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Review Article

Review On Coccinia Grandis Fruits

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ABSTRACT

Many traditional medicines in use are obtained from medicinal plants, minerals and organic matter. During thePast several years, there has been increasing interest among the uses of various medicinal plants from the Traditional system of medicine for the treatment of different ailments. Coccinia grandis has been used in Traditional medicine as a household remedy for various diseases. The whole plant of Coccinia grandis having Pharmacological activities like analgesic, antipyretic, anti-inflammatory, antimicrobial, antiulcer, antidiabetic,Antioxidant, hypoglycemic, hepatoprotective, antimalarial, antidyslipidemic, anticancer, antitussive, mutagenic The present review gives botany, chemical constituents and pharmacological activities of coccinia grandis.

INTRODUCTION

Lants are a boon to the life kind given by God.[1] Herbal drugs are having many advantages over the Synthetic formulations with a longer Pharmacological effect and lesser metabolic toxicity. [2] In India, the use of the different parts of medicinal plants to Cure specific ailments has been in practice from ancient Times. The indigenous systems of medicine, like the Ayurveda, Siddha, and Unani, are in existence for several Centuries. It is estimated that around 70,000 plant species Are being used for various medicinal purposes. India Recognizes more than 2,500 plant species with medicinal Value, Srilanka 1,400 and Nepal around 700. 40% of doctors especially in India and China have advised the Increasing use of indigenous drugs and natural medicines. The World Health Organization (WHO) estimates that About 80 % of the population in the developing countries Rely almost exclusively on traditional medicines for their Health care needs.[3] As per the present scenario, people Mostly requires a type of medicine which does not show Any kind of adverse effects. This could only be made Possible by the traditional plant medicines that are having A complete positive activity towards persons and Complete pharmacological activity towards the diseases. [1] Coccinia grandis belongs to family Cucurbitaceae, commonly known as Ivy gourd or little gourd also known As baby watermelon, gentleman's toes, and locally known As Kundru, is a tropical plant. It is

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native to Bengal and Other parts of India.[4] Coccinia grandis grows abundantly All over India, tropical Africa, Australia, and throughout Other oriental countries. The plant has also been used Tremendously in Ayurvedic and Unani practice in the Indian subcontinent.[5] Every part of the plant is beneficial In medicine and also in various preparations that have Been mentioned in the Indigenous system of medicine Like the anti-inflammatory, analgesic and antipyretic Activity of fruit and leaves have been studied so far and Are found to be noteworthy [5,6].

Taxonomical Classification -

Kingdom: plantae
Division: Magnoliopsida
Class. Magnoliophyta
Order. Violales
Family. Cucurbitaceae
Genus Coccinia Wight & Arn
Species. Coccinia Grandis L Vight.

Vernacular names -

Sanskrit: Tundika
Assam: Kawabhaturi
Bengal: Bimbu
English: Ivy-gourd
Hindi: Kundaru ki bel, Kundru
Punjab: Kanduri
Tamil: Kovai
Urdu: Kunduru
Gujrat: Ghilodi
Oriya: Parwal, Kundru, Tondi
Malayalam: Tendli (Konkani), Ghiloda, Kundri, Kowai, Kovai, Kovakkai

Botany -

Coccinia grandis is a fast-growing perennial vine that Grows several meters long. It can form dense mats on lands that Readily cover shrubs and small trees.

Leaves

Its leaves are arranged alternately along the stems; the Shape of the leaves varies from heart to pentagon shaped. (Up to 10 Cm wide and long). The upper surface of the hairless, Whereas the lower is hairy. There are 3–8 glands on the blade near The leaf stalk. Tendrils are simple. Coccinia grandis is dioecious.

Flower

Flowers are large, white and star-shaped. The calyx has Five subulate, recurved lobes, each 2–5 mm long on the Hypanthium; peduncle 1–5 cm long. The corolla is white, Campanulate, 3–4.5 cm long, deeply divided into five ovate lobes. Each flower has three stamens. The ovary of Coccinia grandis Flower is inferior. Staminate flowers solitary, rarely in axillary clusters of 2-3, Pedicels 15-50 mm long, lobes of calyx is subulate, recurved, 2-5 Mm long, corolla lobes ovate, white, long about 15-20 mm; Pistillate flowers solitary on stalks10-30 mm long, hypanthium 10-15 mm long (7]

Fruit

The fruit is red, ovoid to elliptical, 25–60 mm long, 15–35 mm in diameter, glabrous, hairless on stalks.

