

## Compatibility of Phyton with Common Fungicides and Their Role on the Yield of Safed Musli

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**Abstract:** In order to know the compatibility of Phyton (a Phytotonic) with routine fungicides like Captan and GLSTIN (Carbendazim), for the preliminary management of *Fusarium solani*, a causal organism of tuber-rot of safed musli, the present study was carried out. Among the fungicides, though GLSTIN stood superior, its effect was found inferior to that of Phyton alone. However, the combination of Phyton with GLSTIN @ 0.3% each was proved to be the best in reducing the growth of the fungus. The same combination was also proved its efficiency in the enhancement of the yield of the crop.

**Key words:** Tuber-rot • phytotonic-phyton • fungicide treatments • crop yield

### INTRODUCTION

Safed musli (*Chlorophytum borivilianum*), a herb belongs to family Liliaceae. It was originally grown in thick forests of India[1]. About 300 species are distributed throughout the tropical and subtropical parts of the world. Tropical and subtropical zones of Africa are the probable centers of origin of the genus[2]. In India, it is considered as a valuable medicinal herb, whereas in other parts of the world it is being used as ornamental plant. The roots (tubers) are rich in alkaloids, vitamins, minerals, proteins, carbohydrates, saponins, polysaccharides and steroids of various therapeutic values as total rejuvenator, antioxidant and Immuno modulator[3]. It is being used as an anti arthritic and anticancer drug. Because of its aphrodisial properties, it is mainly identified as 'Herbal viagra'. Safed musli is widely distributed in India mainly in Southern Rajasthan, Western Madhya Pradesh, North Gujarat and few parts of Karnataka. But, continuous exploration has decreased its frequency, distribution and the quality. This species has low rate of regeneration and prone to attack by many diseases. Among them tuber-rot and crown-rot are more prevalent in Agricultural fields at Mysore district of Karnataka State in India. Since the cultivation expenses are very high, it is mandatory to get disease a free product. Hence, in the present study to overcome the problem of tuber-rot and the crown-rot, attempts have been made using fungicides for tuber treatment as well as foliar spray under green-house conditions.

### MATERIALS AND METHODS

Healthy tubers of *Chlorophytum borivilianum* Santapau and Fernandes were collected from the agricultural field at Mysore, Karnataka State in India and were kept in plastic trays under room conditions for further use. These tubers were further washed and used for soaking treatment in 0.3% solutions of fungicides like Captan, GLSTIN and Phyton. During treatment 25 tubers in each set were separately soaked in 0.3% Captan, GLSTIN, Phyton and in a combined solution of 0.3% Phyton and 0.3% GLSTIN for 18 h at 28±2°C. After soaking treatment, the tubers were sown in the pots contained sand, soil and farmyard manure in the ratio of 2:2:1. The pots were maintained at green-house conditions for a period of 9 months and then the tubers were harvested. On harvest, the average biomass of the tubers of each treatment was measured and the data were tabulated. The tubers without treatment with chemicals, maintained under similar conditions were served as corresponding control. In the other set, tuber-rot causing fungus, *Fusarium solani* was isolated from the rotted tubers of crown-rot showing plants and maintained in the laboratory for further studies. In order to find out an effective treatment to manage the incidence of *F. solani* in tubers and to improve its yield, in the present study the above mentioned chemicals in the same concentrations were amended to Potato Dextrose Agar medium. Then, uniform culture discs of 5 mm diameter were obtained from the 8-day-old actively growing colonies of *F. solani* and

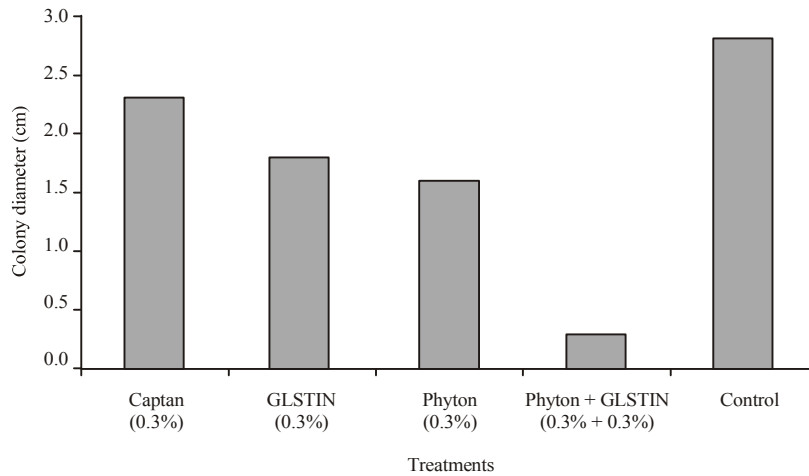


Fig. 1: Effect of different fungicides and Phyton - a Phytotonic on the mycelial growth of *Fusarium solani*

