

Effect of Quercus Cortex Extract with Alum for Bacterial Metritis and Vaginitis Treatment in Different Ages in Cows

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Abstract

This study was conducted at AL-Najaf AL-ashraf by using 100 cows had metritis and vaginitis from three breeds (local, Australian and Friesian crossbred) in different ages (5 to 8) years old from the period of 1/11/2012 – 1/4/2013. Results showed significant effect ($P \leq 0.05$) for the different concentrations of Quercus cortex extract with alum for metritis, vaginitis and pregnancy ratio. Overall means was about (59.68, 61.33 and 56.75) % respectively. Significant effect ($P \leq 0.05$) was found for breed on treatment ratio from metritis, vaginitis and pregnant ratio. Least ratios were found in T. cont. in Friesian breed it's about (20,19 and 19)% respectively. But the highest ratio of treatment were found by using 20% from Quercus cortex extract with alum in local breed it's about (87, 90 and 87) % respectively. Significant effect ($P \leq 0.05$) for cows ages in all traits that studied. The overall means was about (59, 61.25 and 60.75) % respectively. Least ratios were found in T-cont. In 8 years old. But the highest ratios of treatment were found by using 20% from extract in 4 years old. Different concentrations from the extract and parity were affected significantly ($P \leq 0.05$) in Metritis, Vaginitis treatment and pregnancy rate. The overall means were about (63.70, 59.35 and 59.05) % respectively. Least rate was found in T. cont. in 5th parity. The highest ratio of treatment was found by using 20% from the extract in 1st parity. Significant effect ($P \leq 0.05$) of Quercus cortex extract with alum in metritis, vaginitis and pregnancy ratio according to the causative agent. Least ratios were found in T. cont. with *Staph. Epidermidis*, it's about (14,10 and 10)% respectively. But the highest ratio of treatment were found by using 20% from extract with *E.coli* it's about (89, 92 and 87) % respectively. The overall means were about (56.82, 61.6, 68, 314). Sensitivity test was made in vitro for all types of isolated bacteria for each alum, Quercus cortex extract and mixture of them. Results showed that all types of bacteria were sensitive to the all substances in a variety grades but it is identical within the same level.

Keywords: Quercus cortex; Metritis; Vaginitis; Cows

Introduction

Quercus brantii is big high tree (25-30) m height has unisex flours; It's flowering in May. The cortex was hard and rough with dark color [1]. The cortex extract was used for: anal and uterine prolapsed, infected wound, nerve weakness treatment and stop bleeding. Chemical compounds of *Quercus brantii* were Alkaloids, Phenols, Saponins, Turpentine, Ratings, Coumarone, Tannins, Glutamine, Flavonoides, Glycosides, Pectin and different acids, many of these compounds were antibacterial [2]. Alum is in reference to potassium alum, which is the hydrated form of potassium aluminum sulfate and has the chemical formula $KAl(SO_4)_2 \cdot 12H_2O$. However, any of the compounds with the

empirical formula $AB(SO_4)_2 \cdot 12H_2O$ are considered to be alum. Alum has several household and industrial uses. Potassium alum is used most often, although ammonium alum, ferric alum and soda alum may be used for many of the same purposes [3].

Metritis in cows is one of the distributed diseases generally in world and especially in Iraq. Due to distribute of causative agents, like Bacteria, Viruses, Fungi and Parasites [4]. From the bacterial causative agents are: *Escherichia coli*, *Archano bacterium*, *Staphylococcus*, *Fuso bacterium*, *Prevotella*, *Clostridium*, *Streptococcus*, *Peptococcus*, *Bacillus* and others [5]. These causative agents can enter female genital tract by many methods and causes different diseases. The most important of

these diseases were metritis. This leads to less fertilization, lack of parturitions, milk production deficiency. And may leads to lots of animal itself. Causative agents make resistant for antibiotics and chemical medicines, when it used for a long time [6]. They are expensive and causes side effect such as irritation of genital tract mucosa and estrus cycle effect [7]. But the Quercus cortex extract with alum were characterized by cheap, broad spectrum, high activity, less period treatment, with less or without side effect. For that the aim of this study was treatment of metritis and vaginitis caused by different bacteria with different ages and breeds.

Materials and Methods

Materials

Disinfectants, sterilizers, surgical gloves, long nylon gloves, waxes, vagino scope, Transport media swab, cooler, Uterine swab, Autoclave, Petri dishes, different types of culture media, incubator, ruler, Quercus extract, alum.

