



## Medicinal Plants & Cow's excrement: An Estimable Wealth of Nature

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### Contents

1. Introduction . . . . .	156
2. Experimental . . . . .	157
3. Results and discussion . . . . .	158
4. Acknowledgement . . . . .	159
5. References . . . . .	159

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### Abstract

The present study aimed to determine inhibitory effect of Cow urine extract and hot water extract of four medicinal plants *Viz. Bixa orellana, Vitix negundo, Putranjeeva roxburghii* and *Cryptolepis buchanani*. Different parts of the plants were used to check their antimycotial efficacy against *Sclerotium rolsfii* Sacc., a common plant pathogen known as “Kudzu of the Fungal world”. This investigation comprises a comparative corroboration of cow urine extract and hot water extract of the selected medicinal plants by employing Poisoned Food technique. *In-Vitro* study reveals that out of the two solvents used cow urine extracts of plant parts were found to be more effective than the hot water extracts, which shows that Cow urine has immense antimycotial power to annihilate the pathogenic fungi. Out of the four selected plants *Bixa orellana* and *Putranjeeva roxburghii*'s cow urine leaf and root extracts has more potential to check the fungal growth over *Cryptolepis buchanani* and *Vitix negundo* leaf and root hot water extract while comparing with Hexaconazole (100ppm) as standard.

**Keywords:** Medicinal plants, Cow urine, *Sclerotium rolsfii* Sacc., antimycotial efficacy.

### 1. Introduction

Nature has always been the foremost source of medicinal plants and their valuable products (Vats and Miglani 2011). Since time immemorial, medicinal plants have been used in all cultures and predate of social economic and religious barriers (Nyemi et al., 2000). The medicinal plant resources have been the integral component in the health care of human beings including animals. These are the gift to mankind because they cure diseases without any side effects (Sen, et. al 2014). ) From the ancient period cow's urine has been used singly or in combination with some other medicinal herbs against many diseases (Chauhan, 2004) and a variety of pathogens as it has natural

disinfectant (due to the presence of carbolic acid a mixture of phenols and cresol) and antiseptic properties, traditionally consumed as effective and simple medicine as it contains 24 types of salts as well as iron, calcium, phosphorus, potash and lactose (Mandavgane, et. al , 2005). The most important reason for exploiting these nature based products is the increase of drug resistant microbes to allopathic medicines. Both green and red products possess valuable resources of nature that are directly or indirectly beneficial for the mankind. Keeping in view the aforesaid present investigation deals with the testing of effectiveness of cow urine extract and hot water extract of parts (leaf/root) of four medicinal plant i.e. *Bixa orellana*, *Vitix negundo*, *Putranjeeva roxburghii* and *Cryptolepis buchanani* based on their ethno-botanical values against one common fungal pathogen *Sclerotium rolfsii* Sacc. a soil borne fungal pathogen with a very extensive host range which includes more than 500 plants particularly in the tropical, subtropical and warm temperate areas (Mordue, 1974).

## 2. Materials and Methods

### Collection of Plants

Four medicinal plants i.e. *Bixa orellana*, *Vitix negundo*, *Putranjeeva roxburghii* and *Cryptolepis buchanani* belonging to 4 different families (Table-1) were collected from two different regions of Bilaspur district of Chattisgarh state.

**Table 1:** Medicinal Plant species a brief view of relevant parameters

S.no	Plant name	Vernacular Name	Family	Features	Uses	Collection locality
1	<i>Bixa orellana</i>	Sinduri	Bixaceae	A shrub or evergreen small tree.	Root bark is anti periodic and antipyretic.	Nursery of Dept. of Rural Technology & Social Development
2	<i>Vitex negundo</i>	Nirgundi	Asphodelaceae	A large, aromatic shrub.	Improves memory. Skin diseases.	Nursery of T. C. B. Agriculture and Research Station
3	<i>Putranjeeva roxburghii</i>	Putranjiva	Putranjivaceae	Small tree.	Bark is used along with other herb for infertility in women.	Nursery of T. C. B. Agriculture and Research Station
4	<i>Cryptolepis buchanani</i>	Nagbel	Asclepiadaceae	Glabrous twining shrub.	Leaves are used for the treatment of snake bite and rickets. It improves the milk deficiency in women.	Nursery of Dept. of Rural Technology & Social Development

### Identification of Plants:

The plants were identified by Dr. R. Mehta, Department of Rural Technology and Social Development, Guru Ghasidas University, Koni, Bilaspur (C. G) by following the standard methods used in identification Process and by viewing relevant keys and essential taxonomic guides.

