American Journal of Biomedicine and Pharmacy
https://biojournals.us/index.php/AJBP
ISSN: 2997-7177

Anti Bacterial Activity of Cabbage Extract

Dina suhail m saleh, Mohammed Fawzi Majeed, Enas Kasim abd alazeez, Sarah Hussain Khalaf
Yarmouk University College, Department of pharmacy

Received: 2024, 23, Nov
Accepted: 2024, 24, Dec
Published: 2025, 25, Jan

Abstract: In recent years discovered that medicinal plant used as anti-bacterial agent . the adverse effect of chemical synthesis of anti-bacterial drugs increase the chance for use therapeutic plants as source of anti-bacterial therapy . This study aimed to evaluate anti-bacterial activity of Cabbage by analyze the photochemical component of this fruit .In this study Alcoholic extract of Cabbage leaves were used for antibacterial activity against various lactic acid bacteria Gram-Positive and Gram-Negative bacteria (Pseudomonas aeruginosa , E-coli , Staphylococcus aureus , Staphylococcus epidermidis and Streptococcus pyogens) by using disc diffusion method .The result showed that the Alcoholic extract of Cabbage have antibacterial activity and inhibit the growth of all tested bacteria . The G-Positive bacteria were more sensitive to the extract than the G-Negative bacteria , the zone of inhibition of staphylococcus aureus was (12mm) while the inhibition zone of E-coli was (1Omm) .

Keywords: Gram negative, Gram Positive, antibacterial, Cabbage.

Introduction:

Infectious disease are still the major health issue , especially in developing countries leading to the death of people despite enormous improvements in health care systems(1). this is primarily due to acquired bacterial resistance to antibiotics(2). these organisms triggers life threatening aliments and even may contribute to death(3). Many bacteria have revealed resistance to synthetic antimicrobial drugs e.g resistance to Penicillin by Staphylococcus aureus(4). Numerous mechanisms of resistance are identified in bacteria , but the process active afflux performs the primary role(5).

Attention is now being switch over to plants as they may present a new source of anti-bacterial , anti-fungal , and activities(6) . Later on the extract of these plants were found to have phytochemicalsand anti-bacterial activity . The anti-microbial activity of plants maybe due to their ability to synthesize several secondary metabolites of relatively complex structures having anti- microbial properties(7) . Compounds derived from natural products can lead to the discovery of novel drugs (8) . This necessitates to investigate biological activities of plants (9) .

Lactobacillus are rod-shaped bacteria that are part of the intestinal and vaginal normal flora , there are lots of different species of lactobacillus . , these are "friendly" bacteria that normally live surgery , lactobacillus is also taken for skin disorder such as fever blisters , canker sores , acne , and to treat and prevent Eczema . However , in some cases , lactobacilli can cause serious infection of the bloodstream , urinary tract and internal organs especially.immunocompromised individual . our digestive , urinary , and genital system without causing disease , it is also in some fermented foods like yogurt and in dietary supplement , some people take lactobacillus by mouth to treat and prevent diarrhea , including infectious type such as rotaviral diarrhea in children and travelers diarrhea, it is also used for general digestion problems , irritable bowel syndrome (IBS) , inflammatory bowel disease (IBD) , constipation , inflammation of the colon and to improve outcomes after bowel surgery , lactobacillus is also taken for skin disorder such as fever blisters , canker sores , acne , and to treat and prevent Eczema . However , in some cases , lactobacilli can cause serious infection of the bloodstream , urinary tract and internal organs especially immunocompromised individual .

The study aimed to evaluate the antibacterial activity of Cabbage and analyze the component of the fruit to a certain pharmacologic value.

Materials and methods:

The test bacterial isolates: The test isolates were obtained from samples taken from patient having suspected otitis media . All bacterial organisms were isolated and diagnosed to the species level by using different available procedure including Gram stain and other phenotypic method following standarized methods. then diagnosed as Staphylococcus aureus , staphylococcus epidermidis , streptococcus pyogens (G+ve) and Pseudomonas aeruginosa , E.coli (G-ve) .

Extraction of plant material : The fresh Cabbage leaves were collected , peeled , sliced , and dried at room temperature . after drying , pieces of Brassica Oleracae grinded to fine particles in isolated manner utilizing a suitable grinder .

Brassica oleracae was weighed and macerated in 50 ml. of D.W , 96% methyl alcohol , after that , the suspensions were filtered and the filtrates (extracts) were delivered into sterile , clean container and kept at 4C until used for additional assay .

