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Research Article

Effect of Seed Storability Studies Using Accelerated Aging Test in Sorghum

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ABSTRACT

Seed longevity is an important trait of seed quality, and it depends on physiological, genetic and environmental factors. Seed longevity is highly dependent on storage conditions, water content, temperature and atmosphere. The present investigation was carried out in the Department of Seed Science and Technology, Advanced Post Graduate Centre, Lam, Guntur, during 2019-20 using Factorial Completely Randomized Design (FCRD) with four replications. Initially, fresh seed of the sorghum variety NTJ-5 was subjected to accelerated aging at 45°C and 95% RH for 24, 48, 72 and 96 h. A highly significant decrease in germination, seedling length, seedling vigour index and field emergence was noticed with an increase in the duration of accelerated aging. Unlike all the physiological parameters, the electrical conductivity (EC) of seed leachates increased with aging treatment. The aged and unaged seed was stored in a cloth bag for six months under ambient conditions to study the storability of the seed. Results revealed that there was a highly significant decrease in all the physiological parameters under study except EC of seed leachates with an increase in the period of storage. The interaction effect between accelerated aging and storage period showed that the initial germination recorded with 24 h (75.25%) of accelerated aging was almost equivalent to the germination recorded with the unaged (control) seed after four months (74.25%) of storage.

Keywords: *Accelerated ageing, Electrical conductivity, Germination, Sorghum, Storability.*

INTRODUCTION

Seed deterioration is a natural phenomenon during storage. Accelerated aging is used to determine storage quality and germination characteristics by mimicking natural aging conditions for crops like wheat (Galleschi et al., 2002), rice (Kapoor et al., 2011), cotton (Goel et al., 2003), chickpea (Kapoor et al., 2010), Sorghum (Khodratien Fatonah et al., 2017), Sorghum (Gabrielly et al., 2020) and Popcorn (Pontes et al., 2017). Aging causes a progressive decline in biological processes, leading to degeneration and death.

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Accelerated aging (AA) subjects the seeds to highly adverse conditions of high humidity and high temperature for specific periods of time.

During storage, seeds maintain germination ability upto a certain period, and subsequently they show a rapid decline in germinability with an increase in the period of storage due to degenerative processes occurring inside the seed (Kapoor et al., 2011). Loss of seed germinability, viability and vigour by natural aging or controlled deterioration may be due to a series of metabolic defects, including the inability to synthesize RNA, proteins and damage to nuclear DNA (Roberts, 1973). The loss of seed viability either due to natural or accelerated aging was correlated with increased membrane destruction. Hence, the present investigation was planned to study the prediction of storability using an accelerated aging test and also to study the extent of seed deterioration during storage.

MATERIALS AND METHODS

The present study was conducted in the Department of Seed Science and Technology, Advanced Post Graduate Centre, Lam, Guntur, Andhra Pradesh, India, during 2019-20 in a Factorial Completely Randomized Design (FCRD) with four replications with the seed of sorghum variety, NTJ-5, procured from the Regional Agricultural Research Station, Nandyal. Initially, the seed was subjected to accelerated aging for 24, 48, 72 and 96 h. Accelerated aging was performed by placing the seeds in the incubator with high temperature (45ºC) and relative humidity (95%) (Tekrony, 2005). For each aging treatment, about 500 grams of sorghum seeds were scattered within a vacuum container on wire screens; the floor of the container was covered by distilled water, and the containers were placed in an incubator at a fixed temperature.

Initially, the seed of the sorghum variety NTJ-5 was subjected to accelerated aging at 45ºC and 95 per cent relative humidity for different durations, *viz.*, 24, 48, 72 and 96 h, to generate seed samples with different levels of germination and seedling vigour. Seed subjected to accelerated aging for various durations, along with the normal (control) seed, was stored in a cloth bag under ambient conditions to study the storability of the seed. The experiment was laid in two Factorial Completely Randomized Design (FCRD) with four replications. Data on all the physiological parameters were recorded as per the following formulae:

Germination (%): On the 10th day of germination test, the normal seedlings were counted and expressed as germination (%) as per the following formula:

$$\text{Germination (\%)} = \frac{\text{Number of normal seedlings}}{\text{Total number of seed sown}} \times 100$$

Seedling Length (cm): The total distance from the tip of the primary leaf to root tip of ten randomly selected seedlings from each replication of each treatment was measured with a scale and their mean was expressed as seedling length in centimeter

Seedling vigour index: It was computed by adopting the following formula as suggested by Abdul-Baki and Anderson (1973) and was expressed in whole number.

