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The Study of Antibacterial Effect of Capsella Bursa-Pastoris on Some of Gram Positive and Gram Negative Bacteria

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ABSTRACT

Background and purpose: use of medicinal plats to treat diseases has been one of the most usefulways that will cause the least side effects. Strains of bacteria Staphylococcus areus, Bcillus cereus and Pseudomonas aeruginosa and so finding plant extract that could affect on the growth of resistant strains can great help in preparing effective drugs.

Material and Methods

In this study effect of Capsella bursa pastoris alcoholic plant extract on different stages of bacterial growth by using spectrophotometric and draw a large number growth curves were measured accurately. Therefor non-pathogenic strains of E. coli, Pseudomonasaerogenesis, Staphylococcus aerus, Bacillus cereus were used to study different stages of its growth in the presence of Capsella bursa pastoris alcoholic plant extract.

Results

Capsella bursa pastoris alcoholic plant extract showed that have a significant effect in the stages bacterial growth and it inhibits.

Conclusion: results showed that there are significant differences in the stages these strains bacterial growth in the presence or absence of Capsella bursa pastoris alcoholic plant extract. It was inferred that the results obtained in a more accurate understanding of antimicrobial effects of the medicinal plants on the bacterial growth stages create that paved the way for what to use the more effective it is at the right time.

KEY WORDS: Bacillus sereuse, Antimicrobial effect, Capsella bursa pastoris, Gram negative, Gram positive.

INTRODUCTION

Although most strains of E. coli known harmless, but several species of them can create mild to serious. E. coli strains can cause sever diarrhea that in same cases lead to serious complications and even death(4,5).

Unique 3 properties that make distinguish E.coli 0157 of otherE.coli strains: hazardous effects have on health, abnormal resistance in the environment, very low levels required for infectivity, small number of bacteria, from 10 to 100 cells is sufficient to create disease. Pseudomonas gram-negative, are aerobic and moving(6,7).Pseudomonas aeruginose often makes up low number of normal intestinal florand human skin and opportunistic pathogen is in patients with impaired immune syste(8,9).

Pseudomonasaeruginosa producing MBLs first were reported in Japan in 1991 and then different regions of the world including Asia, Europe, Australia, North and South American has been identified and report. Pseudomonas aeroginosa strains carring genes of MBLs are a serious clinical threat(10).Staphylococcus aureus is one of the important pathogenic bacteria that can cause a wide range of infections. The increasing of antibiotics against infections caused by these bacteria is increasing drug resistance in bacteria and this has led to wide research on new antimicrobial drugs with greater effectiveness take place.

Staphylococcus aureus is one of the most important and most serious human pathogens that after E. coli are the second cause of hospital infections. These bacteria are cause a wide rang of disease including superficinal and deep infections and systemic toxicity and urinary infection in human that if attack quickly spread in the body and cause bacteremia and shock. According to the colonization of these bacteria in nasal carries, these individuals can through the air by direct contant, these bacteria transferred and are causeserious infections and increased incidence of nosocomial infections (11, 12).Bacillus cereus is a gram positive and have spore of Basylase family. The bacteria spores dispered widely in nature, soil and water so that it can be isolated from various foods. Basillus cereus can produce extracellular substances such as beta hemolysin that are important to recognize it. This bacterium produces

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causing diarrhea and vomiting enterotoxins and is able to create a diarrha syndrome and vomiting syndrome. In 1950 Basillus cereus was recognized as an agent food poisoning (3, 13).

The importance of medicinal plants against pathogenic bacteria is well known(14).In this regard, according to the abundance and high potential growth Cpsella bursa pastoris plant in East Azarbayjan this plant was selected until according to high potential of medicinal plant were use for against with some pathogenic bacteria.

Capsella with the scientific name of capsella bursa-pastoris is plant on or two years of the cruciferaefamily; plant genus name is taken from the word "capsella" means a bag , plant

Have main root and stems raise; basal leaves are located downy and as a crown; fruits are shape carpetbag triangular and have many oval seeds; this plant almost everywhere as a weed grows in wasteland gardens and all year long can it be collected; this plant is known with common name shepherds purse and pick-pocket.

