



Extraction and estimation of chlorophyll from chilli seedling treated with *Trichoderma* isolates

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ABSTRACT

Chlorophyll is important photosynthetic pigments found in higher plants, algae and cyanobacteria. Chlorophyll is content responsible for green pigment and structurally same as porphyrin pigments such as heme having same metabolic mechanism. In present study Chlorophyll content were extracted from chilli leaves treated with Trichoderma isolates by using acetone. The prepared samples were exposed to a range of light having different wavelength and analyzed using a spectrophotometer. Concentration of chlorophyll a and b was calculated using Arnon method. Chlorophyll content was higher in leaves treated with T7 isolate followed by T4, T1, and T5.

Keywords: *Trichoderma isolates, chilli leaves, spectrophotometer*

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INTRODUCTION

Chilli is considered as one of the most significant spice and vegetable crop belongs to the genus *Capsicum*, generally known as "red pepper while belongs to nightshade family *Solanaceae*" [1]. Chilli crop suffers many fungal diseases but *Fusarium* wilt is the most important soil borne disease caused by *Fusarium* spp. Application of biological control agents (BCA) is a promising and eco-friendly tool in improving current levels of agricultural production. *Trichoderma* as biocontrol agent, its improving a crop production and assists in reducing use of chemical pesticides thereby controlling release of their residues into environment. One of the most efficient ways to achieve this objective is to develop BCAs for disease control alone, or to integrate it with reduced doses of chemicals in the control of phytopathogens resulting in minimal impact of chemicals on the environment [2]. *Trichoderma* possess capability to increase plant growth and soil remediation activity compared to other microbial agents. *Trichoderma* can increase plant growth and crop yield by increasing plant nutrient uptake that help plants to grow more fast and decreasing disease incidence by their biocontrol activity [3]. *Trichoderma* were focused on the capability of these fungi to directly prevent the growth of pathogens with specific mechanisms like as mycoparasitism, production of antibiotics, and competitions for space and nutrition in the rhizosphere [4, 5]. *Trichoderma* as multifunctional biocontrol agent [6,7]. Although, efficiency in their activity is mutable among the species. These fungi have shown to be plant symbionts, in this symbiotic process, they infect plant roots, but through chemical communication components they induce the plant to wall the invading *Trichoderma* hyphae so that the organism is restricted to the outer layers of the root. In so doing, they would induce systemic resistance (ISR) responses to a broad spectrum of pathogens and adverse environmental conditions.

The present studies were undertaken to test the efficacy of seedlings treatment with *Trichoderma* along with different soil amendments on total chlorophyll content of chilli against *Fusarium* wilt of chilli in pot.

MATERIAL METHODS

Collection of leaves:

Chilli leaves were collected from the chilli plants pot and wrapped with silver foil takes it for experiment.

Extraction of Chlorophyll:

0.1 gram leaves sample were taken and ground in sterile mortal pestle with 80 % acetone and then mixture was transferred in centrifuged tube and centrifuged 5000 to 10000 rpm for 5mins and supernatant was transferred in new tube. This process was repeated till the residue becomes obtained is colourless. Absorbance was recorded at 645 nm and 663nm and 80% acetone is used as blank.

Estimation of chlorophyll content:

Use Arnon's equation [8] the content of chlorophyll a, chlorophyll b and total chlorophyll were calculated.

$$\text{Chl a} = [(12.7 \times A_{663}) - (2.6 \times A_{645})] \times \text{ml acetone} / \text{mg leaf tissue}$$

$$\text{Chl b} = [(22.9 \times A_{645}) - (4.68 \times A_{663})] \times \text{ml acetone} / \text{mg leaf tissue}$$

$$\text{Total Chl} = \text{Chl a} + \text{Chl b.}$$

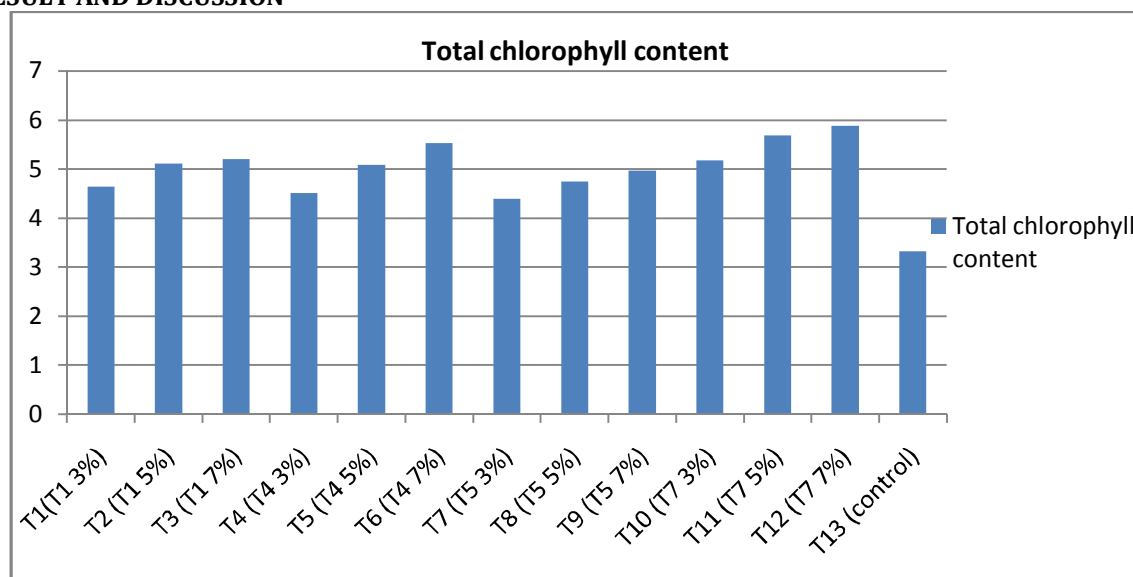
RESULT AND DISCUSSION

Figure-1: Estimation of chlorophyll content in leaves treated with *Trichoderma* isolates

The result shows that significant increased in chlorophyll a, chlorophyll b and total chlorophyll content was observed in seedling treatment with different concentration of *Trichoderma* isolates viz; T7, T4, T1 and T5 as compared to control. Among the treatments the highest total chlorophyll content was recorded to T7 isolates at all concentration (3% 5% 7%) followed by T4 (3% 5% 7%), T1 (3% 5% 7%), T5 (3% 5% 7%) where as minimum chlorophyll content was observed in pathogen inoculated control. Kumari *et al*, [9] observed that chlorophyll content is higher in leaves treated with biocontrol agent and fungicides. Plant chlorophyll content also indicates the health of plants and strongly related to its biophysical conditions [10]. Photosynthesis play critical process in plant physiology and its regulation play an important role in plant defense [11].

CONCLUSION

The present study we conclude that the most significant information that generated in this experiment, effect of chilli seedlings treatment with *Trichoderma* isolates along with different concentration, the content of chlorophyll may vary with different wavelength.

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