Seedling Vigour Index = Germination (%) × Seedling length (cm)

Field Emergence (%): One hundred seeds from each treatment in each replication were counted and sown in well prepared soil at 3 cm depth. The number of seedlings emerged was recorded in all four replications of each treatment separately on the 15th day after sowing, and the field emergence percentage was calculated as per the formula:

$$\text{Field emergence (\%)} = \frac{\text{Number of normal seedlings emerged}}{\text{Total number of seeds sown}} \times 100$$

Electrical Conductivity: Fifty randomly selected seeds were soaked in 75 ml of deionized water for 24 h at room temperature. The seed steep water was decanted and referred to as seed leachate. The electrical conductivity of the seed leachate was measured with a digital conductivity meter

(Model: Conductivity TDS meter-307) with a cell constant of one and expressed as μScm^{-1}.

Data was analyzed by using SPSS (version 16.0) software after subjecting the data to appropriate transformations. The differences among the duration of storage period and accelerated aging means were compared by using Duncan's multiple range test at 5% level of probability. The data were recorded on seed quality parameters at monthly intervals for six months, and the results are discussed below:

RESULTS AND DISCUSSION

Analysis of variance of data (Table 1) showed that accelerated aging and period of storage had highly significant impact on all the physiological parameters *viz.*, germination, seedling length, seedling vigour index, field emergence and electrical conductivity (EC) of seed leachates. Interaction due to accelerated aging and period of storage had highly significant influence on all the physiological parameters except seedling length and field emergence.

Germination (%): Accelerated aging showed a decline in germination of sorghum seed from an initial 88.50% to 53.50% with an increase in the period of accelerated aging to 96 h. There was a significant reduction in germination with an increase in the period of storage. The mean germination decreased from 69.50% before storage to 33.40% after six months of storage. The duration of accelerated aging showed a negative influence on mean germination, which reduced from 75.32% in the control to 35.86% with 96 h of accelerated aging. Highest germination was recorded with unaged (control) (88.50%) seed, while the lowest germination was noticed with seed subjected to 96 h (18.50%) of accelerated aging after six months of storage, with an overall mean of 51.86% (Table 2). After a month of storage, the percentage decline in germination was highest (10.93%) with 72 h and lowest (2.33%) with 24 h of accelerated aging. The per cent decline in germination was maximum (47.37%) with 72 h of accelerated aging and minimum (16.10%) with unaged (control) seed up to four months of storage. The per cent decline in germination was highest (65.42%) with 96 h of accelerated aging while lowest (36.72%) was noticed with unaged (control) seed after six months of storage (Fig 1).

The initial germination recorded with 24 h (75.25%) of accelerated aging was almost equivalent to the germination recorded with the unaged (control) seed after four months (74.25%) of storage. Badiger et al. (2013) earlier observed in cotton that the germination of one day accelerated aged seeds was equivalent to three to four months of naturally aged seed. In the present experiment, the fresh (control) seed with an initial germination of 88.50% showed the germination below Indian Minimum Certification Standards (IMSCS) (75%) after four months of storage (74.25%). This decline might be due to an increase in the moisture content of the seed stored in a cloth bag under ambient conditions in tune with the fluctuations in temperature and relative humidity of the atmosphere. Increase in moisture content results in a greater decrease in metabolic activity and an increase in the rate of respiration, leading to more utilization of food reserves (Tiwari et al., 2014). Kurdikeri et al. (1997) observed a decline in germination of wheat seeds when stored under ambient conditions for 17 months. Gupta et al. (2016 & 2017) observed a decline in germination of pearlmillet when stored in a cloth bag under ambient conditions for 24 months.

Seedling Length (cm): Seedling length follows the same trend as that of germination and showed a considerable decrease with an increase in the period of accelerated aging as well as storage. The mean seedling length decreased from 33.73 cm before storage to 18.39 cm after six months of storage. The mean seedling length decreased significantly with an increase in the duration of accelerated aging from 29.82 cm with unaged (control) seed to 20.19 cm with 96 h of accelerated aging after six months of storage. Maximum (38.58 cm) seedling length was observed with unaged (control) seed initially, whereas minimum (14.25 cm) seedling length was noticed with seed subjected to 96 h of accelerated aging after six months of storage, with an overall mean seedling length of 24.87 cm (Table 3). The per cent decrease in seedling length was highest (50.90%) with 96 h of accelerated aged seed and minimum (41.76%) was recorded with unaged (control) seed stored upto six months (Fig. 2). Similarly, a decrease in seedling length with increase in period of storage was earlier reported by Kurdikeri et al. (1997) in wheat when stored for 17 months under ambient conditions.

