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Saudi Garlic Outcome on Microbes Cause Gastrointestinal Infections

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Abstract

Garlic (*Allium sativum* Linn.), commonly used, possesses a comprehensive range of antimicrobial action. The goal was to test the health properties of Saudi garlic to eliminate the gut pathogenic microbes. The methodology included the collection of Saudi garlic, the extractsthe extracts were prepared, and the pathogenic microbes that cause gastrointestinal infections were tested. The results showed the first score included *Staphylococcus aureus* was eliminated with the boiled extract within twenty-four hours, and forty-eight hours, it was eliminated with the hot extract. The second score included *Shigella dysentery*, *Campylobacter jejun*i, and *Escherichia coli, which* were eliminated within forty-eight hours by the hot and boiled extract. The third score included *Closterdium* sp., *Bacillus cereus*, and *Salmonella enteritica* were eliminated with the presence of some little colonies. The fourth score included *Candida* sp., *Aspergillus* sp., *Cryptococcus neoformans*, and *Saccharomyces services* were partially eliminated. It was decided that the active substances in Saudi garlic could eliminate pathogenic microbes that cause gastrointestinal infections. It was suggested that the pharmacy department be active in determining the permissible quantity of Saudi garlic for an individual to use according to his health condition.

Keywords: Garlic (*Allium sativum* Linn.), pathogenic microbes, gastrointestinal infections.

Introduction

Garlic (*Allium sativum* Linn.), commonly used, possesses a comprehensive range of antimicrobial action. The main antimicrobial component as that Organo-sulfur compounds have antimicrobial actions such as microbicidal, anti-biofilm, anti-toxin, and anti-quorum sensing action against microbes. The reactive disulfide promises with free sulfhydryl collections of enzymes and cooperation the microbial membrane honesty. Multiple antimicrobial effects are

outstanding in the outline for growing hooked on original antibiotics (1). Phenols and phenolic compounds have anti-quorum sensing potential and defeat the biofilm creation and toxin making. The antimicrobial, -quorum sensing, anti-biofilm, and anti-enterotoxin activities, distinct attention to microbes (2). Organic sulfides have numerous typical possessions of acids, such as chemical formula, physical form, pKa value, and molecular weight, that give minimum inhibitory concentration (3). Saponins inhibit microbe's growth and decrease microbial protein synthesis and flow efficiency (4). Polysaccharide allicin is a strong antimicrobial, shows toxic effects towards fungal cells, and inhibits spore incubation and hyphal development. It has been made to utilize this activity and develop allicin for medical treatment requests. They inhibit microbial growth by constraining the DNA and protein mixture partly lengthways with RNA reserve synthesis as the main target. They are carried out allicin to stop the RNA mixture by tricking the RNA peptides cable response and antimicrobial intensification (5). Alliin has enzymatically hydrolyzed to produce allyl sulfenic acid, which condenses spontaneously to allicin (6). S-allyl-cysteine activates inflammation reactions and increases destroy microbial cells (7). Diallyl sulfide, diallyl di-sulfide, and diallyl tri-sulfide block microbial quorum-sensing genes (8). Ajoene stops microbial growth by stopping the activity of cells (9). Garlic has main antimicrobial content, which is the main antimicrobial that destroys the structure and the metabolic process of microbial cells. Garlic inhibits the fungus by penetrating cell organelles, destroying the cell construction, then penetrating cell organelles, destroying the cell construction, then making the cytoplasm and macromolecules leak (10).

Garlic has antibacterial activities and s the development of Staphylococcus aureus, *Escherichia coli*, and *Bacillus* sp. Garlic extracts possess a potent bacteriostatic was affected *Bacillus cereus*, *Staphylococcus aureus*, *Clostridium* sp., *Escherichia coli*, *Salmonella* sp., and *Shigella* sp., by inhibited cell growth (11). Garlic extract had antimicrobial action, so it affected *Campylobacter jejune* by stopping cell growth with increased immune cell activity (12). Garlic-disrupted *Candida* sp., metabolism was related to the outline of key genes complicated in oxidative phosphor-rylation, the cell series, and protein dispensation in the endoplasmic net (13). Garlic has a comprehensive range of antimicrobial and antifungal properties and repressed *Aspergillus* sp. growth (14). Garlic extract had antifungal action, so it stopped the growth of *Cryptococcus neoformans*, and *Saccharomyces services* (15).

The Saudi garlic still using for food needed to be important for maintaining the health of the body, so Saudi garlic needed to be still one of the important plants with qualities to protect health from diseases. The goal was to test the health properties of Saudi garlic to eliminate gut pathogenic microbes. The method involved conducting a laboratory experiment using Saudi garlic.

