Bulletin of Environment, Pharmacology and Life Sciences
Bull. Env.Pharmacol. Life Sci., Vol 4 [3] February 2015: 05-09

Online ISSN 2277-1808
Journal's URL:http://www.bepls.com
CODEN: BEPLAD
Global Impact Factor 0.533
Universal Impact Factor 0.9804

ORIGINAL ARTICLE

Comparable Anti-bacterial Activity of Three Herbal Plants with two Antibiotic Drugs against Pathogenic Bacteria

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ABSTRACT
Different types of antibiotics and chemotherapeutic agents are being used in the treatment of one form of disease or the other. Most of these antibiotics were originally derived from micro-organisms while the chemotherapeutic agents are from plants. However, nowadays these antibiotics and chemotherapeutic agents are obtained by various synthetic processes. After collecting plants peeling and dry was done. After drying, essential oil with Clevenger apparatus method was done. Susceptibility tests were performed by the disc diffuse on method of Bauer et al. In this study two antibiotic and three herbal plants essential oil effects against four bacteria was shown. In this research 5replications were done. In this study Salmonella have more than sensitivity from 3 bacteria with zone of 25.6 and Bacillus cereus have lowest sensitivity (P≤0.05).
Keywords: Antibiotics, Bacteria*, Chemotherapeutic*

Received 13.12.2014 Revised 12.01.2015 Accepted 24.01.2015

INTRODUCTION

In the recent decades, antimicrobial plant products have gained a special attention because of increase resistance to antibiotics acquired of some microorganisms [1,2]. Antibacterial activity is the ability of a substance to inhibit or kill bacterial cells. Different types of antibiotics and chemotherapeutic agents are being used in the treatment of one form of disease or the other. Most of these antibiotics were originally derived from micro-organisms while the chemotherapeutic agents are from plants. However, nowadays these antibiotics and chemotherapeutic agents are obtained by various synthetic processes (3 and 4). Infectious diseases represent a serious health problem today and account for one third of all deaths worldwide. Antimicrobials of plant origin have enormous therapeutic potential as they are effective in the treatment of infectious diseases while simultaneously mitigating many of the side effects that are often associated with synthetic antimicrobials [5, 6].The increase in prevalence of multiple drug resistance has slowed down the development of new synthetic antimicrobial drugs, and has necessitated the search for new antimicrobials from alternative sources. Natural compounds are a source of numerous therapeutic agents. Recent progress to discover drugs from natural sources has resulted in compounds that are being developed to treat cancer, resistant bacteria and viruses and immunosuppressive disorders (7). The aim of this study is Comparable Anti-bacterial activity of three herbal plants with two antibiotic drugs against pathogenic bacteria.

MATERIALS AND METHODS

Collection of plant material

Thymus vulgaris were collected on March 2014 from around of Urmia city.*Allium sativum* were prepared from Rasht city on June 2014.
Stachysschtsche gleevisosn were collected on March 2014 from around of Urmia city.

Culture and Maintenance of bacteria

Bacteria were prepared from Iranian Research Organization for Science and Technology (IROST). After preparation this agent was sub cultured. Salmonella, E.coli, *Staphylococcus aureus* and bacillus cereus were cultured on Mueller-Hinton Agar.

Table 1: characteristics of Bacteria

S. No	Name	Type	PTCC No
1	*Salmonella typhimurium*	Gram Negative bacteria	PTCC1609
2	*E.coli*	Gram Negative bacteria	PTCC1533
3	*Staphylococcus aureus*	Gram Positive bacteria	PTCC2592
4	*Bacillus cereus*	Gram Positive bacteria	PTCC1154

Preparation of plant essential oil:

After collecting plants peeling and dry was done. After drying, essential oil with Clevenger apparatus method was done. 100gram from dry mater added to 400cc sterile water and boiled on heater for 4 hours.

Media Preparation and Its Sterilization:

For the plates we prepared Mueller-Hinton Agar media. All the media prepared was then sterilized by autoclaving the media at (121°C) for 20 min.

Disc diffusion method:

Susceptibility tests were performed by the disc diffuse on method of Bauer et al [8].

