

Qualitative Antifungal Study of Cow Urine (Gomutra) as a Potential Strategy to Fight against Invasive Fungal Infections in Future

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Article Information

Received date: Jan 18, 2019

Accepted date: Jan 25, 2019

Published date: Jan 30, 2019

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Keywords Cow urine, antifungal
potential

Article DOI 10.36876/smtmj.1018

Abstract

Searching of new antifungal lead compound is a great challenge for scientific community. Increasing antifungal resistance and limited number of antifungal drug available in clinical practices are the main reason behind finding of novel source of antifungal agents. Cow urine consider as nectar in India. Research done on cow urine suggests that cow urine have ability to fight against infectious diseases. In present study qualitative antifungal activity of cow urine analyzed against common fungal pathogen viz. *Aspergillus Niger*, *Aspergillus Flavus* and *Fusarium sp.* by agar well diffusion method. The obtained results supported the antifungal potential o cow urine against pathogenic fungi. Present analysis state that detail study of cow urine is required to clarify utilization lead compound against fungal pathogens.

Introduction

Despite medical research and development is fully dedicated to improve treatment strategies but there are only limited number of drugs available in market to battle against fungal infections. Use of antifungal to cure fungal infections is a common worldwide accepted medical practice. But from last few decades, management of infectious fungal infection is become difficult due to resistance and limited numbers of antifungal compounds. Compare to bacterial infections, treatment of invasive fungal infections is more complex because finding a successful therapeutic strategy will kill fungus but safe to human cells is more complicated. To overcome such problems, nature derived products can be expected to play significant role in metamorphosis in antifungal drug designing [1]. In Indian tradition *Gomutra* (Female cow) is considered as a sacred animal. From ancient era *Gomutra* (cow urine) has been use to treat several human diseases and the Indian *Ayurveda* literature '*Charaksamhita*' and '*Shushrutsamhita*' described the different rare medicinal properties of Gomutra. In modern research many experimental evidences supports to antimicrobial, antidiabetic, anticancer activity of *Gomutra* [2, 3,6]. The present study focused on antifungal potential of fresh cow urine against common fungal pathogens *Aspergillus niger*, *Aspergillus flavus* and *fusarium sp.*

Material and Methods

Collection of Cow urine

Fresh cow urine was collected from apparently healthy local breed of cow, in a sterile container (HiMedia Mumbai) from local cattle yard in Malvan MS. (Lat.16.1339938, long.73.5863661) Photo-activation of collected urine was performed by keeping fresh cow urine in sun light for 6 days in sealed sterile glass container. To avoid bacterial contamination photo-activated cow urine filtered through 45 micron Millipore filter (SSU) and stored in 4° C before use. Prepared different concentrations (100, 50, 25, 12.5, 6.25, and 3.125%) of filtered cow urine in sterile distilled water.

Collection and enrichment Test fungal cultures

The grown cultures of test fungus viz. *Aspergillus niger*, *Aspergillus flavus*, and *fusariaum sp.* were collected from Department of Microbiology, Kankavali College. MS India. All cultures were confirmed by microscopic morphology and again enriched on Potato Dextrose Agar (PDA) (HiMedia Laboratories, Mumbai).

