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COW DUNG- A BOON FOR ANTIMICROBIAL ACTIVITY

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ABSTRACT:

India is an agricultural country having variety of plants and animals. Among the animals, cattle like cow has a prominent place in our country. It is considered as go-mata and worshipped by every hindu of India. The five products of cow called "Panchgavya" is a precious gift of this holy animal to our society, which consist of milk, curd, ghee, urine and dung. Among these, cow dung also called cow pad, is a component having crude protein, cellulose, hemicellulose and minerals. It is an efficient organic manure used to increase plant yield in fields. Cow dung slurry is also used by people of our country for plastering the floors and walls of their houses. Considering this custom of our society, a study had been done to evaluate antibacterial and antifungal properties of cow dung extract in distil water, ethanol and n- hexane against *Candida*, *E. coli*, *Pseudomonas* and *Staphylococcus aureus* and found it highly effective against these microbes. The study revealed that cow dung extract possess antimicrobial properties, which can be used to fight against certain pathogenic diseases and other ailments.

KEY WORDS: *Cow dung, Panchgavya, Holy, Antimicrobial, Microbes.*

INTRODUCTION:

Cow dung is a term used for feaces of cow. Cow dung is basically the feed residuces digested by symbiotic bacteria residing within the animal rumen. Cow dung is mixture of dung and urine at the ratio 3:1. It is rich in crude fiber, protein, cellulose, hemicellulose and 24 types of minerals including cobalt, magnesium, phosphorous, manganese and chlorine. There are 250,000,000 cows in India and each cow produces 16- tons (32,000 lbs) of dung per year.

Cow dung is also known as cow pad. Cow belongs to bovine family including cows, buffaloes, etc. Cow dung has enormous uses as fuel, fertilizer, for plastering floors, as heat source, in the bioremediation of toxicants, etc. In the present study, a comparative analysis of different cow dung extracts has been done for its efficacy against clinical isolates of bacteria and fungi to know the antimicrobial properties of cow dung. A lot of workers have contributed in this field like Adegunloye *et. al*; (2007), Swain *et. al;* (2008), Yongabi *et. al;* (2009), Joseph and Sankarganesh (2011), Teo and Teoh (2011), Sahoo *et. al;* (2012) and Waziri *et. al;* (2013).

MATERIALS AND METHODS:

Cow dung samples were collected from a milk dairy at Sai dairy in Amaltas colony, Gwalior, stored in a sterile bag and taken to the laboratory for analysis. For the shake of study, cow dung was dried by two ways: 1- room temperature dried, 2- sun light dried. By using three solvents – distilled water, ethyl alcohol and n- hexane, three extracts have been prepared and for test organisms NAM (Nutrient Agar media) is prepared. Then, Muller Hinton agar plates were prepared and test organisms were spread over those plates by sterile swabs. The filter paper disc dipped into the extract of cow dung, isolates of 6 types of extracts and 2 types of antibiotics were analyzed for antimicrobial activity by using the disc method on the surface of the MHA (Muller Hinton Agar) plates and incubated at 37 °C for 24 h. Inhibition zone diameters were measured with the diameter of the disc.

RESULTS AND DISCUSSION:

The antibacterial activities at different concentrations of cow dung extract against *Candida*, *E. coli*, *Pseudomonas*, *S. aureus* in terms of inhibition zone exhibited by the bacteria are shown in (Table 1).

In studies room temperature dried cow dung extract gave highest microbial activity for distilled water based for *Pseudomonas sp.*, followed by ethyl alcohol extract and hexane extract respectively (Table 1).

When results of room temperature dried cow dung were analyzed, we found highest activity in distilled water based extract of cow dung, medium activity in alcohol extract, followed by hexane extracts for all the microorganisms.

In studies sun light dried cow dung extract gave highest microbial activity for distilled water based for *E. coli*, followed by ethyl alcohol extract and then hexane extract respectively(Table 2).

