Journal of Medicinal Plants Studies
www.PlantsJournal.com

ISSN (E): 2320-3862
ISSN (P): 2394-0530
www.plantsjournal.com
JMPS 2022; 10(2): 01-04

Received: 02-01-2022
Accepted: 05-02-2022

Farhat Haque
Research Scholar, Botany Department, Govt. Girls P.G. College, Rewa, Madhya Pradesh, India

Neeta Singh
Principal, Govt. Girls P.G. College, Rewa, Madhya Pradesh, India

Corresponding Author:
Farhat Haque
Research Scholar, Botany Department, Govt. Girls P.G. College, Rewa, Madhya Pradesh, India

Seed germination of *Semicarpus anacardium* L. F. under various treatment

Farhat Haque and Neeta Singh

Abstract
Semicarpus anacardium Linn. f. is a species of high medicinal and economic value gaining more popularity for preparation of anticancer and antitumor medicines in ayurveda. The natural germination after a period of storage is less. With this information the study was conducted to explore the effects of different seed treatments on germination and storage.
The experiment on seed germination techniques of *Semicarpus anacardium* Linn. f. were carried out in the nursery of the forestry, forest Research garden Jayanti Kunj, Rewa the different treatments were given to know their effect on seed germination and storage technique due to medicinal importance of the species and low viability after the storage of seed for long time germination decreases in this connection an attempt were made & study the germination potential of the species. The different treatment have been tried such as treatment with sulphuric acid for 5 min, thiourea 0.5 and 1% for 12 hours KNO_3 1% for 12 hours and GA_3 100 ppm and 200 ppm Among the different treatment tried treatment with GA_3 200 ppm was found more significant to increase the germination percentage significantly followed by thiourea area, KNO_3 and H_2SO_4 the study also revealed that the interaction between seed source variation and treatment effect significantly different in seed germination starting date, closing date, germination percentage and rates of germination.
Seeds of *Semicarpus anacardium* Linn. f. at the rate with 6% Moisture contained treated with (i) captan at the rate 2g/kg. (ii) Activated clay in the ratio of l:100. (iii) Activated clay and Bavistin at the rate 2g each / kg and (iv) cow dung ash at the rate 1:10 were compared for storability with (v) untreated control. Storability included (i) cloth bags (ii) polythene bags of 700 gauge. Seeds treated with captan 43 and 45 percent germ inability was noticed in cloth and polythene bags respectively even after 30 months of storage and differed significantly from all other treatments.

Keywords: *Semicarpus anacardium* Linn. f., dormancy, germination, Thiourea, KNO_3 Surphuric acid, GA_3, viability

Introduction
Medicinal herbs and plants continue to play a significant role in drug discovery development, particularly in cancer research. The overall contribution of natural products to the expansion of the chemo therapeutic arsenal is evidenced by the fact that 70% of all anti cancer drugs approved worldwide between 1940 to 2006 were either natural products. Recently antiangiogeric drugs have shown induce term tumour dormancy and disease free survival *Semicarpus anacardium* Linn. f. seeds shows antitumor properties, seeds powder in and their methanolic extracts is used as anticancer and anti tumour and as antioxidant.
Semicarpus anacardium Linn. f. a medium to large sized tree 10 to 20.m. tall tree with grey bark leaves are simple alternate obovate - oblong with rounded apex glabrous surface, large sized, fascinated. In pubesent penicles. Fruits obliquely ovoid on oblong, 2.5 cm long, heart shaped, shining green when unripe and black when ripe, seated on a fleshy receptacle which is yellow when ripe, Occurs throughout India in semi evergreen and moist deciduous forest. Basu *et al.* (1979) [1]. The natural propagation of *Semicarpus anacardium* Linn. f. takes place by seeds. However the seeds viability decreases as the time increases. Seeds are rich in oil, protein and medicinally useful.
The fruits are useful in medicine. They are acidic, bitter; sour, sweet, thermogentic, emollient, digestive, anthelmintic, purgative, liver tonic, expectorant and aphorodisiac. They are useful in indigestion, flatulence, constipation, hemorrhoids, vitiated condition of kapha and vata, beriberi, cancer, sciatica, neuritis, asthma, leprosy, leucoderma, scaly skin eruptions, inflamations, diabetes, dysmenorrheal, menorrhoea, scrofula ulcers and general diabitity does recommended, are 3 to 4 gm oil 10-20/drops. (Quinlivan; 1971 and 1978) [2-3].