This plant in different parts of the world is native, including Cyprus, Europe, Saudi Arabia, Turkey, Pakistan , India , Asia , China , North African and central America. In Iran in many provinces of country grows such as Golestan ,Mazandaran, Gilan, Azerbaijan, Central, Isfahan, Fars, Tehran, Khorasan, Qazvin. Of studies both property raise and reduce blood pressure have shows by the plant. Also increased power property and heart rate and uterine contraction.

Formulations containing compounds root plant is an antibacterial effect against gram-negativepathogens(1,2,3).

MATERIAL AND METHODS

Plant samples collection was conducted from East Azerbayjan grassland.

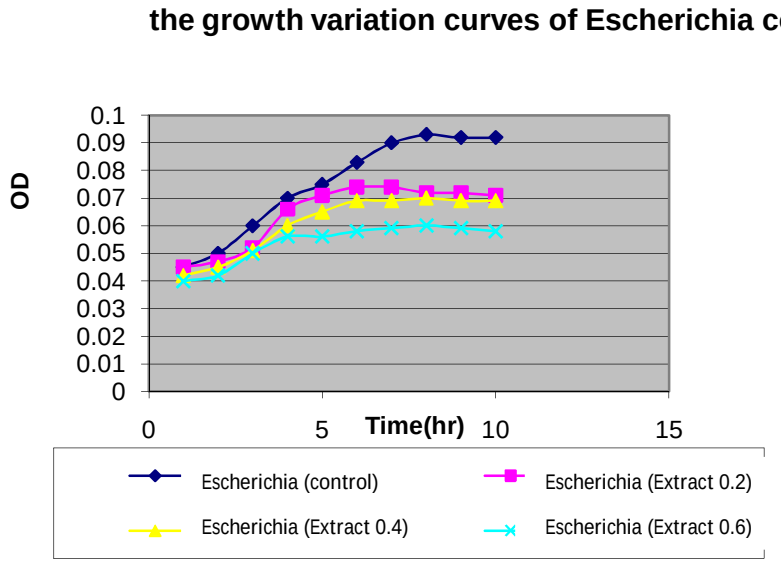
Extraction plant: Extraction was performed by ethanol solvent 96 degrees and soak method using standard methods (extraction with alcohol solvent). For preparation extract first weighed the capsella bursa pastoris and after initial washing with water and sterile distilled water for 15minutes placed in a germicidal solution and then again washed with sterile distilled water that solution of disinfectant will be detected. Then crushed the plant and compacted with a porcelain mortar and in closed aluminum paper tendelizacin action was conducted for three consecutive days. Then were mixed with 150ml of ethanol 96 degrees. After removal of shake device after 45hours in vacuum distillation rotary with 10 round for several hours at temperature about 82c solvent was removed until at this temperature was not extraction the solvent.

Spectrophotometric : Drawing curve of bacterial growth has been made by spectro photometric method and based on reliable sources(15,16).One day before spectrophotometer stages about each of the bacteria desired at least 14 Erlen was prepared that each containing 100ml of BHI medium that often was placed in the mixer, with temperature was 37 degrees. Usually 18 hours before to one of these Erlens are inoculated with two loops of the samples studied microbes. The beginning spectrophotometric stages of the inoculated Erlen we inoculate 1mlinto each Erlens that should be measured attract them. Erlens which should growth rate was measured at intervals of 1hours including a control Erlen that was lacking extract and number of Erlen in them bacterial growed was effected concentrations of 2/0,8/0,2/1 ml extract. An Erlen that only containing 100ml of culture medium was used for the zero (control Erlen). To extracts a separate Erlen is considered with the control extract that contains 100ml medium plus average of concentration extracts was used. Thus, optical absorption effect color extracts was also zero until in assess microbial growth Erlens containing extract does not course problems. Absorption record each of Erlens after zero time immediately after inoculation 1ml microbe to each of them (except the control Erlen) and also started add extracts to necessary Erlen and then was repeated at intervals. In addition, all these steps were done under hood that with UV radiation in the beginning was sterile and with ventilation with a clear flame. Eelens were placed in the mixer device with the same temperature 37c and with 120rpm. One each set with the control samples absorption device was zero (control extract to read Erlens containing extracts and removel color extract concentration effect and also control Erlen for reading absorption control Erlens) then, required data of spectrophotometer device means absorption rate, optical density and percent passing about at least 11hours after time zero was recorded that this duration would depend on the absorption rate or bacterial growth. All sepctophotometrics steps are in optical absorption 600nm.