When results of sun light dried cow dung were analysed. We found highest activity in distilled water based extract of cow dung, medium activity in alcohol extract, followed by hexane extracts for all the microorganisms.

In our studies solvent gave highest microbial activity for distilled water based for *E. coli*, followed by ethyl alcohol extract, hexane extract respectively. (Table 3).

We mainly took cow dung sample in sun light dried and room temperature dried forms and checked its antimicrobial activity for clinical isolates. In spite of this, we had also taken fresh cow dung of cow to

evaluate its efficacy against our test organisms and found that dried cow dung is far much better than fresh cow dung.

The antibacterial activity of the present study also correlates with the reports of other authors which also show good evidences for further work.

The activities of test dung sample preparations were comparable with that of standard, Streptomycin. It was observed that gram positive organisms were more sensitive than gram negative organisms. These observations are likely to be the result of the differences in cell wall structure between gram positive and gram negative bacteria. In gram negative bacteria, outer membrane acts as a barrier to many environmental substances.

CONCLUSION:

Thus it is inferred that cow dung is not only sacred mythologically, but it also possess antibacterial as well as antifungal properties, which had been now scientifically proved. Hence, it is now recommendable to use cow dung against various microorganisms.

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REFERENCES:

Adegunloye, D.V.; Adetugi , F.C.; Akinyosoye, F.A. and Doyeni , M.O. 2007. Microbial analysis of compost using cow dung as booster. *Pakistan Journal of Nutrition* 6(5) pp: 506-510.

Joseph, B. and Sankarganesh, P. 2011. Antifungal efficacy of panchgavya. Inter National Journal of Pharmtech Research 3(1) pp: 585-588.

Sahoo, K.C.; Tamhankar, A.J.; Sahoo, S., Sahu, P.S.; Klintz, S.P. and Lundbora, C.S. 2012. Geographical variation in antibiotic - resistant *Escherichia coli* isolates from stool cow dung and drinking water. *Inter National Technology Journal Environ. Reserch Public Health*. 9(3) pp: 746-759.

Swain, M.R.; Ray, R.C. and Nautiyal, C.S. 2008. Boicontrol efficacy of *Baccillus subtilis* strains isolated from cow dung against past harvest yam pathogens . *Current Microbiology*. 57 pp: 407-411.

Teo, K.C. and Teoh, S.M. 2011. Preliminary biological screening of microbes isolated from cow dung in Kampar. *African Journal of Biotechnology*. 10(9) pp: 1640-1645.

Waziri, M. and Suleiman, J.S. 2013. Analysis of some element and antimicrobial activity of evaporated extract of cow dung against some pathogens . *Journal of Scientific Research*. 5(1) pp: 135-141.

Yangabi, K.A.; Harris, P.L.; Lewis, D.M. and Agho, M.O. 2009. Preliminary study on the effect of anaerobically digested cow dung slurry on the antimicrobial activity of three medicinal plants. *African Journal of Microbiology Research*. 3(4) pp: 168-174.

Table 1. Antimicrobial activity of room temperature dried cow dung against clinical isolates

Room Temperature dried cow dung	Zone of inhibition in mm			
Solvents used	***Candida albicans***	***E. coli***	***Psudomonas sp.***	***S. aureus***
Ethyl alcohol	14	18	17	13
Hexane	10	12	18	11
Distilled water	17	15	19	8

Table 2. Antimicrobial activity of sun light dried cow dung against clinical isolates

Sun light dried cow dung	Zone of inhibition in mm			
Solvents used	***Candida albicans***	***E. coli***	***Pseudomonas sp.***	***S. aureus***
Ethyl alcohol	14	29	15	18
Hexane	18	22	-	28
Distilled water	19	28	22	20

Table 3. Antimicrobial activity of solvents against clinical isolates

Solvents	Zone of inhibition in mm			
	Candida albicans	***E. coli***	***Pseudomonas sp.***	***S. aureus***
Ethyl alcohal	10	16	18	14
Hexane	21	17	20	16
Distilled water	18	19	18	12