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Innovation The Research Concept

Antimicrobial Activity of *Pipernigrum Linn* in Different Antibiotics

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Abstract

The main objective of the study is to screen the antimicrobial activity of *piper nigrum* Linn against staphylococcus aureus, salmonella typhi, E.coli, and pseudomonas aoruginosa During present study the antimicrobial activity of black pepper *(Piper nigrum* Linn.) and its mode of action on bacteria, yeast and fungi were done. The extracts of black pepper were evaluated for antimicrobial activity by disc diffusion method .Agar well diffusion method was performed and found that the bacteria , yeast and fungi showed sensitive to methanol and water extract of black pepper. The diameter of the zone of inhibition against various Gram positive and Gram negative bacteria was measured. The results showed significant activity of piperine and suggesting its use as natural antimicrobial agent.

Keywords: Black Pepper, Piperine, Antibacterial Antifungal Activity.

Introduction

A Spice is defined as natural compound that is extracted from the seeds, fruits, flowers or trunks (skin, roots, leaves) several plants are added to food in order to provide taste smell or flavor .The species of the genus Piper are among the important medicinal plants used in various systems of medicine (Hossein MN et al, 1996). The genus *piper* (L) contains more than 700 species. Piper species are widely distributed in the tropical and subtropical regions of the world and are of high commercial and economic importance.

Piper nigrum (family Piperaceae) is a valuable medicinal plant. It is one of the most commonly used spices and considered as ''The King of spices''. *Piper nigrum* L. belongs to the family of Piperaceae.. *Piper nigrum* is a perennial wood vine with areal roots at the stem nodes ,with shiny leaves and abroad climbing plant cultivated in the tropical and subtropical regions of India. *Piper nigrum* is commonly known as Kali Mirch in Urdu and Hindi, Pippali in Sanskrit, Milagu in Tamil and Peppercorn, White pepper, Green pepper, Black pepper,Madagascar pepper in English.

Black pepper of commerce is the dried mature fruits of the plant . It is one of the most commonly used spices in most part of the world. It is used as appetizer, as a condiment to improve the flavor of foods, preservation of meals and as an ingredient of pepper soup.Phytochemical studies on the fruits reveal the presence of various compounds, viz., phenolics, lignans, terpenes, chalcones, flavonoids, alkaloids and steroids . The biological activities of *Piper nigrum* includes, analgesic, anti-inflammatory anti-diarrhoeal, antispasmodic, antibacterial , antioxidative, anti asthamatic, antitumor and immunomodulatory activities . The plant is used in many Asian countries for the treatment of colic, rheumatism, headache, diarrhea, dysentery, cholera, menstrual pains, as a flatulent and to increase the flow of urine.

Aim of the Study

The aim of this study is to determine the antibacterial and antifungal activity of black pepper (*pipernigrum* Linn) in different antibiotics.

Materials and Methods

Plant Material

The piper nigram were purchased from the local market of satna, cleaned and dried for few days in shade.

Bacterial Culture

Gram positive bacteria staphylococcus and bacillus, Gram negative bacteria *pseudomonas* and *ecoli.*

Chemicals

Ethanol an organic solvent used for the extraction of alkaloids, nutrient agar medium, potato dextrose medium .

Extraction Procedure

Preparation of Methanolic Extract

The methanolic extract of the drug by soaking 75 g of drug powder in 150 ml of 95% methanol. The mixture is allowed to stay for 72 hours in dark away from direct sun light. It was stirred at12 hours the resulting solution was filtered using Whattman Filter Paper 1.

Then the filtrate was evaporated in a shallow dish to dryness. The dried powdered of extract was scratched off the dish and dissolved in small amount of methanol. This solution was used as antimicrobial agent in the test.

Preparation of Hot Water Extract

Hot water extract of the drug sample was prepared by dissolving 75g of powdered drug in 200ml of distil water for 4 hours. It was than further extracted using the Soxhlet apparatus for further 2hours. The resulting infusion was filtered using Whatman Filter paper 1. The filtrate was than subjected to evaporation till dryness. The dried powder of extract was scratched off the dish and dissolved in small amount of distil water. This solution was used as antimicrobial agent in the test.

Preparation of Inoculums

Inoculums of *Salmonella, Staphylococcus*, *Pseudomonas, E. Co*li and total bacterial count was prepared from contaminated water by culturing them in *Nutrient broth*. 10mlof inoculum was diluted with 10ml of Autoclaved distilled water just before inoculation. Similarly, mixed fungal culture was used to prepare a fungal inoculum.

Inoculation Methods

1ml of diluted inoculums was poured in a sterilized petridish. Then about 15ml of autoclaved liquefied media was poured and mixed well. Than the plate were allowed to solidify in refrigerator for about 2 hours. After that wells were bored on the solidified agar plates with the help of sterile cork borer. 50 µl of drug extract was poured into the well and disk of known antibiotics (as given above) were kept on the agar surface. Than all the plates were allowed to stand at room temperature for 1 hours so that the drug diffuse in the agar. Then all the plates were incubated at 37ºC for 24 hours. In case of Fungal culture, as given above was used as known antibiotics. The fungal culture plates were incubated at 25ºC +-2ºC for 72 hours. After completion of incubation period the plates were observed for antimicrobial activity and the diameter of zone of inhibition of growth of microorganisms was measured.

Results

Antimicrobial Activities of *Piper nigrum*

Table-1

Antimicrobial Activity of *Piper nigrum* curna in Hot Water Extract *against* following Microorganism

S.No.	Name of Microorganism	Name of Antibiotics	Code of Antibiotics	Zone of Inhibition in Mm (Antibiotics)
1	Total BacterialCount	Amoxycillin -	SD264	18mm
2	Yeast & Mould	Chlotrimazole	SD115	20mm
3	*Salmonella* spp.	Chloroamphenico	SD006 -	22mm
4	*E. Coli*	Kanamycin	SD017	19mm
5	*Pseudomonas aeruginosa*	Zentamycin	SD195	20mm
6	*Staphylococcus aureus*	Streptomycin	SD091	21mm
7	Total Coliform	Carbenecillin	SD004	18mm

Table-2

Antimicrobial activity of *Piper nigrum curna* in 95% Methanolic extract *against* following Microorganism

S.No.	Name of microorganism	Name of Antibiotics	Code of antibiotics	Zone of Inhibition in mm (antibiotics)
1	Total Bacterial Count	Amoxycillin -	SD264	-
2	Yeast & Mould	Chlotrimazole	SD115	
3	*Salmonell*a spp.	Chloroamphenico	SD006 -	-
4	*E. Coli*	Kanamycin	SD017	-
5	*Pseudomonas aeruginosa*	Zentamycin	SD195	9mm
6	Total Coliform	Carbenecillin	SD004	9mm

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