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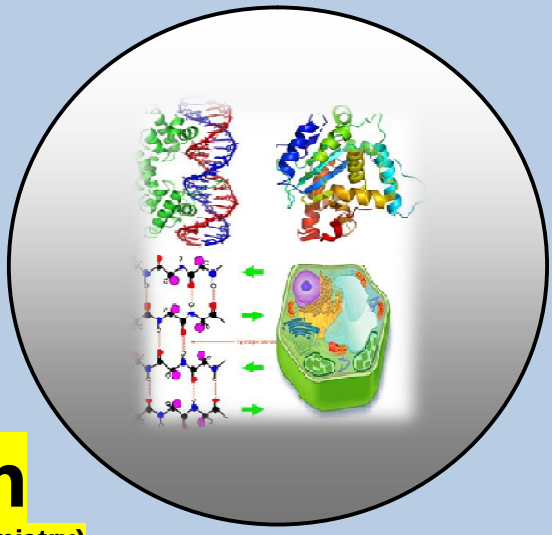

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RESEARCH PAPER

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Antibacterial effects of Alcoholic Extract of *Scrophularia striata* on Acinetobacter baumannii

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ABSTRACT

Now a day, the prevalence of drug resistance among bacteria has caused more people to useherbal medicine. Many of the Acinetobacter baumannii strains are resistant to all available antimicrobial agents. This study aimed to evaluate inhibitory effect of alcoholic extract of Scrophularia striata on Acinetobacter baumannii in vitro. After collecting and washing, Scrophularia striata was cutted and mixed with 250 ml of ethanol 80% and shaking 48 hour in room temperature. Then the extract was filtered twice and its alcohol was evaporated by rotary device and antibacterial effect was evaluated by disk diffusion and agar well diffusion methods. According to the results, the minimum and maximum inhibitory effect of alcoholic extract of Scrophularia striata were in 10mg/ml and 80 mg/ml concentration, respectively. The minimum and maximum inhibition zones were 6mm and 12 mm. This study indicated that alcoholic extract of Scrophularia striata doesn`t have significant effect on Acinetobacter baumannii and suggested to be used phenol extract in the next study.

***Key words:* Scrophularia striata, Alcoholic Extract, Acinetobacter Baumannii, and Disk Diffusion.**

INTRODUCTION

Acinetobacter is a gram-negative bacteria of the Neisseria family, and itis seen as Basil or coco basil.These bacteria are oxidase negative and immobile and not ferment sugars, also may cause bacteremia, urinary tract infection, secondary meningitis and the primary role of them is to develop nosocomial pneumonia. In the Intensive Care Unit to such infection streatment, due to widespread resistance to large group of antibiotics, it becomes very difficult for physicians (Magnet et al. 2001, Wang et al. 2007, Bergogne et al. 1996).So that in Weist et al study's in 2002, in Germany was isolated different bacterial species such as Acinetobacter, Staphylococcus, Enterococcus, Pseudomonas, E. coli and Enterobacter from burn patients (Dunbar et al. 1934). Acinetobacter baumannii strains have great potential for rapid development of antibiotic resistance and also have been identified high acceptance ability of genetic factors resistance (Bergogne et al. 1996, Bonomo et al. 2006). Currently a number of Acinetobacter baumannii strains are resistant to all available antimicrobial agents (Van Looveren et al. 2006), Mechanism of resistance has done in several ways. Resistant strains carry sites of gene sen coding resistance (Segal et al. 2003, Poirel et al 2003). The resistance can be result in a interaction of permeability reduction of outer membrane and activated expression of permeation system (Vila et al. 2007). So that in many cases, finding the species that resistant tobeta-lactams, aminoglycosides and quinolonesare natural (Saadatian-Farivar et al. 2007). Twenty-first century have been called the back to the natural century and herbal treatment. Now a day, research onmedicinal plants has increased the supply new medicines drug inwider dimensions (Samsamshariat et al. 2006). Scrophularia striata is a car plant, perennial and from snapdragon family that grows in Ilam and Khuzestanareas (Mozafarian et al. 1999). Ilamians have long experimentally used of this plant in different forms for treatment of, including inflammation and infection of the eyes, ears, skin burns, wound infections, episiotomypain, digestive disorders, colds and hemorrhoids (Shohani et al. 2003, Shoohani et al. 2010). This study aimed to evaluate Antibacterial effects of Alcoholic Extract of Scrophularia striata on Acinetobacter baumannii in vitro.

MATERIAL AND METHODS

30 clinical samples of acinetobacter were isolated and used. ATCC19606 was considered as standard scale.

Alcoholic extract of Scrophularia striata

After collecting and washing, Scrophularia striata was grinded and mixed with 250 ml of ethanol 80% and shaking 48 hour in room temperature. Then the extract was filtered twice and its alcohol was evaporated by rotary device (Bosio et al. 2000).