Seedling vigour index: Seedling vigour declined from 3423 to 1553 with an increase in the accelerated aging period upto 96 h. Highly significant decrease in mean seedling vigour index was noticed with an increase in period of storage from 2386 before storage to 652 after six months of storage. The mean seedling vigour index decreased from 2298 with unaged seed (control) to 780 with 96 h of accelerated aged seed. Highest seedling vigour index (3423) was noticed with unaged seed (control) initially, and the lowest seedling vigour index (264) was observed with seed subjected to 96 h of accelerated aging after six months of storage. The grand mean of the seedling vigour index was 1396 (Table 4). After the first and second months of storage, the percentage decrease in seedling vigour index was maximum (27% and 39%) with 96 h and 72 h of accelerated aging. Minimum (16% and 25%) per cent decrease was noticed with 24 h accelerated aged seed and with unaged (control) seed after first and second months of storage, respectively. After three months period of storage, a maximum (54%) per cent decline was observed with 72 h of accelerated aging whereas a minimum (30%) was noticed with unaged (control) seed. Maximum per cent (83%) decrease was noticed with 96 h of accelerated aging while minimum per cent (63%) decrease was with unaged (control) seed upto six months of storage (Fig. 3). Gupta et al. (2017) in pearlmillet observed a decrease in seedling vigour index when stored in a cloth bag for 24 months.

Field Emergence (%): Accelerated aging brought down the field emergence of sorghum seed from an initial 86.75% to 54.50% after 96 h of accelerated aging. The mean field emergence decreased significantly from 68.60% before storage to 29.50% after six months of storage. Accelerated aging showed a highly significant decrease in mean field emergence from 67.96% with unaged (control) seed to 35.64% with seed subjected to 96 h of accelerated aging after six months of storage. The highest initial field emergence (86.75%) was recorded with unaged (control) seed, whereas the lowest field emergence (17.00%) was observed with 96 h of accelerated aging after six months of storage, with an overall mean of 49.30% (Table 5). After one month of storage, a maximum (14.06%) and minimum (3.81%) per cent decline in field emergence was noticed with 72 h and 24 h of accelerated aging, respectively. The per cent decrease in field emergence was maximum (38.15%) with seed subjected to 72 h of accelerated aging and minimum (20.75%) was noticed with unaged (control) seed upto three months of storage. The highest (68.81%) per cent decline in field emergence was observed with 96 h of accelerated aging and the minimum (46.40%) per cent decline was recorded with unaged (control) seed after six months of storage (Fig. 4).

Field emergence recorded at 48 h (67.25%) of accelerated aging was almost equivalent to that of three months (68.75%) of naturally aged seed (Table 4.24). Badiger et al. (2013) observed a decrease in field emergence of cotton and reported that field emergence recorded at one day and two days accelerated aged seeds was equivalent to three and nine months of naturally aged seed, respectively.

Electrical Conductivity (EC) of Seed Leachates (μScm^{-1}): An increasing trend of EC of seed leachates from an initial 750 μScm^{-1} to 1080.50 μScm^{-1} was noticed with 96 h of accelerated aged seed. Unlike all other physiological parameters, the mean EC of seed leachates increased considerably from 920.35 μScm^{-1} (initial) to 1111.35 μScm^{-1} with an increase in period of storage upto six months of storage. Increase in the duration of accelerated aging showed a highly significant increase in mean EC of seed leachates from 815.64 µScm^{-1} with unaged (control) seed to 1222.93 µScm^{-1} with 96 h of accelerated aging. Minimum (750.00 µScm^{-1}) initial EC of seed leachates was noticed with unaged (control) seed and maximum (1324.75 µScm^{-1}) EC of seed leachates with seed subjected to 96 h of accelerated aging after six months of storage. The overall mean EC of seed leachates was 1026.94 µScm^{-1} (Table 6). The per cent increment in EC of seed leachates was maximum (14.77%) with 72 h of accelerated aged seed, and the minimum (7.47%) increment was found with unaged (control) seed after three months of storage. Maximum (22.61%) per cent increase was recorded with 96 h of accelerated aging and minimum (18.17%) per cent increase was observed with unaged (control) seed after six months of storage (Fig. 5). Increase in EC of seed leachates with increase in the period of storage was observed by Malimath and Merwade (2007) in garden pea when stored for 10 months in a cloth bag under ambient conditions, the electrical conductivity test showed a positive correlation with potassium leakage Khodratien Fatonah et al. (2017), the EC of seed leachates will increased over the period of storage Gabrielly et al. (2020) and the electrical conductivity test efficiently discriminated seed lots in vigor classes Pontes et al. (2025).