RESULTS

In this study two antibiotic and three herbal plants essential oil effects against four bacteria was shown in this research 5replications were done.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
E.coli	Between Groups	3520.587	5	704.117	46.137	.000
	Within Groups	366.272	24	15.261		
	Total	3886.859	29			
B.cereus	Between Groups	4831.042	5	966.208	104.738	.000
	Within Groups	221.400	24	9.225		
	Total	5052.442	29			
S.areus	Between Groups	4216.887	5	843.377	86.631	.000
	Within Groups	233.648	24	9.735		
	Total	4450.535	29			
Salmonella	Between Groups	3062.167	5	612.433	51.828	.000
	Within Groups	283.600	24	11.817		
	Total	3345.767	29			

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Salmonella	30	13.233	10.7411	1.9610
S.areus	30	13.513	12.3882	2.2618

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Salmonella	6.748	29	.000	13.2333	9.223	17.244
S.areus	5.975	29	.000	13.5133	8.888	18.139

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
S.areus	30	13.513	12.3882	2.2618
B.cereus	30	11.717	13.1993	2.4099

One-Sample Test

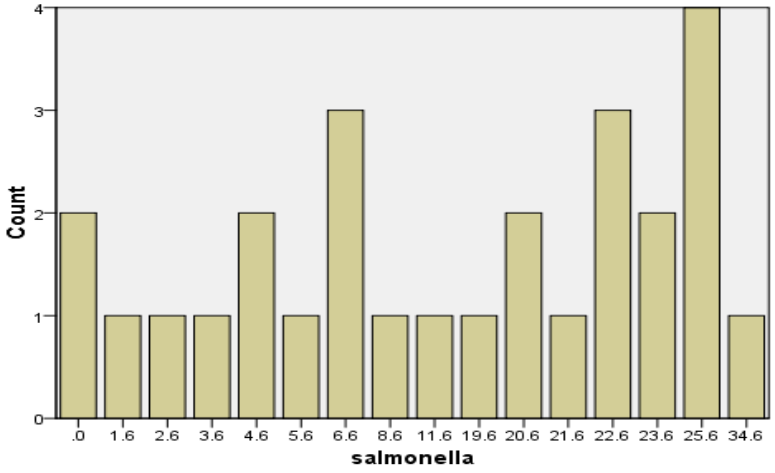
	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
s.areus	5.975	29	.000	13.5133	8.888	18.139
b.cereus	4.862	29	.000	11.7167	6.788	16.645

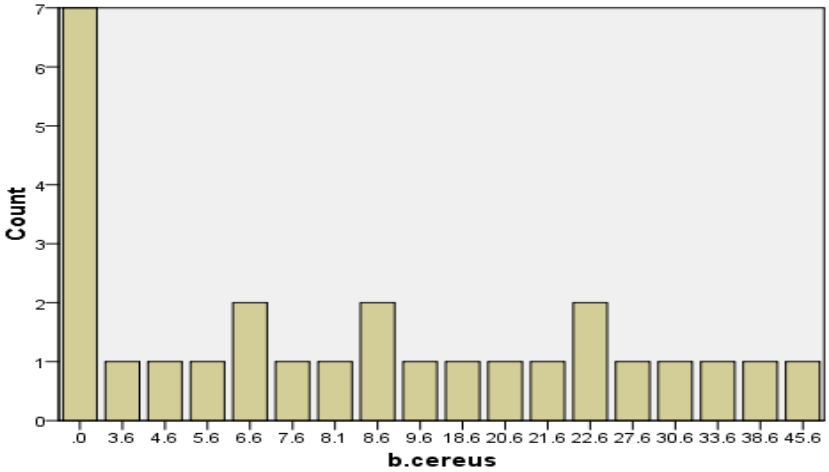
One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
s.areus	30	13.513	12.3882	2.2618
e.coli	30	14.693	11.5771	2.1137

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
s.areus	5.975	29	.000	13.5133	8.888	18.139
e.coli	6.952	29	.000	14.6933	10.370	19.016