Materials and Methods

Saudi garlic was purchased from the local market and peeled to prepare (cold, warm, hot, and boil) extracts (17). The microbial isolates were *Staphylococcus aureus*,

Shigella dysentery, *Campylobacter jejune*, *Escherichia coli*, *Closterdium* sp., *Bacillus cereus*, *Salmonella enteritica*, *Candida* sp., *Aspergillus* sp., *Cryptococcus neoformans*, and *Saccharomyces cervices*. They were isolated from cases of gastrointestinal infections and were diagnosed with micro-scans (17). They were cultured on Mueller-Hinton agar and then on Mueller-Hinton broth (18).

Three ml of microbial broth was placed in a sterile test bottle, and three ml of extract was placed. They were incubated for twenty-four and forty-eight hours. The incubated mixture was followed by "Filtration and Colony Forming Unit". The averages were obtained to make scores by a statistical method (19).

Results

Table (1) and diagram (1) presented the filtration and colony-forming unit after extracts were contacted. The first score included *Staphylococcus aureus*, which was eliminated with the boil extract within twenty-four hours, and within forty-eight hours, it was eliminated with the hot extract. The second score included *Shigella dysentery*, *Campylobacter jejun*i, and *Escherichia coli, which* were eliminated within forty-eight hours by the hot and boiled extract. The third score included *Closterdium* sp., *Bacillus cereus*, and *Salmonella enteritica* was eliminated with the presence of some little colonies, which are considered very few, by the hot and boiled extract. Therefore, it was necessary to prolong the period of exposure to the extract to eliminate the pathogenic microbes infect digestive system completely. The fourth score included *Candida* sp., *Aspergillus* sp., *Cryptococcus neoformans*, and *Saccharomyces services* were partially eliminated.

Table (1): The filtration and colony forming unit after extracts contacted

Microbial names	Scores	Hours	Extracts			
			Cold	Warm	Hot	Boil
Staphylococcus aureus	I	24 hours	(34-39) M 36.5	(27-29) M 28.0	(19-23) M 21.0	(0-0) M 0.0
		48 hours	(23-29) M 26.0	(14-20) M 17.0	(0-0) M 0.0	(0-0) M 0.0
Shigella dysentery ***Campylobacter jejuni*** ***Escherichia coli***	II	24 hours	(45-49) M 47.0	(32-39) M 35.5	(28-34) M 31.0	(10-16) M 13.0
		48 hours	(33-38) M 35.5	(21-26) M 23.5	(0-5) M 2.5	(0-0) M 0.0
Closterdium* sp.** ***Bacillus cereus ***Salmonella enteritica***	III	24 hours	(53-60) M 56.5	(41-47) M 43.5	(37-40) M 38.5	(26-29) M 27.5
		48 hours	(38-43) M 40.5	(27-31) M 29.0	(0-7) M 3.5	(0-4) M 2.0
Candida* sp.** ***Aspergillus* sp.** ***Cryptococcus neoformans ***Saccharomyces services***	IV	24 hours	(61-66) M 63.5	(54-59) M 56.5	(46-49) M 47.5	(31-35) M 33.0
		48 hours	(48-53) M 50.5	(34-39) M 36.5	(20-24) M 22.0	(10-15) M 12.5