Table 1. Analysis of variance for physiological parameters of accelerated aged seed of sorghum during storage

Source	Degrees of freedom	Mean sum of squares				
		Germination (%)	Seedling length (cm)	Seedling vigour index	Field Emergence (%)	Electrical conductivity (µS cm^{-1})
Accelerated Aging (A)	4	2570.361**	410.296**	10,111,829.727**	1687.615**	863,544.454**
Period of Storage (M)	6	1314.233**	560.871**	7,498,339.934**	1514.190**	96,153.948**
A × M	24	5.965**	0.496^{NS}	65,888.524**	3.336^{NS}	1,068.599**
Error	105	2.554	0.497	9101.381	3.141	258.438

** Significant difference at 1% probability level

* Significant difference at 5% probability level

NS – Non-significant

Table 2. Influence of accelerated aging on germination (%) of sorghum seed during storage

Period of storage (Months)	Period of accelerated aging (hours)					
	0	24	48	72	96	Mean
M_0	88.50 (70.61)	75.25 (60.16)	68.50 (55.84)	61.75 (51.78)	53.50 (46.99)	69.50 (57.08)^{*a}
M_1	83.25 (65.86)	73.50 (59.01)	62.50 (52.22)	55.00 (47.85)	48.25 (43.98)	64.50 (53.78)^{b}
M_2	81.25 (64.37)	65.50 (54.02)	55.25 (48.00)	49.25 (44.55)	43.50 (41.25)	58.95 (50.44)^{c}
M_3	80.00 (63.48)	58.75 (50.03)	46.25 (42.83)	39.25 (38.77)	35.75 (36.70)	52.00 (46.36)^{d}
M_4	74.25 (59.49)	50.25 (45.13)	41.75 (40.23)	32.50 (34.74)	28.50 (32.24)	45.45 (42.37)^{e}
M_5	64.00 (53.11)	44.75 (41.97)	36.75 (37.30)	27.75 (31.77)	23.00 (28.63)	39.25 (38.56)^{f}
M_6	56.00 (48.43)	39.50 (38.92)	31.00 (33.82)	22.00 (27.96)	18.50 (25.46)	33.40 (34.92)^{g}
Mean	75.32 (60.76)^{A}	58.21 (49.89)^{B}	48.86 (44.32)^{C}	41.07 (39.63)^{D}	35.86 (36.46)^{E}	51.86 (46.21)
SEm ±	A 0.30		M 0.36		A × M 0.80	
CD (5%)	0.85		1.00		2.24	
CV (%)	3.46					

*Values in the parenthesis indicate arc-sine transformed values

The values in the same column/row with the same alphabet are not significantly different as per DMRT (P< 0.01).

Period of storage:

M_0 – Before storage

M_1 – One month after storage

M_2 – Two months after storage

M_3 – Three months after storage

M_4 – Four months after storage

M_5 – Five months after storage

M_6 – Six months after storage

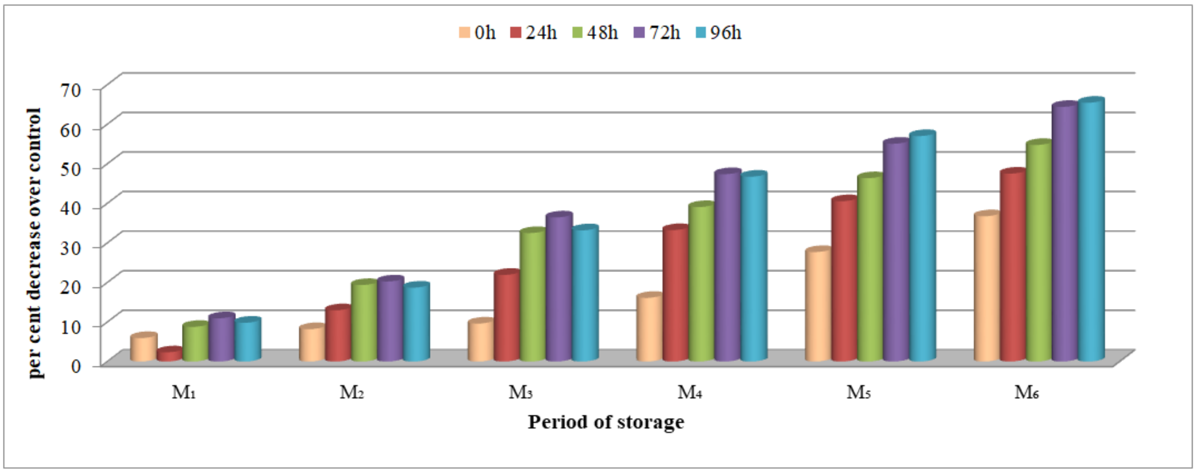

Figure 1. Per cent decrease in germination (%) of accelerated aged seed of sorghum during storage

