A Study of Chemical, Natural and Biofertilizers on Biochemical Changes in Fruits of *Lycopersicon esculentum* var. S-22

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ABSTRACT

The tomato (*Lycopersicon esculentum* var. S-22) is commonly called the love apple or the luxury crop. The pot experiment was conducted in the study of chemical, natural and biofertilizers on biochemical changes in the fruits of fertilizers treated tomato plants. The present study revealed that the mature fruit showed more amount of protein, carbohydrates and sugar than the younger fruit in the natural fertilizers treated plants.

Key Words: *Lycopersicon esculentum,* biofertilizers, biochemical, agriculture.

INTRODUCTION

Agriculture is a actually called farming or husbandry. This means that agriculture is the cultivation of plants animals and other life forms, biofuels and other products for the well beingness of human life.

In India agriculture is the most important and one of the major sectors which accounts for 16.6% of total GDP i.e 50% of total work force. But for the proper yield of the crops the use of fertilizers are very important. Fertilizer is one of the major factors of crop production. Among the factors nitrogen is very much essential for good plant establishment and expected growth (Uddin and Khalequzzaman, 2003). Chemical fertilizers use mineral deposits or industrially manufactured through chemical processes. Organic fertilizers are fertilizers that use manures and have their origin in plants or animals.

Dependence on chemical fertilizers for future agricultural growth would mean further loss in soil quality possibilities of water contamination and unsustainable burden on agricultural system (Rajasekaran *et al.,* 2012). Organic agricultural practices aim to enhance biodiversity biological cycles and soil biological activity so as to achieve optimal natural systems that are socially ecologically and economically sustainable (Samman *et al.*, 2008). Soil microbes play an important role in many critical ecosystem processes, including nutrient cycling

and homeostasis, decomposition of organic matter, as well as promoting plant health and growth as bio-fertilization (Han *et al.,* 2007). The growth substance produced by the biofertilizers might have accelerated the carbohydrate accumulation and increased the metabolic activities (Singh and Usha, 2003).

METERIALS AND METHODS

Lycopersicon esculentum var. S-22 seeds were taken for the present study. Tomato (*Lycopersicon esculentum* var. S-22) and the fertilizers choosen for the study were (cow dung, vermicompost, urea, VAM and Tricholine-LF) collected from Tamilnadu Government Agriculture Extension Centre, Nagercoil.

2.5 g of seeds were weighed. For all inoculations, slurry is prepared by mixing 2.5g of each fertilizer with cooled rice glue (kanji). The treated seeds were sown in six experimental pots. One of the pot was used for sowing control seeds of *Lycopersicon esculentum* without supplying any fertilizers. The remaining five pots were treated as experimental pots in which 2.5 gm of seeds inoculation with fertilizer were sown. Irrigation was done at regular intervals without causing any physical damages. The seedlings were grown until ripening of fruits. The fruits of treated plants were collected and conducted the biochemical studies such as protein, carbohydrate and sugar.

All the experiments were conducted with three replications. The experimental data were statistically analyzed. The different inoculations were as follows: Control, Cow dung, Vermicompost, Urea, VAM, Trichoine-LF. Total protein was estimated by Lowry *et al.* (1951) method, total carbohydrate was estimated by Dubois *et al.* (1956) method and sugar was estimated by Nelson's arsenomolybdate method, (1994).

RESULTS AND DISCUSSION

The protein content in fruit *Lycopersicon esculentum* var. S22 is presented in Table 1. The mature fruit showed more amount of protein than the young fruit. The minimum amount of protein in mature fruit was noticed in control (0.98±0.06 mg). The maximum amount of protein was found in mature fruit of cowdung treated plants (1.69±0.01mg). These results are similar to those of Ghani *et al.* (2000); Nanjundappa *et al.* (2001); Khaliq, 2004 who reported increasing in grain protein content with nitrogen for organic sources. The higher protein content of seedling was observed at the application of cow dung (Chinthapalli *et al.*, 2015)

The carbohydrate content in fruit *Lycopersicon esculentum* var. S22 is presented in Table 2. The mature fruit showed more amount of carbohydrate than the young fruit. The minimum amount of carbohydrate in mature fruit was noticed in control (0.42±0.06mg). The maximum amount of carbohydrate was found in mature fruit of cowdung treated plants (0.71±0.08mg).

The sugar content in fruit *Lycopersicon esculentum* var. S22 is presented in Table 3. The mature fruit showed more amount of sugar than the young fruit. The minimum amount of sugar in mature fruit was noticed in control (0.66±0.08mg). The maximum amount of sugar was found in mature fruit of cowdung treated plants (1.17±0.06mg). The higher sugar content of seedling was observed at the application of organic fertilizer (cow dung) over the inorganic fertilizer (Chinthapali *et al.*, 2015).

Organic manures like vermicompost and Cow dung not only act us a nutrients and organic matter but also increase size biodiversity and activity of the microbial population in the soil nutrient turn over and many other related physical chemical and biochemical parameters of the plants.

Table: 1 Response of fertilizers on the protein content in fruit of *Lycopersicon esculentum* var. S22(values in mg)

Treatments	Young fruit	Mature fruit
Control	0.41±0.02	0.98±0.06
Cow dung	0.72±0.02	1.69±0.01
Vermicompost	0.65±0.02	1.52±0.03
Urea	0.52±0.02	1.11±0.01
VAM	0.57±0.01	1.34±0.02
Tricholine-LF	0.58±0.02	1.40±0.08

Table: 2 Response of fertilizers on the carbohydrate content in fruit of *Lycopersicon esculentum* var. S22(values in mg)

Treatments	Young fruit	Ripen fruit
Control	0.28±0.02	0.42±0.02
Cow dung	0.64±0.02	0.71±0.02
Vermicompost	0.56±0.01	0.62±0.02
Urea	0.35±0.02	0.46±0.02
VAM	0.44±0.02	0.53±0.01
Tricholine-LF	0.49±0.02	0.58±0.02

Table: 3 Response of fertilizers on the sugar content in fruit of *Lycopersicon esculentum* var. S22(values in mg)

Treatments	Young fruit	Mature fruit
Control	0.29±0.02	0.66±0.08
Cow dung	0.57±0.02	1.42±0.09
Vermicompost	0.49±0.01	1.28±0.07
Urea	0.33±0.02	0.93±0.06
VAM	0.38±0.02	1.08±0.08
Tricholine-LF	0.43±0.02	1.17±0.06

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