SEED AND SEED GERMINATION OF *ARTEMISIA PALLENS*

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ABSTRACT

Artemisia pallens is important high valued annual medicinal and aromatic herb of India. It is commonly known as Davana. It is also called as worm wood or sage brush. It belongs to Asteraceae family. It is much priced in India for oil production. Davana is propagated through seeds and before sowing seed germination is essential. Oil possesses antibacterial, antifungal, antispasmodic and stimulant properties. The observation made on germination percentage, seedling length, seed germinate at light conditions and seed germinate at dark conditions.

Keywords: *Davana, seed germination, germination percentage, seedlings length.*

Introduction

The term Mycorrhiza was coined by A.B. Frank in 1885. Mycorrhiza is the Mutualistic symbiotic association between soil born fungi and roots of higher plants in which both are benefited. (Kasliwal and shriniwasmurthy., 2016).

Arbuscular mycorrhizal fungi is the mother of plant root endosymbiosis that establish symbiotic relationship with plants and play an essential role in plant growth, disease protection and soil fertility.(Thapa *et.,al*.2015).

Arbuscular Mycorrhiza fungi absorb immobilized mineral nutrition such as phosphorus, zinc and copper from the soil. (Bagyaraj,2014).

Arbuscular mycorrhizal fungi also absorb nutrient i.e zinc, copper, nitrogen, sulphur, potassium, phosphorous, calcium, magnesium and iron from soil and it supply to the plant. **(**Alizadeh,2012). It maintains carbon and nitrogen cycle. It regulates growth hormone. It increases photosynthetic rate. It maintains plant community and ecosystem. It helps in seedling establishment in forest. (Aggarwal *et. al*.,2011).

Davana (*Artemisia pallens*) is annual aromatic, medicinal herb of India belonging to the family Asteraceae. It is cultivated for its fragrant of leaves and flower which is used for floral decoration. It is commercially cultivated in south India as a short duration crop from November to March. Davana is traditionally used in religious ceremonies and making floral decorations, bouquets, and garlands (Jayanthi *et. al*., 2013, Devare et.al.,2014).

Artemisia is the largest genus comprising of 400 species are found in South Africa and South America and 34 species found in India. Sesquiterpene lactones are known to be present in almost all species. Tribal people used *Artemisia pallens* for various ailments. It is traditionally used in Indian Folk medicine for the treatment of Diabetes mellitus, immunomodulating, antihelmentic, antipyretic and wound healing, tonic properties and also used as good fodder. Davana oil is emotionally balancing and calming down anxiety. Davana leaves and stalks used in making bouquets, garlands, flower arrangement. Davana oil is used for skin infection and cuts. Davana oil is used to making perfumes. (Nakhare and garg, 1990; Singh et.al.,2011 and Devare et.al.,2014).

Artemisia pallens shows the anti-inflammatory and analgesic properties.(Pravin et.al.,2010) and also it shows antioxidant activity.(Ruikar et.al.,2010).It is commonly used as treatment of malaria.(Pala,et.al.,2016).

Materials And Methods: (Obembe and Agboola:2008)

Mature seeds of *Artemisia pallens* were from collected a field planting in 2016. After collection immature seeds and those damaged seeds were removed. The seeds were surface sterilized by soaking in 1% sodium hypochlorite for 5 minute and subsequently washed with sterilized distilled water.

Seeds of *Artemisia pallens* were subjected to germination tests. De-husked seeds were surface-sterilized in 10% (w/v) chlorox for 30 seconds and rinsed in several changes of distilled water. Fifty seeds were planted in each

of the 9 cm diameter petri dishes lined with moist sterile filter. The experiment was carried out under light and dark at 29 ± 1 °C. Light was supplied by four 40 watt white fluorescent lamps at a distance of 1 m (1,200 lux). The petri dishes for the dark condition were wrapped completely with aluminum foil and kept in a dark cupboard. Fifty seeds were also planted for germination. Observations were made for up to day 10 of incubation. Radicle emergence of up to 1.5 mm was taken as a visible sign of germination.. Statistical analysis: All experiments were repeated 5times. All germination experiments were conducted using three replications of 50 seeds per different treatment. Seeds were placed on Whatmann no. filter paper moisture with 5 ml of distilled water in sterilized petridishes with different conditions. Then it observes regularly. The germination percentage, seedling length, seed germinate at light conditions and seed germinate at dark conditions. Data were statistically analyzed by the SAS software using a completely randomized design and means were compared at the P = 0.05 level of significance using Duncan's multiple range test ($P < 0.05$)

Results and Discussion

Percentage of seed germination was observed at light condition as compared to dark condition at 2 days interwal periods. Germination of seed showed at second day and seed germination was occured third day at dark condition. Seedlings length was increased in light condition so we have concluded light condition is better than dark condition for seed germination and seedling.

Similar observation were made by Obeme and Agboola (2008), Germination test showed that the seeds of *O. gratissimum* were in a state of dormancy and Seeds germinated poorly especially in the dark with a maximum of 40% after 10 days. Germination of seeds of *O. gratissimum* was enhanced under light conditions. 70% seed germination was observed as from the 6th up to the 10th day after sowing. seed germination could be tested in davana seeds using paper media between the paper (roll towel) method has to be adopted for obtaining reproducible results of germination percentage observed by Jayanthi,(2013). Similar observations were mady by different resaerchers as the best method in many small seeded species namely Singh *et al.* (1990) in methi; Kalavathi (1996) in *Hibiscus*; Swapna (2003) in *Ocimum spp*, Chauhan *et al.* (2009) in *Andrographis paniculata* and Sumathi (2010) in Karpokkarasi.