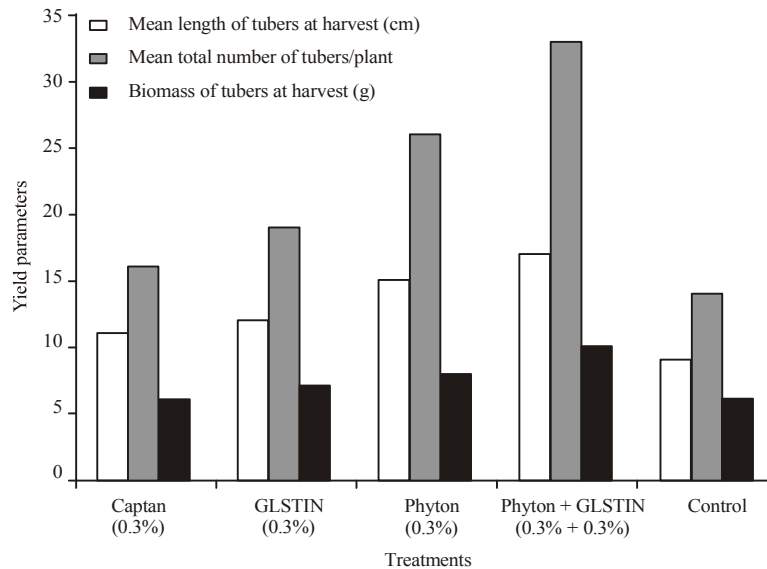


Fig. 2: Role of Phyton and some fungicides on the yield of Safed Musli

were individually plated on the poisoned medium and were incubated for a period of one week under 12/12 h alternate cycles of near ultraviolet light and darkness at  $22\pm 2^\circ\text{C}$  according to the procedures of ISTA[4]. On 8th day of incubation the colony diameter of the fungus was recorded based on the average of three replicates. While measuring, four different sectors of each colony were considered to get consistent data. In this case also the cultures grown on PDA plates unamended with chemicals were served as controls.

## RESULTS AND DISCUSSION

Data indicated in Fig. 1 provides the details of the colony growth of the causal organism *Fusarium solani*

which was varied with respect to different fungicides and Phyton. Comparatively, the growth of the fungus was observed to be more in Captan treated plates. Phyton and GLSTIN @ 0.3% indicated the reduced growth of the fungus. This combination was found to be the best compared to the control and the fungicide amended medium, which was resulted in the reduction of the colony diameter by more than two folds.

Data with respect to mean length of the tubers, total number of tubers/plant and mean biomass of the individual tubers at harvest are represented in Fig. 2. Compared to control all the treatments enhanced the total yield of the tubers. Among the treatments, combination of Phyton with GLSTIN was found to be promising in enhancing the yield of the crop to a maximum extent.

Though Phyton alone was putative, it was much beneficial in combination with GLSTIN. Phyton is known to enrich with potash and phosphorus, which might have facilitated the healthy growth of the plant, thereby enhanced the tuber development, ultimately the yield. Generally potash and phosphorus are known to play an important role in the enrichment of leaves with high chlorophyll content. In contrast high nitrogenous supply make the plants highly vulnerable to the fungal diseases. In the soil as such the availability of phosphorus is meager due to acidic condition of soil. Hence, Phyton played a major role as additional supply of nutrients, which have been easily taken up by the plants and thus resulted in the high yield of the tubers. The combination of Phyton with GLSTIN also favoured the plants in which GLSTIN safeguarded the plants systematically against the tuber-rot causing organism *F. solani*. So, rather than the individual chemical treatment, combination proved their efficacy in the enhancement of yields. Though the pot experiments have certain constraints such as limitation of space and lack of aeration, it provided the promising results at preliminary studies. In support of the present findings, there are reports suggest the effectiveness of Carbendazim against *Fusarium* species [5].

The efficacy of the chemicals is always dose dependent, which also varies with respect of method of treatment and duration of treatment. In other ways, the surface texture of the host tissues also plays an important role in the absorption of the chemical compounds. In this regard it is necessary to fetch more information for the betterment of a crop yield against the tuber-rot fungus.

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