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Research Article

The Saudi Wild Lavender Components Consequence on The Zoonotic Bacteria

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Abstract:

Lavender (Lavandula pubescens) wild flora in the Kingdom of Saudi Arabia (KSA), call "Saudi Wild Lavender", it has aroma and flavor is due to essential oils, and biological activity use in traditional medicine and anti-zoonotic bacteria for food. The importance was to use the "Saudi Wild Lavender" oil extracts, to eliminate the zoonotic bacteria that transmitted through food to humans, causing food spoilage, loss of food quality, reducing food storage time, and causing humans food poisoning. The goal was laboratory experiment to make an oil extracts and tested against the zoonotic bacteria. The results revealed the fastest way of the "Saudi Wild Lavender" oil extract to eliminate the zoonotic bacteria was the "Saudi Wild Lavender" crude oil extract, followed by the oil extract, which contained oil extract two-thirds, then the oil extract one-third. The first level was included Staphylococcus sp. bacteria was eliminated by the crude oil extract on the first night, while the rest were eliminated on the second night. The second level was included Campylobacter jejuni, and Escherichia coli bacteria, that were eliminated on the second night by the crude oil extract, and two third oil extracts. The third level was included Listeria monocytogenes was eliminated by the crude oil extract on the second night only. The fourth level was included Salmonella sp., as the growth was reduced the bacterial dry weights and not completely eliminated. It was concluded that the extent of the ability of the components of the "Saudi Wild Lavender" to eliminate the zoonotic bacteria that may cause food spoilage. It helped in preserving food and reduced the food poisoning incidence. It was recommended that a suitable extract of the "Saudi Wild Lavender" be used in the healthy amount appropriate to preserve food and ensure food quality.

Keywords: Lavandula pubescens, Saudi Wild Lavender, Staphylococcus sp. Campylobacter jejuni, Escherichia coli, Listeria monocytogenes, Salmonella sp

1. Introduction:

Lavender (Lavandula pubescens) is commonly found among the wild flora in the Kingdom of Saudi Arabia (KSA), so calling the "Saudi Wild Lavender" [1]. The lavender has a large part of the aroma and flavor is due to essential oils, some have also biological activity use in traditional medicine. Lavender have been used in medicine, as antimicrobial, antiseptic, and broncho-pulmonary infections therapy [2]. The lavender has antibiofilm activity, which inhibit the formation of biofilm, as antibacterial effects. It has interaction in pathogen cell respiration leads to change in cell respiration causes separation of oxidative phospho-rylation, carbonylation increase bacteriostatic activity so inhibits microbial growth, and has sterile possible.

Lipo-philicity and/or hydro-phobicity and hydroxyl groups decisive elements of their antibacterial effect. That reported to lipid membrane lowering activity by interacting with lipo-philic tails of inter-membrane lipid and polar head groups [3]. The lavender has bactericidal effects, antimicrobial activity against twenty five different phytopathogenic bacteria ability to permeabilize and depolarize the cytoplasmic membrane, so inhibit bacterial growth [4]. The lavender methyl ether and Caryophyllene oxide have disintegrated outer membrane of bacterial cells [5]. The lavender has antibacterial action against *Salmonella enterica* and *Staphylococcus aureus* [6].

The importance was to use the "Saudi Wild Lavender" oil extracts, which contained powerful substances to eliminate the zoonotic bacteria that transmitted through food to humans, causing food spoilage, loss of food quality, reducing food storage time, and causing humans food poisoning. The goal was to make the "Saudi Wild Lavender" oil extracts and tested against the zoonotic bacteria. The methodology was a laboratory experiment for the materials under study, which included the "Saudi Wild Lavender" oil extracts and the zoonotic bacteria.

Methodology:

Crude oil extract:

The "Saudi Wild Lavender" was obtained from the main area in KSA. The plant parts were clear with distilled water, then were dried in oven at 50°C for loss wetness, and it was electric mixed to reveal powder. The powder 100 g and Ethanol 500 ml were placed in the "Soxhlet Device", for distillation. After extraction procedure, the solvent and extractor were located on water bath for solvent evaporation, and the crude oil extract was resulted [7].

Crude oil dilution:

The crude oil extract was diluted into one-third and two-thirds, was by additional mineral created liquid average has Peptone 5.0g/L, Sodium Chloride 5.0g/L, and Yeast Extract 3.0g/L [8].

Zoonotic bacteria:

The zoonotic bacteria were collected from private laboratory, were identified as the zoonotic bacteria, and were included *Staphylococcus* sp., *Campylobacter jejuni*, *Escherichia coli*, *Listeria monocytogenes*, and *Salmonella* sp. The isolates were cultured on Mueller Hinton Agar, and were incubated at 37°C for one night. The pure colonies were transferred to Mueller Hinton Broth and were incubated for four to six hours at 37°C [9].