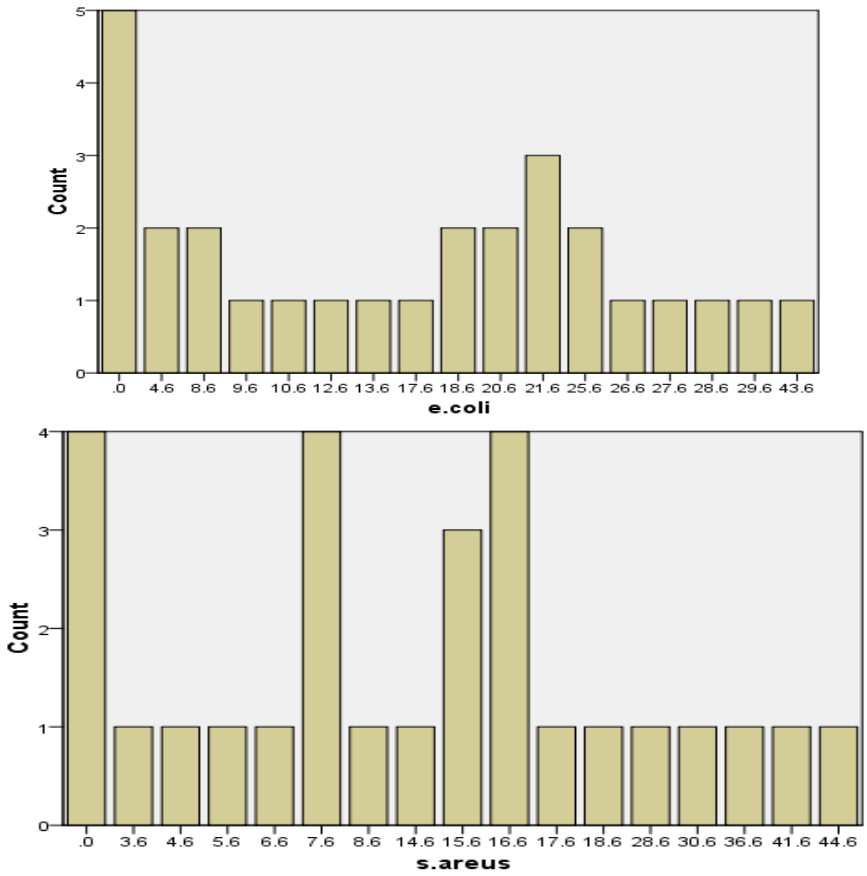


Figure: Herbal plants essential oil effects against four bacteria

In this study Salmonella have more than sensitivity from 3 bacteria with zone of 25.6 and Bacillus cereus have lowest sensitivity. (P≤0.05).

DISCUSSION AND CONCLUSION

Anti-bacterial activity of three herbal plants with two antibiotic drugs against pathogenic bacteria. Two antibiotic and three herbal plants essential oil effects against four bacteria was shown. Salmonella have more than sensitivity from 3 bacteria with zone of 25.6 and Bacillus cereus had lowest sensitivity. (P≤0.05)

In 2014 Seyyed Gholizadeh et al. whit title In vitro Anti-fungal effect of *Allium sativum* and Thymus vulgaris on two pathogenic fungi showed that *Allium sativum* have more than antifungal effect than thymus vulgaris.

In another research with title the aerial parts of Stachysschtsche gleeviiSosn. As hydro alcoholic extract has antibacterial Activity on Multi-Drug Resistant Bacterial Isolates in Comparison to Ciprofloxacin, Peyman Mikaili et al. [9] showed that Stachysschtsche gleeviiSosn have antibacterial effect against *E.coli* and *S.areus*.

ACKNOWLEDGMENT

Authors are thankful to Islamic Azad university Urmia branch for providing financial assistance in the form of a major research project. Special thanks to Dr. Gharabaghi, Mr. Marandi and Mr. Reza Delshad for helping and so thank from Dr. Gharabaghi veterinary lab.

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CITATION OF THIS ARTICLE

Amin H, Mohammad E*, SasanJalil J Reza T, Masoud A A, Ebrahim J M. Comparable Anti-bacterial Activity of Three Herbal Plants with two Antibiotic Drugs against Pathogenic Bacteria. Bull. Env.Pharmacol. Life Sci., Vol 4 [3] February 2015: 05-09