RESULTS

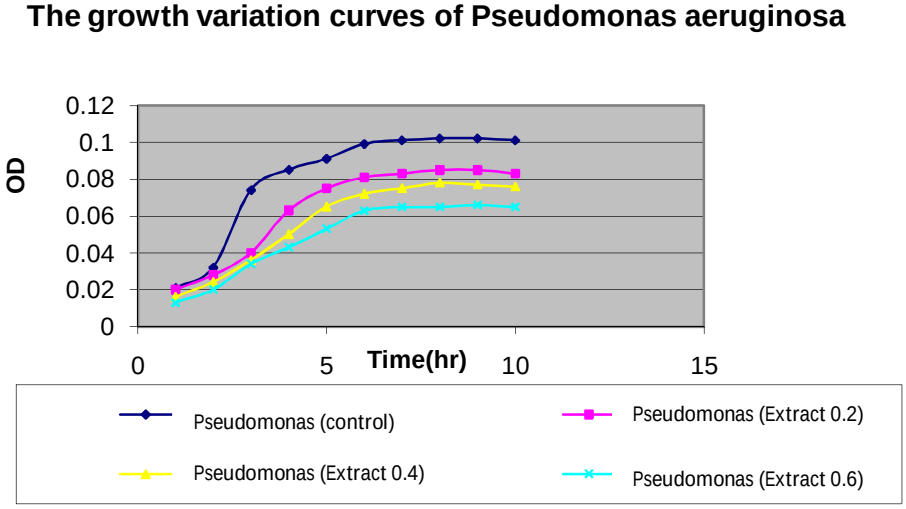
Capsella bursa pastoris extract effect in this way was examined on bacterial growth curves that bacterial growth on plates was performed with adding 0/2ml of plant extract to 100ml of BHI medium inoculated with bacteria desired and growth rate assay using spectrophotometry at 600nm wavelength. And work for each bacterium was performed ternary Erlen from. And a sample positive control (Erlens inoculated with bacteria and with extract) and a negative control (Erlens with extract and without bacteria) also were considered.

Changes to the growth of bacteria in the presence and absence of E.colibacteria: in the presence and absence alcoholic extract with 0/2ml rate was highly significant and only a little difference in initial growth stages it is observed that it is significant difference. With study concentration effect 0/4 and 0/6 ml extract and compare it with control be observed significant that with increasing concentration alcoholic extract at initial hour bacterial growth according to the same inoculated material absorption difference between bacterial growth increase in the presence and absence of alcoholic extract. Also comparison different concentrations alcoholic extract of capsella bursa pastoris showed that alcoholic extract plant mentioned on all growth curse hours according to the same inoculum is more effect significant. This effect has reached its maximum growth in the final hours growth carve details at following chart is significant.



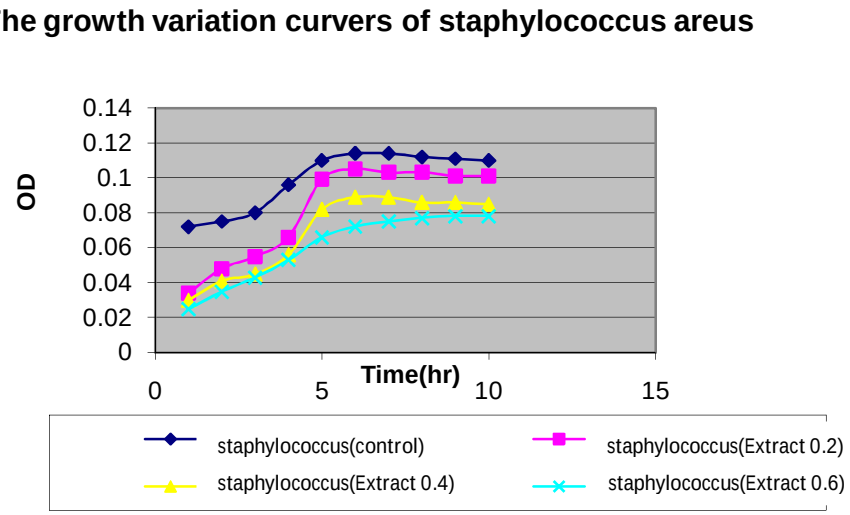
Standard deviation for each point of the curve was calculated using Excel software and statistical program that as error load is displayed at any point. Results show that between different realicates in a certain concentration difference significant is observed.

