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EFFECT OF COW URINE TREATMENT ON PLANT GROWTH AND ANTI-MICROBIAL ACTIVITY ON *GOSSYPIUM HIRSUTUM* L.

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ABSTRACT

In Hindu culture, the cow is treated as a divine animal. Cow's urine, cow dung and Milk are utilized for different purposes. Cow's urine has been utilized as an enhancer of plant growth and an antifungal agent for the current study. The plant selected for this study *Gossypium hirsutum* L.(cotton).The plant was grown utilizing various concentrations of cow urine, such as 0% (control), 1:10, 1:5, 1:1 for 90 days. Various parameters for example leaf area, shoot length, plant height, root length, as well as biomass of the plant have been monitored. The antifungal activity has been studied by utilizing different concentrations of cow urine against (*Alternaria macrospora*) using agar diffusion method. Among all the concentrations, the 1:1 concentration showed maximum plant growth compared to other two concentrations. On the other hand, 1:5, 1:10 concentrations showed more antifungal activity. The conclusion of this study found that cow urine can be utilized as a growth enhancer of plant and has antifungal properties.

Keywords **:** Cow urine, antimicrobial activity, plant growth enhancer, *Alternaria macrospora*

INTRODUCTION

Cow urine has been considered as a significant one since 'Vedas' (Ancient Hindu texts). It was often treated as *Amrita, the* beverage of immortality. The Indian cow breed is exceptional, because, unlike crossbreed or other exotic cows, cow urine of this variety has immense medicinal properties. Recent experiments have shown that cow urine has a significant impact on the immune system, increasing macrophage phagocytic response. This has also been shown to have antibacterial properties (Anuradha *et al*., 2011). Cow Urine has several health properties like treating edema and indigestion, weight reduction, treating kidney issues, etc. (Ipsita *et al*., 2014) Cow urine is now a popular medicine practicing Buddhist community in Myanmar (Suresh *et al*., 2006). Cow urine is proportionate and thus has a major impact in the treatment of diseases. It is therefore very important. Cow urine is widely used for the prevention and treatment of rural diseases in India in particular. In the Hindu tradition in India, cow has always been considered the most holy animal. When Western medicine has evolved, the use of Cow urine decreases, although it still works in some parts of the world for treatment. Cow urine has already been used as a medicinal agent for the treatment and control of conditions. Cow Urine's study has shown that it contains in limited amounts all essential enzymes, vitamins, minerals, metals, salts, and other entities; (Kuladeep *et al*., 2014).

Gossypium hirsutum L. is a plant under the family Malvacae. Primarily this is cultivated for its fiber, seed, as well as vegetable. This is also used in large volumes as a raw material in textile industries. The bulk of the commercial cottons come from this species (Taiye *et al.,* 2011). In conventional medicinal medicine, many Malvaceae family species were applied (Taiyeet *et al*., 2011), but their active principle(s) were not elucidated for many infectious diseases. Anti-parasite activity may be caused by substances other than gossypols (Sotelo *et al.*, 2005). Initially isolated from *Gossypium* L. (Malvaceae) seed, the pharmacological characteristics of Gossypol were studied in relation to the reversible effects it has on human ant fertility (Soterola *et al.,* 2005), effect on various pathogens such as *Trypanosoma cruzi*, *Plasmodium telpemerum* (Tripathi *et al*., 2004), Edward siellaictaluri and others (Trepathi *et al*., 2004). In addition to hampering the development of certain parasites, Gossypol exhibits antiviral activity against a variety of the viruses enveloped, such as AIDS (Vander Jagt *et al*., 2000). It is designed to determine whether cow urine can be utilized as an enhancer of plant growth as well as *Gossypium hirsutum* L. plant has antimicrobial properties.

MATERIALS AND METHODS

Collection of Cow Urine

Fresh urine has been gathered in a sterile container from several cows. The urine has been purified by Whatman No. 1

filter paper, which removes the waste as well as precipitation and deposited until use in airtight containers at 4°C.

