EFFECT OF SOME FUNGICIDES ON INCIDENCE OF SEED-BORNE FUNGI OF *SOLANUM GILO* RADDI AND THE IMPACT ON SEED GERMINABILITY.

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ABSTRACT: Standard blotter method was used in the isolation of seed-borne fungi of *Solanum gilo*. The isolates as *Aspergillus flavus, Aspergillus fumigatus, Aspergillus niger, Aspergillus terreus,* and *Fusarium oxysporium.* The highest percentage incidence was recorded by *A. fumigatus* (66.81%) and *A. flavus* (62.14%). *Aspergillus terreus* recorded the least incidence of 32.69%. The fungicides Kocide, Nordox and Ridomil at three rates (1, 2 and 3g) were evaluated as seed treatments. The fungicides recorded reduced percentage recovery of all the isolated seed-borne fungi. At 3g, Ridomil completely inhibited incidence of *A. fumigatus A. niger* and *F. oxysporium.* Seeds treated with Ridomil also recorded maximum percentage germination (64.86%) at 3g, while Nordox recorded the least percentage of 45.93%. Increase in rate of fungicides gave reduction in the recovery of seed borne fungi and increase in seed germination.

INTRODUCTON

Eggplant (*Solanum gilo* Raddi) is also known as scarlet eggplant. It is a cosmopolitan plant (Obute and Ndukwu, 2006). It is a tropical crop that are generally perennials but are usually cultivated as annuals. The most important producing countries are Nigeria, Ghana and Senegal, others are south America and Caribbean (Udoh *et al,* 2005). The immature fruits are eaten fresh, with the leaves used in some areas as cooking vegetables (Lester and Seck, 2004). Sometimes eggplant is cultivated as an ornamental. However eggplant is susceptible to fungal diseases which reduce their germination. More than 50 pathogens are reported to be seed-borne in nature in different vegetable seeds (Richardson, 1990). Presence of seed borne pathogen in low number is an important factor in the determination of seed quality and viability to ensure health and vigour of the future crop (Habib *et al,* 2007). Disinfection of the seed to kill these parasite is an important method of fighting vegetable disease. Fungicidal seed treatment is an inexpensive method for disease control that can protect the seedlings against a variety of fungal pathogens and improve emergence (Agrois, 1997). This research was therefore carried out to determine the fungicide effect on incidence of seed-borne fungi and determine the impact on seed germination.

MATERIALS AND METHODS

Isolation of Seed-Borne Fungi

Four hundred uncertified local seeds were obtained from a market in Itu and used for this experiment. These were selected for isolations by using standard blotter method (Sheppard *et al.,* 2003). Twenty five seeds from the sample were placed on three layers of moistened blotter paper in a 9cm diameter Petri dish after pretreatment with 1% Sodium hypochlorite for three minutes. All the Petri dishes were incubated at 28 ± 2^{0}C for seven days. After seven days, the plates were examined directly under a stereobinocular microscope for fungal growths.These growth appearing on seed were identified based on their spore characteristics and other morphological features using relevant literature (Barnett and Hunter, 1998).

Evaluation of fungicides *in-vivo*

Three fungicides (Kocide,Nordox and Ridomil) were used for these treatments. The rate of treatment were 1, 2 and 3g/5g of seeds. Seed dressing was done by gently shaking 5g of seed plus dosage fungicide in flask for 20 minutes. The treated seeds were stored in small bottles for 48 hours before plating them on three layers of moistened blotter paper in Petri dishes. These dishes were incubated at 28 ± 2^0C. The data for recovery of seed-borne fungi and germination on blotter was recorded after twelve days . The control experiments were not given any treatment with fungicides.

The recorded data was analyzed statistically for sensitivity of the seed-borne fungi to different fungicides at different concentrations.

RESULTS AND DISCUSSION

Fungi associated with the seed samples were identified as *Aspergillus flavus, Aspergillus fumigatus, Aspergillus niger, Aspergillus terreus* and *Fusarium oxysporium.* The results showed that *Aspergillus fumigatus* had the highest percentage incidence (66.81), closely followed by *A. flavus* (62.14) though these were not significantly different. Incidence of *A. niger* (50.11) and *Fusarium oxysporium* (51.72) were not significantly different ($P < 0.05$). *Aspergillus terreus* recorded the lowest percentage recovery of 32.69 (Fig.1). All the fungicides tested at three rates reduced the incidence of seed-borne fungi significantly ($P < 0.05$), as compared with the untreated seed samples.

