



Isolation of Fungi From Root Tubers Of Chlorophytum Borivilianum San. And Fem.

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ABSTRACT

Chlorophytum borivilianum root tubers are used as a raw material for the preparation of some important drugs for curing various human diseases. During unscientific methods of storage causing fungal contamination. The fungal contamination affect on the chemical composition of raw materials and thereby decreases potency of drugs. Regarding the above fact the present experiment was conducted and observed that the maximum fifteen fungi were isolated by using Agar Plate Method. And minimum thirteen fungi were isolated by using Blotter Method respectively.

Keywords: Chlorophytum borivilianum, Isolation, Fungal Contamination.

I. INTRODUCTION

Chlorophytum borivilianum (San .and Fem) is commonly known as safed musli, family liliaceae, is a highly economical important medicinal plant in Indian system of Ayurveda. (Chakraborty et al., 2014). (Purohit and Prajapati, 2003) reported that in Indian herbal medicine used as an aphrodisiac, antiageing health restorative and health promoter. Varying its common use for health promotion, it is also used for increasing lactation, treating various gynecological disorders, arthritic conditions and to control diabetes mellitus.. Its medicinally important root tubers are rich source of alkaloids, many vitamins, minerals, proteins, carbohydrates, saponins and steroids (Gondi et al., 2004). World Health Organization (WHO) survey report indicates that about 70-80% of the world population particularly in the developing countries rely on non-conventional medicines mainly of herbal sources in their primary health (Okunlola et al., 2007). The herbal medicines are prepared from materials of plant origin they are prone to microbial contamination (Shrikumar and Ravi, 2007). The presence of microbial contaminant in non sterile pharmaceutical products can reduce the therapeutic activity of the products and adversely affect on patients taking the medicines.

Manipulation and processing factors largely indicate the microbiological quality of the products (Busse, 2000).

Many researchers have confirmed that the presence of potential contaminants in herbal preparations viz. (Czech et al., 2001), (Kulshrestha et al., 2008), (Kosalec et al., 2009), (Martins et al., 2001), (Alwakeel, 2008), (Idu et al., 2011). Thus, (Okunlola et al., 2007) concluded that the manufacturers should ensure the lowest possible level of microorganisms in the raw material, finished dosage forms and the packaging components to maintain appropriate quality, safety and efficacy of the natural products. (Rai and Mehrotra, 2005) studied that the quality of herbal drugs with lots of contaminants like heavy metals, pesticides and microbes causes various deformities like congenital paralysis, sensori-neural defects, liver and kidney damage. The unscientific methods of harvesting, collection, storage of raw materials, post harvest processing, transport and storage of herbal drugs in unhygienic conditions, are the main causes considered to make both, raw materials as well as herbal drugs prone to microbial infections leading to deterioration. It can cause health hazard. So present investigation is an attempt to identify the mycoflora associated with Chlorophytum borivilianum root tubers.

II. MATERIALS AND METHODS

1. Collection of plant material.

Chlorophytum borivillianum root tubers were collected from different authentic stores of Jalna district in pre-sterilized polythene bags and brought to the laboratory. samples were identified using the Flora of Marathwada (Naik, 1998) at Department of Botany, Dr. Babasaheb Ambedkar Marathwada University. The plant material was first cleaned by washing several times under running tap water and Surface sterilization was performed by sequentially rinsing the plant material with 70% ethanol for 30 seconds, then with 0.01% mercuric chloride for 5 minutes and finally with sterile distilled water for 2-3 times, then dried in between folds of sterile filter papers, placed at equal distance on moist blotters on the sterilized petriplates similarly material inoculated aseptically on the sterilized petriplates containing Potato Dextrose Agar (PDA) medium and Blotter Method incubated at $25 \pm 2^\circ\text{C}$ temperature for 7 days.

2. Isolation of mycoflora.

Mycoflora was isolated by using Blotter Method and Potato Dextrose Agar (PDA) medium.

3. Identification of fungi

The fungi occurring on plant material in the plates were identified preliminary on the basis of sporulation characters like sexual or asexual spores with the help of stereoscopic binocular microscope. The identification and further confirmation of fungi was made by preparing slides of the fungal growth and observing them under compound microscope. The identification was made with the help of manuals (Mukadam et al., 2006), (Alexopoulos, 1996) and (Barnett, 1970). Pure cultures of these fungi were prepared and maintained on potato dextrose agar (PDA) slants.

III. RESULTS AND DISCUSSION

1. Incidence of fungi on tuber roots of *Chlorophytum borivillianum*:

In order to study the incidence of fungi on tuber roots of *Chlorophytum borivillianum* was studied and the results are summarized in table 1.