Preparation of different Concentrations of cow Urine

Various Concentrations of cow urine has been prepared such that 1:10, 1:5, 1:1% concentrations were prepared by mixing of cow urine in distilled water.

Collection of Seeds

The seeds of *Gossypium hirsutum L.* (Cotton) of WGCV-48 variety were obtained at Regional Agricultural Research Station, Warangal, Telangana.

Seed treatment

Before sowing seeds, they were treated with cow urine solution.

Sowing of seeds by Pot Culture Experiment

The Pot culture method has been adopted to the present study for finding the effect of different cow urine concentrations on the cotton plants' growth. Five seeds of cotton have been sown each in various pots which were filled with sterile garden soil. For about half an hour, this has been sterilized at 15 lbs pressure in an autoclave with adjusted pH 7. Twice a day, every pot has been irrigated at various concentrations of cow's urine (1:10, 1:5, 1:1. v/v). In control pots, tap water was used for the irrigation of seeds. When plants grew spontaneously, 3 seedlings have been removed without disrupting the root system from every treatment. The plant growth has been determined in 30 and 60 and 90 days by various parameters, like leaf area, number of branches and leaves, root and shoot length, plant height (Figure.1)

A B C

Fig. 1 : Cotton Plant Pot Experiment A) 30 Days B) 60 Days C) 90 Days

Parameters

Numerous parameters of the plants have been observed. These parameters are:

1. Root Length: is measured in cms with the help of scale from ending of shoot to the tip of root.
2. Shoot Length: is measured in cms with the help of scale from shoot.
3. Plant height: Measured in cms utilizing scale.
4. Leaf area: The leaf with highest area has been considered by Graphical method in cm.
5. Plant biomass: A growth character Index with regard to dry weight has been shown to increase biomass (w) (Sestak *et al.*, 1971)

$$W = W_2 - W_1$$

Where the subscripts 1 and 2 indicate values of *W* on two occasions.

Soil analysis

The treatment given to the soil samples bare estimated of the changes made by the cow urine in the soil. For soil analysis, numerous parameters as well as approaches were utilized.

N- nitrogen: 0.782ppm/mg

P- Prosperous: 0.331ppm/mg

K-Potassium: 0.291ppm/mg

Isolation of Fungal Pathogens

Alternaria macrospora isolated from infected plants of *Gossypium hirsutum L.* that showed wilting and damping off symptoms

Antifungal Activity

Cow urine has been produced in three concentrations (10%, 5%, and 1% v/v). 10 ml of various cow urine concentrations has been amended in 10 ml of potato dextrose agar medium and mixed methodically by stirring. Distilled water was used to maintain the control. The medium was treated in autoclave. The content was poured into sterilized Petri plates and was left. From the actively growing cultures, cork borer used for taking5mm diameter fungal discs. Thus, the discs have been duly poisoned with cow urine, aseptically transmitted on PDA covers. Incubation of plate was carried out for 7 days at 28 ± 2°C incubator temperature. The plates have been observed after seven days and the diameters of the colony have been determined by using ruler. By utilizing the following formula, the proportion of inhibition was determined.

"Percent inhibition of mycelia growth (1%)

$$I = \frac{100(C - T)}{C}$$

Here, inhibition percentage is represented by *I*, and colony diameter is given by *C* in control plates whereas in poisoned plates colony diameter is represented by *T* .

RESULTS

Growth observation

The plants had been put on a white paper sheet as well as the parameters have been determined in accordance with the methods described.

Physical parameters comparison

With various cow urine concentrations, the plants have demonstrated various physical improvements. This demonstrates that urine affects the plant's growth. From physical parameters the data for 30 days, 60 days and 90 days was tabulated in Table 1, 2 &3 and Figure 2,3 & 4.