Period of storage:
M_1 – One month after storage
M_2 – Two months after storageM_3 – Three months after storage
M_4 – Four months after storage
M_5 – Five months after storage
M_6 – Six months after storage

Table3. Influence of accelerated aging on seedling length (cm) of sorghum seed during storage

Period of storage (Months)	Period of accelerated aging (hours)					
	0	**24**	**48**	**72**	**96**	**Mean**
M_0	38.58	36.06	33.97	31.03	29.02	33.73^a
M_1	33.67	31.13	28.59	25.52	23.38	28.46^b
M_2	31.54	29.19	26.51	23.57	21.62	26.49^c
M_3	30.02	27.18	25.11	22.35	20.32	24.99^d
M_4	27.26	23.91	21.91	19.66	17.68	22.09^e
M_5	25.23	22.09	20.12	17.06	15.08	19.92^f
M_6	22.47	20.45	18.45	16.35	14.25	18.39^g
Mean	29.82^A	27.15^B	24.95^C	22.22^D	20.19^E	24.87
SEm ±	A 0.13		M 0.16		A × M 0.35	
CD (5%)	0.37		0.44		NS	
CV (%)	2.84					

The values in the same column/row with the same alphabet are not significantly different as per DMRT (P<0.01).

Period of storage:
M_0 – Before storage
M_1 – One month after storage
M_2 – Two months after storage
M_3 – Three months after storage
M_4 – Four months after storage
M_5 – Five months after storage
M_6 – Six months after storage

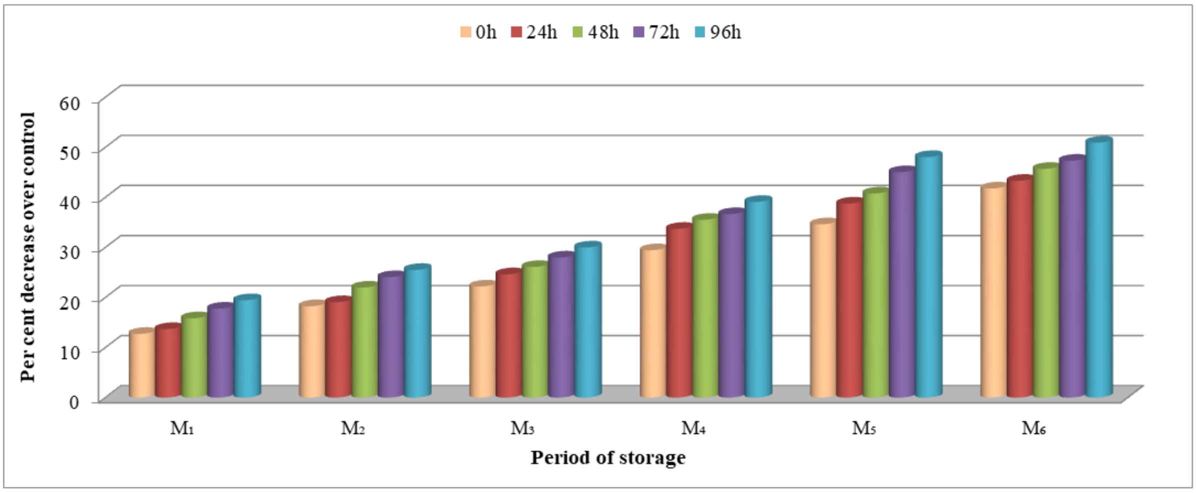

Figure 2. Per cent decrease in seedling length (cm) of accelerated aged seed of sorghum during storage

Period of storage:
M_1 – One month after storage
M_2 – Two months after storage
M_3 – Three months after storage
M_4 – Four months after storage
M_5 – Five months after storage
M_6 – Six months after storage

Table 4. Influence of accelerated aging on seedling vigour index of sorghum seed during storage

Period of storage (Months)	Period of accelerated aging (hours)					
	0	24	48	72	96	Mean
M_0	3423	2714	2328	1915	1553	2386^{a}
M_1	2802	2288	1787	1404	1128	1882^{b}
M_2	2563	1911	1464	1160	941	1608^{c}
M_3	2401	1597	1162	877	726	1353^{d}
M_4	2024	1202	915	639	504	1057^{e}
M_5	1615	989	739	473	347	833^{f}
M_6	1258	808	572	360	264	652^{g}
Mean	2298^{A}	1644^{B}	1281^{C}	975^{D}	780^{E}	1396
SEm ±	A 18.03		M 21.33		A × M 47.70	
CD (5%)	50.63		59.91		133.95	
CV (%)	6.84					

The values in the same column/row with the same alphabet are not significantly different as per DMRT ($P < 0.01$).

