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**OCCURRENCE OF FUNGI PATHOGENS ASSOCIATED WITH SEEDLING BLIGHT DISEASES IN *Solanum lycopersicum* CULTIVATED IN BIDA LOCAL GOVERNMENT AREA, NIGER STATE.**<sup>1</sup>Muhammed, H.M., <sup>2</sup>A. Yunusa and <sup>3</sup>Adebola, M.ODepartment of Biological Sciences  
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Niger State, Nigeria.**ABSTRACT:**

*Solanum lycopersicon* seedlings showing seed decay, seedling wilting and seedling blight symptoms were randomly selected from three farms in Bida Local Government Area and was examined using baiting method for the presence of fungal pathogens inducing seedling blight and identified based on their morphological characteristics. *Aspergillus niger*, *Fusarium oxysporum* and *Rhizopus nigricans*, were found to be associated with seedling blight disease of *Solanum lycopersicon*. Pathogenicity tests was carried out on the three weeks old seedlings. The Pathogenecity tests revealed that all the isolated fungi were pathogenic to the *Solanum lycopersicon* seedlings.. *A. niger* and *F.oxysporum* has the highest rate of occurrence which covered the whole plate at 5 days incubation period in 35°C at 85% and 100% respectively. The result of this present investigation could be utilized in vegetables farms and tomato industries in Nigeria as well as farmers in other to prevent loss of yields to these pathogens.

**Keywords:** Occurrence, Fungi Pathogens, Seedling, Blight Diseases, *Solanum Lycopersicum*, Niger State

**INTRODUCTION**

Tomato is one of the most widely grown vegetables in the world. The popularity of tomato among consumers has made it an important source of vitamins A and C in diets (Tukru, 2007., Tanko *et al.*, 2010).

In Niger State, tomato has an average annual production of 223.478 metric tonnes in 2011 from about 7500mt/ hac of land (N.S.A.D.P,2011).Tomato belongs to the family of Solanaceae, this vegetable is consumed raw and as an ingredient in many dishes and sauces and in drinks.

Niger state is located within the middle belt of Nigeria. It is blessed with soils that are germain to vegetable production in very large quantities. Seedling diseases of vegetables are common on farmlands before harvesting both in dry and wet seasons. These diseases markedly cause reduction in the produce. Seedling blight diseases of vegetables randomly attack our farmlands and is visible among vegetable seedlings in Niger state (N.S.A.D.P, 2011).



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Seedling blight can occur as a result of the effects of abiotic and biotic factor. Healthy seedlings growing under unfavourable environmental conditions may perform well and die or suffer retard development which ultimately results in yield reduction. When biotic factor are involved, seedling blight arises as a result of poor seed quality or infection by seed or soil borne pathogens (Roberts, 2007).

The pathogenic microorganisms that attack vegetable seedlings can be classified into two groups: fungi, bacteria. Seedling blight diseases of crops have remained very serious constraints to vegetables, particularly the principal zones of their production. Consequently, most of the efforts have been directed towards developing suitable control options (Nunez, 2001).

Vegetable seedlings often do not grow well under humid conditions, particularly if the soil is cold and wet. The grower then has the choice of keeping weak, sickly plants or undertaking the costly operation of replanting. This kind of damage is usually caused by one or more soil-borne fungi that attack under conditions unfavourable for rapid seed germination and growth (Muhammed, 1998).

This study is aimed at investigating the economic importance of some seedling blight inducing pathogens in *Solanum lycopersicon* seedlings produced in Bida Local Government Area, Niger State, Nigeria.

## MATERIALS AND METHODS

### Isolation of Pathogenic Fungi from the Infected Vegetable Materials

The infected seedlings of *Solanum lycopersicon* were obtained from three randomly selected farms in Bida Local Government Area, which was properly sealed in sterile polythene bags and were brought to the laboratory of Ibrahim Badamasi Babangida University Lapai, Niger State, in the North Central Nigeria for isolation and identification of the samples.

The infected samples of *Solanum lycopersicon* were rinsed in tap water and the necrotic portions were excised and cut into 1mm pieces and surface sterilized with 10% sodium hypochlorite for 30 seconds and rinsed in four successive changes of sterile distilled water and the sections were then blotted dry on clean, sterile paper towels. They were then plated on PDA in 3 replicates and incubated for 36 hours at  $32 \pm 2^{\circ}\text{C}$  under 12-h photoperiod (Muhammad *et al.*, 2001).

