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Full length Research paper

Antimicrobial evaluation of *Carica papaya* Leaf Extract on Four Bacterial Isolates

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The examination was completed to decide the antimicrobial and phytochemical piece of the n-hexane and fluid rough leaf concentrate of Carica papaya on four bacterial detaches (Salmonellena typhi, Klebsialla pneumonae, Escherichia coli, Staphylococcus aureus and Bacillus subtilis), utilizing agar dispersion procedure. Watery unrefined concentrate demonstrated action at different focuses running from 30-70mg/ml against every one of the creatures, while the n-hexane indicated action at fixations going from 40mg/ml-50mg/ml on Bacillus subtilis and E. coli as it were. The normal zone of restraint for fluid unrefined concentrate was 27mm while that of n-hexane rough concentrate was 17mm. facilitate examination ought to be directed utilizing diverse extraction methods and distinctive dissolvable, to discover the antimicrobial status of the unrefined concentrate.

Key words: Antimicrobial, assessment, *Carica papaya*, rough extractd, bacterial isolates.

INTRODUCTION

Carica papaya generally called pawpaw is a tree like herbaceous plant broadly developed for its palatable organic products. It has branchless stem developing from 5-10 meters tall, with spirally organized leaves limited to the highest point of the storage compartment. The lower trunk obviously scarred where departs are borne. The leaves are extensive, around 50-70cm in distance across; it has 7 projections that are profoundly palmate. The blossoms are comparable fit as a fiddle to the bloom of the plumeria, however are significantly littler and wax-like. They show up on the axils of the leaves, developing into expansive 15-45cm long, 10-30 cm width organic products. The organic products is ready when it feels delicate and its skin has achieved golden to orange shading. Carica papaya was the main transgenic natural product to have it genome deciphered (Lohya, 2006). It is generally known for its nourishment and nutritious incentive nearby it therapeutic application. For instance, the organic product contain safe animating and cell reinforcement operators (Aruoma et al., 2006), youthful leafy foods are utilized for their abortificient action (Cherian, 2000); it seeds are utilized as a potential post-testicular antifertility medication (Lohya, 2006); in African healing facilities it pulps are utilized for treating wounds and consumes. The latex and the seeds are utilized as a part of treatment of gastrointestinal nematode diseases and they have indicated anthelmintic action (Stepek et al., 2003). The leaves are utilized to mitigate manifestation of asthma and a vermifuge, in the treatment of gastric issues, fever and amoebic looseness of the bowels (starly et al., 1999). This examination thusly is an endeavor to decide the antimicrobial capability of the plant against the bacterial confines specified previously

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MATERIALS AND METHODS

Gathering of Plant Materials

Fresh leaves were collected from Government secondary school Bosso road Akure, Niger State and identified by a botanist in the Department of Biological Sciences, Federal University of Technology, Akure.

Processing of Plant Materials

The leaves of the identified plant collected were air dried; the dried sample was milled into fine powder by pounding

Table 1: Phytochemical Component of Aqueous and n-hexane Extract of *Carica papaya* Leaves

	Extracts	
Phytochemicals	Aqueous	n-hexane
Tannin	Highly present	Absent
Reducing sugar (fehling test)	Highly present	Highly present
Terpene	Highly present	Moderately present
Steroid	Moderately present	Absent
Phenol	Moderately present	Faintly present
Anthraquinone	Moderately present	Absent
Saponins	Moderately present	Absent
Cardiac glycoside	Highly present	Moderately present
Alkaloid	Moderately present	Absent
Flavonoid	Highly present	Faintly present +
Carbohydrate	Faintly present	Absent

Table 2: Antibacterial Activity of Aqueous and n-hexane crude extracts of *Carica papaya* Leaves.

Organisms	Zone of inhibition (mm)	
	Aqueous extract	n-hexane extract
Bacillus subtilis	24	18
Salmonella typhi	28	-
Escherichia coli	20	15
Staphylococcus aureus	22	_
Klebsiella pneumonia	23	25

Table 3: Minimum Inhibitory Concentration (MIC) µg/ml of Aqueous and n-hexane Crude Extracts of *Carica papaya*

Organisms	Aqueous extract	n-hexane extract	Control (penicillin)
	µg/ml		
Bacillus subtilis	20,000	20,000	16,000
Salmonella typhi	16,000	-	12,000
Escherichia coli	24,000	28,000	16,000
Staphylococcus aureus	24,000	-	16,000
Klebsiella pneumonia	25,000	-	12,000

manually with a clean sterile motor to increased surface area. The powder was weighed and collected into a clean cellophane bag and labeled. The samples were kept in a cool dry place for further use.

Extraction of Plant Materials

Fifty gram (50g) of the pounded dried plant materials were weighed and extracted with 400ml of aqueous and n-hexane. The process was run for 3 hours each after, which the extract was evaporated to dryness using stem evaporator. The dried extracts were weighed and kept in a well labeled sterile specimen bottles and stored in a refrigerator at 40^{o} C.