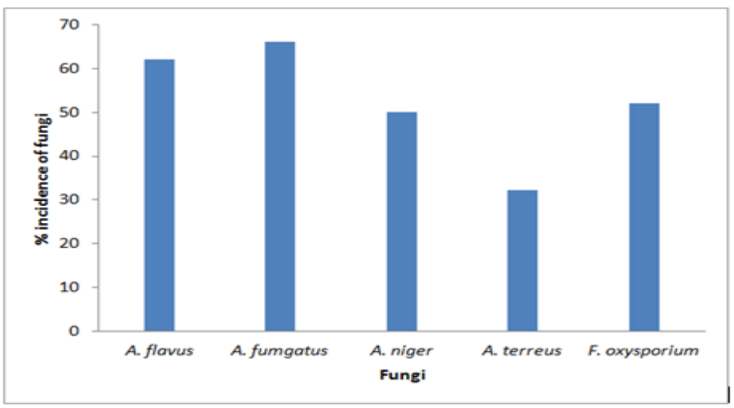

Figure1: Percentage incidence of seed-borne fungi isolated from seeds of *S. gilo* obtained from Itu.

The effect of the fungicides on the incidence of the test fungi was concentration dependent. There was decrease in recovery of seed-borne fungi with increase in the concentration of the fungicides. At 1g, and 2g the fungicide reduced the incidence of seed-borne fungi but did not completely control the fungi (Figs. 2 and 3). But at 3g, Ridomil completely controlled *A. funmigatus*, *A. niger* and *F. oxysporium* (Fig.4).

In the next part of the experiment, results showed that seeds treated with fungicides recorded increase in percentage seed germination. Ridomil recorded the highest percentage germination of 61.6% (1g), 62.85% (2g), and 64.86% (3g). The least percentage germination was recorded by Nordox (Table 1). This was not significantly ($p<0.05$) different from the value recorded by the untreated seeds.

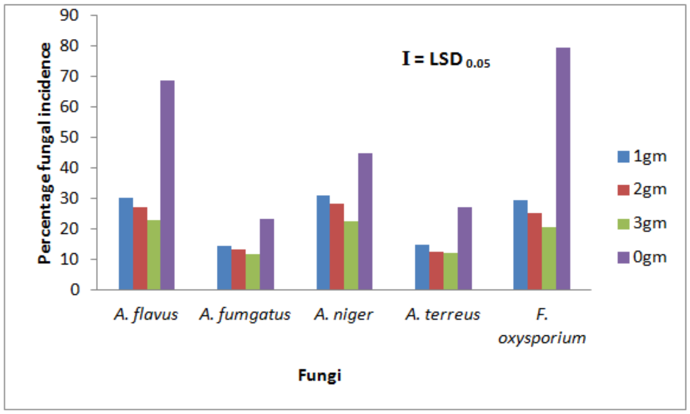

Figure 2: Effect of Kocide as seed dressing fungicide on incidence of seed borne fungi of *S. gilo* seed

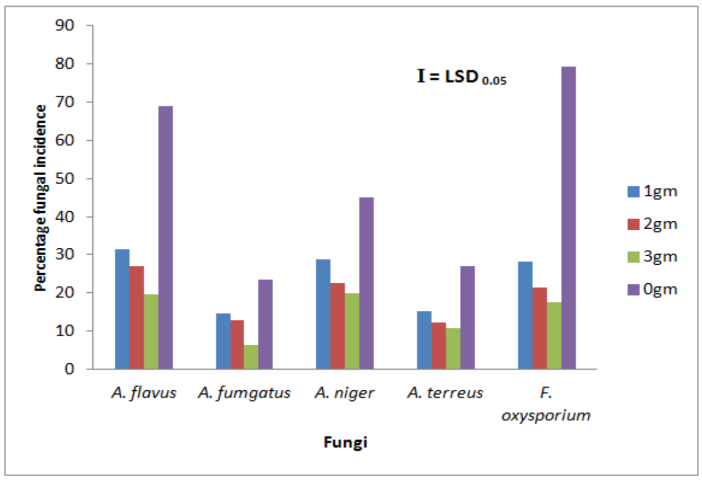

Figure 3: Effect of Nordox as seed dressing fungicide on incidence of seed borne fungi of *S. gilo* seeds

