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Evaluation of Antibacterial Activity of Water and Alcoholic Extracts of *Coriandrum Sativum* (Fruit)

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Abstract

Aqueous and alcoholic extract of *Coriandrum sativum* (Fruit) were evaluated against pathogenic bacteria. Results showed that the [MIC] of aqueous extract for these pathogenic bacteria (*Staphylococcus aureus, Klebsiella pneumonia, Pseudomonas auer and E. coli*) ranged between (8192-16384) □g/ml while MIC of alcoholic extract for above pathogenic bacteria ranged between (4096-16384) □g/ml. There is no significant difference between the two extracts effectives.

تقدير الفعالية البايولوجية للمستخلص المائي والكحولي لثمار نبات الكزبرة

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المستخلص

تم قياس وتقدير الفعالية البايولوجية لمستخلص حبة الكزبرة المائي والكحولي تجاه بعض البكتريا المرضية. اظهرت النتائج باستخدم تراكيز مختلفة في الوسط الزرعي ان معدل التركيز المؤثر للمستخلص المائي يتراوح ولكافة العزلات البكتيرية () ما بين (٨١٩٢-١٦٣٨٤) مايكروغرام/مللتر. وان التركيز المؤثر عليها من المستخلص الكحولي يتراوح ما بين (٤٠٩٦-١٦٣٨٤) مايكروغرام/مللتر. لا توجد فوارق معنوية بين المستخلصين، بسبب تقارب الاستقطاب للمحلولين.

Introduction

Coriandrum Sativum belong to Umbelliferae family its an annual aromatic herb 30-91 cm high.The herb was grown in the Mediterranean region central and Eastern Europe, Eastern Asia and North and South America (1,2). In Iraq it was cultivated in a small scale as winter crop especially in the middle and lower regions (1). The leave stem and in fact every part the plant posses, a pleasant aromatic odor and are used as a flavoring agent (1). Coriander was caminative tonic stomachic antibilious and refrigerant, it was employed also to control the distasteful odor of some medicine and the seeds were chewed to remove foul smell of the mouth and they were considered useful to eliminate intoxicating effect of liquors (1,2), it also used to decrease the sugar levels in blood (3,4) also to stimulates the secretion of gastric juices and spasmalytic in vitro, it has antibacterial and antifungal effects and inhibition of growth and lactoxin production in Aspergilla parasites due to its contents of essential oil (2,5,6), anticonvulsant effects (7).In folk medicine, Coriander was also used for digestive, gastric complaints; in other culture for coughs, chest pains, bladder, complaints leprosy rash, fever, dysentery, externally, for headaches oral, and pharyngeal disorder halitosis post partal complications (2). Also seeds having antiperoxidative effect and hypolidemic (8,9).Chemical of analysis Coriander gave the following composition.Coriander yield colorless pale yellow oily the chief constituent of which was linalal (4-7%). The other constituents were □-pinene, □-pinene, □-eymine dipentene, Y-terpinene, phellandrene, terpinolene, and traces of gernial, 1-borneal, n-decylaldehyde (2,11,12,13).Besides the essential oil the seeds also contain a dark brown fatty oil (21%) having a Coriander like smell contains about 2-3% unsaponifiable matter and also insoluble fatty acids like palmitic, petroselinic and linoleic acid (1).

Materials and Methods

1. Collection plant

Coriandrum sativum (fruits) were obtained from markets, cleaned and crushed to fine powder then kept at (25 °C).

2. Methods of extraction

In order to obtain plants extracts for evaluation of their bacterial activity the following procedures were carried out.

2.1 Alcoholic extract

The *coriandrum sativum* (fruits) were cleaned and was extracted by soxhlet apparatus over night with 500 ml 95% ethanol, the solution filtered using filter paper No1, then the extract was evaporated to nearly dryness under reduced pressure and transferred to glass Petri-dish and completely dried by incubator (14).

2.2 Water extract

50 gm of fine powder of the fruits infused in distilled water (500 ml) and placed in a sterile conical flask and stirred by magnetic stirrer at room temperature for 24 hrs.the slurry was filtered and the extract was evaporated under reduced pressure nearly to dryness. The residue was transferred to glass Petri-dish and dried completely to solidify in an incubator, then kept in refrigerator (14).

2.3 Biological activity of the extract

2.3.1 Bacterial isolates

Bacterial isolate were obtained from microbiology department, college of medicine, Tikrit University, each of the following were included in present of study.

1-Staphylococcus aureus.
2-Pseudomonas aeruginosa.
3-Klebsilla pneumonia.
4-Escherichia coli.

*.3.2 Determination of minimal inhibitory concentration (MIC) of alcoholic and aqueous extracts of Coriander fruit*This was performed according to the procedure described by Kady et al. (15) Muller-Hinton agar plates contained concentrated alcoholic and aqueous in 2-fold dilution were prepared, all plates were inoculated with bacteria and incubated at (37 °C) for 24 hrs. The Mics of the extract was determined as the test shows growth inhibition

Results and Discussion

Minimal inhibitory concentration (MIC) of aqueous and alcoholic extracts for some bacterial isolates

The results showed that antibacterial activity was performed by increasing the concentration of extracts in the media, the MIC of aqueous extract for *Staphylococcus aureus*, *Klebsiella pneumonia* and *E. coli* ranged between (8192-16384) µg/ml while for *Pseudomonas aeruginosa* was (8192) µg/ml Table (1).(MIC) of alcoholic extracts for *Staphylococcus aureus* ranged between (4096-8192) µg/ml. MIC for *Pseudomonas aeruginosa* was (8192 µg/ml). (MICs) for *Klebsiella pneumonia* and *E. coli* ranged between (8192-16384 µg/ml) Table (2).The results showed that there were no significant difference between aqueous and alcoholic extract activity against bacteria isolates which may be due to the similarity of constituents of the two solvents and may have the nearest polarity

Table (1): Minimal inhibitory concentration (MIC) of aqueous extract *Coriandrum sativum* (fruit) to some bacterial isolates

Isolate	No. of strain	No. (%) of isolates						
		512	1024	2048	4096	8192	16384	32768
Staphylococcus aureus	10	+	+	+	2(20)	4(40)	-	-
Pseudomonas aeruginosa	10	+	+	+	+	-	-	-
Klebsiella pneumonia	10	+	+	+	+	6(60)	-	-
Escherichia coli	10	+	+	+	+	8(80)	-	-

(+) growth are seen in all isolates (-) no growth.

Table (2): Minimal inhibitory concentration (MIC) of alcoholic extract *Coriandrum sativum* (fruit) for some bacterial isolates

Isolate	No. of strain	No. (%) of isolates						
		512	1024	2048	4096	8192	16384	32768
Staphylococcus aureus	10	+	+	+	2(20)	4(40)	-	-
Pseudomonas aeruginosa	10	+	+	+	+	-	-	-
Klebsiella pneumonia	10	+	+	+	+	4(60)	-	-
Escherichia coli	10	+	+	+	+	6(80)	-	-

(+) growth are seen in all isolates (-) no growth

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