

RESEARCH ARTICLE

Screening of Antibacterial Activity In Vitro of *Eryngium creticum*

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ABSTRACT:

This study was conducted to evaluate the antimicrobial activity of tow extract of *Eryngium creticum* plant belonging to the *Apiaceae* family collected from the coastal surrounding, Tartous, Syria. Many efforts have been made to discover new antimicrobial activity from a variety of sources such as micro-organisms, animals and plants. One such source is Folk medicine. Systematic screening of them may result in the discovery of new effective compounds. These extracts were prepared with polar solvent (methanol and ethanol) by steeping extraction method. The antimicrobial activity of the extracts was assessed using the disk diffusion method against gram-positive (*Staphylococcus aureus*), and gram-negative (*Escherichia coli*) bacteria. The methanolic extracts of *Eryngium creticum* have shown antimicrobial activity against tested bacteria. The activity was compared with potent broad spectrum antibiotics such as Cefipime, Amecazine and ceftriaxon.

KEYWORDS: *Eryngium Creticum*, disk diffusion method, antimicrobial activity, extracts, *Staphylococcus aureus*, *Escherichia coli*.

INTRODUCTION:

Anti-microbial agents are undeniably one of the most important therapeutic discoveries of the 20th century. However, mankind is now faced with the global problem of emerging resistance in virtually pathogens¹. Concern has been expressed about the rising prevalence of pathogenic microorganisms, which are resistance to the newer of modern antibiotics that have been produced in the last three decades². The toxic side effects and high cost of new generation antibiotics with limited effective span have resulted in an increase in morbidity and mortality. Therefore, there is a need to look for substances from other sources with proven antimicrobial activity³. for over thousands of years, natural plants have been considered as a valuable source of medicinal agents with proven potential of treating infectious diseases and with lesser side effects compared with the synthetic drug agents.

The World Health Organization estimates that 80% of people in developing countries (65% of the world's population) still rely on traditional medicine⁴. Plants extracts have been rich sources of medicines because they produce a host of bioactive molecules, which probably evolved as chemical defenses against infection. Most active compounds in these extracts remain unidentified, and their presence is only detected by biological tests⁵. *Eryngium creticum* L (apiaceae) is perennial plant spread in Spain France Germany Balkan peninsula and other scattered in Europe and in Africa and Asia as well⁶

E. creticum contain glycosides of quercetin⁷ lypophylic extract of species of genus *Eringium* contain different phytosterols which are considered as important constituents for topical anti-inflammatory activity on acute and chronic inflammation models⁸. Many researchers have been conducted with the aim of studying the biological activities of medicinal plants and using them for the treatment of microbial infections as

possible alternatives to chemically synthetic drugs to which many infectious microorganisms have become resistant⁹. This study was aimed at evaluating the antimicrobial property in vitro of methanolic extract of *S. officinalis* L cover of berries.

MATERIAL AND METHODS:

Plant extracts:

The used part of the plant material (leaves) were dried in an oven at 40° for one hour every day for a week until the stability of weight and then grounded to a fine powder in a mechanic grinder. The powdered plant materials (30g) were then extracted with (300ml) of methanol 70% for 72 hours by steeping method^{3,9}, the extracted fraction was (1g:10 ml). Following filtration with what man filter paper (No 1), all extracts were concentrated and evaporated to dryness at room temperature. The yields from the different extracts were weighed and dissolved in dimethyl sulphoxide (DMSO) to form a mother solution (500mg/1ml) for each extract, then two dilution (50,100 mg/ml) were made from each mother solution. All extracts were maintained at +4°C until being used for disk diffusion assay⁹.

Test Microorganisms:

The extracts inhibitory effects were tested against two microbial species including *Escherichia coli*, *Staphylococcus aureus* obtained from Al Assad Hospital, Lattakia. The bacterial culture of test organisms were maintained on Muller Hinton Agar at 4°C, and were subcultured in petriplates (90mm) prior to use¹⁰. DMSO was used as a negative control under the same condition for the tested microorganisms. Ceftriaxone (Abtek®), Cifipime (Abtek®) and Amikcine (Abtek®) 30µg/disc) was used as a positive control. for the tested microorganism. Amicacin, cefipime and ceftriaxon (30 mcg/disc) was used as a positive control. The tests were carried out in duplicate. Antimicrobial activity was evaluated by measuring the zone of inhibition (mm) against the tested microorganisms¹¹.

Determination of Antimicrobial activity

The antimicrobial activities of the methanol extracts by the different concentration as well as the positive control Amicacin, cefipime and ceftriaxon were tested by means of the disk diffusion assay against two human pathogenic bacterial strains, including Gram positive (*S aureus*) and Gram negative (*E coli*)¹². Approximately two cultures from each bacterial stain were inoculated over the surface apetri plates containing Muller Hinton Agar using sterile swab sticks. Whatman paper disk injected by 20 mcl of each concentration and ceftriaxon and amikacin disks were placed on the surface of petri plates. The plates were incubated at 37°C for 24 hours¹³. The inhibition zones were calculated by measuring the diameters (mm) of inhibition in (including disk).

Experiments were performed in duplicate and inhibition zones were compared with the positive control¹⁴.

RESULTS:

The anti-bacterial activities of leave extracts were evaluated in vitro against *E. coli*, *S. aureus*, which are known to cause common infectious diseases. The results of antibacterial activity were recorded as zone of inhibition in mm around the active extract against the test microorganisms compared with the standard antibiogram Ceftriaxone, cefipime and Amikacin as positive controls¹⁵. Methanolic extract of *S. Officinalis* has shown antibacterial activity against test organisms. The diameters of zone inhibition of this extract against *S.aureus* were (11-14mm) compared with the diameters of zone inhibition of cefipime (16mm) and ceftriaxone (12 mm). The diameters of zone inhibition of the extract against *E.Coli* were (12-13mm) compared with the diameters of zone inhibition of Amicacin (16mm) and cefipime (8mm).

As shown in table 1, all concentration of methanolic extract have shown good inhibitory effects against the tested bacteria.

Table 1: Antibacterial activity of metanolic extract of the fruits of *Eryngium Creticum*

	50	100	500	cefp	ceft	Ami
<i>S.aureus</i>	11	12	14	16	12	-
<i>E.coli</i>	12	13	13	8	-	16

Metanolic extracts mg/ml

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