Seeds

6-7 mm long, tan-colored, margins thickened.

Root

The roots and stems are succulent, tuberous and most Likely facilitate the plant to survive prolonged drought. Desperations of Coccinia grandis are by the humans. Also spread By birds and other animals, pigs, moved unintentionally on Equipment or on wood and germinate where they land. Hybridization and clonal selection are one of the viable methods to Develop improved Clone in ivy gour [8,9].

Chemical composition -

Aerial part: - Heptacosane, Cephalandrol, β - sitosterol, Alkaloids Cephalandrins A and B.

Fruits: - β- Amyrin Acetate, Lupeol, Cucurbitacin B, Taraxerone, Taraxerol, β-carotene, Lycopene, Cryptoxanthin, Xyloglucan, Carotenoids, β-sitosterol, Stigma-7-en-3one.

Root: - Resin, Alkaloids, Starch, Fatty Acids, Carbonic Acid, Triterpenoid, Saponin Coccinoside, Flavonoid Glycoside, Lupeol, β-amyrin, β- sitosterol, Taraxerol.

Pharmacological activity -

Anti-Ulcer Activity

Thirupathi et al., carried out a study on the Antiulcer Activity of ethanolic, aqueous and total aqueous extracts Of coccinia grandis leaf in pyloric ligature-induced ulcers In albino rats. The ulcer was induced by pylorus ligature. Rats were divided into 8 groups with six each. Drugs were Administered in two different dose levels (200mg/Kgbwt, And 400mg/ Kgbwt). All the three extracts of Coccinia Grandis, dose-dependently reduced the total acidity, ulcer Index, and increased pH of gastric juice, while the ethanol Extract showed a remarkable result that is (78.57%), Which shows a highly significant ulcer curative potential And decreased ulcer formation also. Preliminary Phytochemical analysis revealed the presence of different Phytoconstituents such as alkaloids, carbohydrates, Glycosides, phytosterol, saponins, volatile oil, tannins etc Which may impart their antiulcer activity by acting as antisecretory and cytoprotective agents. The present result Suggests that both anti-secretory and cytoprotective Mechanisms of different extracts of Coccinia grandis Exerted a protective effect.[10] Hansa Gupta et al., conducted a study on the Pharmacodynamic Interaction of Coccinia Indica leaf Extract with Omeprazole in experimentally induced ulcers In rats. Gastric ulcers in Sprague Dawley rats were Induced by Indomethacin (25mg/kg), Pylorus ligation Model and Stress-induced Ulcer. Various parameters like Acidity, ulcer index, pepsin and mucin content, Antioxidant parameters like superoxide dismutase (SOD) And Catalase were evaluated. Omeprazole (2mg/kg) was Used as standard. Coccinia indica was administered at two Dose levels of 200mg/kg and 400mg/kg. Oral Administration of a combination of Omeprazole and Coccinia at 200 and 400mg/kg produced a marked Decrease in acidity, ulcer index and severity of ulceration In the pylorus ligation model as well as considerable Protection against stress and indomethacin-induced Ulcerations compared to control. It also showed a Particular decrease in pepsin content and a significant Increase in mucin content as compared to the control in Pylorus ligation model. In Indomethacin-induced model, Combination therapy at high dose showed a notable Increase in antioxidant parameters like SOD and catalase Compared to the control. The anti-ulcer effects of the Combination of Omeprazole and Coccinia at

both dose Levels were markedly higher than Omeprazole alone[11].

Anti-bacterial activity

Umbreen Farrukh et al., investigated the In vitro Antibacterial activity of leaves and stem extracts of Coccinea grandis against gram-positive (Bacillus cereus. Corynebacterium diphtheriae, Staphylococcus aureus and Streptococcus pyogene and gram-negative (Escherichia Coli, Klebsiella pneumoniae, Proteus mirabilis, Pseudomonas aeruginosa, Salmonella typhi, and Shigella Boydii). The study was carried out using the well-diffusion Technique. Ampicillin and Amoxicillin were used as Standard and nutrient agar was employed as the medium. The zone of inhibition of bacterial growth was measured And is compared with the control. Water extract of leaves And ethanol extract of the stem showed high activity Against Shigella boydii and Pseudomonas aeruginosa Equivalent to the reference drugs [12].