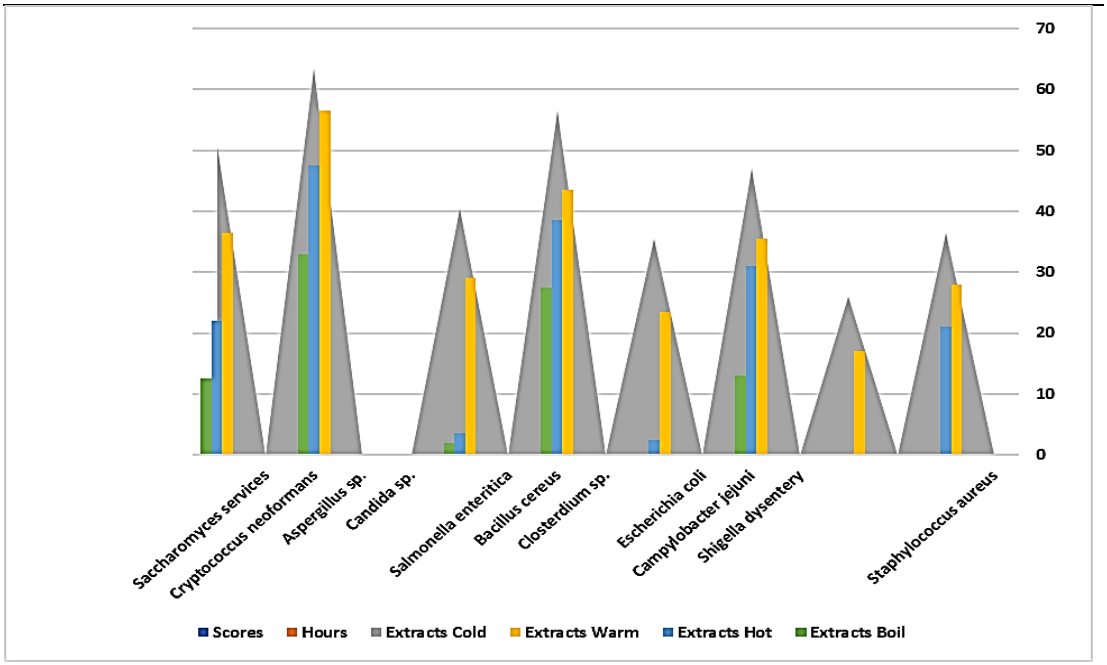

Diagram (1): The filtration and colony forming unit after extracts contacted

Discussion

Table (1) and diagram (1) presented the filtration and colony-forming unit after extracts contacted. Saudi garlic is considered one of the important sources of natural substances that kill pathogenic microbes that affect the digestive system. Therefore, it is used in food in daily life. It is considered one of the important materials because it contains substances that kill the pathogenic microbes that affect the digestive system (1, 10).

The results showed that pathogenic microbes infected the digestive system and were divided into four scores based on the extracts' effect. It turns out that the most powerful extract (hot and boiling) leads to the elimination of pathogenic microbes that infect the digestive system. As for the other extracts (cold and warm), they partially eliminated the pathogenic microbes that infect the digestive system, but not completely. This suggests that the extract contains a low percentage of active substances, and a longer exposure period may be necessary to eliminate the pathogenic microbes infecting the digestive system (1, 10).

The first score included *Staphylococcus aureus*, which was eliminated with the boil extract within twenty-four hours, and within forty-eight hours, it was eliminated with the hot extract. The second score included *Shigella dysentery*, *Campylobacter jejun*i, and *Escherichia coli*, which were eliminated within forty-eight hours by the hot and boiled extract. The third score included *Closterdium* sp., *Bacillus cereus*, and *Salmonella enteritica* was eliminated with the presence of some little colonies, which are considered very few, by the hot and boiled extract. Therefore, it was necessary to prolong the period of exposure to the extract to that infect

the digestive system. The fourth score included *Candida* sp., *Aspergillus* sp., *Cryptococcus neoformans*, and *Saccharomyces services* were partially eliminated. It must be exposed for a longer period to eliminate the pathogenic microbes that infect digestive system completely [11, 15).

The results indicated the strength of the active ingredients in Saudi garlic that pathogenic microbes infecting the digestive system, which indicated their role in preventing and treating pathogenic microbial infections of the digestive system. Accuracy in using Saudi garlic must be taken according to the individuals' health condition to benefit without harm (1, 15).

Conclusion

It was decided that the active substances in Saudi garlic could eliminate pathogenic microbes that cause gastrointestinal infections.

Acknowledgment

Our thanks and appreciation were extended for the assistance in extracting the current research.

Conflicts of interest

The authors declare that there is no conflict of interest.

Ethical Clearance

This work is approved by The Research Ethical Committee.

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نتيجة الثوم السعودي على الميكروبات المسببة لالتهابات الجهاز الهضمي

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الخلاصة

يتميز الثوم (*Allium sativum Linn*.) حيث يستخدم بشكل سائد، وجد انه يمتلك مجموعة مشتملة التي تسبب الأثار المضادة للميكروبات. كان الهدف اختبار الخصائص الصحية للثوم السعودي في القضاء على الميكروبات المسببة للأمراض المعوية. تضمنت الأدوات والطرق جمع الثوم السعودي، إعداد المستخلصات، واختبار الميكروبات التي تسبب التهابات الجهاز الهضمي (الامراض المعوية). قد أبدت النتائج كلا من، شملت النتيجة الأولى القضاء على بكتيريا *Staphylococcus aureus* باستخدام مستخلص الثوم بالغليان في خلال أربع وعشرين ساعة، انما في خلال ثمان وأربعين ساعة تم القضاء عليها باستخدام مستخلص الثوم الساخن. شملت النتيجة الثانية القضاء على بكتيريا *Shigella dysentery, Campylobacter jejuni*, *Escherichia coli* في خلال ثمان وأربعين ساعة باستخدام مستخلص الثوم الساخن والغليان. شملت النتيجة الثالثة القضاء على بكتيريا *Closterdium* sp., *Bacillus cereus*, *Salmonella enteritica* مع وجود بعض المستعمرات الصغيرة. اشتملت النتيجة الرابعة القضاء جزئيا على فطريات *Candida* sp., *Aspergillus* sp., *Cryptococcus neoformans*, *Saccharomyces services*. تم اثبات ان المواد الفعالة في الثوم السعودي قادرة على القضاء على الميكروبات المسببة للأمراض المسببة التهابات الجهاز الهضمي. اقترح أن يكون قسم الصيدلة فعالا في احتساب الكمية المسموح بها من الثوم السعودي للفرد توفقا لحالته الصحية.

الكلمات المفتاحية: الثوم (*Allium sativum Linn*.)، الميكروبات المسببة للأمراض، التهابات الجهاز الهضمي.