Available online at http://www.journalcra.com

International Journal of Current Research
Vol.2, Issue, 1, pp.185-187, January, 2011

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

SCREENING MEDICINAL USE OF PEPPER AGAINST CERTAIN PATHOGENIC BACTERIA ORGANISMS

***Prabudoss, V.**

Department of Agrl. Microbiology, Faculty of Agriculture, Annamalai University, Annamalai Nagar – 608 002

ARTICLE INFO

Article History:
Received 7th October, 2010
Received in revised form
12th November, 2010
Accepted 30th December, 2010
Published online 6th January, 2011

Key words:
Pepper, Antimicrobial activity.

ABSTRACT

The spice black pepper known for its medicinal properties and also used for different kinds of infection, actually the medicinal properties of pepper due to the presence of phytochemical like Tannis, alkaloids and Flavonoids. In the present investigationsextracts ofblack pepper namely ethanol extract and chloroform extract were tested for it's antimicrobial activities against pathogenic bacteria like staphylococcusaureus, E. Coli, salmonella typhi, pseudomonas aeruginosa and proteussp. by following agar well diffusion method. Both the extracts showed efficiency in the bio control of pathogenic bacterial organisms by showing maximum inhibition zone in plate assary.

INTRODUCTION

The stimulating effect of the black pepper on the human digestive tract and circulatory system can be inferred from its familiar sharp taste, it can be used as a stimulant,used by itself or as a part of some herbal remedies in combination with other well known herbs and spices, the black pepper is often used to warm the body, and to help in improving the performance of the digestive system, by stimulating its functioning, it is also used in the treatment of other disorders such as nausea, to treat all kinds of stomach-ache, to treat abdominal flatulence and abdominal bloating, it is also used in the treatment of constipation, and to treat people with a lack of appetite. As an herbal remedy, the essential oil from the black pepper is used to reduce the symptoms associated with rheumatic pain and to treat the painful sensations associated with toothaches and other dental problems. The black pepper based herbal remedies are also known to have antiseptic and antibacterial activities, and they are used in bringing about a reduction in the temperature of fever affected individuals. Plants that are related to the blackpepper vine such as the cubeb berries, which produces pepper like fruits closely akin in shape to the cubeb pepper, or the P. cubeba, also possess many beneficial chemical compounds which have seen commercial utilization as natural antiseptics, as herbal carminatives, and as diuretics for the treatment to different disorders and conditions. In the tropical countries where they grow, these pepper are also smoked as additives to cigarettes, after they have been ground down into powder form, the smoke is said to bring relief from throat inflammations affecting patients.

Corresponding author:* **Prabudoss, V.

In addition to this use, several throat relieving lozenges also contain the essential oil of the cubeb as an important constituent. Bacteria have broad host range and have often been isolated from humans. Since the introduction of antibiotics there has been tremendous increase in the resistance of diverse bacterial pathogen. This shift in susceptibility greatly affects our ability to successfully treat patients empirically. Plant derive products have been used for medicinal purposes for centuries. At present, it is estimated that about 80% of the world population rely on botanical preparations a medicines to meet their health needs. Herbs and spices are generally considered safe and proved to be effective against certain ailments. They are also extensively used, particularly, in many Asian, African and other countries. In recent years, in view of their beneficial effects, use of spices or herbs has been gradually increasing in developed countries also (Hema *et al.,* 2009). In the present study, we have evaluated the antibacterial effect of the ethanol and chloroform extracts of widely used spice in South India, such as*Piper nigrum*(Black Pepper) against five bacterial human pathogens such as *Escheichia coli*, *Salmonella typhi*, *Pseudomoinasaeruginosa*, *Staphylococcusaureus*, and *Proteussps* and the results are discussed.