Table 1: Effect of Cow urine on plant growth parameters for 30 days Pot experiment:

Sample	Root length cm.	Shoot length cm.	Plant length cm.	Leaf area cm."	Plant bio mass gms.
Control	14.96	30	44.96	247	26
Cow urine	25.33	46.66	71.99	252.34	30.89

Table 2: "Effect of Cow urine on plant growthparameters for 60 days Pot experiment

Sample	Root length cm.	Shoot length cm.	Plant length cm.	Leaf area cm."	Plant bio mass gms.
Control	27.33	49.33	76.66	248.9	69.37
Cow urine	32.66	56.64	89.3	259	75.25

Table 3: "Effect of Cow urine on plant growth parameters for 90 days Pot experiment

Sample	Root length cm.	Shoot length cm.	Plant length cm.	Leaf area cm."	Plant bio mass gms.
Control	9	11	20	28.98	2.4
Cow urine	10	12	22	34.57	2.62

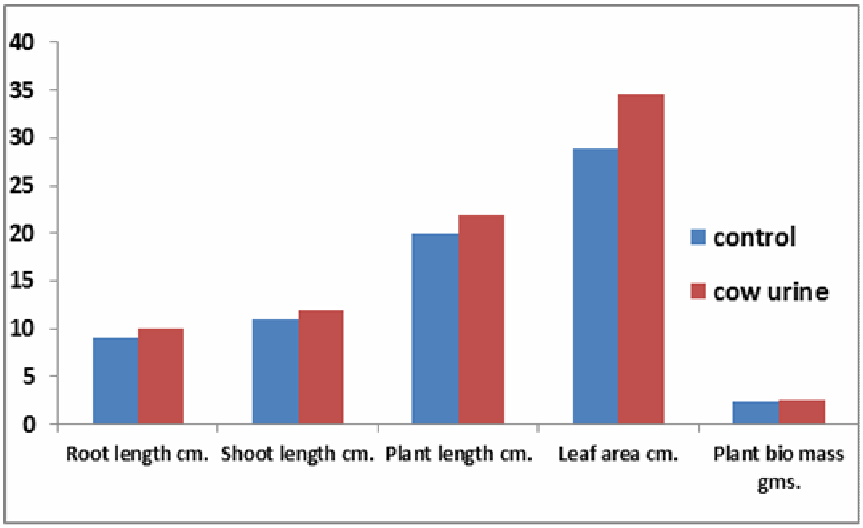

Fig. 2 : Graphical representation of physical parameters of (*Gossypium hirsutum L.*) 30 Days cotton plant with cow urine treatment

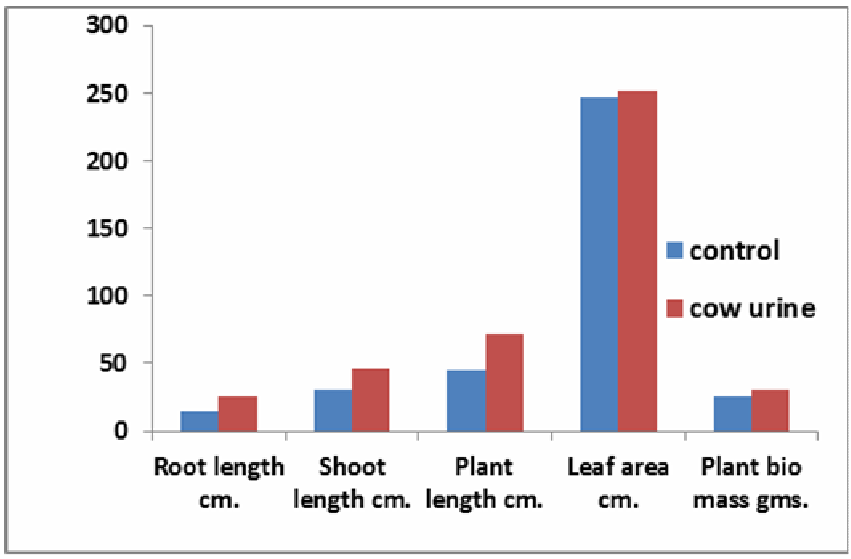

Fig. 3 : Graphical representation of physical parameters of (*Gossypium hirsutum L.*) 60 Days cotton plant with cow urine treatment