Table:1 Percentage germination of *Artemisia Palslens* seeds after 10 days incubation under light and dark condition at 29 ± 1 °C

Percentage Germination		
Periods (Days)	**Light**	**Dark**
2	**0.0±0.0**	**0.0±0.0**
4	**15±1.5**	**00.00**
6	**28±1.7**	**16. ±.2.1**
8	**35±2.1**	**25±.2.3**
10	**42±2.5**	**32±2.4**

Mean± SD, (Standard deviation with 5 replicates) ANOVAs, p-value ≤ 0.05 there is significant difference between different treatment

Table:2 Seedlings of *Artemisia Pallens* seeds after 10 days incubation under light and dark condition at 29 ± 1 °C

Seedling length		
Periods (Days)	**Light**	**Dark**
2	**0.0±0.00**	**0.0±0.0**
4	**2.74±0.15**	**0.0±0.0**
6	**3.12±0.14**	**1.71±0.21**
8	**3.51±0.26**	**2.17±1.5**
10	**3.71±0.22**	**2.51±1.7**

Mean± SD, (Standard deviation with 5 replicates) ANOVAs, p-value ≤ 0.05 there is significant difference between different treatment.

References

1. Aggarwal, A. Kadian, N. Tanwar, A. Yadav, A. Gupta, K. K, (2015). Role of AMF in global sustainable development. Journal of Applied and Natural Science. 3(2). 340-351.
2. Alizadeh, O.(2012).A critical review on the nutrition role of arbuscular Mycorrhizal fungi. International journal of the bioflux society. 4(1).1-7.
3. Bagyraj. D. J (2014). Mycorrhizal fungi. Proc. Indian. Natn. Sci. Acad. 80(2):415-428.
4. Chauhan, J.S., Tomar, Y.K., Indrakumar Singh, N., SeemaAli, Anoop Badoni, Debarati and Rana. A. 2009.
5. Assessment of compatible substratum for Andrographis paniculata standard seed germination testing. J. American.
6. Sci., 5(6): 70-75.
7. Devare, S. M. Lavate, S. S. Shendhkar, C. D. Deshpande, N. R Salvekar, J. P (2014). Quantification of phenolics and flavonoids by spectrophotometer from Artemisia pallens roots. Journal of pharmacy research. 8(3). 240-242.
8. Jayanthi. M, Vijarkumar A, Vananagamudi, K Rajamani. (2013). Influence of Date transplanting on growth and yield attributes and resultant seed quality of davana. American journal of plant sciences.(4)1721-1724.
9. Jayanthi. M, Vijarkumar A, Vananagamudi, K Rajamani. (2013). Standardization of germination media for seedling evaluation of davana. Vol. 3, issue, 10, ISSN: 2230-9926 pp.111-113.
10. Kasliwal, M and Srinivasamurthy. (2016)Influence of arbuscular mycorrhizae inoculation on growth and development of Hibiscus rosa-sinesis. International journal of current microbiology and applied sciences. 5(3). 659-666.
11. Kalavathi, D. 1996. Seed production, processing, testing and storage studies in medicinal plants of senna (Cassia angustifolia Vahl), periwinkle (Catharanthus roseus G. Don cv. Roseus) and roselle (Hibiscus sabdariffa Linn.). Ph.D. Thesis, Tamil Nadu Agricultural University, Coimbatore.
12. Nakhare, S and Garg, S. C. (1991). Anthelmintic activity of the essential oil of Artemisia pallens wall. Ancient science of life. 10(3):185-186.
13. Obembe and Agboola (2008). Seed pretreatments enhance seed germination in ocimum gratissimum. Life sciences journals. ISSN: 1097 – 8135: PP.87-89
14. Ruikar, A. D. Kmable. G. S. Puranic, V. G, Deshpande, N. R. (2009). Antimicrobial screening of medicinal plant- Artemisia pallens. International journal of pharmtechresearch.1(4). 1164-1166.
15. Singh R. (2015). Medicinal plants. A review. Journal of plant sciences.3.(1).50-55.
16. Sumathi, S. 2010. Studies on seed production, post harvesthandling and seed testing in karpokkarasi (Psoralea corylifolia L.) Ph.D. Thesis, Tamil Nadu Agricultural University, Coimbatore.
17. Swapna, M. 2003. Tracing seed maturation pattern and development of seed testing procedure for Ocimum spp.,M.Sc. (Ag.) Thesis, Tamil Nadu Agricultural University, Coimbatore.
18. Singh, T., Singh, P.V. and Singh, R.K. 1990. Evaluation ofbest temperature and medium for testing germination of fenugreek seeds in laboratory. Seed Res., 18(1): 31-33.
19. Thapa, T. Kumarde , U, Chakrborthy, B(2015). Association and root colonization of some medicinal plants with arbuscular mycorrhizal fungi. Journal of medicinal plants studies. 3 (2)25-35.