

ANTIBACTERIAL ACTIVITY OF CARICA PAPAYA ON BACTERIA CAUSING ENTERIC INFECTIONS

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ABSTRACT

AIM : To find the effect of CARICA PAPAYA extract on bacteria causing enteric infections.

BACKGROUND : PAPAYA extract is used for preventing and treating gastrointestinal tract disorders , intestinal parasite infections and as a sedative and diuretic PAPAYA contains a chemical called papain which helps in this . PAPAYA extract exerts a proteolytic effect on bacteria resulting from the coagulant that immobilises micro organisms and protects the host against bacterial infections . Papaya also contains the alkaloid , carpaine , which has antibacterial properties .

METHOD: The antibacterial activity is carried out by agar well diffusion technique against Enteric bacteria and the zone of Inhibition is measured in mm diameter.

RESULT : From the study it was inferred that Carica papaya extract is most effective against E.coli with a zone of 30mm at concentration 1000 microgram per ml with enterococcus and pseudomonas bacteria the zone size was 29 and 23 mm respectively.

KEYWORDS : Carica Papaya , Carpaine , Enteric infections , Antibacterial, Papain .

INTRODUCTION : The search for newer sources of antibiotics is a global challenge preoccupying research institutions, pharmaceutical companies and academia, since many infectious agents are becoming resistant to synthetic drugs . Infectious diseases are the world's major threat to human health and account for almost 50,000 deaths every day.(4)The situation has further been complicated with the rapid development of multi drug resistance by the microorganisms to the antimicrobial agents available. Plants have the major advantage of still being the most effective and cheaper alternative sources of drugs .(1) The local use of natural plants as primary health remedies, due to their pharmacological properties, is quite common in Asia, Latin America and Africa . *Carica papaya L.* (Family Caricaceae), commonly called pawpaw (English), Ibebe (Yoruba–Nigeria) or Okroegbe (Igbo–Nigeria), is a mono sexual plant of Central American origin.(13) Besides the fruits being edible they have been reported along with the roots and leaves to be of medicinal value. (2) The latex from the leaves has been used as antihelminthes and for the treatment of infections of bacterial origin.(3) Enteric diseases are diseases of intestine caused by any infection.Symptoms similar to those caused by pathogens maybe produced by chemical toxins in inge

sted foods and by allergic reactions to certain food substances. Among bacteria the ones which are commonly involved in enteric diseases are *E.coli* and *Vibrio cholerae* and several species of salmonella shigella and anaerobic streptococci.

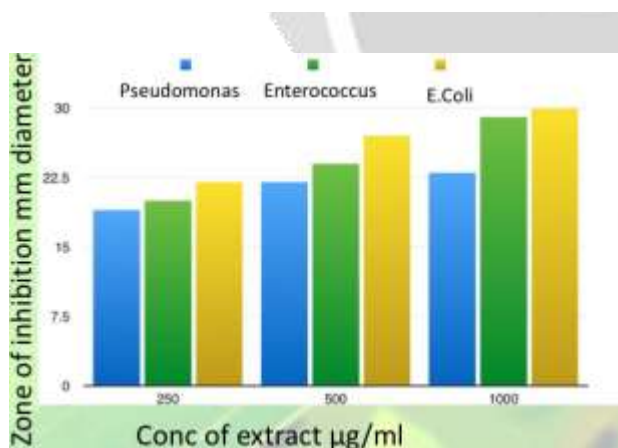
Enteric infections are characterised by diarrhoea abdominal discomfort nausea and vomiting and anorexia .A significant loss of fluid and electrolytes may result from severe vomiting and diarrhoea. Oral rehydration therapy with clean water and electrolyte solution may be given. Antibiotics may be recommended, depending on the specific micro organism causing the infection. *Carica papaya* extract is proved to be very effective against almost all the bacteria causing enteric infections.

This study was there-fore designed in order to investigate the antibacterial activity of the extracts of *C. papaya* against some infectious and enteric bacteria and to determine the chemical constituents that may be present in the extracts.

MATERIALS AND METHODS : The antibacterial activity is carried out by agar well diffusion technique against Enteric bacteria and the zone of Inhibition is measured in mm diameter.The organism was obtained from Department of Microbiology ,Saveetha Dental College.The *Carica papaya* extract was dissolved in distilled water in following concentrations 2.5mg/ml, 5mg/ml and 10mg/ml so that 100 μ l delivers 250 μ g/ml,500 μ g/ml and 1000 μ g/ml respectively.

AGAR WELL DIFFUSION TECHNIQUE: Broth culture of the test organisms compared to Mac Farland's standard 0.5 were prepared.Lawn culture of the test organism were made on the Muller-Hinton agar[MHA-M1084] plates using sterile cotton swab and the plates were dried for 15minutes.Well measuring 4mm depth was made on the agar with sterile cork borer.100 μ l of the extract was added to the wells .The plates were incubated overnight and the zone of inhibition of growth was measured in mm diameter . All the test were done in triplicate to minimize the test error.

RESULTS :



Conc of Extract μ g/ml	Zone of Inhibition mm diameter		
	Pseudomonas	Enterococcus	E.coli
250	19	20	22
500	22	24	27
1000	23	29	30
Control	16	17	19

From the study the carica papaya extract has different zone of inhibition for for different concentration for different bacteria . For the particular concentration (ie) for 250 μ g/ml the zone of inhibition for the concerned bacteria are as follows , for pseudomonas (zone of inhibition 19mm) for enterococcus (the zone of inhibition is 20 mm) for E.Coli (zone of inhibition is 22mm) for a concentration of 500 μ g/ml , for pseudomonas (the zone of inhibition is 22mm), for enterococcus (the zone of inhibition is 24 mm) and for E.Coli (the zone of inhibition is 27mm) , carica papaya extract showed maximum activity against E.coli with a zone of 30mm at concentration 1000 microgram per ml with enterococcus and pseudomonas bacteria the zone size was 29 and 23 mm respectively.

DISCUSSION: The presence of bioactive substances have been reported to confer resistance to plants against bacteria, fungi and pests and therefore explains the demonstration of antibacterial activity by the plant extracts used

in this study.(5) There may be several factors that will predispose bacteria to antibacterial agents such as previous encounters with the agents or the nature of medium used, which may affect the diffusibility of the agent. (6) The activity of the extracts was comparable to those of antibiotics(7). The demonstration of activity against the test bacteria provides scientific bases for the local usage of these plants in the treatment of various ailments. (8) The fact that the carica papaya extract was active against all the three bacteria tested may indicate a broad spectrum of activity. (9) This observation is very significant because of the possibility of developing therapeutic substances that will be active against multi drug-resistant organisms.(10)

CONCLUSION: The demonstration of antimicrobial activity against these bacteria is an indication that the plant is a potential source for production of drugs with a broad spectrum of activity.(11) The results of the study also supports the traditional application of the plant and suggests that the plant extracts possess compounds with antibacterial properties that can be used as antibacterial agents in novel drugs for the treatment of various diseases and wound infections.(13) Further pharmacological evaluations, toxicological studies and possible isolation of the therapeutic antibacterial from this plant are the future challenges.

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