

Consequences of relative humidity (RH%) and temperature on occurrence of storage fungi of niger (*Guizotia abyssinica*) oil seed

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Abstract

In the present study an attention was made to determine the effect of relative humidity (RH) and temperature on shelf life of Niger seed borne fungi of Marathwada. The seed born fungi naturally linked with oil seeds causes seed worsening. The oil seeds become unfit for utilization. The seed borne fungi causes diseases to crop plant and inhibit seed germination. The seeds mycoflora of Niger (local, N8 and Ootacomand) was detected by standard blotter method and Agar plate method. During present work following fungal species were obtained: *Alternaria alternate*, *Fusarium oxysporum*, *Aspergillus niger*, *Rhizopus nigricans*, *Aspergillus flavus*, *Penicillium expansum*, *Curvularia lunata*, etc. It was found that relative humidity (RH) and temperature habitually affect the quality of seeds in the storage condition. The percentage occurrence of fungi found different relative humidity and temperature. The relative humidity 80% was found to be more favourable for the fungal prevalence while it is optimum at 40%. The temperature 30°C was found to be more favourable for the prevalence of fungi on Niger seeds.

Keywords: Niger, Relative humidity, Temperature, Seed borne fungi

1. Introduction

Seed is an important factor for crop production. Many plant pathogens are seed borne, which can cause seed rot, seedling blight, foliar infection and pod blight diseases ([1,2,3].

High relative humidity and storage temperature increases fungal infection which leads to rapid loss of germ in ability. The storage fungi, insects and rodents humidity and temperature are major factor causes seed rot. Humidity and temperature can lead to chemical deterioration found in Niger seeds. It causes major loss in oil quality in terms of colour, free fatty acid, iodine and other biological values. In the present investigation attempt was made to determine the effect of relative humidity and temperature on consequence of seed mycoflora of different varieties of Niger seeds in storage condition.

2. Materials and Method

The samples of oil seeds were obtained from the local market as well as research station, Latur. The three cultivar of Niger (*Guizotia abyssinica*) cv. Local, cv. N8 and cv. Ootacomand were investigated for seed mycoflora in relation to storage relative humidity and temperature. 400 seeds of each sample were tested for associated mycoflora by standard blotter method and agar plate method. Untreated as well as pre-treated seeds were used. Pre-treatment of seeds done by shaking them in 0.1% mercuric chloride solution for 2 minutes and then washing with sterile water. 25 seeds

were plated in 9 mm diameter petri dish lined with 2 layer of moist blotter paper. The plates were incubated at under cool white florescent light with altering cycle of 12 hours light and 12 hours darkness at different temperature ranges from 10°C to 40°C for 7 days. Likewise the seeds were stored in gunny bags at various RH 40-80% in humid chamber separately up to 9 months. After regular time interval seeds were taken and mycoflora was determined. The seeds were examined under stereoscopic binocular microscope. The percentage incidence of seed mycoflora was recorded.

3. Results and Discussion

10 fungal species were associated with 3 varieties of Niger. The *Alternaria alternata*, *Aspergillus niger* and *A. flavus* was found on all varieties followed by *Fusarium oxysporum*, *Rhizopus nigricans*, *Penicillium expansum*, *Curvularia lunata*. Out of these varieties ootacomand showed less number (5) fungi than local and N8. The optimum temperature for all the 10 fungi of 3 varieties of Niger is 30°C and RH 90%. Similarly it is reported by (Nandi et al., 1982) studied the seeds of sesame, mustard, linseed and found that highest loss of germiability is noted at RH 90% and temperature 30°C.

Table 1: Incidence of storage fungi on Niger oil seeds.

Seed mycoflora	Local	N8	Ootacomand
<i>Alternaria alternata</i>	+	+	+
<i>Alternaria tunis</i>	-	-	+
<i>Aspergillus flavus</i>	+	+	+
<i>Aspergillus niger</i>	+	+	+
<i>Curvularia lunata</i>	+	+	-
<i>Fusarium moniliforme</i>	-	-	+
<i>Fusarium oxysporum</i>	+	+	-
<i>Macrophomina phaseolina</i>	-	+	-
<i>Penicillium expansum</i>	+	+	-
<i>Rhizopus nigricans</i>	+	+	-

Table 2: Consequence of RH percentage incidence of seed mycoflora *Guizotia abyssinica*(Niger)

RH	Percentage incidence of seed mycoflora of Niger					
	Blotter Method			Agar Method		
	Local	N-8	Ootacamand	Local	N-8	Ootacamand
40	26	27	29	33	31	35
50	41	41	44	47	48	50
60	52	52	57	59	60	62
70	76	77	73	82	82	81
80	84	81	82	91	90	90

Table 3: Consequence of temperature percentage incidence of seed mycoflora *Guizotia abyssinica* (Niger)

Temp (°C)	Percentage incidence of seed mycoflora of Niger					
	Blotter Method			Agar Method		
	Local	N-8	Ootacamand	Local	N-8	Ootacamand
10	7	58	8	9	7	10
15	18	20	22	22	25	27
20	32	35	38	40	43	45
25	55	60	63	63	67	70
30	72	77	77	80	83	85
35	67	68	70	73	75	78
40	60	60	61	66	67	67

Conflict of interest

No conflict of interest influenced in this research.

- Nandi D, Mandal GC and Nandi B. Studies on deterioration of some oil seeds in storage. *Seed Sci. and tech.*, 1982; 10(1): 141-150.

5. References

- Agarwal VK, Joshi AB. A Preliminary note on the purple stain disease of soybean. *Indian phytopath.*, 1972; 24(4):810-812.
- Agarwal VK, Mathur SB and Neergard P. Some aspect of seed health testing greengram with respect to seedborne fungi of rice, wheat, blackgram and soybean grown in India. *Indian phytopath.* 1972, 25:91-100.
- Anil kumar TB and Shantha D. Urs. Seed mycoflora of sunflower and its control. *Musore J. agric Sci.*, 1976; 10:424-427.
- Jhararia SL, Sharma KB and Gupta RBL. Fungi intercepted from sunflower seeds and there control. *Indian J. Pl. Port.*, 1974; 2: 86-88.
- Kanwar ZS, Khanna PK and Thareha ML. Seed mycoflora of sunflower and there control. *Pesticides.*, 1979; 13(9): 41-43.