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ORIGINAL ARTICLE

Effect of Leaf extract and synthetic Fungicide on Shelf life of Tomatovar.NS-2535.

A.M.Vikhe and P.Gopal Reddy.
Department of Dairy Science, Padmashri VikhePatil College, Pravaranagar-Loni
Dist: Ahmednagar, Maharashtra-413713
e-mail: vikhe_amol@rediffmail.com

ABSTRACT
The effect of 25%,50%,75% and 100% concentrations of leaf extracts of Vitex negundo, Annona squamosa, Withania somnifera, Polyalthial ongifolia, Azadirachta indica on Shelf life of Tomato fruits var.NS-2535. Tomato which is a commonly cultivated and more demanded vegetable, was evaluated and compared with synthetic agro-chemical Dithane M-45, by under field conditions.The plant extracts have not only arrested the growth of pathogen and lowered the disease intensity but also helped to increase the shelf life and decrease the weight loss in the tomato fruits better than the synthetic fungicide. Maximum shelf life of fruits could be achieved when treated with the leaf extracts of W. somniferaand P. longifolia. The extract of the latter also considerably which the shelf life was less and percent weight loss was more . Continuous efforts to search for good botanicals which are not only antagonistic to plant pathogens but also act as Shelf life enhancement agents.
KEY WORDS: *Tomato, Synthetic fungicide, Concentration, Leaf extract, shelf life .*

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INTRODUCTION

Tomato (*Lycopersicon esculentum* Mill.) belongs to the family Solanaceae and is one of the most remunerable and widely grown vegetable crops in the world. Among the vegetables, tomato ranks next to potato in world acreage however ranks first among the processing crops [3]. Tomatoes are grown for edible fruits, which can be consumed either fresh or in processed form and as a very good source of vitamins A, B,C and minerals. They are also used widely for making salad, ketchup, sauce, pickle and many other commercial edible products. Tomato is one of the most widely used food crops in world Vegetable economy consumer preference for fresh tomatoes are influence by appearance texture the fruit sensory quality nutritional considerations and safety mostly freedom from disease .It known more than 90 % of vitamin in human diets is supplied by fruit and vegetables. The shelf life is period of time which starts from harvesting and extends up to the start of rotting of fruits. In some countries of the world fruits and vegetables are washed in chlorine or potassium permanganate before packaging. 50 % shelf life tomato is loss in between harvesting ,transportation and consumption. since tomato is highly perishable. It having several problems in its transportation, storage and marketing. The tomato fruits are pickled green & ripening is initiated by ethylene treatment. when tomato are picked mature green but frequently immature green fruit will develop red pigmentation. During processing and storage tomato products undergo nutritional changes .The fruit of tomato which are eaten both raw as well as cooked. The tomato fruit constitute carotenoids B- carotene and lycopene.The tomato fruits are perishable since to increase the shelf life of tomato with the help of various plant extract [1]. Hence the present investigation is planned to investigate the Effect of Botanicals and synthetic Fungicide on Shelf life of Tomato fruits var.NS-2535.

MATERIAL AND METHODS

Synthetic Chemical Fungicide: The chemical fungicide Indofil-Mancozeb 75% WP (Dithane M-45) was purchased from Private Agro Services for its use as standard.

Preparation of plant extracts: Fresh and Mature Leaves of *Azadirachta indica, Annona squamosa, Polyalthia longifolia, Vitex negundo, Withania somnifera* used as bio-agents. 100 gm of air dried leaves of each plant were cut into small pieces separately and crushed to fine paste with the help of mortar and pestle using 300ml of 98% ethanol as solvent. The homogenized mixture was filtered through double-layered muslin cloth. The filtrate was kept for 24hrs., in oven at 40°C for the evaporation of ethanol and the residue was dissolved in 100ml distilled water to get a stock solution [6] from which various concentration viz. 25%, 50%, 75% and 100% were made by adding distilled water [2].

Preparation and Planting:

Raised nursery beds and seedling trays: Healthy tomato seeds were sown in rows of 10-15 cm apart on nursery beds of size 180 x 120 x 25cm and also in the seedling trays and covered with fine soil and straw. Beds were watered twice a day to ensure sufficient moisture for germination. The emerging seedlings were observed after 7-10 days.

