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Phytochemical Screening and anti-microbial activity of *Momordica charantia Linn*

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Abstract

Momordica charantia Linn. (Karela) commonly known as bitter melon or bitter guard is tropical and subtropical climber of family cucurbitaceae. Traditionally it possesses many uses as Antidiabetic, Carminative, Anthelmintic Antimalarial and Antimicrobial, Antiviral, Anti-carcinogenous, Contraceptives, Immmunostimulant, and Laxative, Antioxidant and Insecticidal. It indicates in skin treatment (eczema, acne, mycoses, scabies and hexoroid). In the present study we carried out phytochemical screening to identify phytoconstituents present in plant. Along with its antimicrobial activity against *E. Coli* by Cup plate method. Phytochemical screening reveals that presents of various phytoconstituents such as Alkaloids, Saponin, Cardiac Glycosides, Tannins, Protein and Flavonoids. *Momordica charantia* shows significant antimicrobial activity against *E.Coli.*

Keywords: *Momordica charantia*, karalla, *E.coli*, Antimicrobial Activity.

1. Introduction

Momordica charantia commonly called bitter melon; belongs to family Cucurbitaceous and grown in tropical areas. Include part of Amazon, East Africa, Asia, Caribbean, and is cultivated throughout South America as a food and medicine it's a slender climbing annual vine with long stalked leaves and yellow, solitary male and female flower borne in the leaf axils. The fruits look like a warty guard usually ablong and resembling a small cucumber. All part of plant including fruit taste very bitter. [1]

The Cucurbitaceae family composed by 90genera and about 700 species mainly inotropic region (Asia, Amazonia, oriental Africa and Caribe) and subtropical. The species can be found in temperate region too many species are cultivated because their comestible property as pumpkin (Cucurbita) melon (curcumismelo). [1]

The species is a liana with flower and yellow fruit that present red seed. When are ripe it possesses many uses as Antidiabetic, Carminative, Anthelmintic Antimalarial and Antimicrobial, Antiviral, Anti-carcinogenous, Contraceptives, Immmunostimulant, and Laxative, Antioxidant and Insecticidal. It indicates in skin treatment (eczema, acne, mycoses, scabies, and hexoroid). [2-10,13]

Figure 1: ***Momordica Charantia*** **Linn**

2. Experimental Work

2.1 Material

Agar, Peptone, Beef Extract Powder, Sodium Chloride, Distilled Water, pH Paper, Methanol, Chloroform, Conc. H_2SO_4, Glacial Acetic Acid, F_eCl_3, Conc. HCl, α-napthol, Benedict reagent, Dragendorff's reagent.

2.2 Collection of Plant Materials

The leaves of *Momordica Charantia Linn*. were collected in polythene bags in the month of January, 2018

from Sakoli, Maharashtra state, and were plant identified and authenticate by Department of Botany, M.B. Patel Collage Sakoli, The freshly collected leaves of were cleaned and dried under the shade dry at normal room temperature. After drying the plant material was ground using pestle and mortar into smaller particles without adding any solvent. It was stored in well closed container free from environmental climate changes till usage.

2.3 Preparation of Extracts

2.3.1 Methanolic extraction

Figure 3: Soxhlet extraction

We taken a 250g of leaves powder and 500 ml of methanol keep in thimble which is loaded into Soxhlet vessel having flask containing extractor solvent. Solvent vapors move up to the column and floods into the chamber housing the thimble of solid. Some parts of non-volatile compound dissolve in solvent. Process repeat many times until we get desire concentrated compound in flask process has been done at boiling temperature of solvent. [11]

2.3.2 Hydro-alcoholic extraction

2.3.2.1 Simple maceration process

20 gm of dried powdered sample was soaked in 250 ml of distilled water and 250 ml of methanol contained in a 500 ml flask. The flask was covered with cotton plug and then wrapped with aluminium foil and shaken vigorously at 7 days at room temperature, daily shaken the flask, after 7 days, the crude extract was shaken vigorously and filter using a muslin cloth and then Whatman no. 1 filter paper, the filter sample was evaporated to dryness using thermal evaporator water bath at 60^0C. The concentrated extract was stored in airtight container for testing the antibacterial activity. [11]

2.5 Phytochemical Analysis

Test for the screening and identification of chemical bioactive chemical constituent in the Karela were carried out with the extract using the standard procedure as described.