MATERIALS AND METHODS

Fresh peppercorn of Piper nigrum was collected from a stationery store, Chidambaram, Cuddalore district. The black pepper was washed thoroughly three times with sterile distilled water. The materials were air dried under hot air oven at 55°C for 3 hours and powdered. The powdered samples were hermetically sealed in separate polythene bags until the

time of the extraction. 40g of powdered black pepper was extracted successively with 200ml of ethanol (56-60°C) and chloroform (76-78°C) in Soxhlet extractor until the extract was clear. The extracts were evaporated to dryness and the resulting pasty form extracts were stored in a sterile plastic container. Five different clinical bacterial isolates Viz., Staphylococcus aureus, Salmonella typhi, Escherichia coli, Proteus mirabilis and Pseudomonas aeruginosa were collected from Rajah Mutthiah Medical College Hospital, Annamalai University, Annamalai Nagar.

- Muller Hinton agar plates were inoculated with test organisms by spreading the bacterial inoculums on the surface of the media.
- Wells (8mm in diameter) were punched in the agar.
- Extracts with different concentrations (1mg/m1, 2mg/m1, 3mg/m1 and 4mg/m1) were added.
- Along with the extraction solvent Chloroform and Ethanol, 40µ1 of control was added.
- The plates were incubated at 37°C for 18 hours
- The antibacterial activity was assessed by measuring the diameter of the zone of inhibition (in mm).

The following test were performed to identify different compound chemicals Present in the Black pepper *Piper nigrum* which may possess Antibacterial activity.

Table 1. Antibacterial activity to *Piper nigrum* Ethanol extract against bacterial pathogens

Organisms	Concencentrations of extract and zone of inhibition			
	1mg/m1	2mg/m1	3mg/m1	4mg/m1
Escherichia coli	11mm	13 mm	20 mm	22 mm
Salmonella typhi	6 mm	10 mm	12 mm	13 mm
Pseudomonas aeruginosa	NZ	NZ	6 mm	9 mm
Staphylococcus aureus	6 mm	8 mm	9 mm	11 mm
Proteus sp.	NZ	6 mm	9 mm	12 mm

Ethanol extract of *Piper nigrum* showed high antibacterial activity against *Escherichia coil, Salmonella typhi, Proteus* sp. *and Staphylococcus aureus*. Where as *Pseudomonas aeruginosa* showed resistant against methanol extract of Pepper up to 1mg and 2mg.

Table 2. Antibacterial activity to *Piper nigrum* Chloroform extract against bacterial pathogens

Organisms	Concencentrations of extract and zone of inhibition			
	1mg/m1	2mg/m1	3mg/m1	4mg/m1
Escherichia coli	15mm	16 mm	17 mm	18 mm
Salmonella typhi	6 mm	8 mm	11 mm	14 mm
Pseudomonas aeruginosa	NZ	NZ	NZ	6 mm
Staphylococcus aureus	11 mm	13 mm	15 mm	16 mm
Proteus sp.	12 mm	14 mm	16 mm	18 mm

Chloroform extract of Piper nigrum showed much significant activity against Escherichia coli, *Salmonella typhi, Proteus* sp. *and Staphylococcus aureus*. Where as *Pseudomonas aeruginosa* showed much resistant against chloroform extract of Pepper up to 3mg/ml and minimum intribition zone was notice in 4mg/ml of pepper. Recently, many bacterial pathogens are becoming resistant to existing antibiotics due to their indiscriminate use in the treatment of infectious diseases. Therefore, there is exigency to discover new and efficient antimicrobials from other source such as plant (Rathish *et al.,* 2005). In the present study an attempt was made to screen different extracts prepared from dried fruit of *Piper nigrum* for its antimicrobial action against Gram positive and negative bacteria. Ahmed chaudhry *et al*., (2006) focused on antibacterial potential of aqueous decoction of black pepper (*Piper nigrum L.*), bay leaf (*Laurusnobilis Ls.*), aniseed (*Pimpinellaanisusm L.*), and coriander (*Coricandumsativum L.*) against 176 bacterial isolates, isolated form oral cavity of 200 individuals. The disc diffusion technique was employed. Overall aqueous decoction of black pepper was the most bacterial-toxic exhibited 75% antibacterial activity as compared to aqueous decoction of bay leaf (53.4%) and aqueous decoction of aniseed (18.1%), at the concentration of 10µ1/disc. The aqueous decoction of coriander did not show any antibacterial effect against tested bacterial isolates.

