Antifungal Soap Production from Menstruum of Medicinal Plants

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Abstract:

The fungal infection of the skin can be easily prevented by employing the applications of herbal soaps produced from the tropical medicinal plants. The purpose of this research work is to prepare the antifungal soap using the leaf extract of medicinal plant, Cassia auriculate herbal cosmetics have importance due to their lack of adverse effects and high antimicrobial activity and also has has facial applications to enhance skin glow. The leaves are extracted in three solvents namely chloroform, ethanol, methanol, and aqueous as control by hot continuous maceration process. The main objective of this study is to access the antifungal activity, Phytochemical activity and finally production of soap. The antifungal activity at different concentration (25, 50, 75, 100)mg/ml. of C. auriculata were tested on dermatophytic fungal strains such as *C. albicans,C. parapsilosis*, *A.niger* using agar well diffusion method and compared with standard drug (Ketoconazole).The different zone of inhibition is depicted in table no. 2, phytochemical constituents in table no 1.and physicochemical properties of soap in table no3.

Keywords: *C. ariculata* , Fungal strains, Antifungal activity , Phytochemical activity, Antifungal soap.

Introduction

Plants are an important source of medicines and play a key role in world health.[4]. Cassia auriculata. is one such herb, profoundly used in Ayurvedic medicine, known locally as 'avaram' and belonging to the family Caesalpiniaceae. C. auriculata is a shrub with smooth brown bark and is a common plant in Asia, India and Sri Lanka[7]. Different medicinal properties have been attributed to this plant in the traditional system of Indian medicine. Various anthraquinones have been isolated from the seeds of Cassia species. Sennosides, which are well known for their medicinal importance, have been detected in the leaves of this plant.[8].*Cassia* species are already reported in the ancient ayurvedic literatures and literature survey indicated its use against various skin diseases such as ringworm, eczema, and scabies. Because of the high incidence of skin diseases, especially among the weaker section of the Indian population, it was felt worthwhile undertaking research on this plant.[6]. There is a variety of phytochemicals present in the plants having unique therapeutic potential. Alkaloids, flavonoids, saponins, and tannins are some of the important phytochemicals. In this research, efforts have been made to comprehensively compile information related to these phytochemicals in various Cassia species using different solvents.[3] . It is expected that plant extract showing target sites other than the dose used by antibiotics will be active against drug resistant microbial pathogens and will provide novel or lead compounds that may be employed in controlling some infections globally.[7]. Recently Natural products of higher plants, may give a new source of antimicrobial agents with possibly novel mechanisms of action.[2]. The cost of drugs in use today is too expensive for the majority of the population in the third world countries and therefore the search for some cheap sources of antimicrobial substances in nature become inevitable. Plants are good sources for new safe, biodegradable and renewable drugs. The use of plants as therapeutic agents in addition to being used as food is age long.Though the therapeutic uses of plants by the primitive people lack scientific explanations. there is a great awareness in the use and significance of these medicinal floras by the World Health Organization in several resource- poor nations [1]. The hygiene product called “soap” is a bar soap, usually perfumed, intended for body cleaning, and which may contain adjuvants, humectants, essences, and flavorings, among other additives. They are composed of alkaline salts of fatty acids resulting from a saponification reaction between an alkaline product with natural fatty acids and glycerides. The antifungal soaps, disinfectants or antibacterial stand out in the cosmetic and personal hygiene

market as the level of consumer demand for products with differentiated quality and better efficacy grows. These products generally have the cleaning, perfuming, and correction of body odor properties common to conventional soaps, and they have the purpose of preventing fungal proliferation and infections related to pathogenic microorganisms.[5].

Materials and Methods

Collection of Plant Material

The leaves of C. auriculata (Caesalpiniaceae) were collected from local areas and biotechnological departments.

Preparation of Solvent extract: The fresh leaves of C. auriculata were cleaned with tap water, air dried at room temperature 8 days and the dried sample ground into fine powder by using household grinder. The powdered material (100gm)was exctracted with three differerent solvents namely chloroform, ethanol.methanol (each 200ml)for 24hrs. by using hot continuos maceration process.After the extract was filtered with Whatman filter paper no. 1 and the filter was evaporated in rotary evaporator at 55˚c.The extract obtained was used for further steps of procedures.

Phytochemical Analysis:

Alkaloids:

Hager's test:To 2mg of the extract taken in a test tube, few drops of Hager's reagent were added. Formation of yellow precipitate confirmed the presence alkaloids.

Flavonoids:

Shinod's test:

In attest tube containing 0.5ml of the extract,10 drops ofdiluted hydrochloric acid followed by a small piece of magnesium were added.Formation of pink,reddish or brown colour indicate the presence of flavonoids.