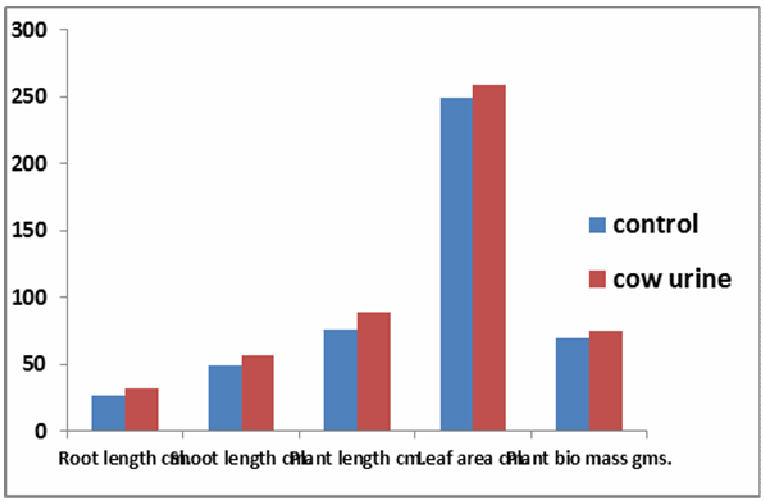

Fig. 4 : Graphical representation of physical parameters of"(*Gossypium hirsutum L.*) 90 Days cotton plant with cow urine treatment

Antifungal Activity

The antifungal activity was conducted utilizing disc diffusion approach as well as the outcomes are depicted in Figure 5.

Fig. 5 : Antifungal Activity of Cow urine on various concentrations:
A) 1:10% concentration B) 1:05% concentration C) 1:01% concentration"

Table 4 : Diameter of the inhibition zone in various concentrations"

Sample name	1:10% Conc.	1:05% Conc.	1:10% Conc.
Control	NA	NA	NA
Cow urine	10	13	19

The fungi growth has been inhibited with the rise in the concentration of cow urine.

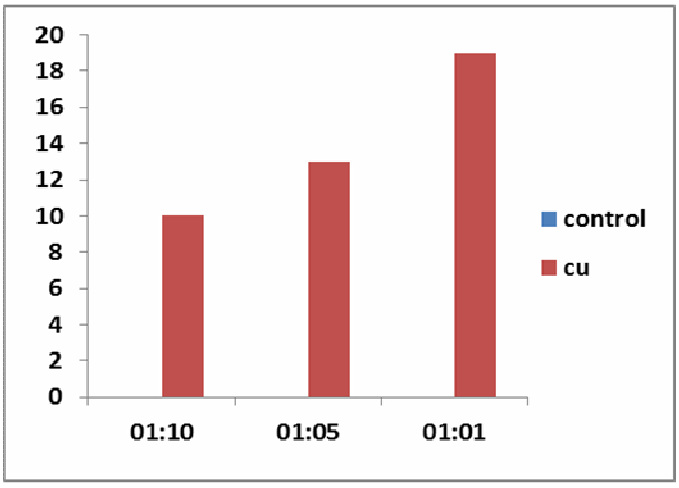

Fig. 6 : Graphical representation antifungal "activity of cow urine various concentration"

DISCUSSION

The plant *Gossypium hirsutum* L. was grown using different concentrations (Control, 1:10%, 1:05% &1:01%) of cow urine for 30, 60and 90 days. The growth of plant has been observed in 90 days. The plant has shown varied growth, assessed and calculated at various concentrations and parameters. The 1:01 percent concentration of cow urine shows more growth relative to other concentrations as per the calculated observations. Soil has been sent to be tested for soil tests by cow urine for soil improvements. The different soil parameters have been examined. The antifungal activity was conducted by using disc diffusion method then measured zone of inhibition. The zone of inhibition was increased with increased the concentration of cow urine and this shows the existence of antifungal agents in cow urine.

CONCLUSION

From the research above it can be concluded that cow urine has the plant antimicrobial characteristics as well as growth enhancer. The extraction of compounds from the cow urine will help to protect our environment by preventing synthetic processing methods.

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