### Purification of isolates

In this process, as soon as growth colonies were recognized in the mixed-culture, they were sub-cultured aseptically by transferring them on to fresh culture plates of SDA three times before a single pathogen was obtained in a plate. The sub-culturing was done by

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using sterilized loop and needle to obtain pieces of growing mycelium of fungi from parts and edges of the mixed cultures.

### Pathogenicity of the isolates

The mycelia suspension of the isolates was produced in V8 broth medium in 250 ml conical flasks for 6 days. The mycelium of each isolates was filtered through the cheesecloth, gently pressed to remove excess liquid and blended for 3 seconds in warring blender at the rate of 5g of mycelium per millilitre of sterile deionized water. The resulting suspensions were used as inoculum. The inoculum was freshly prepared before the applications. Three weeks old vegetable seedlings growing in oven-sterilized topsoil (0.5cm) contained in 15cm diameter pots were inoculated with the mycelia suspension of the fungal isolates. The plants were then placed on benches in greenhouse and observed for symptoms of the disease. The pathogens were later re-isolated from the inoculated plants and compared with the initial isolates.

### Results

#### Seedling blight pathogens isolated from *Solanum lycopersicon*

Isolation from the blighted seedlings revealed the association of the following fungal species, *Aspergillus niger*, *F. oxysporum*, *R. nigricans* and upon testing the pathogenicity of these isolated fungi, the severity of the disease was 85-100% from day 5-15 in *Solanum lycopersicon* (Table 1).

**Table 1: Pathogenicity of the isolates and the percentage (%) of disease incidence in *Solanum lycopersicon* from Day 5-15.**

Days	Treatments	
	Mean value	Disease incidence (%)
5	3.833a	85
10	3.000 c	100
15	1.407b	100

Each value represents the mean of 5 values. Different letter(s) within row represent values that are significantly different at  $p=0.05$  based on ANOVA Duncan test.



## DISCUSSIONS

Tomato (*Solanum lycopersicon*) is one of the most widely grown vegetable crops in the world. It is used as a fresh vegetable and can also be processed and canned as a paste, juice, sauce, powder or as a whole (Barone and Fruscianate, 2007., Bahattin and Cengiz, 2010). The findings of this study revealed that *Aspergillus niger*, *Fusarium oxysporum* and *Rhizopus nigricans* were found in the infected seedlings of tomato and were found to be associated with seedling blight disease of the plant.

Fungi affecting tomatoes includes species of *Fusarium*, *Aspergillus* and *Rhizopus* as reported by Onoegbu, 2002. Which corroborate with this study that *Aspergillus niger*, *Fusarium oxysporum* and *Rhizopus nigricans* were isolated from the infected seedlings of *Solanum lycopersicon* in study area. The isolation of *Fusarium oxysporum* from the tomato seedlings confirmed with studies of Omokhua *et al.*, (2009), that *F.oxysporum* is one of the microbes associated with seedling blight disease in crops. *Aspergillus niger* have been reported as pathogen that causes seedling blight in three weeks old seedlings of *Solanum lycopersicon* (Muhammed *et al.*, 2011). This study revealed that *A.niger* was isolated from tomato seedlings which corresponds with the studies of Ajayi and Olasehinde, 2009, that *A.niger* are responsible for most of the deterioration of tomato in storage and in the farms

Previous studies on the fungi associated with tomato rot includes species of *Fusarium*, *A.flavus* and *A.niger* they were all found to be pathogenic on the tomato seedlings (Al Hindi *et al.*, 2011 and Akintobi *et al.*, 2011). It was also reported that fungal species affecting tomato includes *Fusarium oxysporum*, *Aspergillus niger* and *Rhizopus stolonifer* which were all responsible for tomato soft rot as was reported by Onuegbu, 2002; Akinmusire, 2011 and Akintobi *et al.*, 2011).

The results of the pathogenicity tests that was carried out revealed that all the fungi species isolated were all pathogenic and were the actual causative agents of seedling blight disease of the affected sample.

## CONCLUSION

The high occurrence of some fungi demand that appropriate control measures against infection, should be employed if farmers expect good yield of their produce. There should be adequate microbiological knowledge on the symptoms of these disease for the farmers to identify them.



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