Transplanting: Thirty day old seedlings were transplanted into the experimental field. Watering the seedlings was stopped 12-14 hours before uprooting the seedlings for transplanting. However the seedlings were again slightly watered at the time of uprooting so as to avoid excessive damage to the roots. Seedlings of 15-25 cm tall with 3-5 true leaves were used for transplantation. Transplanting was done in the afternoon so as to reduce the transplanting shock. The transplanted seedlings were immediately watered.

Spacing: 60 cm plant to plant and 75 cm row to row spacing was maintained in plots. Plants were protected from heat during the first five days by covering them with large leaves.

Spraying: Synthetic fungicide M-45 and leaf extract with concentrations (25%, 50%, 75% and 100%) were tested as 4 sequential sprays at an interval of 15 days. The first spray was carried out as soon as the first symptom of early blight was noticed in the field.

Picking: Picking of mature fruits of var. NS-2535 from each treatment was carried out.

Quality parameters: Shelf life (days) of tomato: A composite sample of about 1 kg of mature fruits of Tomato var. NS-2535 from each treatment was kept at room temperature of 26 ± 2^0C. Fruits in each treatment were daily observed visually for shrinkage. When the shrinkage was noticed on any of the fruit in a treatment, the date was recorded and shelf life was worked out up to that day for the respective treatment.

Weight of each fruit sample was noted the first day and also on the day when shrinkage was first noticed in same treatment to find out the shelf life in days.

Physiological loss of weight (PLW):

For determining PLW the weight of Tomato was recorded and the total loss of physiological weight was then calculated by subtracting the final weight of the vegetables from the initial weight. The results were then expressed in percentage using following formula [2, 4]:

$$\% \text{ PLW} = \frac{\text{Initial weight} - \text{Final weight}}{\text{Initial weight}} \times 100$$

Statistical analysis: Based on the observations recorded for different parameters, the statistical analysis was done. The data was subjected to the analysis of variance (ANOVA) of the experiments carried out in laboratory as well as in the field (RBD) and interpreted in accordance with Panse and Sukhatme [5]. To compare two treatments, mean and critical difference (CD) at 5% level was worked out.

RESULTS AND DISCUSSION

Results reveal that the plant extracts have not only arrested the growth of pathogen and lowered the disease intensity but also helped to increase the shelf life and decrease the weight loss in the tomato fruits better than the synthetic fungicide. Maximum shelf life of fruits (15 days) could be achieved when treated with the leaf extracts of *W. somnifera*and *P. longifolia.* The extract of the latter also considerably decreased the loss in weight during the shelf life period as compared to control in which the shelf life was less (11 days) and percent weight loss was more (14%). This suggests that the leaf extracts can be safely used as agents for increasing the shelf life of horticultural commodity. Surekha *et al*. [7] reported the increase in shelf life of tomatoes with different concentrations (1%, 5% and 10%) of Garlic (*Allium sativum*) and Ginger (*Zingiber officinale*) extracts. The extracts also reduced physiological loss and microbial load on the surface of the fruits thereby enhancing the keeping quality of fruits. Continuous

efforts to search for good botanicals which are not only antagonistic to plant pathogens but also act as but also helped to increase the shelf life, growth and yield enhancement agents. Therefore essential to gather more information for formulation of new agro-compounds acceptable in agriculture and horticulture practices for the human and animal welfare.

Table No. 1: Effect of synthetic fungicide and leaf extract on the shelf life and physiological loss (in weight) of Tomato fruits.

S. No.	Treatments	Self Life [days]	Physiological loss in weight (PLW%)
1	T1	14	8.6
2	T2	14	5.6
3	T3	15	7.8
4	T4	15	1.5
5	T5	14	6.0
6	T6	13	8.8
7	T7	11	1.4
	SEM	0.577	0.218
	CD (5%)	2.430	0.918
	CV	7.291	5.587

Fig 1: Effect of synthetic fungicide and leaf extract on shelf life of Tomato.