Laboratory trial:

The sterile capped tubes were prepared, three tubes were used for each extract. Three ml of oil extract and three ml of culture were added to each isolate. The incubation was done for one and two nights at 37°C. The mixture was filtered with the Bacterial Filter Paper, then the dry weight method in grams was performed for the remaining cells after exposure to the oil extract [10].

Data analysis:

The results were obtained, then the arithmetic median was created, and statistics were used, then it was presented in a table to results clarify [11].

Results and discussions:

Table (1): The bacterial dry weight in gram after oil extract interaction

Bacteria	Time	Oil extract			Mean	Level
		One third	Two third	Crude		
Staphylococcus sp.	One night	0.12gm ±0.02	0.07gm ±0.01	0.00gm ±0.00	0.06gm	I
	Two nights	0.00gm ±0.00	0.00gm ±0.00	0.00gm ±0.00	0.00gm	
Campylobacter jejuni	One night	0.27gm ±0.03	0.13gm ±0.02	0.02gm ±0.01	0.14gm	II
	Two nights	0.11gm ±0.02	0.00gm ±0.00	0.00gm ±0.00	0.04gm	
Escherichia coli	One night	0.29gm ±0.03	0.16gm ±0.01	0.03gm ±0.01	0.16gm	
	Two nights	0.15gm ±0.02	0.00gm ±0.00	0.00gm ±0.00	0.05gm	
Listeria monocytogenes	One night	0.38gm ±0.02	0.21gm ±0.01	0.09gm ±0.01	0.23gm	III
	Two nights	0.20gm ±0.01	0.10gm ±0.02	0.00gm ±0.00	0.10gm	
Salmonella sp.	One night	0.49gm ±0.02	0.33gm ±0.01	0.13gm ±0.02	0.32gm	IV
	Two nights	0.35gm ±0.02	0.21gm ±0.01	0.04gm ±0.01	0.20gm	

Table (1) was cleared the bacterial dry weight in gram after oil extract interaction, the results revealed the effect of the "Saudi Wild Lavender" oil extract on the zoonotic bacteria, that was through the basic components of the "Saudi Wild Lavender" oil extract because of the contains ability as anti-zoonotic bacteria [2-6].

The fastest way of the "Saudi Wild Lavender" oil extract to eliminate the zoonotic bacteria was the "Saudi Wild Lavender" crude oil extract, followed by the oil extract, which contained oil extract two-thirds, then the oil extract one-third [2-6, 12].

It was clear from the results that the "Saudi Wild Lavender" oil extract effect was divided into four levels according to the

elimination time of the zoonotic bacteria.

The first level was included *Staphylococcus* sp. bacteria was eliminated by the "Saudi Wild Lavender" crude oil extract on the first night, while the rest were eliminated on the second night by the all "Saudi Wild Lavender" oil extract. The average of bacterial dry weights represented in the first night was 0.06gm, and 0.00gm for the second night [2-6, 13].

The second level was included *Campylobacter jejuni*, and *Escherichia coli* bacteria, that were eliminated on the second night by the "Saudi Wild Lavender" crude oil extract, and two third oil extracts. The mean bacterial dry weights were for *Campylobacter jejuni* as 0.14gm and 0.04gm respectively. The mean results were for *Escherichia coli* as 0.16gm and 0.05gm respectively [2-5].

The third level was included *Listeria monocytogenes* was eliminated by the "Saudi Wild Lavender" crude oil extract on the second night only. The mean bacterial dry weights were 0.23gm and 0.10gm for one night and two night respectively [2-5].

The fourth level was included *Salmonella* sp., as the growth was reduced the bacterial dry weights and not completely eliminated. The bacterial dry weights average was at the first night 0.32gm, and at the second night was 0.20gm. These bacteria need a longer period of exposure to the "Saudi Wild Lavender" crude oil extract to completely eliminate the growth [2-6].

The "Saudi Wild Lavender" crude oil extracts components indicated the power to eliminate the zoonotic bacteria, and it was the important Saudi Wild plants that were used to eliminate the zoonotic bacteria, reduced food spoilage, and also good food preservation, and reduced the food poisoning incidence [2-6, 14].

The "Saudi Wild Lavender" is considered one of the national wild plants that was described as containing substances that kill the zoonotic bacteria and is still used in food preservation to maintain food quality [2-6, 15].

Conclusions:

It was determined from the results the extent of the ability of the components of the "Saudi Wild Lavender" to eliminate the zoonotic bacteria that may cause food spoilage. It helped in preserving food and reduced the food poisoning incidence.

Recommendations:

It was suggested that a suitable extract of the "Saudi Wild Lavender" be used in the healthy amount appropriate to preserve food and ensure food quality.

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