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❖ **Saponins:**

In a test tube containing about 5ml of extract,a drop of sodium bicarbonate solution was added.The test tube was shakened vigorously and left for 3 min.Formation of honeycomb like froth indicates the presence of saponins.

❖ **Tannins:**

To 1-2ml of of extract few drops of 5%w/w ferric chloride were added formation of green color.

Antifungal Activity:

The antifungal screening was done by agar well diffusion method for plant extract (chloroform, ethanol,methhanol and aqueous) of (*C.auriculata Linn* .against the three dermatophytes namely (*Candida albicans, Candida parapsilosis, Aspergillus niger*).Plant extracts were dissolved in suitable solvents (For every 1mg of extract add 1 ml of respective solvents).Potato dextrose Agar (PDA)was used for the Agar well diffusion method. The culture medium about 0.1 ml was inoculated with the different fungal strains into separate petri plates in sterile condition..A total 8mm diameter wells were punched into the agar and the extracts (25,50,75,100 mg/ml) of sample was added into the respective wells through sterile tips. Standard antibiotic (ketaconazole 25,50,75,100 mg/ml)was used as the positive control and fungal plates were incubated at 30°c for 72 hrs. in the incubator.The diameters of zone of inhibition was measured in cm.(Fig no. 1,2,3).

Preparation of an Antifungal Soap:

For the preparation of basic soap 65 ml of coconut oil is taken in beaker to this 50 ml of 20% NaOH sotution is added and heated until the mixture became whitish paste. Cool it and add 15 gm common salt stirred until suspension gets precipitated out as solid .The solidified base is cut into samller pieces and melted on water bath, 1 gm of chloroform extract of *C. auriculata* was added to 30 gm of soap base , for odour few drops of fragrance is added.The mixture is poured into moulds allowed to solodify for 12 hrs. Evaluation of physicochemical properties of soap is depicted in table no.3.Soap base and antifungal soap after addition of leaves extract is shown in fig.4 and 5. resp.

Results and discussion:

Phytochemial Analysis: When compared each other alkalin test and tannins test were negative for choloform and ethanol respectively.Table no.1 depicts all the solvent extracts showed best results so all of them were proceeded for antifungal test.

Antifungal Activity: The anti-fungal activity of chloroform extract of *C.auriculata* against *C.albicans, and A. niger* by using disc diffusion method revealed significant effect against the above two organisms with the net inhibition zone of 20 and 18 mm, respectively at 100µg/ml concentration, which is almost comparable with standard control, ketokonazole. The detailed zone of inhibitions in mm is depicted in table no. 2.and fig no. 1,2,3,4 shows the anifungal activity of four different solvent extracts against three fungal strains.

Tableno.1. Phytochemical activity (C. auriculata)

Types of solvents	Alkaloid	Saponin	Flavonoid	Tannin
Chloroform	-ve	+ve	+ve	+ve
Methanol	+ve	+ve	+ve	-ve
Ethanol	+ve	+ve	+ve	+ve
D.W	+ve	+ve	+ve	+ve

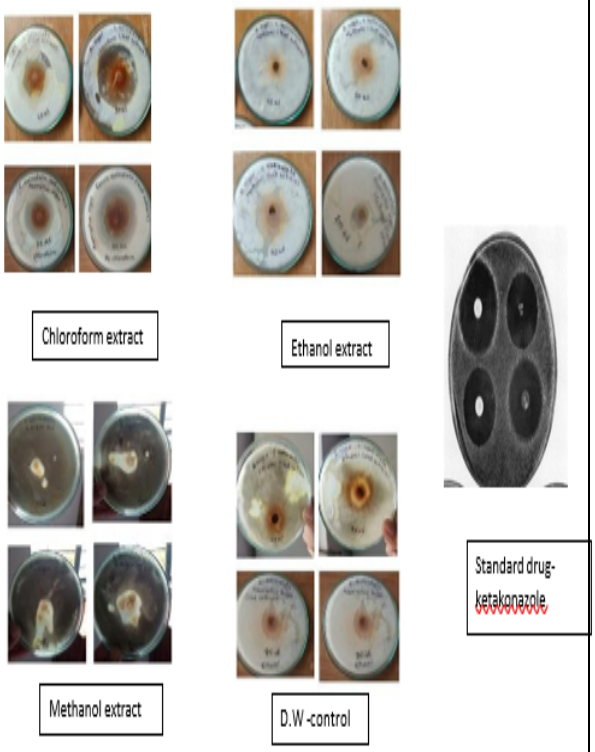

Fig no.1 Zone of inhibition shown by three solvents at 25,50,75,100 mg/ml against *A. niger* strain compared with control and standard drug.

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