



## M.Phil Thesis Summary

# Screening of Tomato Germplasm Against *Alternaria alternata* and Management of Disease Through Chemicals

Tehreem Sehar<sup>1</sup>,  
Sidra Muqet<sup>2\*</sup>,  
Muhammad Amjad Ali<sup>1</sup> and  
Fatima Nasir<sup>1</sup>

<sup>1</sup>Department of Plant Pathology,  
University of Agriculture, Faisalabad, Pakistan

<sup>2</sup>Pest Warning and Quality Control of Pesticides,  
Punjab, Pakistan

\*Corresponding Author

### Key words:

Tomato, *Lycopersicon esculentum*,  
*Alternaria* black leaf spot, chemicals,  
*Alternaria alternate*, carbendazim,  
sulphur, metalaxyl+mancozeb

Tomato scientifically known as *Lycopersicon esculentum* is a self-pollinated crop with 1% open pollination. It is an important Solanaceous vegetable crop by its nutritive value and is grown all over the world. Tomato has originated from the highlands of the west coast of South America where its local name was tomato. Tomato was taken to Europe and Asia from Mexico<sup>1</sup>. Tomato is a rich source of Lycopene called the "world's most powerful antioxidant," which has a beneficial effect on health. It is a good appetizer and suitable for diabetic patients. Tomato extract is good for maintaining human urinary acidity as compared to that of orange juice. Branded tomato extract (Lycomato) is very helpful for the treatment of high blood pressure.

*Alternaria* black leaf spot was reported in the early 20th century. Initially, the researcher described only a few characters of disease. The group *Alternaria* was first identified by Nees in 1817. The fungus can rot through the whole stem of tomato and

cause an unusual 'ghost spot' unripe tomato reduces fruit market value. *Alternaria alternata* is a ubiquitous fungal pathogen that causes severe damage to a large number of economically important fruits and vegetables<sup>2</sup>.

Ten tomato varieties were sown in the research area of the Department of Plant Pathology, University of Agriculture Faisalabad. Soil selection was done to come to know that either field was infected or not also record the soil type and pH of the soil. A complete history of the field was collected from field man. Pathogen isolated from diseased samples collected from tomato growing areas of Pakistan mainly from Faisalabad and other districts of South Punjab. Samples were disinfected with 70% Ethanol and twice dipping in distilled water then plated on media containing plat that is PDA (Potato Dextrose Agar media). Based on morphological characters identification and purification of the pathogen were done. At different stages of growth and disease cycle,

data were record and calculated percentage disease incidence by using the formula given below:

$$\text{PDI (\%)} = \frac{\text{Number of disease plants}}{\text{Total number of plants inspected}} \times 100$$

*Alternaria alternata* is a highly destructive pathogen of both greenhouse and field-grown tomatoes. In warm vegetable production areas, it has now gained more importance in Pakistan due to the introduction of susceptible germplasm. The cheapest control measure to overcome losses due to disease is the cultivation of resistant varieties but in the case of leaf spot against pathogen is lacking in the commercial varieties. This fungal disease can be managed by screening the varieties against pathogenic fungi and by using chemicals in low doses. In addition to screening, chemical control of the disease is most desirable as it is effective and results can be achieved in minimum time.

Keeping in view the above-mentioned circumstances, study trials were conducted to identify the source of resistance and also chemicals were evaluated against the leaf spot of tomato disease. In screening trail, ten tomato varieties were evaluated against fungal disease under field conditions and data was collected showed that

among all the screened varieties. No variety was found immune and resistant. Only three varieties were found moderately resistant FOSTER, KORTATJ, AS-3870. Two varieties HT-1570, QASBA were susceptible and five were found highly susceptible against a fungal pathogen. Eight chemicals with 6 concentrations viz 200, 150, 100, 50, 25, 0.25  $\mu\text{L}$  were tested against *A. alternata* under in-vitro conditions. Data was recorded after 24 hours. Data has revealed that carbendazim, sulfur and Metalaxyl+Mancozeb produced significant results in controlling mycelial growth of fungi at their maximum rate 73. protease additives, is a feasible substitute for cell lysis reagent that can be efficiently employed to isolate undamaged genomic DNA with high purity.

#### REFERENCES

1. Abdel-Mallek. A., S. Hemida and M. Bagy, 1995. Studies on fungi associated with tomato fruits and effectiveness of some commercial fungicides against three pathogens. Mycopathologia, 130: 109-116.
2. Abhinandan, D., H.S. Randhawa and R.C. Sharma, 2004. Incidence of alternaria leaf blight in tomato and efficacy of commercial fungicides for its control. Ann. Biol., 20: 211-218.