Semicarpus anacardium Linn. f. is medicinally important plant. The demand of seed is increasing day by day. However unlike other medicinal plant seeds the viability of seeds lost in storage at room temperature but when awareness and infrastructure for better storage is develops substantial quantity of seeds maybe stored for few planting seasons to overcome such situation as monsoon failure. Total crop failure outbreak if pest diseases and also as Precaution against production of seeds of poor quality. Maintenance of viability and vigor of seeds in storage is governed by a variety of factors (Bewley and Black, 1982) [4]. The study was undertaken to get information on the methods of storing seed with specific reference to the type of containers and the nature of seed treatment. The stem of the plant yields by tapping an acidic juice from which varmin is prepared. The nut yield a powerful and better substitute used for making ink for clothes before application it must be mixed with lime water as a fixator. The fruits are also used as dye. The kernel oil is used as a lubricant as well as wood preservative against termites. Fruits seeds are collected from December to march. Seeds lose their viability after storage seeds have medicinal value and are used to treat wide range of diseases. The seeds do not retain their viability. After collection in the month of, December to January. Seeds are seen fertile at very early age many laboratories has been tried to evaluate the germination percentage and seeds storage procedure but information's are still scanty on this plants therefore it was decided to investigate the storage methods of plants to increase the viability of seeds.

Detoxified nuts of *Semicarpus anacardium* Linn. f. were used in Ayruveda for skin diseases tumors malignant growth, fever, excessive, menstruation, vaginal discharge, constipations intestinal parasites, the most common methods for detoxification involves rubbing of seeds with brick powder and then mashing the seeds with warms water the another method is to tie the seeds in muslin cloth and suspended it in a vessel containing coconut water then heated for three hours. The seed oil is used for medical purpose. Oil is applied generally on wounds it works well when mixed with garlic onion and ajwayana in sesame oil it is also used as brain tonic chronic rheumatic disorders. The metabolic extract of nuts is used as anticancer, antitumor it is also used as neuroprotector it has antioxidant activates also.

Materials and Methods

The seeds were collected from Harrai forest range district Chhindwara (M.P.). The seeds were washed thoroughly with running tap water then the seeds were risned with 0.1% $Hgcl_2$ for 5 months followed by Sterile water the seeds were soaked for 24 hours in water before they kept for germination count (Baskin and Baskin, 1977)[5]. The seeds were kept in sterile pesticides lined with cotton and circle of filter paper what man no 1. The seeds were moistened with 15ml/ sterile water. The germination count were made after 6 days intervals upto 30th day. The emergence of radical 1cm is treated as index for germination (Anonymous 1966, ASO, 1983) [6-7]. The seeds were given the treatment of sulphuric acid 5mts followed by through washing with fresh water and kept for germination 12hr. The treatment given with thiouriea 0.5% and 1% solution for 12.hrs and the seeds were germinated in petridishes. The seeds were also given the treatment with KNO_3. 1% for 12.hrs and then tested for germination. The seeds of *Semicarpus anacardium* Linn. f. also treated with GA_3. 100 and GA_3. 200 ppm one hundred seeds for each treatment tested for germination in each of five replicates (Anonymous, 1966, ISTA, 1999) [6, 8].

In another experiment the seeds of *Semicarpus anacardium* Linn. f. collected from the forest department Chhindwara (M.P.) (i) seeds were collected from dec. to Jan. cleaned by floatation method. The seeds lots were divided into five portions and treated with captan at the rate 2g/kg of seeds in 5ml of water (ii) activated clay at 1:100 ratios, (iii) activated clay + Bavistin at the rate 2g/ kg. Each (iv) cow dung ash at 1:10 ratio and the last portion was kept as control & no treatment is given. A small quantity of 50gm each of this treated as well as untreated seeds were separately packed in (i) unused fresh cloth bags and polyether bags(700gauge) and stored at ambient temperature and relative humidity before storage and at 3 months intervals samples from all the treatments under each container were taken and tested for their germ inability for germination 100 seeds with five replications in each treatment were taken and germinated at room temperature 25 °C ± 2 °C in petrideshes lying with a circle of filter paper and cotton moisture with distilled water (Anonymous, 1985) [9]. The germination count were taken after six days Intervals up to 30 days emergence of radical is treated as index for germination.