Period of storage:
M_0 – Before storage
M_1 – One month after storage
M_2 – Two months after storage
M_3 – Three months after storage
M_4 – Four months after storage
M_5 – Five months after storage
M_6 – Six months after storage

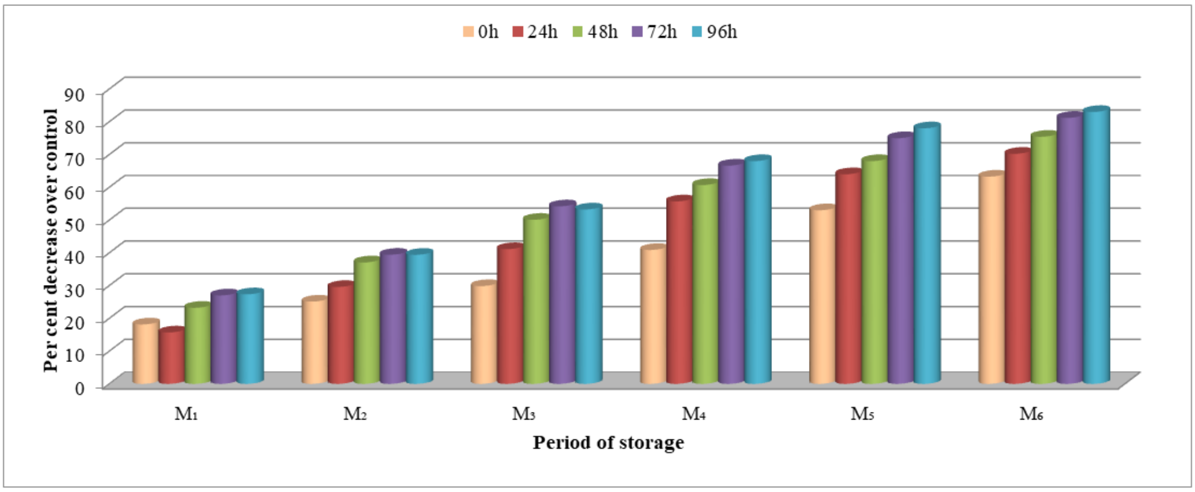

Figure 3. Per cent decrease in seedling vigour index of accelerated aged seed of sorghum during storage

Period of storage:
M_1 – One month after storage
M_2 – Two months after storage
M_3 – Three months after storage
M_4 – Four months after storage
M_5 – Five months after storage
M_6 – Six months after storage

Table 5. Influence of accelerated aging on field emergence (%) of sorghum seed during storage

Period of storage (Months)	Period of accelerated aging (hours)					
	0	24	48	72	96	Mean
M_0	86.75 (68.72)	72.25 (58.20)	67.25 (55.10)	62.25 (52.07)	54.50 (47.56)	68.60 (56.33)^{*a}
M_1	82.50 (65.58)	69.50 (56.46)	63.25 (52.67)	53.50 (46.99)	47.75 (43.69)	63.30 (53.08)^{b}
M_2	78.50 (62.39)	63.00 (52.52)	56.00 (48.43)	50.75 (45.41)	45.25 (42.25)	58.70 (50.20)^{c}
M_3	68.75 (56.01)	56.25 (48.58)	45.75 (42.54)	38.50 (38.31)	35.75 (36.69)	49.00 (44.43)^{d}
M_4	59.75 (50.60)	45.25 (42.26)	39.75 (39.07)	31.75 (34.28)	27.25 (31.44)	40.75 (39.53)^{e}
M_5	53.00 (46.70)	41.75 (40.23)	32.75 (34.89)	26.75 (31.12)	22.00 (27.96)	35.25 (36.18)^{f}
M_6	46.50 (43.55)	37.00 (38.47)	26.25 (33.35)	20.75 (28.29)	17.00 (25.26)	29.50 (33.78)^{g}
Mean	67.96 (56.22)^{A}	55.00 (48.10)^{B}	47.28 (43.72)^{C}	40.61 (39.49)^{D}	35.64 (36.41)^{E}	49.30 (44.79)
SEm ±	A 0.34		M 0.40		A × M 0.89	
CD (5%)	0.94		1.11		NS	
CV (%)	3.96					

*Values in the parenthesis indicate arc-sine transformed values
The values in the same column/row with the same alphabet are not significantly different as per DMRT (P< 0.01).