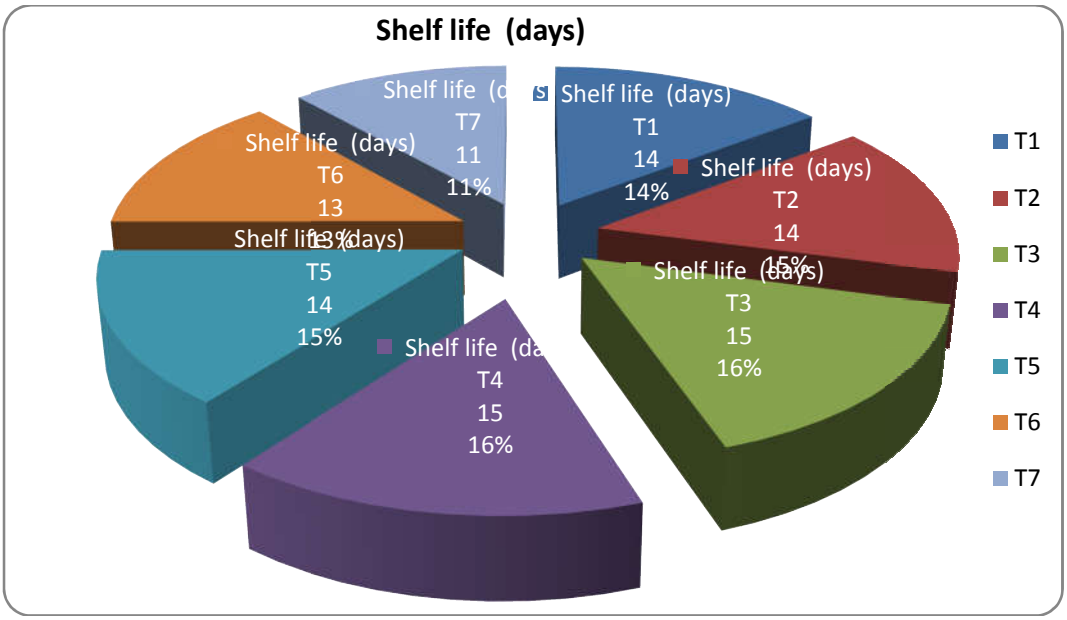
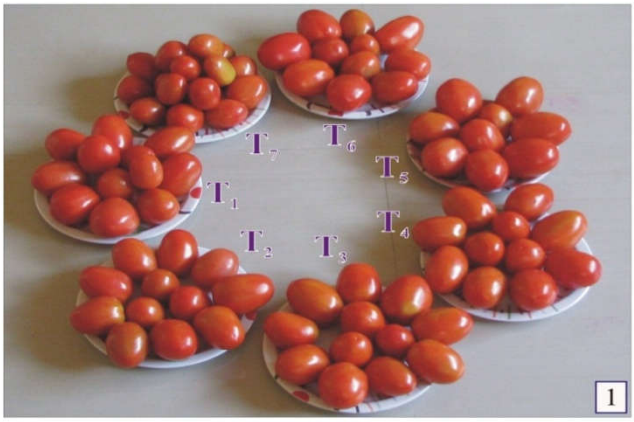


Fig 2: Effect of leaf extract and synthetic fungicide on the shelf life.



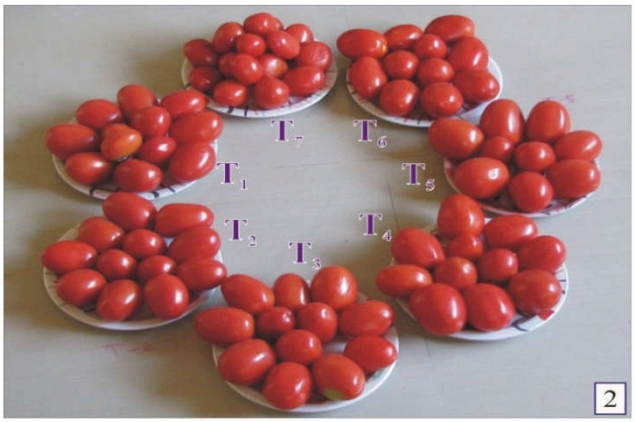


Fig.1 and 2: T_1.*Vitex negundo leaf extract.*
T_2. *Annona squamosa leaf extract.* **T_3**. *Withania somnifera leaf extract.*
T_4.*Polyalthialongifolialeaf extract.* **T_5.***Azadirachtaindicaleaf extract.*
T_6. Synthetic fungicide M-45. **T_7.**control.

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