Phytochemical Screening

The aqueous and n-hexane extracts of the plants was subjected to phytochemical test to determine the chemical constituents using standard method of (Evan, 1989; Sofowora, 1982).

Screening for steroids, tannins, phenol, reducing sugar, terpene, Alkaloids, anthraquinone and carbohydrates was conducted and result recorded.
Source of test organism (*Salmonellena typhi, Klebsialla pneumonae, Escherichia coli, Staphylococcus aureus* and *Bacillus subtilis)* were obtained from the department of Microbiology Federal University of Technology, Akure.

verification of Identity of the Bacteria Isolates

The bacteria isolates were identified using the API system and characterized by examining the colonial morphology through gram's reaction, followed by biochemical tests.

consistency of Inoculums

Table 4: Minimum Bacteriocidal Concentration (MBC) of the Aqueous and n-hexane Crude Extracts of *Carica papaya*

Organisms	Aqueous extract	n-hexane extract	Control (penicillin)
	µg/ml		
Bacillus subtilis	20,000	24,000	16,000
Salmonella typhi	16,00	-	12,000
Escherichia coli	20,0000	24,000	16,000
Staphylococcus aureus	24,000	-	16,000
Klebsiella pneumonia	20,000	-	12,000

The procedure described by McFarland was adopted (Akujobi *et al*., 2004)

assessment of the Antimicrobial Activity of the Extracts

The agar diffusion method was used. The sterile nutrient agar plates were prepared. 1ml of the test organism were added to 19ml of the sterile nutrient agar and allowed to gel. 7mm diameter cork borer was used to bore hole on the agar plate, the holes were filled up with the extract and the hole sealed with molten agar. The plates were incubated at 37^{o} C for 24 hours. The zones of inhibition were measured and recorded.

Determination of Minimum Inhibitory Concentration

The soup weakening strategy was utilized. Six (6) test tubes were gathered and organized. 2ml of supplement soup was brought into each of the six test tubes. The test tubes were immunized with test life forms. The concentrates were added to the test tubes at various fixation 0.3ml, 0.4ml, 0.5ml, 0.6ml, 0.7ml, 0.8ml individually and were brooded at 37o C for 24 hours. The tube with most reduced fixation with no noticeable turbidity after hatching was viewed as least inhibitory focus.

Determination of Minimum Bacterial Concentration

The test tube that demonstrated no unmistakable turbidity after hatching of the cluster of test tubes was sub refined on supplement agar plates and brooded at 39o C for 24 hours. The plate with no obvious development after hatching was viewed as

RESULTS

Phytochemical screening of fluid rough concentrate of Carica papaya leafs uncovers the nearness of tannin, saponin, flavonoids, steroids, terpenes, alkaloids, fehling's test, cardiovascular glycoside and phenol, while n-hexane unrefined concentrate show terpenes, flavonoid, diminishing sugar, phenol and heart glycosides (Table 4). Fluid concentrates of the leave plant had action on the test life forms going from 20-28mm, while n-hexane extricates indicates movement against Bacillus subtilis and Escherichia coli just (Table 2).

DISCUSSION

Antimicrobial examination of the watery and n-hexane unrefined concentrates of Carica papaya against four bacterial separates in this investigation uncovered that the fluid concentrates had action against all the segregates, n-hexane rough concentrate don't hinder the development of Salmonella typhi, Klebsiella pnuemonae and staphylococcus aureus; this might be because of the way that higher protection of a few microscopic organisms to plant extricates has already been recorded and identified with thick murein layer in their external most film that keep the section of inhibitory substances into the cell (Martin, 1995; 1996; Tortora et al., 2001; Matu and Van staden, 2003).

The action of the concentrates was equivalent to those of the anti-infection agents. The showing of fluid concentrate against the test microscopic organisms gives logical premise to the neighborhood use of this plant in the treatment of different diseases. The way that the concentrates were dynamic against both gram positive and gram negative microbes tried may demonstrate an expansive range of action. The phytochemical segment distinguished (Table 1), demonstrated that concentrates contain tannins, cardiovascular glycoside, flavonoid and phenol.

This agreed with past report by Chika et al. (2007) that revealed that tannins, cardiovascular glycoside and flavonoid have irreversible movement that can bring about restraint of cell divider or cell layer union. The nearness of the previously mentioned phytochemical parts could be utilized to legitimize the impact of the watery concentrate on the test life form in this examination as it could influence the whole tried living being significant. The consequences of the examination likewise underpins the conventional utilization of the Carica papaya departs extricates and propose that it groups mixes with antibacterial properties that can be utilized as antimicrobial operator in novel medications for the treatment of infirmity. Encourage pharmacological assessment ought to be led to learn the science of the dynamic part close by toxicological assessment to decide their poisonous quality.

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