### Extraction of Experimental Plant Parts:

Out of the four medicinal plants leaves of *Bixa orellana*, *Cryptolepis buchanani* and root of *Vitix negundo*, *Putranjeeva roxburghii* were selected for the extraction procedure. Freshly plucked and intactly uprooted leaves and roots were used in this study respectively. The specified plant parts were cleaned with the help of fine edge brush to remove the adhered dust/dirt present if any. Also, intrusive particles were removed by introducing the plant parts to gentle flow of running tap water thrice followed by distilled, double distilled(dd/w) water and sterile dd/w twice and singly respectively. Dried under the shade and were cut into fine pieces. Extraction of the dried plant samples were done by using Accelerated Solvent Extractor ASE-150 (Dyner). Crude extract of all the four plant parts were mixed with the cow urine and hot water in a ratio (1:1w/v) in a glass beaker and the remaining solution were kept in refrigerator, stored at 4<sup>0</sup> C for further use.

### Isolation of Pathogenic Fungal Species:

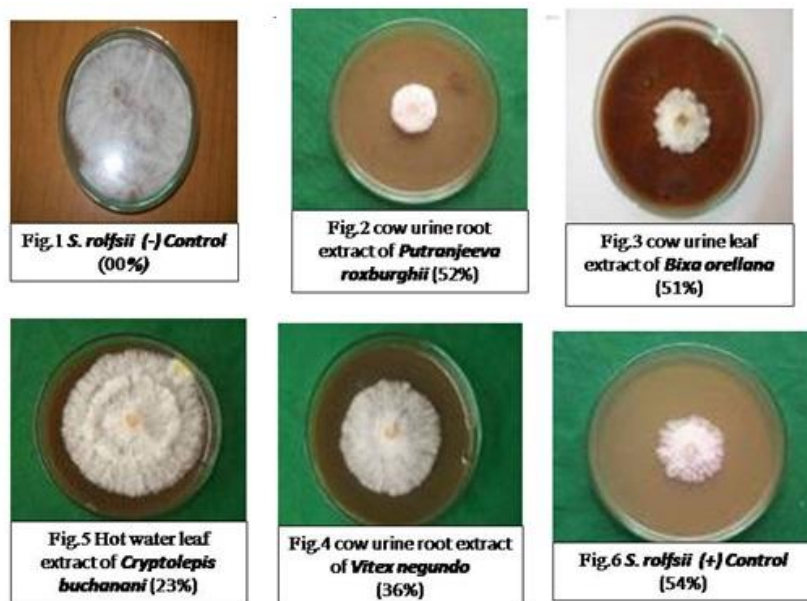
Viable well maintained culture of foot rot fungus *S. rolfsii* was collected from the Department of Rural Technology & Social Development which was sub-cultured in PDA agar medium [containing streptomycin (to prevent bacterial contamination) and incubated at 28°C for 7 days] for further requirement, during the experimental period.