2.6 Antibacterial activity

2.6.1 Micro-organism

The test organism includes Gram negative bacteria. (*Escherichia coli*) They were previously isolated and stored in the laboratory of microbiology of B. K. C. P. Sakoli.

2.6.2 Culture Growth

Optimum growth of *E.coli* occurs at 37^0C (98.6%) but some laboratory strain can multiply at temperature up to 120^0C. *E.Coli* grows in variety of defined laboratory media, such as lysogenic broth, or any medium that contains glucose, ammonium phosphate, dibasic, magnesium sulphate, potassium phosphate and water. Growth can drive by aerobic and anaerobic respiration, using a large pair of redox pairs, including the oxidation of pyruvic acid, formic acid, hydrogen and amino acids and the reduction of substrate such as oxygen, nitrates, fumarate, dimethyl sulphoxide, and trimethylamine N-oxide. *E. coli* classified as a facultative anaerobe. Its uses oxygen when it is present and available.

It can, however, continue to growth in the absence of oxygen using fermentation or anaerobic respiration. The ability to continue growing in the absence of oxygen is an advantage to bacteria because their survival is increase in environment where water predominates.

2.6.2 Cup plate method

Antimicrobial susceptibility testing was done using the well diffusion method according to the standard of the national committee for clinical laboratory standard the plant extract was tested on Muller Hinton 2 plate to detect the presence of antimicrobial activity, prior to streaking the plate with bacteria, 5 mm diameters well were punched into the medium using a sterile borer. All plate was inoculated with the test bacterium which has been previously adjusted to the 0.5 McFarland solution, a sterile cotton swab was dipped into the suspension, rotated several times, and pressed firmly on inside the wall of the tube above the fluid level removing excess Inoculum.

The surface of the agar plate was streaked over the entire sterile agar surface rotating the plate to ensure an even distribution of Inoculum with final swab around rim. The plate allowed 3 to 5 min to the dry the excess moisture 50 µl aliquots of each test extract was dispense into each well after the inoculation of plate with bacteria the well was also arranged in a triangle formation 2 inches apart; with a total of three plate used for each extract for selecting bacteria. For each bacterial strain, control was maintained where pure solvents were used instead of extract. The plate is sealed with para-film, labelled and placed in an incubator set to 37^0C. After 24 hours of incubation, each plate was examined for inhibition zones. A ruler was used to measure the inhibition zone in millimeters. Every experiment was

carried out in parallel, and the result represented the average of at least three independent experiments. [14]

3. Observation and result

3.1 Phytochemical test

Table 1: Result of Phytochemical test

Chemical test	Methanolic Extract
Alkaloids	
Dragendorff'stest	+++
Saponin	
Foam test	+++
Sterol test	++
Carbohydrates	
Molisch test	-
Benedict test	++
Cardiac Glycosides	
Legal's test	+++
Killer killani test	-
Tannins	
Lead acetate solution	+++
Ferric chloride test	++
Protein	
Xanthoproteic test	+
Biuret test	++
Flavonoids	
Ammonia test	+++
Magnesium ribbon test	++

Note: -Very strong (+++), strong (++), Presence (+), Absence (-)

3.2 Cup plate method

Table 3: Hydro-alcoholic extract

Plant Extract	Zone of inhibition *E.Coli*
Hydro-alcoholic Extract	15mm
Amikacin	17mm

4. Conclusion

It is clearly seen that *Momordica charantia* has antimicrobial properties. The hydro alcoholic extract of *Momordica Charantia* can be used as the active constituents of an Antimicrobial formulation, anti-bacterial. Future work such as isolation and purification of bioactive constituents should target the ethanol extract of *Momordica charantia*.

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