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Research article

Evaluation of antifungal activity of *Lageneria Siceraria* seeds for ringworm infection

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ABSTRACT

Lageneria siceraria commonly known as Bottle gourd Syn. Doodhi , Synonyms Lauki (Hindi) Kadoo (Marathi) which is official in Ayurvedic Pharmacopoeia Preliminary phytochemical screening of the crude extracts revealed the presence of carbohydrates , Proteins etc and secondary metabolites like saponins , glycosides , alkaloids etc .Thus, the study is carried out in order to determine the antifungal (ringworm) activity of the seeds of the plant. The seeds of the plant are subjected to extraction with water and ethanol. The antifungal activity was carried out using agar well diffusion method. All the plant extracts were compared with standard Isoconazole (1% w/w) as positive control and distilled water, ethanol used as negative control. Accordingly ethanolic extract of the roots was found to more effective against Trichophyton rubrum as compared to aqueous extract.

Keywords: *Lageneria siceraria,* Alkaloids, Extraction.

INTRODUCTION

Nature always stands as a golden mark to exemplify the outstanding phenomena of symbiosis. Natural products from plant, animal and minerals have been the basis of the treatment of human disease. Today estimate that about 80 % of people in developing countries still relays on traditional medicine based largely on species of plants and animals for their primary health care. The various indigenous systems such as Siddha, Ayurveda, Unani and Allopathic use several plant species to treat different ailments. The use of herbal medicine becoming popular due to toxicity and side effects of allopathic medicines.India has one of the richest plants medical traditions in the world. There are estimated to be around 25,000 effective plant-based formulations, used in folk medicine and known to rural communities in India. There are over 1.5 million practitioners of traditional medicinal system using medicinal plants in preventive, promotional and curative applications. It is estimated that there are over 7800 medicinal drug-manufacturing units in India, which consume about 2000 tones of herbs annually. Exploration of the chemical constituents of the plants and pharmacological screening may provide us the basis for developing the leads for development of novel agents. In addition, herbs have provided us some of the very important lifesaving drugs used in the armamentarium of beta damaging to the human body than synthetic drugs. Therefore laboratories around the world are engaged in screening of plants for biological activities with therapeutics potential. The market for Ayurveda medicines is estimated to be expanding at 20% annually. Sales of medicinal plants have grown by nearly 25% in India in past ten years (1987-96), the highest rate of growth in the world. But the per capita expenditure in India on medicines per annum is amongst the lowest in the world. In other developing countries too, plants are the main source of medicine. Two of the largest users of medicinal plants are China and India. Traditional Chinese Medicine uses over 5000 plant species; India uses about 7000.According to Export Import Bank, the international market for medicinal plant related trade having a growth rate of 7% per annum. China's share in world herbal market is US$ 6 billion while India's share is only US$1 billion. The annual export of medicinal plants from India is valued at Rs. 1200 million. All the major herbal-based pharmaceutical companies are showing a constant growth of about 15 per cent. Traditional medicine has served as a source of alternative medicine, new pharmaceuticals,

and healthcare products. Medicinal plants are important for pharmacological research and drug development, not only when plant constituents are used directly as therapeutic agents, but also as starting materials for the synthesis of drugs or as models for pharmacologically active compounds. The derivatives of medicinal plants are non- narcotic with little or no side effects [1].

Lagenaria siceraria

Cucurbitaceae family is commonly mentioned as the gourd, melon or, pumpkin family is medium sized generally a climbing plants family composing 118 genera and 825 species having wide distribution. Among all plants of the cucurbitaceae family, Lagenaria species have important contribution for the overall popularity. The bottle gourd belongs to genus Lagenaria that is derived from the word lagena , meaning bottle .In the older literature it is offen referred to as Lageneria vulgaris (Common) , or Lageneria leucantha (White flowered gourd) but it is now generally agreed that the correct name is Lageneria siceraria . Lageneria siceraria commonly known as Bottle gourd Syn. Doodhi , Syn. Lauki (Hindi) ,Kadoo (Marathi) which is official in Ayurvedic Pharmacopoeia [2].

Taxonomical Classification

Kingdom: Plantae Division: Magnoliophyta Class: Magnoliopsida Order: Cucurbitales Family: Cucurbitaceae Genus: Lagenaria Species: L. siceraria

Part used: Fruit, root, leaves and seed oil Lagenaria is a larg pubescent, climbing or tailing herb with stout 5- angled stems and bifid tendrils, found throughout India, either wild or cultivated. Leaves are long, petioled, 3-5 lobed, 7-10* 10-12 cm, hirsute; Fruits are large, up to 1.8m. Long, fruit bottle shaped with a hard shell- like epicarp when ripe; numerous seeds, long, white, smooth, 1.6- 2.0 cm long, horizontally compressed with marginal groove 2. Flowers are white, solitary, axillary unisexual. Male flowers posses botanical description of calyx and campanulate, tube narrow, lobes 5, linear; petals 5, free, white; stamens 3, Female flowers posses botanical description of calyx and carola as in male flowers.overy densely villous, style thick , stigmas 3, bilobed 2 [3].

