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-Short Communication

SEED GERMINATION RESPONSE OF *RAUVOLFIA SERPENTINA* BENTH. TO CERTAIN PHYSICAL AND CHEMICAL TREATMENTS

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Although *Rauvolfia serpentine* Benth. can be propagated by both seeds and vegetative propagules, growth of plant and root yield are better in those raised from seeds (Badhwar *et al.* 1956). But germination of seeds is much lower (Nayar 1956, Dutta *et al.* 1962). Moreover, collection of seeds from wild sources is both laborious and costly, inasmuch as the plants grow sporadically and the seeds ripen a few at a time. If the ripe seeds are not collected in time, they drop off to the ground and are lost. For these reasons seeds are not easily available from wild sources. Therefore, in the present investigation attempts have been made to improve the germination percentage of seeds of *R. serpentina.*

Freshly collected seeds of *R. serpentina* were subjected to the following treatments: 1. Mechanical scarification: Individual seeds were rubbed against sand paper or grind stone or nicked with a needle. 2. Hot water soaking: The seeds held in a netting wire were soaked in hot water at 80 ± 2^0C for 5, 10, 15 and 20 minutes. 3. Sulphuric acid treatment: The seeds were dipped in conc. sulphuric acid for 3, 5, 10, 15, 30, 40, 60 and 90 minutes, after which the seeds were thoroughly washed in running tap water and dried on paper towels. 4. Hydrochloric acid treatment: As in sulphuric acid treatment. 5. Heat treatment: For dry heating, the seeds were exposed to temperatures of 70, 80 and 90^0 C for 16, 24, 48, 72 and 96 hours duration in an oven. 6. Pre-sowing seed treatment with chemicals: Seeds were soaked for 24 hours in the following chemicals: 1% boric acid, 1% calcium hydroxide, 1% sodium dihydrogen phosphate, 1% potassium nitrate, 0.5% thiourea, 100 ppm GA_3 and 100 ppm NAA. Interactive effects of KNO_3 with GA_3 and NAA were also investigated. Pre-soaked seeds were re-dried for 24 hours in a stream of air. Untreated seeds were used as control. Germination tests were replicated thrice. Seeds were placed on two layers of blotting paper in petri dishes of 9 cm diameter. A seed regarded as germinated when radicle was approximately 5 mm in length.

Seed scarification with sand paper increased germination percentage to some extent, but grinding of seeds with stone or nicking with a needle were not effective (Table 1). Sinha *et al.* (1993) reported that scarification of seeds of *Trigonella corniculata* with sand paper was the most effective for increase of germination. Singh *et al.* (1985) in lentil and Padma *et al.* (1994) in *Leucaena, Alkbizzia* and *Samanea* also observed similar result with sand paper. Contrary to the present results, Padma *et al.* (1994) reported increased percentage of germination with grind stone scarification and nicking.

Seed treatment with conc. sulphuric acid up to 30 minutes increased germination percentage to some extent (Table 1). This result corroborates the findings of Sinha *et al.* (1993), Padma *et al.* (1994) and Rao *et al.* (1985). However, the duration of soaking in sulphuric acid for better germination was different in different plant species.

The result of the present study revealed that hot water treatment of seeds for any duration and temperature did not improve germination percentage. These results are in agreement with the work of Jha and Sinha

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(1989) in *Vicia faba* and Sinha *et al.* (1993) in *Trigonella corniculata.* However, Padma *et al.* (1994) reported hot water soaking (80^0 C) for 5 minutes improved germination in *Leucaena leucocephala,* but not in *Albizzia lebbeck* and *Samanea samon.*

Presowing seed treatment with chemicals did not improve germination percentage. However, potassium nitrate and thiourea improved germination to some extent. (Table 1). Increased germination following treatment with potassium nitrate has been documented in *Glycine max* and *Momordica charantia* (Devi and Selvarj 1994). Increased germination following thiourea has been reported in marigold (Selvaraju 1986) and bitter gourd (Devi and Selvaraj 1994). Basra *et al.* (1990) reported that seed soaking treatment with potassium nitrate, GA_3 and phthalimide increased seed germination in *Panicum maximum.* Devi and Selvaraj (1994) also observed enhanced germination of bitter gourd due to seed soaking with a number of chemicals like, bavistin, boric acid, calcium hydroxide, calcium oxychloride, sodium dihydrogen phosphate, potassium dihydrogen phosphate, succinic acid and NAA. But in the present study, some of these chemicals failed to elicit any positive effect on germination of *R. serpentina* seeds.

As mechanical and chemical scarification of seeds could not improve germination of *R. serpentina* seeds, it appears that germination inhibitors may be located inside the seeds. It appears that seed germination of *R. serpentina* is very complex and further work is necessary to understand the mechanism of germination.

Table 1. Effect of pre-sowing seed treatment on % of germination of *R.serpentina.*

Treatment		% germination	Treatment	% germination
Control		26	Heat treatment	
Scarification			70°C 16h	28
	Sand paper	48	24h	28
	Grind stone	32	48h	32
	Nicking	30	72h	26
Hot water			96h	28
	5 min	26	80°C 16h	28
	10 min	24	24h	30
	15 min	28	48h	32
	20 min	28	72h	30
Sulphuric acid			96h	28
	3 min	25	90°C 16h	26
	5 min	25	24h	28
	10 min	26	48h	30
	15 min	30	72h	30
	30 min	38	96h	28
	45 min	32	1% Boric acid	32
	60 min	30	1% Calcium hydroxide	30
	90 min	25	1% Sodium dihydrogen phosphate	30
Hydrochloric acid			1% Potassium dihydrogen phosphate	30
	3 min	30	1% Potassium nitrate	40
	5 min	28	0.5% Thiourea	30
	10 min	32	100 ppm GA_3	32
	15 min	26	100ppm NAA	30
	30 min	32		
	45 min	28		
	60 min	27		
	90 min	27		
LSD 5% for comparing any two means = 7				

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