Experimental animals

In this study was used 100 cows had metritis and vaginitis from three breeds (local, Australian and Friesian crossbred) in different ages (5 to 8) years old. Cows were divided in to four groups randomly and equally numbers 25/ group (T1. control while T2, T3 and T4 were treated by 10, 15 and 20) gm/100ml of Quercus cortex extract with alum respectively. The dose was 120ml/cow for metritis treatment and 50 ml/ cow for vaginitis using locally injection. Animals of experiment were chose characterized by 1- regular estrus cycle fertilized from different bull's life times and no fertilization happened. 2- Turbid unclear vaginal discharge. 3- Ovaries and ovarian ducts were intact. These three factors inshore that the defect was in the uterus which 80 % of the defect was metritis and 20% was due to other causes. The treatment by extract gave after took the swap.

The extract was prepared in three concentrations (10%, 15%, and 20%). The cortex was grinded by electric grander to be as powder. Weighted 100 g from this powder by Sartorius and soluble in one liter of D.W then boiled for 20 minutes and then cooling to 30 °C and filtered , divided on 10 vials equally, in this way we were made 10% concentration, Added 10 g of alum power for any vial, and made the other concentrations in same way. Bacterial identification: The swab was toke from the uterus by uterine swab, vaginal swab was toke by normal swab, put them in the Transport media, and put it in the cooler and transport to the laboratory for culture in the Petri dishes, incubation in 37 °C for 24 hour, primary test was done by Gram Gention, purification of colonies, biochemical classification, motion test was done by use SIM medium as [8], culture by using Candle Jar for identification of semi aerobic bacteria, the identification was certain by A B I 20. Sensitivity test was done for all isolated bacteria by pepper discs in Mueller Hinton agar.

Statistical Analysis

Used SAS Program for Results analyses as following mathematic model:

Yijklmn: effect of observation in any treatment.

μ : General mean of experiment.

Di: effect of Different concentration of extract 0-20%.

Mj: effect of breed (local, Australian and Friesian crossbred).

Sk: effect of age (5 to 8) years old.

RL: effect of causative agent.

Pm: effect of parity (1st -5th).

Eijkman: value of rondo mirror.

Results and Discussion

Results showed significant effect ($P \leq 0.05$) for the different concentrations of Quercus cortex extract with alum for metritis, vaginitis and pregnancy ratio. Overall means was about (59.68, 61.33 and 56.75) % respectively because the extract had ability to kill bacteria in different concentration. The results were similar to [9] in types of isolated bacteria and number of isolation. Significant effect ($P \leq 0.05$) was found for breed on treatment ratio from metritis, vaginitis and pregnant ratio. Least ratios were found by T-cont. In Friesian breed it's about (20,19 and 19)% respectively. But the highest ratio of treatment were found by using 20% from Quercus cortex extract with alum in local breed it's about (87, 90 and 87) % respectively Table 1. This difference was due to high activity of extract and strong defense of local breed. It's similar to [10].

Table 1: Effecting of extract and breed in the studying characters.

Factors		% of Healing from Metritis	% of Healing from Vaginitis	% of Parturition
Breed	Con. of Extract %			
local	Cont.	22 ±1.53 a	25 ±1.22 a	20 ±2.12 a
	10	68 ±2.30 b	65 ±6.01 b	65 ±2.85 b
	15	79 ±3.28 c	77 ±2.6 c	77 ± 2.17 c
	20	87 ±3.51 d	90 ±3.77 d	87 ± 4.20 d
Australian	Cont.	24 ±3.39 a	36 ±4.00 e	24 ±2.11 a
	10	55 ±4.46 b	59 ± 3.41 b	55 ± 1.77 b
	15	75 ±3.26 c	76 ± 2.55 c	72 ± 1.17 d
	20	86 ±3.81 d	86 ±5.38 d	60 ±3.20 e
Friesian	Cont.	20 ±1.22 a	19 ±1.66 a	19 ±2.06 a
	10	48 ±3.51 c	52 ±4.03 b	64 ±2.31 e
	15	73 ±4.66 c	70 ±2.38 c	70 ±3.18 c
	20	83 ±5.69 d	79 ± 4.10 cd	74 ±4.45 c
Mean		60.68 ± 3.38	61.33 ± 3.42	56.75 ± 2.63
Significance		*	*	*

(*: $P \leq 0.05$)

In addition, a significant effect ($P \leq 0.05$) for cow's ages in all traits that studied. The overall means was about (59, 61.25 and 60.75) % respectively. Least ratios were found by T-cont. in 8 years old it's about (19, 18 and 18)% respectively but the highest ratios of treatment were found by using 20% from extract in 4 years old it's about (89, 89 and 84) Respectively Table 2. This result was due to immunity force of animals in fourth years old which lead to increase extract ability to kill the bacteria opposite the aged animals. Different concentrations from the extract and parity were affected significantly ($P \leq 0.05$) in metritis, vaginitis and pregnancy ratio. The overall means were about (63.70, 59.35 and 59.05) % respectively. Least ratios were found by T-cont. in 5th parity it's about (15, 14 and 12)% respectively but the highest ratio of treatment were found by using 20% from the extract in 1st parity it's about (92, 96 and 88)% respectively Table 3. Accumulation of parturitions lead to weakness of immunity of females and increase of diseases, this case connected with age which leads to high infection ratio when parity was increased [11].