Results and Discussion

The germination percentage of untreated seeds is 35% in control among various treatments was also found useful more seeds were germinated against 35% in control. The treatment with thiourea and KNO_3 at conc 1% was found useful to enhance the germination treatment with GA_3 100 and 200 ppm is also increased upto 68% overall germination percentage significantly increase as compared to control The germination percentage of untreated seeds in 35% in control the different treatments tried given better results this may be due to the break in the seeds dormancy which may cause due to dormant embryo and adverse environmental conditions Table-1 (Quinlivan, 1971, 1978, Basu and Dark, 1979, Todaria and Negimak, 1992) [2-3, 1, 10].

The difference in germination due to seed treatments captan treated seeds recorded 43 and 45% germination in cloth bags and polythene bags respectively at the end of the storage period which is well above the prescribed seed certification standard followed by the activated clay treatment (41 and 42%) such beneficial effects of treating the seeds with captan for prolonging the storage life have been reported by Singh and Mayura (1972) [11] and Shanmugaraj (1978) [12] respectively. Seeds were stored in polythene bags treated with captan, activated clay and bavistin shows better germination percentage and viability. (Ramammurthy *et al*., 2005) [13].

However seeds treated with cow dung ash remained inferior to the untreated seeds throughout the storage period and the effects was well pronounced in seeds stored in cloth bags that in polythene bags containers as the storage period advanced. It is possible that the retention equilibrate with the atmospheric moisture content when the ambient temperature is low and the relative humidity is high thereby causing faster deterioration. Munn *et al.* (1929) [14] observed that vegetable seeds packed in moisture previous containers were poor in quality (Ballard 1973, Rolston, 1978, Devranayagodi *et al.* 1981 and Kobmoo, 1984) [15-18].

From the tables-1 it is evident that storing the seeds treated with captan on the other hand seeds treatment with a combination of activated clay and bavistin was superior to cow dung ash the improvement is only on par control. Irrespective of treatment the slow reduction in germ inability of seeds stored at room temperature in polythene bags

containers is possible due to impermeability of 700 gauge polythene to water vapors and thus preventing fluctuation in seed moisture (Silva *et al.* 1976, Selvaraj and Ramaswamy, Kobmas, 1998, Todaria 1992, Newman and Garg, 2007) [19, 20, 10, 21]. Observation on the rate of seed germination reveal that the germination initiated at 30 days the rate of seed germination showed an increase trend with concentration of growth hormone GA_3 ppm and the chemicals used in this study. Maximum percentage of seed germination was recorded to the treatment with thiourea 1% 30th day after the treatment 65% of seeds were germinated which was superior to control. Similarly significant result were obtained with sulphuric acid and $KNO_3$1% the result obtained were statistically comparable.

It was noted that the germination percentage of seed gradually decreased during the period of storage irrespective of treatments and containers. Among different treatments, seed with captan stored in polythene bags recorded 46 percent germination after 30 months of storage followed by activated clay, activated clay & bavistin and cow dung ash respectively (table-2).

Table 1: Effect of different treatments on seed germination percentage of *Semicarpus anacardium* Linn. f.