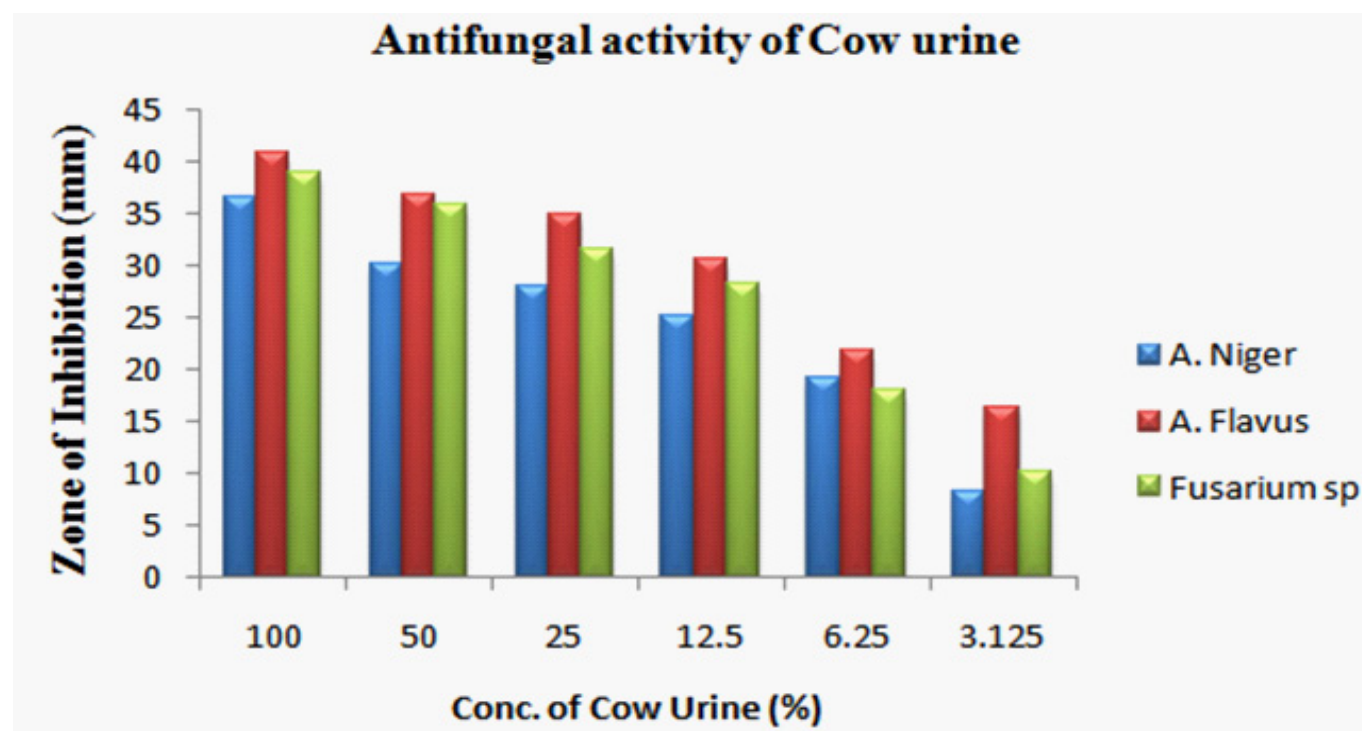
Preparation of fungal spore suspension

Spore suspensions of freshly grown fungal cultures were prepared in 0.84 % sterile saline water and the turbidity of homogeneous suspensions was adjusted to 0.5 Mac Farland standards.

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ISSN: 2573-363X

Table 1: Diameter of inhibition zone against test fungal culture.



Antifungal activity of cow urine

Antifungal activity of cow urine was performed by agar well diffusion method as described previously with little modification. The homogeneous spores suspension of test fungal culture was swab inoculated on sterile PDA plates. 6 mm diameter well was made on the inoculated plate by using cork borer. 100 μ l of filtered sterile photo-activated cow urine added to the well. Entire procedure was performed in triplicate manner for all test fungal culture. The plates were kept for diffusion in refrigerator for 30 min. After diffusion plates were transferred to the incubator and incubated at 25° C for 3 days.

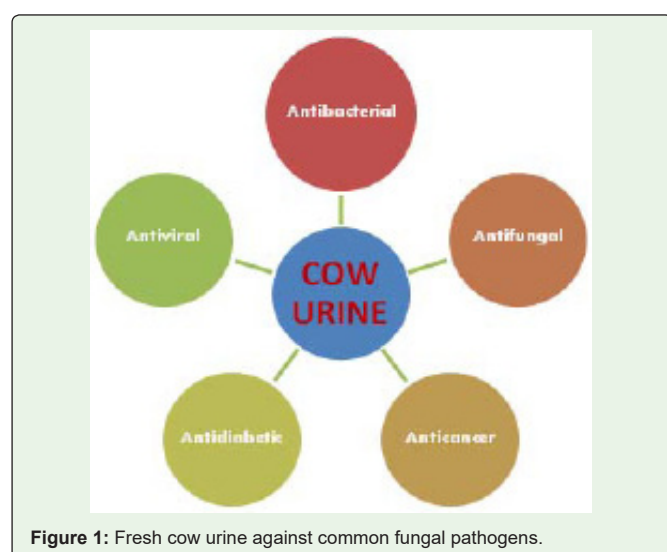


Figure 1: Fresh cow urine against common fungal pathogens.

Results and Discussion

After 3 days incubation the plates were observed for evaluation of antifungal efficacy of cow urine. It is found that the cow urine showed clear zone of inhibition against all tested fungal cultures (Table 1). The data obtained present qualitative investigation likely to be presence of potent antifungal molecule in cow urine. Till date many researcher investigated antifungal potential of cow urine against same fungal pathogens but the results obtained in present investigation showed more potent results. Shaha et al analyzed the potency of cow urine against bacterial pathogens they found that fresh cow urine is more potent than stored cow urine because during storage volatile bioactive compounds may lose [5]. For present study analysis of fresh urine was done might be because of that the results obtained are in higher value than others. Rakesh, et al analyzed the cow urine against agricultural important fungal pathogens the value of antifungal zone diameter against *Fusarium sp.* is slightly higher than present investigation [4] is because of difference between two tested strains but the results obtained from present study against *Fusarium sp* are enough to support efficacy of cow urine against clinical as well as agricultural invasive fungal infections (Figure 1).

Conclusion

Cow urine is a factory of variety of diverse bioactive compounds but as compare to plant derived product research on cow urine is less. The research done on cow urine from last decades supports that cow urine have ability to successfully fight many dangerous infections. On other hand use of cow urine is cost effective as well as safe for mankind and environment. From present qualitative analysis concluded that cow urine can be control to minimize fungal infections and future investigation is required to clarify role of actual lead compounds present in cow urine against fungal pathogen.

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