Table 2: Effecting of extract and age in the studying characters.

Effecting Factors		% of Healing from Metritis	% of Healing from Vaginitis	% of Parturition
Age (year)	Con. of extract%			
4	Cont.	24 ± 2.33 a	23 ± 1.31 a	22 ± 2.65 a
	10	63 ± 3.14 b	65 ± 3.18 b	61 ± 4.71 b
	15	74 ± 3.65 c	77 ± 3.98 d	74 ± 4.79 c
	20	89 ± 2.92 d	89 ± 3.23 c	84 ± 6.12 d
5	Cont.	25 ± 1.66 a	31 ± 1.66 a	21 ± 1.98 a
	10	65 ± 2.15 b	60 ± 2.11 b	59 ± 3.14 b
	15	78 ± 4.21 c	72 ± 4.14 d	74 ± 4.08 c
	20	84 ± 4.30 d	84 ± 4.08 c	83 ± 5.22 d
6	Cont.	22 ± 1.71 a	22 ± 2.71 a	19 ± 2.01 a
	10	63 ± 2.84 b	65 ± 3.10 b	63 ± 3.74 b
	15	76 ± 2.69 c	78 ± 4.66 d	76 ± 4.88 cd
	20	82 ± 4.19 d	86 ± 5.90 c	82 ± 5.19 d
7	Cont.	21 ± 2.22 a	28 ± 2.88 a	21 ± 2.14 a
	10	64 ± 3.73 b	62 ± 4.28 b	62 ± 5.13 b
	15	75 ± 3.08 c	72 ± 4.19 d	75 ± 5.68 c
	20	81 ± 5.11 cd	83 ± 4.15 c	81 ± 5.22 a
8	Cont.	19 ± 1.24 a	18 ± 2.90 a	18 ± 3.05 a
	10	60 ± 2.47 b	59 ± 4.73 b	60 ± 4.71 b
	15	70 ± 3.51 c	72 ± 3.99 d	70 ± 4.18 c
	20	80 ± 4.10 d	79 ± 5.79 dc	75 ± 4.83 c
Mean		60.75 ± 3.06	61.25 ± 3.64	59 ± 4.177
Significance		*	*	*

Effecting Factors % of Healing from Metritis % of Healing from Vaginitis % of Parturition

Table 3: Effecting of extract and parturition serious in the studying characters.

Parity	Effecting Factors	% of Healing from Metritis	% of Healing from Vaginitis	% of Parturition
	Con. of Extract%			
1 st	Cont.	30 ± 1.66 a	21 ± 1.64 a	21 ± 2.39 a
	10	68 ± 1.95 b	66 ± 3.37 b	66 ± 3.19 b
	15	79 ± 3.86 c	76 ± 4.05 c	79 ± 4.41 c
	20	92 ± 3.17 d	96 ± 6.13 d	88 ± 5.35 d
	Cont.	30 ± 4.11 a	17 ± 1.36 a	17 ± 1.17 a
2 nd	10	67 ± 3.34 b	63 ± 3.12 b	63 ± 3.59 bc
	15	77 ± 4.72 c	75 ± 4.42 c	75 ± 4.27 c
	20	89 ± 5.31 d	84 ± 5.39 e	82 ± 4.62 cd
	Cont.	22 ± 1.91 a	16 ± 1.28 a	16 ± 1.25 a
3 rd	10	66 ± 4.28 b	62 ± 3.57 b	60 ± 4.61 b
	15	74 ± 4.49 c	74 ± 5.50 c	74 ± 5.10 c
	20	83 ± 4.19 c	80 ± 3.71 e	82 ± 5.44 d
4 th	Cont.	29 ± 2.26 a	21 ± 2.21 a	20 ± 2.07 a
	10	63 ± 2.95 b	60 ± 4.20 b	60 ± 3.25 b
	15	78 ± 3.87 c	75 ± 5.11 c	74 ± 6.02 c
5 th	20	80 ± 5.82 c	84 ± 3.39 ce	80 ± 4.33 d
	Cont.	15 ± 2.71 e	14 ± 1.96 a	12 ± 1.88 a
	10	62 ± 2.88 b	62 ± 2.57 b	62 ± 2.94 b
	15	70 ± 4.30 b	69 ± 4.10 bc	70 ± 4.40 c
	20	80 ± 3.84 c	82 ± 5.62 e	80 ± 5.81 cd
Mean		63.70 ± 3.58	59.35 ± 3.63	59.05 ± 3.80
Significance		*	*	*

