



The Study of Ethanolic and Aqueous Extracts of *Plantago psyllium* Seed on Pathogenic Multidrug- Resistant Gram Negative Bacteria

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ABSTRACT

In recent years, due to the indiscriminate use of synthetic drugs are irrational drug resistance of pathogenic microorganisms is increasing the need for new compounds. The purpose of this study was to investigate the effect of ethanolic and aqueous extracts of *Plantago psyllium* seed on *Escherichia coli*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Citrobacter freundii*, *Enterobacter aerogenes*, *Pseudomonas aeruginosa* and *Acinetobacter baumannii*, from hospitals (Shariati, Sadoughi, Garazi) and Vahid Medical Laboratory in zarrin shahr were isolated. Also, on the standard of bacteria. *Plantago psyllium* seed of Agriculture and Natural Resources Research Center of Isfahan was prepared. aqueous and ethanolic extracts were prepared by maceration method. After identification of bacteria, antibiotic resistance was determined by disk diffusion method. Antibacterial effect of ethanolic and aqueous extracts of *P. psyllium* seed on the growth of multi-drug resistant bacteria by plate diffusion in four ml of 50,100,400 and 800 mg were studied. The MIC and MBC of this extract on bacteria macro dilution method was used. Well diffusion of ethanol and aqueous extract of *P. psyllium* seed not only mortality but also inhibited the effect on the growth of isolates was observed. The ethanolic and aqueous extract *P. psyllium* seed neither inhibited nor lethal effect on standard strains of bacteria. The results showed that the aqueous and ethanolic extract *P. psyllium* seed on multidrug-resistant bacteria (MDR) is not effect antibacterial.

Key words: *Plantago Psyllium* Seed, Gram Negative Bacteria, Minimum Bactericidal Concentrations (MBC), Minimum Inhibitory Concentration (MIC), Multi -drug Resistant

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INTRODUCTION

Acute bacterial infections of the health problems of the countries considered. For example, one of the most common infections in infants, the elderly and women, urinary tract infections, which are the frequency of respiratory diseases in second place [1, 2, 3]. Infection in the lower urinary tract (bladder and bladder outlet ducts) is common among women in their lifetime, and they have had a urinary tract infection. This infection can be asymptomatic or accompanied by uncomfortable

symptoms such as pain during urine output pressure above the pubic bone with pain, urgency of urination, fatigue, and difficulty in urination pyuria is. Although urinary system normally sterile and free from bacteria, but bacteria from the anus and vagina to the urethra and can then migrate to higher areas [4]. Important bacteria causing the disease can be *Enterobacter aerogenes*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Staphylococcus aureus*, *Proteus vulgaris* and *Staphylococcus epidermidis* [5, 3]. The most common gram-negative bacilli infections. More than 85 percent of infections caused by *E. coli* are alone [3]. Treatment is with antibiotics. If the antibiotics are frequently used to treat and urinary tract

infections caused prevent recurrent by antibiotic resistance [4]. An increasing medical problem of resistant strains of pathogenic bacteria to antibiotics is which reduces the number of antibiotics are effective in treating various infections [3]. In recent years, due to the indiscriminate use of synthetic drugs are irrational drug resistance of pathogenic microorganisms is increasing the need for new compounds. Today, researchers are searching for new plant antimicrobial substances to replace antibiotics that microorganisms that are resistant to solve this problem is the use of a new medicinal plants [5]. Also using herbal remedies instead of medication, complications are reduced [1, 6]. *P. psyllium* plant is Plantaginaceae family of plants. 5-10 cm tall perennial herbaceous vegetation or without stems and leaves are soft fluff are stretched. *P. psyllium* contains high amounts of mucilage, which has an important role in the treatment of cough and constipation. Mucilage of the polysaccharide hydrocolloids, pharmaceuticals as well as used for the preparation of low-calorie foods, jellies, condiments and beverages [5].

The purpose of this study was to investigate the effect of ethanolic and aqueous extracts of *Plantago psyllium* seed on multidrug-resistant Gram-negative bacteria causing urinary tract infection was performed.

MATERIALS AND METHODS

This study on 140 bacterial strains, *Escherichia coli*, *Klebsiella pneumoniae*, *Proteus vulgaris*, *Citrobacter freundii*, *Enterobacter aerogenes*, *Pseudomonas aeruginosa* and *Acinetobacter baumannii*, all multi-drug resistant (MDR) isolated from Zarrinshahr Vahid medical diagnostic laboratories and several hospitals in Isfahan province (Shariati, Saddughee and Gharazy). Also on the standard of bacteria prepared from these bacteria were Iranian Research Organization for Science and Technology. Biochemical parameters studied isolates were identified by biochemical tests and species in its genus and some of them were identified. Also for the detection of drug resistance in samples of 10 different common antibiotics, belonging to several families of antibiotics were used. *Plantago psyllium* seed of Agriculture and Natural Resources Research Center of Isfahan was prepared. aqueous and ethanolic extracts were prepared by maceration method. The aqueous extract 50 grams of powdered seeds of PP with 100 ml of distilled

water, sterile and ethanol extract 50 grams of powdered seeds of PP with 100 ml of 70% ethanol into the flask separately at 25 ° C for 48 hours on a shaker made. Buchner funnel with filter paper extract separated. Into sterile glass plates to dry. The DMSO solvent dilution series were prepared. After identification of bacteria, antibiotic resistance was determined by disk diffusion method. Antibacterial effect of ethanolic and aqueous extracts of *P. psyllium* seed on the growth of multi-drug resistant bacteria by plate diffusion in four of 50,100,400 and 800 mg /ml were studied. The MIC and MBC of this extract on bacteria macro dilution method was used [5].

RESULTS AND CONCLUSION

Well diffusion of ethanol and water extract of *P. psyllium* seed not only mortality but also inhibited the effect on the growth of isolates was observed. The ethanolic and aqueous extract *P. psyllium* seed neither inhibited nor lethal effect on standard strains of bacteria.

The results showed that the aqueous and ethanolic extract *P. psyllium* seed on multidrug-resistant bacteria (MDR) is not effect antibacterial. Perhaps due to the solvent used in the extraction. Sharifi *et al.*, 2011 study on the antimicrobial properties of psyllium extract the microorganisms studied. At the end concluded that the effect of the dilution on the control of gram-negative bacteria *Staphylococcus aureus* but to extract the diameter of inhibition increased with increasing dilution. Perhaps due to the use of solvent is used for extraction.

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