Antimicrobial activity tests

Antibacterial activity of extract was experimented using disk diffusion. Then minimum inhibitory concentration and minimum bactericidal concentration were appointed using macro dylotion method and NCCLS standard, by this modify that DMSO by final concentration of 1% was used as solvent.

Some holes (6mm) in Mueller-Hinton agar plates were created. From 24 hour planting of microbial reciprocals, suspensions of 0.5 (Mac far lend) in serum physiology (0.85NaCl) was provided and inseminated uniformly by cottony sterile. Extract with 250 ml density was solved in distilled water, strolled by filters of 0.2, and 100 µm of extract was infused in each hole. In disk method, some blank disks were inserted on vacuum plates and extracts by destiny of 5, 10, 20, 40, 80 mg were implant over them. The plates were transferred to incubator 37^{Co} for 24 hour. Then areola of none growth around disks diagonal was measured and recorded. Each test was repeated three times (Egorov et al.1985, NCCLS 2000, Chitsaz et al. 2007).

RESULTS AND DISCUSSION

The result of this experiment indicated that minimum and maximum inhibitory effect of alcoholic extract of Scrophularia striata were in 10mg/ml and 80 mg/ml concentration, respectively. Minimum and maximum inhibition zone were 6 mm and 12 mm (table 1).This study showed that alcoholic extract of Scrophularia striata didn`t have significant effect on acinetobacter, as a result, not done appointment of MIC and MBC (table 2).

Table 1.Results of disk diffusion method.

Extract	**Samples**	**Concentration** mg/ml	**Zone of growth inhibition** mm
Alcoholic extract of Scrophularia striata	Acinetobacter	10	6
		20	7
		40	9
		80	12
	Acinetobacter ATCC 19606	80	14

Table 2. Results of Agar well embedded.

Extract	**Samples**	**Concentration** mg/ml	**Zone of growth inhibition** mm
Alcoholic extract of Scrophularia striata	Acinetobacter	10	7
		20	9
		40	11
		80	12
	Acinetobacter ATCC 19606	80	15

In recent year stend to use her bald rugs instead of the current is increased (Ozaslan et al. 2007), although the bulk of conventional drugs are from chemical source, but it is estimated that about one third of all medicinal products have been deformed or extracted from plants (Dalimi et al. 2013). Hospital burn unit is suitable environment for bacterial growth, such as Pseudomonas, Enterobacter, Staphylococcus and others (Weist et al. 2002).These bacteria that are part of the normal flora of the skin are rarely pathogenic. But they considered as a major pathogen in patients in burn centers. These bacteria usually exist in moist areas of hospitals and often found on the skin of the patients (Nurozi et al. 2004). Among these, Acinetobacter baumannii play an important role in nosocomial infections. So, there is in the West of Iran traditionally used of Scrophularia striata extract for the treatment of superficial, deep and domestic infections (Abbasi et al. 2007), and also the restorative effects (Shoohani et al. 2010) Anti-inflammatory effect (Shoohani et al. 2010, Azadmehr et al. 2009), antiseptics effect (Abbasi et al. 2007), antidepressant effect (Babri et al. 2012), and also clarify the active components found in this plant (Monsef-Esfahani et al. 2010). We decided to study the inhibitory effects of alcoholic extract of Scrophularia striata on Acinetobacter baumannii in vitro. Due to proving the existence of phenolic compounds, flavonols and flavonoids and other active components in the ethanol extract (Sharafati-chaleshtori et al. 2010) and other extracts of this plant in other studies are expected that ethanolic extract of Scrophularia striata has a significant effect against pathogenic Bacteria, result of this study indicated that Contrary to expectations alcoholic extract of Scrophularia striata doesn`t have significant effect on Acinetobacter baumannii and maximum and minimum diameter of inhibition zone of it, were 12 mm and 6 mm, respectively. Zamanians study in 2013 indicated the antimicrobial activity of aqueous extract of seed of Scrophularia striata (Zamanian-Azodi et al. 2013). Abbasi et al study in 2004 indicated that antibacterial effect of Scrophularia striata against Staphylococcus aureus and Pseudomonas aeruginosais equal to povidone iodine (Abbasi et al. 2007). Havasian et al in 2013 indicated that hydro alcoholic extract of Scrophularia striata has antifungal effect on Candida albicans (Havasian et al. 2013). Sherafati et al studied inhibitory effect of alcoholic and aqueous extract of Scrophularia striata on E.coli and result of this study indicated that aqueous extract didn`t have significant effect but MIC and MBC of alcoholic extract were 90 mg/ml and 100 mg/ml (Sharafati-chaleshtori et al. 2010). Bahmani et al study showed that alcoholic extract has the same effect amphotericin Bon Candida albicans (Bahmani et al 2011).

CONCLUSION

According to the obtained result we can conclude that alcoholic extract of Scrophularia striata doesn`t have effective compounds against acinetobacter and suggested the inhibitory effect of phenol extract of this plant in future examinations.

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