(* $P \leq 0.05$)

Results showed a significant effect ($P \leq 0.05$) of Quercus cortex extract with alum in metritis, vaginitis and pregnancy ratio according to causative agent. Least ratios were found by T-cont. With *Staph Epidermidis*, It's about (14, 10 and 10) % respectively. But the highest ratio of treatment were found by using 20% from extract with *E.Coli*, it's about (89, 92 and 87) % respectively. The overall means were about (56.82, 61.6, 68.314) respectively Table 4. The extract contain phenols, flavonoids, tannins, chlycosides, and saponin with alum, these compounds were kill bacteria [12-14]. Phenols able to proton motive force which leads to inhibition of enzymes, electron transport, and decrease of Oxidative phosphorylation leads to killing of bacteria [15,16]. Tannins can activate Phagocytes' cells and destroyed of bacterial proteins [17]. Turpentine can tear bacterial membranes by lipophilic compounds and finally alum was bactericide [18,19]. Different effect of extract on bacteria was due to Different bacterial defense [20].

Table 4: effecting of extract and causative agent in the studying characters.

Factors		% of Healing from Metritis	% of Healing from Vaginitis	% of Parturition
Causative Agent	Con. of Extract%			
<i>Echerichia coli</i>	Cont.	28 ± 2.27 a	31 ± 2.44 a	27 ± 1.37 a
	10	69 ± 3.18 b	65 ± 2.67 b	63 ± 2.24 b
	15	77 ± 4.15 b	77 ± 3.45 c	75 ± 3.60 c
	20	89 ± 4.37 c	92 ± 3.18 d	87 ± 4.19 d
<i>Arcanobacterium pyogenes</i>	Cont.	19 ± 2.39 a	25 ± 1.33 a	16 ± 1.18 a
	10	66 ± 3.25 b	60 ± 3.28 b	63 ± 3.23 b
	15	78 ± 4.43 b	72 ± 3.78 c	74 ± 4.61 c
	20	88 ± 4.62 c	84 ± 3.31 e	86 ± 3.46 d
<i>Staphylococcus aureus</i>	Cont.	28 ± 2.66 a	30 ± 2.89 a	25 ± 2.21 a
	10	64 ± 3.28 b	64 ± 2.95 b	64 ± 3.27 b
	15	73 ± 3.14 b	72 ± 4.11 c	70 ± 4.67 c
	20	85 ± 4.08 c	85 ± 4.14 e	85 ± 5.33 d
<i>Fusobacterium necrophorum</i>	Cont.	22 ± 3.13 a	19 ± 1.27 f	19 ± 1.17 a
	10	61 ± 3.62 b	66 ± 2.60 b	60 ± 3.62 b
	15	79 ± 4.47 c	76 ± 3.88 c	74 ± 5.14 c
	20	88 ± 3.81 c	89 ± 5.14 e	84 ± 6.02 d
<i>Prevotella melaninogenica</i>	Cont.	23 ± 2.99 a	18 ± 1.14 f	18 ± 1.98 a
	10	68 ± 3.57 b	63 ± 4.23 b	63 ± 3.68 b
	15	74 ± 3.23 b	72 ± 4.15 c	70 ± 4.19 c
	20	87 ± 4.11 c	84 ± 5.39 e	82 ± 5.69 d
<i>Clostridium tetani</i>	Cont.	31 ± 2.86 a	23 ± 2.44 a	22 ± 2.70 a
	10	60 ± 5.09 b	62 ± 3.78 b	60 ± 3.10 b
	15	77 ± 5.22 c	78 ± 4.30 c	74 ± 4.70 c
	20	85 ± 4.42 c	87 ± 5.29 e	84 ± 5.58 d
<i>Staphylococcus Uberis</i>	Cont.	14 ± 1.88 e	10 ± 1.80 f	10 ± 1.12 e
	10	63 ± 3.16 b	65 ± 3.17 b	63 ± 2.89 b
	15	70 ± 4.12 b	71 ± 4.26 c	70 ± 4.72 c
	20	86 ± 4.17 c	85 ± 4.55 e	86 ± 5.35 d
Mean		56.82 ± 3.63	61.60 ± 2.912	59.785 ± 3.14
Significance		*	*	*

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