

Antimicrobial Activities of Cow Urine Against Various Bacterial Strains

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Abstract

Number of plants and animal derivative resources were reported to have antimicrobial activity. The current study narrated to such valuable and blessed mammal resulting material cow urine, which has these actions. The antimicrobial activity of cow urine and its distillate was tested by agar well method using the microbes like *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas fragi*, *Bacillus subtilis*, *Streptococcus agalactiae* and *Proteus vulgaris*. The cow urine and its concentrate tested for antimicrobial activities and comparatively fresh cow urine was found to be better than its distillate. These results indicate that the cow urine has antimicrobial activities, which supports the claim of traditional practitioners.

Keywords: Antimicrobial; Cow urine; *Staphylococcus aureus*; *Escherichia coli*; *Pseudomonas fragi*; *Bacillus subtilis*; *Streptococcus agalactiae*; *Proteus vulgaris*.

1.0. INTRODUCTION

Cow urine has a great pharmacological importance its medicinal utility has been greatly mentioned in depth in Ayurveda. Cow urine is found to be effective against reversal of certain cardiac and kidney diseases, indigestion, stomach ache, edema, skin disease etc. [1]. The cow urine distillate has been patented as an activity enhancer and availability facilitator for bio molecules including anti- infective and anti-cancer agents [2]. Cow urine has certain volatile and non volatile components which might have high antimicrobial activity [3]. After photo activation and purification cow urine was found effective against certain drug resistant bacterial strains [4]. Cow urine contains few essential components such as estrogen [5], Nitrogen [6], Phosphorus [7], Pheromones [8], Potassium [9], chloride, calcium and urinary protein. Cow urine is also used by traditional healers in combination with herbs to treat fever, epilepsy and anemia. Cow urine exhibits both antioxidant and antimicrobial -

-activities which was confirmed by Edwin [10]. Cow's urine is widely used in the Ayurvedic pharmaceuticals for enhancing the properties of many drugs, by giving *bhavana* (repeated trituration). In *shodhana* (purification) of metals used in therapeutics, cow urine was extensively used. Charka, Sushruta and all other ancient physicians have given prime importance to cow's urine. Our study was aimed at studying the antibacterial activity of Sahiwal cow urine distillate against the given pathogenic bacterial strains *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas fragi*, *Bacillus subtilis*, *Streptococcus agalactiae* and *Proteus vulgaris*.

2.0. METHODOLOGY

Collection of disease free cow urine was selected for antimicrobial studies. Fresh cow urine was collected in a sterile container from local cattle yard. For the experiment photo activated urine was prepared by keeping fresh cow urine in sun light for 72 h in sealed glass bottle. The urine was filtered through Whatmann No.1 filter paper to get rid of debris and precipitated material and was stored at 4° C before use. Before evaluation of antibacterial activity, cow urine was checked for the presence of microbial contamination.

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2.1. Antibacterial activity

The test organisms used in the study were *Staphylococcus aureus*, *Escherichia coli*, *Pseudomonas fragi*, *Bacillus subtilis*, *Streptococcus agalactiae* and *Proteus vulgaris*. All the test culture were obtained from the Microbiology laboratory. The purity of al the cultures was checked before use. The cultures were maintained at 4°C on nutrient agar (Himedia, India). The antibacterial of the selected cow urine preparations were performed by agar well diffusion method. Twenty milliliter of sterile Muller Hinton agar was poured in sterile Petri dishes. The plates were allowed to solidify and used. Ten milliliter of sterile, Muller Hinton agar medium (seed agar) was seeded with organisms (about 0.2 ml according to 0.5 Mc Farland's standard), in semi hot conditions and was poured uniformly on the base agar. Bores (8mm) were made each equidistant from one another on the medium using sterile borer and 100 µl of the different urine preparations were added to respective bore. The plates were incubated at 37°C for 24 h and zone of inhibition was measured. We also performed another test in which each bacterial strains were put in 5 vials and 1 ml of fresh cow urine were added in each vial. After every 1 hour optical density by spectrophotometer was measured at 600nm. The decrease in OD values was indicative of antimicrobial activity of cow urine.

3.0. RESULTS AND DISCUSSION

In our study it was reconfirmed that the cow urine possesses antimicrobial properties. From our study we came to a conclusion that urine from different cows had different level of antimicrobial properties. The difference in level of antimicrobial properties of different cow urine may be because of difference in chemical composition of urine which may arise due to several reasons. We found out in our studies that fresh cow urine was more effective antimicrobial agent than photo activated urine this may be because fresh urine is more acidic in nature. The microbial inhibition count (MIC) values are given in the table below. The antimicrobial activity of cow urine was given in **Table 1 & 2** and **Figure 1**.