Period of storage:
M_0 – Before storage
M_1 – One month after storage
M_2 – Two months after storage
M_3 – Three months after storage
M_4 – Four months after storage
M_5 – Five months after storage
M_6 – Six months after storage

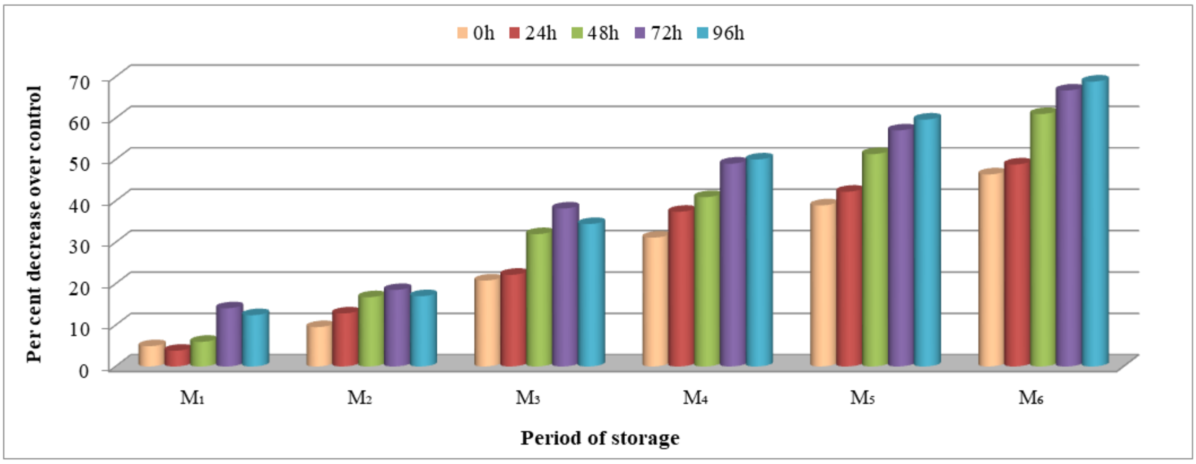

Figure 4. Per cent decrease in field emergence (%) of accelerated aged seed of sorghum during storage

Period of storage:

M_1 – One month after storage
M_2 – Two months after storage
M_3 – Three months after storage
M_4 – Four months after storage
M_5 – Five months after storage
M_6 – Six months after storage

Table 6. Influence of accelerated aging on electrical conductivity (µS cm^{-1}) of sorghum seed during storage

Period of storage (Months)	Period of accelerated aging (hours)					
	0	24	48	72	96	Mean
M_0	750.00	787.50	960.00	1023.75	1080.50	920.35^{g}
M_1	765.00	814.00	998.00	1078.25	1152.75	961.60^{f}
M_2	787.50	853.25	1048.25	1122.75	1189.50	1000.25^{e}
M_3	806.00	889.50	1092.25	1175.00	1238.25	1040.20^{d}
M_4	845.25	905.50	1109.50	1198.75	1278.00	1067.40^{c}
M_5	869.50	925.50	1132.75	1212.75	1292.75	1086.65^{b}
M_6	886.25	945.00	1158.50	1242.25	1324.75	1111.35^{a}
Mean	815.64^{E}	874.32^{D}	1071.32^{C}	1150.50^{B}	1222.93^{A}	1026.94
SEm ±	A 3.04		M 3.60		A × M 8.04	
CD (5%)	8.53		10.10		22.57	
CV (%)	1.57					

The values in the same column/row with the same alphabet are not significantly different as per DMRT (P< 0.01).

Period of storage:

M_0 – Before storage
M_1 – One month after storage
M_2 – Two months after storage
M_3 – Three months after storage
M_4 – Four months after storage
M_5 – Five months after storage
M_6 – Six months after storage