In this present study, the extracts of *Piper nigrum* were tested against pathogenic bacteria like *Staphylococcusaureus*, *Escherichiacoli*, *Salmonellaltyphi*, *Pseudomonasaeruginosa*, and *Proteus* sp. by Agar well diffusion method. The ethanol extract of *Pipernigrum* showed maximum inhibition against *Escherichia coli*, *Salmonellatyphi*, *Staphylococcus aureus.* The chloroformextract of *Piper nigrum*, showed maximum inhibition against *Eschrichiacoli* and *Staphylococcusaureus* and *Salmonellatyphi*. *Psesudomonas aeruginosa* was resistant to chloroform extract of *Pieprnigrum.* The antibacterial activity of *Piper nigrum ethanol*extract is due to the presence of phytochemical compound like tannins and alkaloieds. The Chloroform extract of *Pipernigrum* plant leaves posses antibacterial activity due to the presence of phytochemical compound like Tannins. Alkaloids and Flavonoids. Reshmi*et al.,* (2010) studied on isolation of piperdine from *Piper nigrum*and its antiproliferative activity. The present study aimed to extract the phytochemical compounds in the different solvent system in *Piper longum, piper nigrum*and *piper cubeba* as well as testing their antibacterial and antitumour activity. HPTLC analysis of *Piper nigrum*sample showed six alkaloid bands two alkaloid bands were similar to Piperine standard 1 and 2, the other alkaloid may be piperidine, piperttine and piperanine. *Piper longum*sample contain three alkaloid bands one band was similar to Piperine standard 1, the other may be piperlognumine and piperlonguminine and no alkaloid band was found in *Piper cubeba.* The anti bacterial activity was tested against gram positive and negative organism using Agar well diffusion method. High activity was found in *Piper nigrum* ethanol extract against the organism *Salmonella typhi.* The alkaloid piperdine was purified by refluxion method to check the antitumor activity which shows 51.38%of inhibition at 5 g/ml concentration that conforms the compound piperidine to be used as anticancer drug for further mechanistic works. The ethanol extract of *Piper nigrum*showed maximum inhibition against *Escherichia coli, Salmonella typhi, Staphylococcus aureus,* and *Proteus* sp. 1 mg/ml of ethanol extract showed resistant against *Pseudomonas aeruginosa* and *Staphylococcus aureus.*The Chloroform extract of *Piper nigrum,* showed maximum inhibition against *Escherichia coli* and *Staphylococcus aureus* and *Salmonella typhi*where as *Pseudomonas aeruginosa* was resistant to chloroform extract of *Piper nigrum.*

Conclusion

The study of Antibacterial activity of *Piper nigrum*extract shown that ethanol extract shows promising antibacterial

activity against *Escherichia coli, Salmonella typhi,* and *Pseudomonas aeruginosa* when compare to chloroform extract. Chloroform extract showed promising antibacterial activity against *Staphylococcus aureus, Escherichia coli,* and *Proteus* sp. when compared to ethanol extract.

REFERENCES

Albena Stoyanova, Zapriana Denkova, NenoNenov, Aleksander, Slavchev, Leopold Jirovetz, Garhard Buchbauer, Hu Lien, Erich Schmidt, Margit Geissler 2006. C2H2F4-scfe- oleoresins of black pepper (*Piper nigrum l.)* And ginger *(Zingiberofficinale (l.) Rosc.)* From Vietnam: Antimicrobial testings, gas chromatographic analysis and olfactoric evaluation Electron. *J. Envrion. Agric. Food Chem.*

Hema R, Kumaravel S, and Elanchezhiya N. 2009. Antimicrobial Activity of Some of the South-Indian Spices and Herbals Against Food Pathogens *Global Journal of Pharmacology* 3(1): 38-40.

Reshmi S. K, Sathya E, and Suganya Devi P. 2010. Isolation of piperdine from *piper nigrum*and its antiproliferative activity. *African Journal of Pharmacy and Pharmacology* Vol. 4 (8). Pp.562-573

Rathish R.Nair and Sumitra V. Chandra, 2005. *Puciniagranatum* - A potential source as antibacterial drug. *Asian journal of Microbiology, Biotechnology and Environemntal Science*, Vol. 7, 625-628.

****