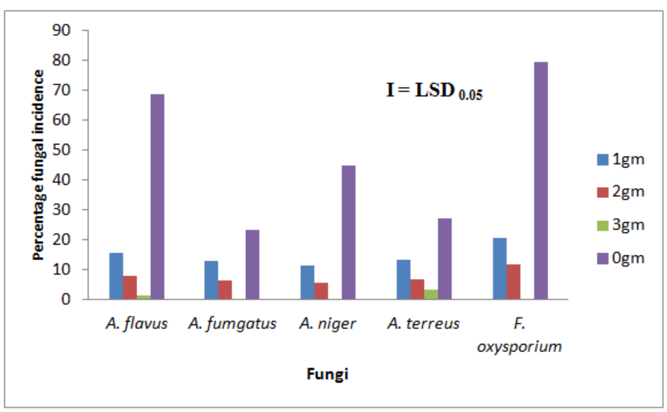

Figure 4: Effect of Ridomil as seed dressing fungicide on incidence of seed borne fungi of *S. gilo* seeds

The work of Begun *et al.* (2005) has shown that seed infection due to the fungi *Macrophomina phaseolina* and *Fusarium verticilloides* lead to seedling disease, this confirms the presence of seed-borne fungi in seed samples. Nasreen *et al,* (1988), recorded *Fusarium moniliforme* frequently in the embryo of sorghum seeds.

Inhibition of seeds germination due to seed mycoflora had been confirmed by the work of Wahid (1985) recorded in cucurbitaceous crops. According to the work of Habib *et al,* (2007) seeds of eggplant treated with seed dressing fungicides (Benlate, Topsin, Captan), promoted the seed germination but also reduced the percentage recovery of seed-borne inoculums of *F. solani* and *A. alternata.* According to Khare (1985). *F. solani* is more sensitive towards Benlate as compared to captan and it also increases the germination of seeds.

Table1: Effect of seed dressing Fungicides on percentage germination of *S. gilo* seeds.

Treatment	0g	1g	2g	3g
Kocide	45.43	51.58	51.92	52.91
Nordox	45.43	45.57	45.68	45.93
Ridomil	45.43	61.60	62.85	64.86

LSD = 4.46

REFERENCES

Agrois, G. N. (1988): *Plant Pathology* (3rd Ed.) Academic Press Inc; San Diego,USA.803PP.

Barnett, H. L. and Hunter, B. B. (1998). *Illustrated Genera of Imperfect Fungi.* 4th ed. American Phytopathologial Society Press. USA 218pp.

Begum, M., Lokesh, S., Vasanth Kumar, T. (2005): Pathogenicity of *Macrophomina Phaseolina* and *Fusarium verticilloides* in Okra. *Integrative Biosciences* 9 (1), 37-40.

Habib, A., Sali, S. T., Ghazanfer, M. U. and Ali, S. (2007): Evaluation of some fungicides against seed-borne mycoflora of eggplant and their comparative efficacy regarding seed germination. *Int. J. Agric. Biol.* 9.(3): 519-520.

Khare, K. B. (1985): Fungi associated with maize and beans growns as a mixture by small scale farmers in Kenya and their control. *Turrialba Nigeria*, 35:101-3.

Lester, R. N. and Seck, A. (2004): *Solanum aethiopicum* L. In: Grubben, G. J. H. and Denton, O. A (eds). *Plant Resources of Tropical African 2.Vegetables*. PROTA Foundation, Wageningen, Netherlands/CTA, Wageningen, Nether lands PP472-477.

Nasreen, S., Khan, S. A. J., Khanzada, A. K. (1983): Detection and location of seed-borne fungi in sorghum seed. *Pakistan Journal of Botany*, 20(2): 239-244.

Obute, G. C. Ndukwu, B. C. (2006): Infraspecific Variation in Some *Solanum* L. Species in Nigeria: An Aid to Taxa Separation. *Nigerian Journal of Botany.* 19(1): 182-187.

Richardson, M. J. (1990): *An Annotated List of Seed Borne Disease,* 4th Edition, ISTA Zurich, Switzerland. USA 803pp.

Sheppard, J. W., Cockerell, V. and Roberts, S. J. (2003): *Blotter Method for the Detection of Alternaria radicina on Dancus carota*. International seed Testing Association (ISTA). Bassersdorf, Switzerland.

Udoh, J. D. Ndon, B. B., Asuquo, P. E. and Ndaeyo, N. U. (2005): *Crop Production Techniques for the Tropic.* Concept Publications Limited, Shomolu, Lagos, pp 232-237.

Wahid, A. (1985): *Seed Borne Diseases of Vegetables.* Report submitted to Danish Institute of seed pathology, Dermark, 36p.