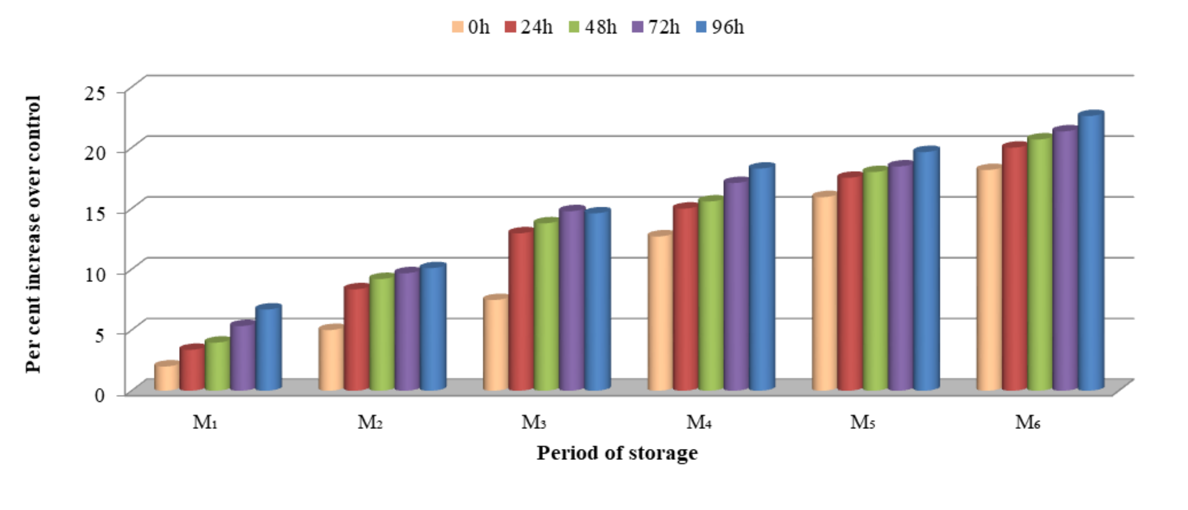

Figure 5. Per cent increase in electrical conductivity (μScm^{-1}) of accelerated aged seed of sorghum during storage

Period of storage:
M_1 – One month after storage
M_2 – Two months after storage
M_3 – Three months after storage
M_4 – Four months after storage
M_5 – Five months after storage
M_6 – Six months after storage

CONCLUSION

It is concluded that accelerated aging caused a significant decline in seed germination and vigour. The initial quality of the seed plays an important role in the further deterioration of the seed quality. Seeds that were subjected to higher temperature and high humidity for different durations (24, 48, 72 and 96 h) had lower initial seed quality, which further reduced quickly compared to unaged (control) seed. The interaction effect between accelerated aging and storage period showed that the initial germination recorded with 24 h (75.25%) of accelerated aging was almost equivalent to the germination recorded with the unaged (control) seed after four months (74.25%) of storage.

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Conflict of Interest:
There is no such evidence of conflict of interest.

Author Contribution:
All authors have participated in critically revising of the entire manuscript and approval of the final manuscript.

REFERENCES

Abdul-Baki, A. A., & Anderson, J. D. (1973). Vigour determination in soybean seeds by multiple criteria. *Crop Science. 13*, 630-633.

Badiger, B., Patil, S., & Rajaput, S. (2013). Influence of accelerated aging on determination of naturally aged cotton seed viability. *International Journal of Green and Herbal Chemistry*. *2*(4), 1037-1040.

Gabrielly, B. D., Resende, O., Ligia Campos de Moura Silva & Junior, W. N. F. (2020). Physiological quality of graniferous sorghum seeds during storage. *Research, Society and Development. 9*(6). e27963152.

Gupta, A., Punia, R. C., & Dhaiya, O. S. (2016). Physiological and biochemical changes in pearlmillet seeds under different storage conditions and containers. *The Bioscan*. *11*(3), 1455-1460.

Gupta, A., Punia, R. C., & Dhaiya, O. S. (2017). Seed aging and deterioration during storage of pearlmillet hybrid along with their parental line. *Research in Environment and Life Sciences*. *10*(6), 554-556.

Kapoor, N., Arya, A., Siddiqui, M. A., Kumar, H., & Amir, A. (2011). Physiological and biochemical changes during seed deterioration in aged seeds of rice (*Oryza sativa* L.). *American Journal of Plant Physiology*. *6*(1), 28-35.

Fatonah, K., Suliansyah, I., & Rozen, N. (2017). Electrical conductivity for seed vigor test in Sorghum (*Sorghum bicolor*). *Cell Biology & Development*. *1*(1), 6-12.

Kurdikeri, M. B., Hanchinal, R. R., Danapur, H. N., Hiremath, N. V., & Hanamaratti, N. G. (1997). Storage studies in wheat genotypes. *Karanataka Journal of Agricultural Sciences*. *10*(4), 1072-1077.

Malimath, S. D., & Merwade, M. N. (2007). Effect of storage containers on seed storability of garden pea (*Pisum sativum* L.). *Karnataka Journal of Agricultural Sciences*. *20*(2), 384-385.

Pontes., B. S., Catao, H. C. R. M., Oliveira, M. A., Santos, A. L. S., & Zanetti, R. B. (2025). Improving accelerated aging and electrical conductivity tests to assess popcorn seed vigor. *Bioscience Journal. 41* (e41009): 1-10.

Roberts, E. H. (1973). Loss of seed viability: chromosomal and genetical aspects. *Seed Science and Technology*. *1*, 515-527.

Tekrony, D. M. (2005). Accelerated aging test: Principles and procedures. *Seed Technology*. *27*(1), 135-146.

Tiwari, R. K. S., & Das, K. (2014). Impact of differential storage conditions on seed germination and viability of some medicinal plants. *African Journal of Agricultural Research*. *9*(20), 1578-1585.