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Effect of pre-storage treatment on seed germination of *Strychnos potatorum* L.f.

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A study was carried out to investigate the effects of GA_3, hot and cold water treatments on the germination of *Strychnos potatorum* L.f. The highest germination was recorded in seeds treated with 1000 ppm GA_3 concentration with 24 hours soaking period. Germination was enhanced by increase in the GA_3 concentrations in all the trials.

Seed germination / *Strychnos potatorum*.

Germination is a critical stage in the life cycle of weeds, medicinal and crop plants, and often controls population dynamics, with major practical implications (Keller and Kollmann, 1999). Plant growth regulators such as GA_3 (gibberellic acid) (Hilhorst and Karssen, 1992), hot water treatments (Hermansen et al. 1999) have been recommended to break dormancy and enhance germination. The objectives of this study were to determine the effect of gibberellic acid, hot water and cold water on germination in finding effective methods for improving seed germination characteristics of *Strychnos potatorum*. It is a medicinal tree belongs to the Loganiaceae family. The medicinal value of unripe fruit is useful in diseases of the eye, thirst, poisoning, and conjunctivitis (Kritikar and Basu, 1975). According to Ayurveda, seeds are acrid, alexipharmic, lithotriptic and cure strangury, urinary discharges, head diseases and roots are used to cure Leucoderma whereas fruits are useful in eye diseases, thirst, poisoning and hallucinations. The fruits are emetic, diaphoretic alexiteric (Varier, 1997). According to Unani system of medicine, seeds are bitter, astringent to bowels, aphrodisiac, tonic, diuretic and good for liver, kidney complaints, gonorrhea, colic (Agharkar, 1991). The seed extracts appreciably suppressed the development of typical skin lesions induced by the infection of Herpes Simplex Virus-1 (HSV1) (Hattori et al.1995).

Considering the scanty information and need for promoting propagation by seeds in this important medicinal species, there is need for applying conventional method of propagation for conservation and sustainable utilization of biodiversity of *Strychnos potatorum*. There is no earlier report on conventional method of propagation by seeds in this species.

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Materials and Methods

Fruits of *Strychnos potatorum* were collected from Kalakkad Hills, Tamilnadu. Random sampling was followed during collection. Ripe fruits were collected during December - January, 2006. The seeds were separated by macerating the fruits by hand (Fig.1). Extracted seeds were washed in running water and surface dried at room temperature (25±2 ^{o}C) under shade and used for the study. The seeds were soaked for 12hours hot water, 24hours cold water and 24hours various concentrations of GA_3. The pretreated seeds were subjected to germination test. It was done using 200 seeds in 3 replications of 50 seeds as prescribed by DFSC (2000). The seeds were sown in sand medium and in the nursery beds maintained at 25±2ºC temperature and 95±2 % relative humidity. The germination data collected from various experiments were subjected to arcsine transformation wherever required and statistical analysis was carried out as per Panse and Sukhatme, (1995). The means were tested at 5% level of significance.

Results and Discussion

Germination was first noted 21st day after sowing seeds (Fig 2). Among all the treatments tried, 1000 ppm GA_3 solution recorded higher percentage of germination (81%) compared to control (57.5%). Germination energy and values were also high for seeds soaking 24 hrs in GA_3 1000 ppm, concentration (Table -1).

Fig. 1: Seeds of *Strychnos potatorum*

Fig. 2: Seed germination of *S. potatorum*

Table -1: Effect of pre-storage treatment on seed germination of *Strychnos potatorum* L.f.

Treatments	Germination (%)	Germination energy (%)	Germination value (Czabator)	Germination value (D&P)
Control	57.5	50.0	11.23	6.46
Cold water soaking 24 hours	60.0	52.5	11.71	6.89
Hot water soaking 12 hours	47.5	40.0	7.42	3.87
GA_3 (500 ppm) soaking 24 hours	75.0	65.0	19.04	14.83
GA_3 (1000 ppm) soaking 24 hours	81.0	75.0	20.64	16.77
GA_3 (2000 ppm) soaking 24 hours	71.0	62.0	16.91	13.13
GA_3 (4000 ppm) soaking 24 hours	67.5	42.5	19.64	15.77
GA_3 (5000 ppm) soaking 24 hours	55.0	32.5	16.91	13.13
	SEd	7.76		
	CD (5%)	19.0		

The seeds treated with GA_3 at concentrations above 1000 ppm have inhibited the germination. Similar studies was conducted by Misiha and El-Ashry, (1991) that the seeds of *Magnolia grandiflora* achieved highest germination when soaked in 1000 ppm of GA_3. In case of *Atropha belladonna* the seeds treated with GA_3 300 ppm concentration yielded the

best germination and seedling survival (Bisht Kediyal, 1995). Masilamani and Dharmalingam, (1995) reported that three months old seeds of silver oak treated with 250 ppm GA_3 for 24hours gave 43 percent germination against 9 percent in control. Rheum austral seeds were treated with 1000 ppm GA_3 for 24hours increased the germination up to 89% (Rajendra Kumar Sharma et al. 2006). In *Tamarindus indica*, *Parkia biglobosa*, *Prosopis africana* and *Albizia lebbeck* 80-100% germination was observed when treated with concentrated sulphuric acid (Ajiboya and Agboola, 2011). In *Leptadenia reticulata* seeds were treated with 200ppm GA_3 for 24hours increased the germination up to 72% (Kalidass et al. 2011).

In conclusion, the present results showed the seeds treated with GA_3 1000 ppm concentration gave an effective strategy for breaking seed dormancy and enhancing seed germination of *Strychnos potatorum*.

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