

Pre-sowing seed treatment to improve germination in musk (*Abelmoschus moschatus* L.)

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ABSTRACT

Studies were conducted with musk (*Abelmoschus moschatus* L.) the medicinal and aromatic plant of *Malvaceae* on germination improvement through various dormancy breaking treatments. The results revealed that soaking of seeds in hot water for 30 min enhanced the germination up to 98 per cent, which was 82 per cent higher than control. Not only germination the seedling vigour characters evaluated through root length, shoot length, vigour index and speed of emergence was also higher in seeds treated with hot water for 30 min. compared to control.

Key words : Musk, Medicinal and aromatic plant, Ambrette oil dormancy, Malvaceae.

Musk (*Abelmoschus moschatus* L.) is an important medicinal and aromatic plant of *Malvaceae*. The oil extracted from this seed is called Ambrette oil and is present in the seed coat. The oil is a mixture of farnesol and ambrettolide besides a few other minor aromatic compounds. The aroma of the seed is similar to that emitted by musk produced by male musk deer. Oil is used as base material for preparing high-grade perfumes and cosmetics. Seeds are also used as stimulant, antiseptic, cooling tonic, carminative and aphrodisiac. The seeds are ovoid - reniform in shape and black in colour having thousand seed weight of around 14.5 grams. The crop is raised from seeds but the seeds exhibit poor germination. Therefore, studies were conducted to enhance the germination through various dormancy breaking treatments.

MATERIALS AND METHODS

Freshly harvested seeds of *A. moschatus* were obtained from Horticulture College and Research Institute, Periyakulam and were soaked in cold water for 6 and 12hr and also in boiled hot water for a 15 and 30 min. The seeds were also soaked in the concentrated H₂SO₄ for various duration (2, 5, 10, 15, 20 and 25 minutes) and scarified by rubbing the surface of seeds against hard rough cement surface and also with sand paper. Each treatment was replicated four times with 25 seeds each and the treated seeds were evaluated for germination adopting between paper method in a germination room maintained at 25°C and RH 90+5 per cent. During the germination period daily count were taken and the speed

of emergence (Maguire, 1962) was calculated.

The final count was made after 21 days as per Agrawal (1993) (recommended for *Abelmoschus spp.*) and germination percentage was worked out based on the normal seedlings percentage. Ten normal seedlings were selected at random and measured for their shoot and root length and seedlings were dried under hot air oven maintained at 85°C for 48 h and the dry weight of the seedlings was recorded. By multiplying the mean germination percentage with mean dryweight of the 10 seedlings the vigour index values were computed. The data were analysed as per Panse and Sukatme (1985) by adopting completely randomized design for understanding the level of significance.

RESULTS AND DISCUSSION

The maximum germination (98%) was obtained with hot water for 30 min followed by soaking of seeds in hot water for 15 min (90%). Similarly seeds treated with concentrated H₂SO₄ for 2 and 5 min. increased the germination percentage of 84 and 82, respectively. The results suggested that these treatments were effective in overcoming dormancy in musk. The germination of untreated seeds was found to be very low (16%) (Table1). The rest of the treatments were found ineffective in breaking dormancy. Baskin and Baskin (1997) listed malvaceae as a one of the common families, for the occurrence of physical dormancy that occurs due to hardness of seed coat. Copeland (1988) reported that hot water treatment could break the physical dormancy and enhance the seed germination. The results of the present

Table 1 : Effect of various treatments on breaking seed dormancy in musk

Sr. No.	Treatments	Germination (%)	Speed of germination	Root length (cm)	Shoot length (cm)	Drymatter production (mg 10 ⁻¹ seedlings)	Vigour index
1.	Control	16	1.85	5.7	10.8	0.082	1.31
2.	Soaking in water						
	(i). 6 hrs	16	1.66	3.5	10.1	0.070	1.12
	(ii). 12 hrs	20	3.81	3.6	8.9	0.090	1.80
3.	Soaking in hot water						
	(i). 15 min	90	7.29	6.3	10.6	0.094	8.46
	(ii). 30 min	98	9.14	6.8	12.8	0.097	9.51
4.	Soaking in Conc.H ₂ SO ₄						
	(i). 2 min	84	7.05	6.6	10.8	0.092	7.73
	(ii). 5 min	82	7.62	5.2	11.3	0.093	7.63
	(iii). 10 min	60	4.85	4.2	5.6	0.071	4.26
	(iv). 15 min	54	3.21	2.3	3.8	0.062	3.35
	(v). 20 min	30	2.86	4.4	10.3	0.086	2.58
	(vi). 25 min	24	2.20	4.0	9.6	0.065	1.56
5.	Rubbing on cement surface	60	6.85	5.7	10.8	0.082	4.92
6.	Rubbing on sand paper	64	7.18	5.9	10.9	0.084	5.38
	C.D. (P=0.05)	15.18	0.94	2.48	1.56	NS	2.04

study might also be due to hardseedness of the seed coat of *A.moschatus*, which belongs to the family malvaceae. Not only the germination, the seedling vigour characters evaluated through root length, shoot length, vigour index and speed of emergence was also higher in seeds treated with hot water for 30 min. compared to control. Occurrence of low germination due to physical dormancy in untreated seeds of Bhenidi, the member of malvaceae was reported by Onwueme (1975) Passam and Polyzou (1997). They also observed hike in seed quality characters through hot water treatment.

Thus the study expressed that soaking of seeds in hot water for 30 min. improved the germination of fresh seeds by 82 per cent.

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