these deficits in humans.^[34] However, there is still variation within the published articles for an increased risk of cancer due to cannabis smoking in upper respiratory tract.^[31]

Solanum Nigrum

It is an African plant use for its several ailments which are responsible for infant mortality, particularly in feverish convulsions. It is a most common plant grows in different parts of Europe and the African continent and mainly in the region like a waste land, old fields, ditches, edges of woods and cultivated land etc. It is a popular plant because to its toxic content of Solanine, which is a glycoalkaloid found in most parts of the plant, especially in unripened berries.^[35,36]

Common names- Black nightshade, wonder berry, and makoi.

Biological name – *Solanum nigrum* L.

Description

Solanum nigrum is an ordinary herb or short-lived perennial shrub which is found in several wooded areas, as well as disturbed throughout the temperate and tropical habitats of the world.^[37] It is an Annual herb and reaches a height up to 90 cm. Its leaves are dull dark in color, juicy, ovate or lanceolate in shape, and margins are toothless to slight tooth. Flowers of *Solanum nigrum* are small, white in color with a short pedicellate and with five widely spread petals. Fruits are generally small, and get black when ripe.^[35,36] It is well thought-out as a rich

source of one of popular plant poisons, and also proven as a reservoir of various phytochemicals with numerous pharmacological properties.^[35,38] Another strain of *Solanum nigrum* is found in India with berry es that turns red when ripe.^[39]

Common use

The glycoprotein obtained from *Solanum nigrum* may have been shown the anti-cancer property by blocking the anti-apoptotic pathway of NF-kappaB, by activating caspase cascades reaction and by increasing nitric oxide production.^[40] In some places of India like Thar desert, roots of *Solanum nigrum* are used to increase fertility in women.^[41] It is also used in case of Asthma and whooping cough.^[42] *Solnaum nigrum* is commonly used in various aspects of treatment of ringworm, used for dressing of warts, given to kids to stop bed-wetting, acute Streptococcus bacterial infection (erysipelas), Snake bite/sting by a venomous animal, blindness; conjunctivitis; glaucoma; trachoma; cataract, burns and dermal affections, stomachache; stomach ulcer, rabies; wound healing, cough, as a liver tonic.^[43]

Scientific classification

Kingdom : Plantae
Order : Solanales
Family : Solanaceae
Genus : *Solanum*
Species : *S. nigrum*

Side effects

The oral administration of black nightshade is unsafe as it contains a toxic chemical known as solanine which at lower dose, can cause nausea, vomiting, headache, and at higher dose, it can cause severe poisoning which includes irregular heartbeat, trouble in breathing, dizziness, drowsiness, twitching of the arms and legs, muscle cramps, diarrhoea, paralysis, coma, and death. It is unsafe for the pregnant woman to take black nightshade because it might cause birth defects. A decoction of the plant depresses the CNS and reflexes of the spinal cord.^[44] Antiulcerogenic activities of *Solanum nigrum* studied against aspirin-induced gastric ulcers in rats. The powder of aerial parts of *Solanum nigrum* as well as its methanolic extract, decreased the ulcer index significantly. The activity may be due to inhibition of acid and pepsin secretions.^[44]

Datura

Datura stramonium is a wild-growing Solanaceae plant. It is widely distributed and easily available in deserts of the North American, South America, Europe, Asia, and Africa and it is mainly found in the Himalaya region from Kashmir to Sikkim. It mainly contains tropane alkaloids which are highly toxic in nature like atropine, hyoscyamine, and scopolamine.^[45]

Common names- Thorn apple, Datura metel, angel's trumpets and moonflowers.

Biological name - *D.stramonium L.*

Description

Datura stramonium is a coarse shrub of height about 3 to 4 feet. It is an annual plant with alternate leaves, 8 cm in length and 5 cm breadth, with a lobed margin. The roots of *Datura stramonium* are large, white in color, and have advance taproot system. The stem of *Datura stramonium* is greenish in color, hairless, and cylindrical in shape. Flowers are single and erect and arise through the branches.^[45]

Common uses

Datura is been reported for various medicinal properties such as it is effective for treatment of Asthma^[46], Parkinson's disease, and motion sickness. It also has acaricidal, repellent and oviposition deterrent properties, anti-microbial properties^[47], pesticide toxicity, and anti-inflammatory properties and it is also been reported that datura also shows anti-cancer activity.^[48]

Scientific classification

Kingdom : Plantae
Order : Solanales
Family : Solanaceae
Genus : *Datura*
Species : *stramonium*.

Side-effects

Poisonous to human health, anticholinergic delirium, hyperthermia; tachycardia; bizarre, and possibly violent behavior; and severe mydriasis with resultant painful photophobia a pronounced amnesia. It has been found that seeds of datura lead to acute encephalopathy.^[49]

Golden Rod

Solidago is commonly known as goldenrods and belongs to aster family, Asteraceae. It consists of 100 to 120 species of flowering plants of an Asteraceae family. They are mostly found in North America, mainly in Mexico; and some species are found in South America and Eurasia.^[50]

Common names: Solidago, Aaron's Rod, Canadian Goldenrod, Early Goldenrod, European Goldenrod, Solidage, Solidage du Canada, *Solidago canadensis*, *Solidago longifolia*, *Solidago serotina*, and *Solidago virgaurea*.