Changes to growth bacteria in presence or absence pseudomonas aeruginosebacteria: with study concentrations effects 0/4 and 0/6ml extract and it comparison with control is observed significant that with increasing concentration also increased growth inhibition rate. Most effect is observed in the beginning growth stages. The results obtained is observed in the below chart.

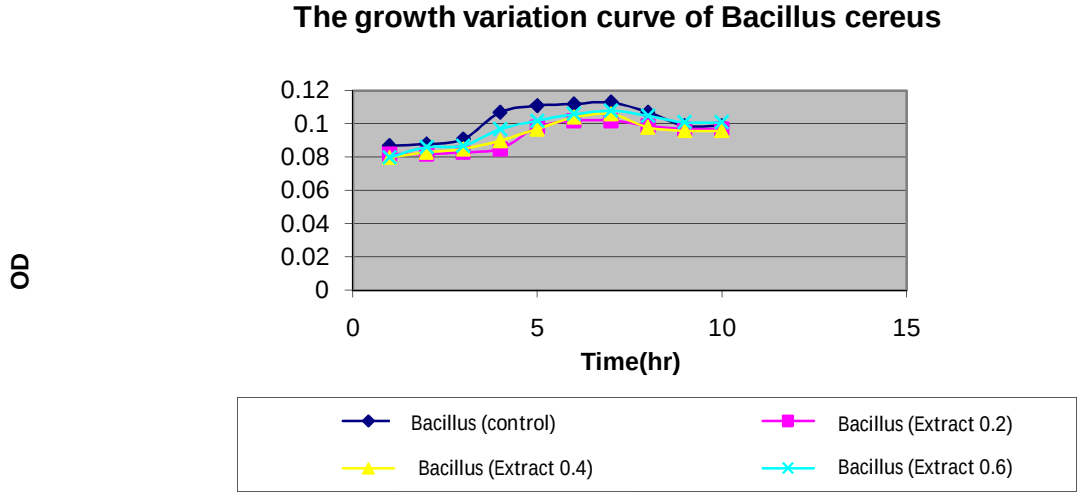


Changes to growth bacteria in presence or absence staphylococcus aureus:

Growth changes this bacteria indicates more effect at the beginning growth stages and anti bacterial effect is reduced over time. According to increasing concentration plant extract reduce the growth rate significantly is substantially. The following chart shows growth stages of this bacteria in the presence of various concentrations extract.



Changes to growth bacteriain presence or absence Bacillus cereus: with study concentration effects 0/4 and 0/6ml extract it comparison with control is observed significant that with increasing concentration alcohol extract at initial hour bacterial growth according to the same inoculated material absorption difference between bacterial growth increases in the presence and absence of alcohol extract. Also comparison different concentrations alcoholic extract of capsella bursa postoris showed that alcoholic extract plant mentioned on all growth curve hours according to the same inoculum is more effect significant. This effect has reached its maximum growth in the find hours growth curve details at following chart is significant.



Discussion: several reports about the antimicrobial effects of extracts of medicinal plants obtained from different parts of Iran(17,18).This research has been done on various microorganisms. These studies the antimicrobial effects of evaluated plants in this study one the basis of obtained results has been confirmed of halo of growth inhibition(19). Also, studies conducted in other parts of the world prove the inhibitory effect of plant extract(20,21).Studies on the antimicrobial effect of 180plants from 72 families of medicinal plants native to Iran on E.coli showed that 14plants have produced halo of growth inhibition about 12 mm. But in this study using results obtained by growth curve and measuring it spectrophotometric method was determined that different concentrations

of alcohol extract of capsella bursa pastoris have similar effect on the growth of E.coli, pseudomonas areogenes, staphylococcus aureus and Bacillus cereus bacterias and significant differences in bacterial growth rate was observed in the presence and absence of alcoholic extract. Effect on the early stages of growth was greater than other stages. Also of results this study can have a good understanding in investigate the effects of medical plants extract on bacterial growth stages in this case that the usepractical drug determine that drug is more effective at what stage of bacterial growth. In this study has tried addition to the usual methods in study antimicrobial effects of plant extracts such as measurement inhibition zone diameter of growth extract effects on the each of growth bacteria also are examined.

Further studies on the effects of other different extracts medicinal plants on the growth stages these bacteria was doing that will be published in subsequent reports.

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