Hepatoprotective Activity

Vadivu et al., evaluated the hepatoprotective activity of Alcoholic extract of the fruits of Coccinia grandis using Carbon tetrachloride (CCl4)- induced hepatotoxicity in Rats. Male Wistar strain albino rats weighing 150 – 200 g And albino mice weighing 22 –25 g were used. 24 rats Were taken for the study, divided into 4 groups of 6 Animals. The levels of serum glutamate oxaloacetate Transaminase (SGOT), serum glutamate pyruvate Transaminase (SGPT), alkaline phosphatase (ALP), total Protein, total and direct bilirubin were evaluated in Experimental rats (with or without CCl4-induced Hepatotoxicity) following administration of an alcoholic Extract of the fruits of C. Grandis using standard Procedures. The potency of the extract was compared With the standard drug silymarin at a dose of 100 mg/kg p.o. Histopathology of the liver tissues treated with the extract was also studied. At a dose level of 250 mg/kg, the alcoholic extract significantly decreased the activities of serum enzymes (SGOT, SGPT, and ALP) and bilirubin which were comparable with that of silymarin.[13] Anusha Bhaskar et al., studied on the Protective effect of Coccinia grandis fruit extract against (Diethyl nitrosamine) DEN-induced Hepatotoxicity in Wistar Albino Rats. They Were divided into 5 groups consisting of 6 rats in each Group. An elevated level of the liver enzymes aspartate Aminotransferase (AST), alanine aminotransferase (ALT), Alkaline phosphatase (ALP) and Alcohol dehydrogenases (ADH) were observed. Liver oxidative stress was Confirmed by the elevation of lipid peroxidation that was Measured as malondialdehyde (MDA), and a decrease in The enzymic and non-enzymic antioxidant activities. Oral Administration of the methanolic fruit extract of Coccinia Grandis for 30 days to DEN-treated rats significantly Improved the antioxidant levels, reduced the oxidative Stress and also caused a reversal of the liver parameters. The results obtained were comparable with that of the Standard drug silymarin.[14]

Anti-inflammatory activity

Deshpande et al., carried out a study on the Anti-inflammatory activity of the leaf and stem aqueous Extracts of coccinia grandis. Sprague Dawley rats (120-150 g) and Swiss albino mice (40-50 g) were used for the Study. The effects of extracts and indomethacin on the Acute phase of inflammation were investigated. Doses of Extracts (50,100 and 200 mg/kg) were administered orally Once a day for a period of about 2 days. After one hour The last dose was administered; 0.2 ml of formaldehyde (1%, w/v) injected into the rat hind paw. Before Formaldehyde injection, the paw volume for each rat was Measured separately by means of Plethysmometer. Edema caused by formaldehyde was measured at 3, 6 and 24 hr of the first day, and also measured once per day on The following days until inflammation disappeared. The Anti-inflammatory potency of

the extracts was Determined by comparing it with a group in which a 10 Mg/kg dose of indomethacin has been administered Orally. Aqueous extract of the leaves showed a more Significant percentage inhibition of paw edema than the Aqueous extract of stem and standard, used as Indomethacin. So Coccinia grandis can be thought to Possess antiproliferative and antiarthritic activities similar To indomethacin.[15]

Antioxidant activity

evaluated Ethanol extract of root of Coccinia grandis contain flavonoids which are responsible for Antioxidant activity. Methanol extracts of the fruit of Coccinia Grandis posses the potent antioxidant activity [16]. The methanol Extract of Coccinia grandis contains glycoside and flavonoid. The Antioxidant activity of Coccinia grandis is due to the reducing Power ability, hydrogen peroxide scavenging potential [17]. Mongkolsilp et al., 2004) Ethanol and methanol Extract shows the antioxidant activity [18] Coccinia grandis stem extract containing solvent petroleum, Chloroform and ethyl acetate shows antioxidant activity. Ethyl Acetate possess potent antioxidant activity than petroleum (Deshpande et al., 2011) Coccinia grandis methanol extract and Leaf powder contain the antioxidant principle [19]

CONCLUSION -

In view of the above discussion, it can be concluded that Coccinia grandis is a versatile medicinal plant and its Multiple benefits is a true miracle of nature. Numerous Studies have been conducted on different parts of the Plant and thus being proven that every part of this plant Is valuable as a medicine. This review gives a new Dimension to researchers to find other valuable Properties of this wonderful plant. Hence an extensive Investigation of the plant and its phytoconstituents on their pharmacodynamics, kinetics and proper Standardization and clinical trials is needed to exploit its Toxicity profile and therapeutic utility which may bring About the plant as a suitable candidate for further studies Towards isolation of efficacious therapeutic agents. This Plant has been developed as a drug by pharmaceutical industry.

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