**In-Vitro antifungal activity against *S. rolfii*:**

To evaluate the *In-Vitro* antifungal efficacy of crude plant extracts ‘poisoned food technique’ was applied (Grover and Moore, 1962). 100 ml of Potato Dextrose Agar medium (PDA) was prepared in 250 ml Erlenmeyer flask and sterilized in autoclave. Crude plant extracts were used at two different solvents for this experiment i.e. Cow urine and hot water. Plates were prepared following the technique given by Tiwari et al., 2005. Media with fungicide (Hexaconazole) at 100ppm concentration served as positive control. In general antibiotic *Streptomycin* (100ppm) was added to semisolid PDA medium before pouring the media in petriplate to check any bacterial contamination. All the Petriplates with gelled medium were aseptically inoculated at the center with mycelial disc of 7 mm diameter taken from 24hrs old culture of *S.rolfsii*. Plates were then incubated at 28° C in BOD incubator and mycelial growth was recorded after every 24 hrs of incubation for a week. Percent mycelia inhibition was determine following the formulae- Mycelial growth inhibition (%) =  $(C-T/C) \times 100$ , where ‘C’ is average colony diameter (CD) in control plate and ‘T’ is average colony diameter in poisoned plates (Kambar et al., 2014).

**3. Results and Discussion**

The efficacy of two types of leaf and root extract of four different categories of medicinal plant were studied and observed against the growth of *S. rolfii*, shown in Table 2. It was noticed that all extracts were shown to be effective in inhibiting the fungus but to a varied extent. In case of both the cow urine leaf and root extract and the hot water leaf and root extract growth were arrested in a subsequent manner. The plot clearly states that growth of the pathogenic fungal isolate was more effectively trapped in cow urine root extract of *Putranjeeva roxburghii* (52%) followed by cow urine leaf extract of *Bixa orellana* (51%) and is more or less nearest to the hot water root extract of *Vitex negundo* (49%). Whereas the potential of the plant *Cryptolepis buchanani* was not found significant so far. The most noticeable point is the percent mycelial inhibition of the (+) control Hexaconazole at 100ppm (54%) which approximately touches the values of *Putranjeeva roxburghii* and *Bixa orellana* cow urine root & leaf extract respectively.



**Figure- Showing the Percent mycelial inhibition(%) of Four Medicinal plants against *S. rolfii* a fungal pathogen**

**Figure 1**

**Table 2: Antifungal effect of extracts of selected plants**

Plant Name	Part Used	Cow Urine Extract		Hot water Extract	
		CD in cm	% Mycelial Inhibition	CD in cm	% Mycelial Inhibition
<i>Bixa orellana</i>	Leaves	2.6	51	3.1	43
<i>Vitex negundo</i>	Root	3.5	36	3.3	49
<i>Putranjeeva roxburghii</i>	Root	2.9	52	2.8	41
<i>Cryptolepis buchanani</i>	Leaves	3.9	29	4.2	23
(+) control (Hexaconazole) at 100ppm	-	2.5	54	2.5	54
(-) Control (without supplement)	-	5.5	0	5.5	0

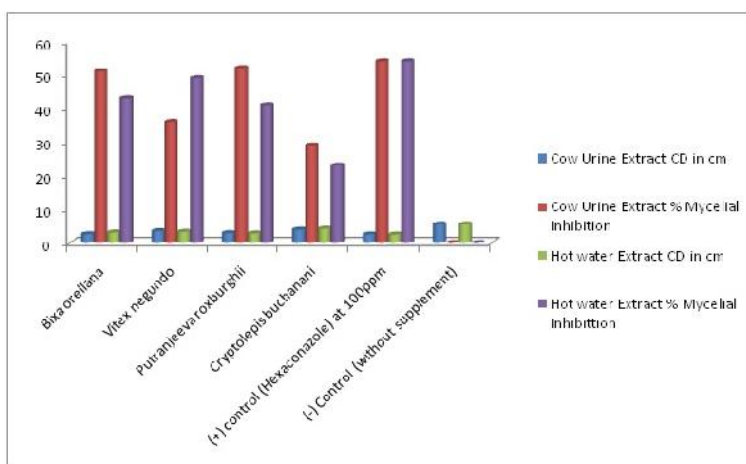


Figure 2

So, a conclusion can be drawn that inspite of using the chemical based drugs one can use the herbal therapy to cure microbial infection. A term commonly employed for this called Allelopathism which involves triggering the growth of nearby living organism by secreting metabolites. Thus, it is clear that natural fungicides are effective, selective, biodegradable, and less toxic to the environment. So one should keep in mind “Go safe directly implies Go Green”

#### 4. Acknowledgement

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