Production of discs (disks of the extracts) : By using whatman filter paper No. I Discs of 5mm in diameter were produced by using of paper borer . After that , the prepared disks were put in suitable containers , then , the discs were subjected to autoclave in order to sterilize the discs (adjusting the conditions of autoclave to be 121 C for 15 min.) and left to become cold , later , the discs were allowed to suck up the extract filtrate and, maintained for later assay . the produced discs (each one) have the ability to absorb about 0.01 ml.

Antimicrobial susceptibility test by kirby-Bauer method (22):

The antibiotic susceptibility procedure for bacterial species has been done through using a 1nethod that depend on the ability of disc to permit the penetration of antibiotics through the medium which is also called kirby-Bauer method. the overall steps of the procedure should be produced through entirely sterilized status . plates of agar have been inoculated , each alone , by the test bacterial isolates , then the bacterial suspension was uniformly distributed overall the area of the plate . after a while , sterilized discs (measuring 5 mm. in diameter) were put under sterilized conditions in various extracts (for about 1 min.) , then fixed plates (petridishes) inoculated previously by

suspension of bacteria , after this step , all plate had been put aside (at 25C for about 15 min.), after that , all cultured plates were placed in the incubator at 36 C for 18-20 hrs. the area of inhibition has been examined and calculated in millimeters (mm.) .

Result and Discussion

The result of antibacterial activity of Brassica extract we showed in (Table 1) , the extract have anti-bacterial activity on all species of the tested bacteria . The result of our experiment showed that different bacterial species exhibit different sensitivities towards the extract of Brassica , the extract showed more activity against G+ve bacteria compared to G-ve bacteria (Table 2) . G-ve bacteria such as P. aeruginosa and E.coli were more resistant than G+ve bacteria such as Staph. aureus and Strep. pyogen . these variation in inhibition maybe because of differences in the composition and structure surface between G+ve and G-ve bacteria(23) in addition to cell wall and cell membrane , G-ve bacteria have an outer composed of a phospholipid bilayer which maybe protective barrier against any active compound in the extract . more ever the cell wall of G+ve bacteria have a large amount of peptidoglycan and small amount of lipid while G-ve bacteria due to the presence of an outer membrane , large amount of lipid and small amount of peptidoglycan found (24).

Some plants may produce certain such as secondary metabolites being known as phytoalexins . These compounds have shown remarkable in vitro antibacterial activity against potential pathogens (25) . There is immense need of antimicrobial drugs developed from natural sources as plant derived products are safe in comparison to chemically synthesized products (26) . Some of the species of Brassica family like Brassica nigram hve revealed anti-bacterial against some food born pathogens (27) . Furthermore, the leaf juice of Brassica Oleracae is also identified to have anti- bacterial activity against some food born pathogen (28) .

Taking into account , the considerable potentiality of plants as a source of anti-microbial drugs , this study was carried out to explore the anti-bacterial activity of methanol extract of Brassica Oleracae against selected bacteria . brassica Oleracae is a commonly consumed vegetable and a valuable source of glucosinolates , polyphenols , and flavinoids . On hydrolysis by enzyme myrosinase ,glucosinolates can produce d-glucose sulfate ' isoyhiocyanates , thiocyanates and nitriles(29) . Isothiocyanates have the largest bactericidal , bacterio-static and anti-fungal potential among these bioactive products(30) . The medicinal properties of Cruciferous vegetables can be related to the activity of isothiocyanates against several human pathogens (31) . The Glucosinolate hydrolysis products inhibited G+ve bacteria and fungi more than G-ve bacteria .

The result of this study have shown that tha methanol extract of Brassica Oleracae have displayed distinct anti-bacterial activity against E.coli , Streptococcus , staphylococcus apidermidis, and staphylococcus aureus . This is mainly ascribed to the isothiocyanates compounds present in Brassica Oleracae , This recomended the use of brassica Oleracae as a broad spectrum anti- bacterial agent to treat obsinate infections .

Table (I) Anti-bacterial activ i ty of the Brassica extract :

No.	Test organisms	Brassica alcoholic Extract
1	Staplylococcus aureus	+
2	Staphylococcus epidermidis	+
3	Streptococcus pyogen	+

4	Pseudomona aeruginosa	+
5	E.coli	+

+ = Active

Table (2) Inhi biti on zone of bacteria growth by Brassica extract :

N o.	Test organisms	Zone of inhibition of Brssica extract (1n1n)
1	Staph. aureus	12
2	Staph. epidennidis	12
3	Strep. pyogen	12
4	P. aeruginosa	10
5	E.coli	10

Conclusion:

Result of present study indicated that methanol extract of Brassica Oleracae effectively arrested the growth of selected bacterias. Further study undertaken to assess the mode of action.

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