From the result given in table 1, it is indicated that young root tubers of *Chlorophytum borivillianum* showed no incidence of fungi except *Aspergillus niger*

and *Fusarium oxysporum* on blotter method where as the same young root tubers kept on PDA showed slight high incidence of fungi. In case of mature root tubers *Chlorophytum borivillianum* the blotter paper method showed the incidence of fungi like *A. flavus*, *A. niger* and *F. oxysporum* where as PDA method showed slight higher incidence of fungi as compared to Blotter method.

Table 1. Incidence of fungi on root tubers of *Chlorophytum borivillianum* from different age.

Fungi	Young		Mature		Stored	
	Blotter	PDA	Blotter	PDA	Blotter	PDA
<i>Alternaria alternata</i>	-	05	-	-	10	10
<i>Aspergillus flavus</i>	-	-	10	10	20	35
<i>Aspergillus niger</i>	05	15	15	35	25	50
<i>Aspergillus fumigatus</i>	-	05	-	20	05	30
<i>Aspergillus nidulans</i>	-	-	-	-	-	05
<i>Aspergillus terreus</i>	-	-	-	-	10	15
<i>Curvularia lunata</i>	-	10	-	20	05	25
<i>Cladosporium</i> sp.	-	-	-	-	-	20
<i>Fusarium oxysporum</i>	05	15	15	25	25	45
<i>Fusarium roseum</i>	-	10	-	15	10	15
<i>Mucor globosus</i>	-	-	-	-	05	10
<i>Phoma</i> sp.	-	-	-	-	05	15
<i>Penicillium notatum</i>	-	-	-	-	05	30
<i>Rhizopus stolonifer</i>	-	10	-	20	10	35
<i>Rhizoctonia solani</i>	-	-	-	-	05	05

It was interesting to note that the stored root tubers of *Chlorophytum borivillianum*, the maximum incidence of fungi were reported as compared to young and mature root tubers. In case of stored fruits PDA method, percent incidence of fifteen fungi such as *Alternaria alternata* (10), *Aspergillus flavus* (35), *Aspergillus niger* (50), *Aspergillus fumigatus* (30), *Aspergillus nidulans*

(05) , *Aspergillus terreus*(15), *Curvularia lunata* (25), *Cladosporium.sp* (20) , *Fusarium oxysporum* (45), *Fusarium roseum*(15), *Mucor globsus* (10), *Phoma sp.*(15), *Penicillium notatum* (30), *Rhizopus stolonifer* (35) and *Rhizoctonia solani* (05) were reported where as thirteen fungi viz. *Alternaria alternata* (10) *Aspergillus flavus* (20), *Aspergillus niger* (25), *Aspergillus fumigates* (05), *Aspergillus terreus*(10), *Curvularia lunata* (05), *Fusarium oxysporum* (25), *Fusarium roseum*(10), *Mucor globsus* (05), *Phoma sp.*(05), *Penicillium notatum* (05), *Rhizopus stolonifer* (10), *Rhizoctonia solani* (05) were associated on Blotter method.

Roy, (2003) reported that the frequent occurrence of *Aspergillus*, *Fusarium* and *Penicillium* species on different crude herbal drugs. (Abou et al.,1999) and (Gautam and Bhaduria, 2008, 2010) noted that the occurrence of these fungi in Egyptian herbal drugs and in stored herbal fruit samples.(Dhale, 2013)studied and concluded that 45 fungi were recorded on the blotter and agar plate methods . Maximum number of fungi belonged to Deutroomycetes. All samples of plant material showed maximum infestation of *A. niger* and *Aspergillus spp.* (Sharma et al., 2013) The some herbs are good substrate for *Aspergillus flavus* infestation and production of aflatoxins with potential hazard to the health of consumers. (Kumar et al.,2009) concluded that the herbal preparations had the presence of fungal contaminants with predominance of *Aspergillus spp.* and *Penicillium spp.*, but *Mucor spp.*, *Candida spp.*, *Trichosporium spp.*, also were found. The fungal deterioration adversely affects the chemical composition of the raw materials and thereby decreases the medicinal potency ofherbal drugs .respectively, supporting findings of present investigations.

IV. CONCLUSION

The present study was aimed to isolate the mycoflora associated with root tubers of chlorophytum borivilianum . In the stored root tubers of Chlorophytum borivilianum, the maximum incidence of fungi was reported as compared to young and mature root tubers. This study stresses the importance of scientific methods for proper storage of plant parts. Therefore, this study suggests that the methods of harvesting, collection, preparing and storage of medicinal plants must be improved for reducing percentage incidence of mycoflora and mycotoxins contaminations. These

factors can certainly contribute significantly promoting ecofriendly herbal drugs for the health care of human society.

Photo plate 1. Isolation of Mycoflora on different media.



Blotter Method.



PDA Medium.

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VI. REFERENCES

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