Chemical Composition

Analysis of edible portion of the fruit gave following values: moisture, 96.3; protein, 0.2; fat (ether extract), 0.1; carbohydrates 2.9; mineral matter 0.5; calcium 0.02; and phosphorus < 0.01%. Other mineral elements reported to be present are: iron (0.7 mg/100g.), sodium (11.0 mg./100g)., potassium (86.0mg/100g.) and iodine (4.5 mcg/ kg.). Glucose and fructose have been detected. The amino acid composition of the fruit is as follows: leucines 0.8;phenylalanine 0.9; valine 0.3; tyrosine 0.4; alanine 0.5; threonine 0.2; glutamic acid, 0.3; serine, 0.6; aspartic acid 1.9; cystine 0.6; cysteine 0.3; arginine 0.4; and proline 0.3mg/g [4].

MATERIAL AND METHOD

Collection of plant material and authentication

The fruit was obtained from the vegetable market of Durg. They were authenticated by Dr. Mrs. Ranjana Shrivastav, Professor (Botany) and HOD, Govt. V.Y.T Autonomous P.G. College, Durg (C.G) Preparation of sample

The seed of Lageneria siceraria were collected and dried in the shade and then pulverized in a grinder. The powdered drug was utilized for extraction. Material was passed through 120 meshes to remove fine powders and coarse powder was used for extraction. Extraction was done by ethanol and water. Isoconazole (1% w/w) is used as standard drug [5].

Extraction method

Solvents used for extraction were of Lab. Grade. Extraction was carried out using Soxlet apparatus. It was originally designed for the extraction of a lipid from a solid material.

However, a Soxhlet extractor is not limited to the extraction of lipids. It is continuous Heating Extraction method .The solvent is heated to reflux. The solvent vapour travels up distillation arm and floods into the chamber housing the thimble of solid. The condenser ensures that any solvent vapour cools, and drips back down into the chamber [6].

Phytochemical Screening

Phytochemical screening of the extract was carried outto identify primary metabolites like carbohydrates (Molisch reagent test) , Proteins (Biuret test) and of secondary metabolites such as alkaloids(Mayer's test), flavonoids , terpenoids (Salkowski test), tannins (Ferric chloride test), saponins (Frothing test), cardiac glycosides (Keller- Killiani test) and anthrax-quinones(Borntrager's test) [7].

Evaluation of Antifungal activity

The in vitro antifungal activity of the extract of Lageneria siceraria was carried out by Agar well diffusion method. All the extracts were separately dissolved in ethanol and water to get 15mg/ml and 20mg/ml solutions. Isoconazole (1mg/ml) were used as standard antifungal agent respectively. Antifungal activity was carried out against culture of Trichophyton rubrum, using Sabouraud dextrose agar medium.12 mm hole can be made in Petridis. The microorganism inoculated plates were maintained at room temperature for 2 hours to allow diffusion of the solution into the medium. The petridishes used for antifungal activity were incubated 25°± 1 for 7 days. The diameters of zone of inhibition surrounding each of the wells were recorded [8].

RESULT

The antifungal results reveal that graph no –1 the activity of the crude extracts of plant is encouraging. Antifungal activity was done by using Agar well diffusion method; Isoconazole were used as standard for comparing results for antifungal activity. The zone of inhibition of ethenolic extract is 19 mm and aqueous extract has 17 mm taking 10mg/ml of extract. The zone of inhibition of standard drug Isoconazole has

21 mm. Ethenolic extract shows good antifungal activity. Ethenolic extract shows good antifungal activity against Trichophyton rubrum as compare with aqueous extract [9].

DISCUSSION

Ethanolic extract shows good antifungal activity against Trichophyton rubrum as compare with aqueous extract. The zone of inhibition of ethanolic extract (19mm) shows more than aqueous extract (17 mm) while taken 20 mg/ml extract. Phyto constituents present in ethanolic extract are steroids, saponins, glycosides, and aqueous extract contains saponins, glycosides. The active principle responsible for antifungal activity is due to the presence of saponins, glycosides and steroids in the extracts. The zone of inhibition of standard drug Isoconazole has 21 mm (1 mg/ml). On the basis of zone of inhibition results, ethanolic extract shows better antifungal activity against Trichophyton rubrum as compare with aqueous extract [10].

CONCLUSION

From the above results, it is concluded that Lageneria siceraria used traditionally and in backward areas to treat ringworm infection, showed significant antifungal activity. The experimental evidence obtained in the laboratory model could provide a rationale for the traditional use of this plant as antifungal. The activity was almost reach about to the standard. The plant may be further explored for phytochemical profile to recognize the active constituent accountable for antifungal activity. Thus the present experiments scientifically proved its traditional claim for the beneficial effect in the ringworm infection from aqueous extract and better from ethanolic root extract of Lageneria siceraria.

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