Biological name- Solidago.

Description

Solidago is perennials growing species with woody rhizomes. The stem is erect with a height 5 cm. The majority of Solidago species are unbranched, but in the upper part of some plant, some Solidago species do exhibit branching. Both leaves and stem vary from hairless to pubescence. The leaf margins are entire and some possibly show trinerved venation. The flower

heads are generally radiate with distinct ray and disc florets, but some are occasionally discoid.

Common uses

Goldenrod is used to reduce pain and inflammation, also used as a diuretic to increase urine flow and to stop muscle spasms. It is used in case of gout, joint pain (rheumatism), arthritis, as well as eczema and other skin conditions. Goldenrod is also used in the treatment of tuberculosis infections, diabetes, asthma^[51], enlargement of the liver, hemorrhoids, internal bleeding, hay fever, asthma, an enlarged prostate, urinary tract infections^[52], and in low back pain.^[53]

Scientific classification

Kingdom : Plantae
Order : Asterales
Family : Asteraceae
Genus : *Solidago*
Species : *S. Canadensis* and *S. longifolia*.

Side effects

There is not sufficient information available on net and journals which prove that whether goldenrod is safe to be taken for medical conditions. There are some special warnings and precautions given on the use of goldenrod in cases like high blood pressure, edema, pregnancy and breast feeding.

Poison Ivy

Toxicodendron radicans, are well known as poison ivy or eastern poison ivy, it is found as poisonous flowering plant in Asian and North American, which is well recognized to cause an itching, irritation, allergic and painful rash in those people who touch it, and it is caused due to presence of urushiol, which is a clear liquid compound found in the plant's sap. Poison ivy is found throughout the North America, as well as the Canadian Maritime provinces, Quebec, Ontario, Manitoba, and on the rocky mountains of U.S, and also in the mountain region of Mexico.^[54]

Common name - *Rhus toxicodendron* and *Rhus radicans*.

Biological name - *Toxicodendron radicans*.

Description

There are abundant species of *Toxicodendron radicans*, which are found growing in any forms which have a woody stems and the deciduous leaves are trifoliate and have three almond-shaped leaflets. The color of leaf ranges from light green to dark green, which turns bright red when it falls. The clusters of leaflets are alternate on the vine, and the plant has no thorns. Vines growing on the trunk of a tree become determinately attached through abundant aerial rootlets. A clear liquid compound urushiol found in poison ivy is not a defensive measure but to a certain extent, it helps the plant to preserve or

retain water. It is recurrently eaten by animals like deer and bears. It grows either vegetatively or sexually. It is dioecious, and the flowering occurs from the month of May to July. A drupe matures by August to November and becomes acquire grayish-white color and for some birds and other animals, these fruits are their favorite winter food.^[55,56]

Common uses

Poison ivy is commonly used to reduce pain and inflammation^[57], also used in musculoskeletal injuries, chronic aches, pains, and arthritic conditions.^[58]

Scientific classification

Kingdom : Plantae
Order : Sapindales
Family : Anacardiaceae
Genus : *Toxicodendron*
Species : *radicans*

Side-effects

The most commonly occurring side-effects due to ingestion of poison ivy are allergic reactions, urushiol-induced contact dermatitis and poison ivy rash.^[59]

Sumac

Sumac is among the 35 species of flowering plants in genus *Rhus* of family Anacardiaceae, and it is found in subtropical and temperate regions throughout the world, mainly in East Asia, Africa and North America.^[60]

Common names- *Rhus*.

Biological name- *Rhus*.

Description

Rhus are shrubs or small trees which can reach a height up to 1–10 m. The leaves of *Rhus* genus are spirally arranged, and while some species have trifoliate and simple leaves. The flowers are in dense panicles or spikes, and 5–30 cm in length. The flowers are very small in size, greenish to creamy white or red in color, with five petals. The fruit forms dense clusters of reddish drupes known as sumac bobs. The dried drupes of some species are ground to produce a tangy crimson spice. Sumac propagate both by seed which is spread by birds and other animals through droppings, and some by new shoots from rhizomes, forming large clonal colonies.^[60]

Common uses

Sumac is commonly used as dye and tanning agent, as a spice and beverage flavoring agent. It is also used as an anti-fungal, anti-microbial^[41], anti-inflammatory agent^[61] and also effective in the treatment of Leucorrhea.^[62] It is also used as a remedy in case of chemotherapy induced nausea and vomiting in Breast cancer.^[63] It is also effective in the treatment of

diarrhea^[64], also used as an anti-cancer agent^[65] and in the treatment of diabetes.^[66]

Scientific classification

Kingdom : Plantae
Order : Sapindales
Family : Anacardiaceae
Genus : *Rhus*
Species : *coriaria*.

Side-effects

Erythema, edema, burning, and rhus dermatitis are the most common side effects caused due to ingestion of sumac.^[67]

CONCLUSION

Weeds, as known, grow on cultivated ground and cause injury to the desired crops. As per the general concept, rice on a paddy-wheat field is a weed, and similarly wheat on a paddy field is a weed. So considering these weeds are noxious to the growth of the desired crop but they are not useless at all, rather they can be beneficial. The only thing matter is the knowledge about them and their proper utilization. After reviewing all these articles and researches, I came to conclude that weeds can also be beneficial plants for human use as they show enormous useful pharmacological activity.

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