Table 1: Antibacterial activity of different cow urine sample against pathogenic bacterial strains. The values of different samples represent mean zone of inhibition in mm.

Bacteria	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
<i>Staphylococcus aureus</i>	13	17	19	22	25
<i>Pseudomonas fragi</i>	12	18	21	23	27
<i>Escherichia coli</i>	14	16	20	22	22
<i>Bacillus subtilis</i>	17	19	24	27	28
<i>Streptococcus agalactiae</i>	11	16	18	24	26
<i>Proteus vulgaris</i>	9	15	17	20	24

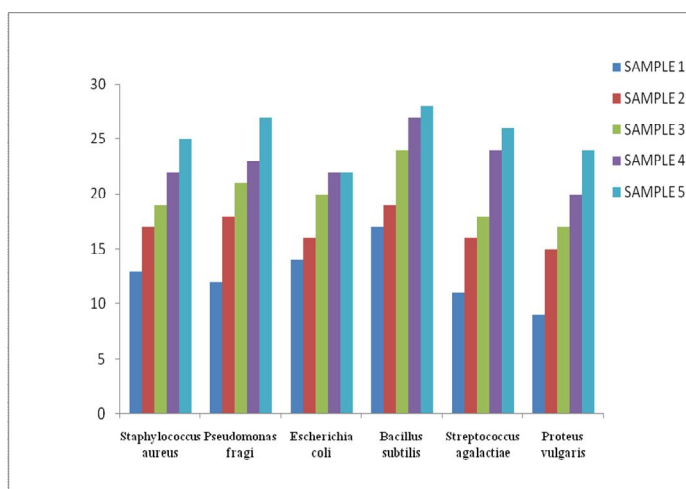


Figure 1: Antimicrobial activity of cow urine

Hours	Bacteria	Sample 1	Sample2	Sample 3	Sample 4	Sample 5
1	Staphylococcus aureus	0.982	0.905	0.93	1.032	1.184
	Escherichia coli	0.701	1.012	0.755	0.891	1.075
	<i>Pseudomonas fragi</i>	1.509	1.704	1.704	1.357	1.052
	<i>Bacillus Subtilis</i>	1.135	1.022	1.129	1.148	1.206
	<i>Streptococcus agalactcia</i>	1.331	1.356	0.951	1.157	1.123
	<i>Proteus vulgaris</i>	0.983	0.89	0.732	0.852	0.876
2	Staphylococcus aureus	0.978	0.879	0.905	0.991	1.18
	Escherichia coli	0.676	0.896	0.743	0.877	1.071
	<i>Pseudomonas fragi</i>	1.495	1.429	1.41	1.343	1.045
	<i>Bacillus Subtilis</i>	1.12	0.958	1.045	1.116	1.15
	<i>Streptococcus agalactcia</i>	1.166	1.139	0.898	0.894	1.036
	<i>Proteus vulgaris</i>	0.946	0.673	0.665	0.821	0.813
3	Staphylococcus aureus	0.946	0.847	0.89	0.989	1.177
	Escherichia coli	0.669	0.882	0.738	0.868	1.068
	<i>Pseudomonas fragi</i>	1.493	1.388	1.362	1.319	1.014
	<i>Bacillus Subtilis</i>	1.101	0.948	1.037	1.125	1.13
	<i>Streptococcus agalactcia</i>	1.133	1.088	0.869	0.865	0.977
	<i>Proteus vulgaris</i>	0.922	0.665	0.643	0.795	0.729
4	Staphylococcus aureus	0.928	0.825	0.89	0.987	1.175
	Escherichia coli	0.656	0.794	0.716	0.863	1.067
	<i>Pseudomonas fragi</i>	1.492	1.387	1.361	1.287	1.011
	<i>Bacillus Subtilis</i>	1.097	0.94	1.036	1.105	1.1
	<i>Streptococcus agalactcia</i>	1.116	1.062	0.849	0.815	0.947
	<i>Proteus vulgaris</i>	0.914	0.656	0.626	0.782	0.721
5	Staphylococcus aureus	0.918	0.802	0.872	0.944	1.137
	Escherichia coli	0.55	0.678	0.668	0.603	1.057
	<i>Pseudomonas fragi</i>	1.436	1.296	1.36	1.27	0.98
	<i>Bacillus Subtilis</i>	1.029	0.915	1.002	1.076	1.016
	<i>Streptococcus agalactcia</i>	1.104	1.019	0.086	0.81	0.905
	<i>Proteus vulgaris</i>	0.913	0.649	0.62	0.771	0.715

Table 2: Representing the optical density value of 5 samples of in which fresh cow urine was inoculated and the O.D was taken after every 1 hr. The declines in the O.D values indicate that the cow urine is showing its antimicrobial activity.

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