S. No.	Treatment	Days after treatment and percent germination				
		8	12	18	24	30
1.	Control	8±0.48	18±0.3	23±0.7	28±1.4	35±0.2
2.	Concentrated surphuric acid 15 minute	16±0.1	25±0.48	30±0.6	39±0.05	50±0.07
3.	Thiourea 0.5% 12 hours	17±0.6	27±0.7	32±0.3	43±0.46	63±1.2
4.	Thiourea 1% 12 hours	18±0.46	30±0.9	35±0.8	48±0.5	65±0.9
5.	KNO_3 1% 12 hours	19±0.7	30±0.3	32±0.8	47±0.6	64±0.5
6.	GA_3 100 ppm	19±1.3	31±0.4	44±0.46	48±0.7	65±0.6
7.	GA_3 200 ppm	20±0.2	32±0.6	45±0.48	49±0.5	68±0.3

Note: 1. Each value of mean of five replicates
2. ± indicate of standard deviation (S.D.)

Table 2: Effect of different seed treatments and storage containers and period of storage on germinability percentage of *Semicarpus anacardium* Linn. f.

S. No.	Period of storage	Storage containers	Control	Captan	Activated clay	Activated Clay + Bavistin	Cow dung Ash
1.	0 Month	Cloth bag	50±0.7	50±0.7	50±1.3	50±1.3	50±1.3
		Polythene bag	50±0.7	53±0.8	54±0.8	55±1.1	53±0.9
2.	6 months	Cloth bag	45±0.5	44±5	43±0.7	42±0.1	40±0.4
		Polythene bag	48±0.2	46±0.2	45±0.5	44±0.5	42±0.1
3.	12 months	Cloth bag	43±0.7	41±0.7	40±0.45	39±0.3	37±0.46
		Polythene bag	44±0.5	43±0.2	41±0.5	40±0.5	39±0.1
4.	18 months	Cloth bag	41±0.7	39±0.7	38±0.46	37±0.1	36±0.46
		Polythene bag	40±0.2	40±0.5	39±0.7	38±0.1	36±0.5
5.	24 months	Cloth bag	40±0.46	41±0.1	40±0.46	36±0.7	35±0.5
		Polythene bag	39±0.46	42±0.1	40±0.5	38±0.4	36±0.1
6.	30 months	Cloth bag	36±0.5	43±0.5	41±0.7	37±0.5	35±0.3
		Polythene bag	35±0.7	45±0.5	42±0.2	35±0.2	34±0.5

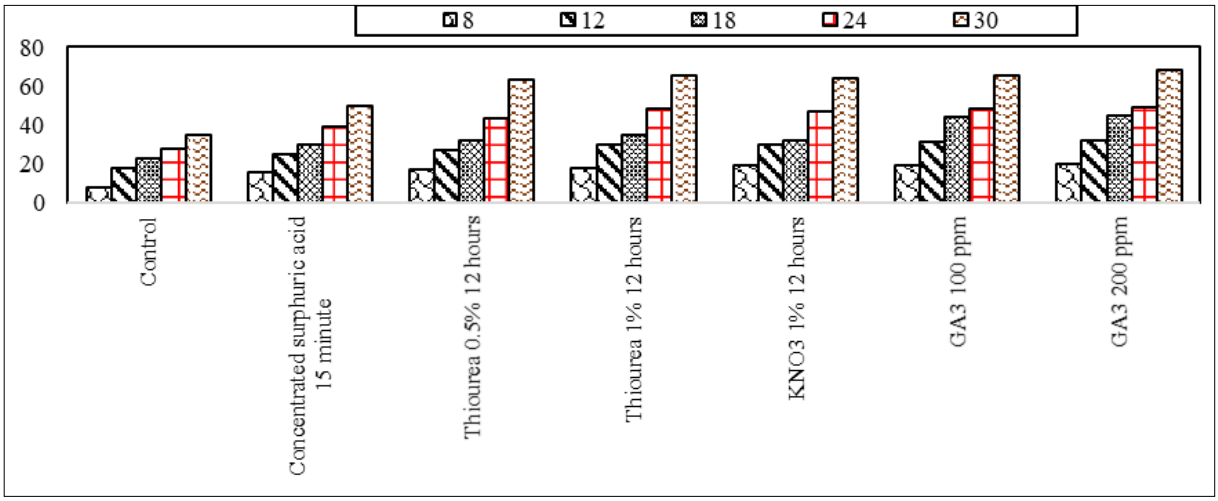

Fig 1: Graph analysis of Effect of different treatments on seed germination percentage of *Semicarpus anacardium* Linn. f.

Conclusion

The study has been given insight to the working knowledge and performance in regarding to the selection of seed. Storage device and various kinds of treatments to enhance the germination of seeds of *Semicarpus anacardium* Linn. f. the seeds of *Semicarpus anacardium* Linn. f. Lost their viability as the time increases the germination potential of seeds and to know the storage techniques *Semicarpus anacardium* Linn. f. is extremely hot and it should be used with caution. The toxic symptoms of the internal use of the plant is itching, skin rashes, burning etc. it is necessary to detoxify the plant with hot water before the use it is medicinally important value in ayurveda and sidha system of medicine.

Acknowledgement
The authors are thankful to the authorities of forest Department of Chhindwara district and Govt. Girls P.G. College Rewa (M.P.) for the facilities they provides to carry out this work.

References

1. Basu SN, Dark DC, James E. Physiolical and chemical control of seed deterioration. Seed Res. 1979;4:15-23.
2. Quinlivan B.J. Seed Ecology Biography and Evolution of Dormancy and Germination Academic press inc San Diego C.A, 1971, 666.
3. Quinlivan BJ. Water impermeability in legumes. Jr. Aust. Inst. Sci, 1978, 283-294.
4. Bewley JD, Black M. Physiology and Biochemistry of seeds in relation to germination vol 2, viability. Dormancy and Environmental control Springer Yeriag Berlin, 1982, 375.
5. Baskin JM, Baskin CC. Seed Ecology, Biography and Evolution of Dormancy and Germination academic press Inc. SanDiego. C.A, 1977, 666.
6. Anonymous. International rules of seed testing procedure. Int. Seeds testing Association. 1966;31:152.
7. ASO. Seed vigor testing Handbook contribution no.32 associatation of seed analyst linco In, N.E. U.S. Ar, 1983.
8. ISTA Internationals rules of seed testing. Seed science and technology 27th supplement Zurich, Switzerland, 1999.
9. Anonymous. International rules of seed testing. Seed sci. & technol. 1985;13:299-513.
10. Todaria Negimak NP. Pre-Treatment of some Indian Cassia Seeds to improve their germination. Seed Sci. Technol. 1992;20:583-588.
11. Singh JN, Mayura ML. Effect of storage conditions on germination of soybean seeds. Bull. Grain Technol. 1972;10(3):158-167.
12. Shanmugaraj K. Seed maturation and storage studies in *Lab-lab perpuerus* (L) Sweet M.Sc. (Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore, 1978.
13. Ramamoorthy K, Rajendra C, Sivasubananain S. Seeds treatment for alleviation of hard seededness in Senna Cassia angustifolia. Adv.Pl. sci. 2005;18(1):429-430.
14. Munn MT, Olive M, Mary E. The quality of packed vegetable seeds on. Sale in New York in 1929, 1927, and 1928. New York (General) Agric. Exp. Sta. Bull. 1929;565:47.
15. Ballard LAT. Physical barriers to germination. Seed science & technology. 1973;1:285-303.
16. Rolston MP. Water impermeable seed dormancy. Bot Rev. 1978, 365-369.
17. Devaranayagodi SB, Venkatachala ST, Manegowda MK. Cold water treatment improves the germination in *Leucaena leucophala* (amk), dewit Cur. Res. 1981;10:83-84.
18. Kobmoo B, Hellium AK. Hot water and acid improves the germination of Cassia siamea. Britt Seed. The Embryon. 1984;1:27-33.
19. Silva RFJ, Silva FD, Viggiano A, Couto A, Conde AR. The effect of seed moisture contents type of Containers and Storage conditions on the germination of Okra seeds, *Revista Ceres*, 23(126):77-82. Hort Abstr. 1976;47(16):5622.
20. Selvaraj JA, Ramasamy KR. Effect of container and storage period on germination and seeding vigour in cotton MCU-7 (Gossypium hirsute) Cott. Dev. 1978;8:3-6.
21. Newmann DJ, Cragg GM. Natural products as sources of new drugs the last 25 years. J. Nat, prod, 2007, 461-477.