

GERMINATION STUDIES ON A VULNERABLE SWAMPY SPECIES *GYMNACRANTHERA CANARICA* WARB.

Deepa G.S, Vasudeva R and Narasimha Hegde

Gymnacranthera canarica Warb. is one of the threatened tree species (IUCN, 2002) that is associated with swampy habitat in the Western Ghats, a global mega diversity hot spot in India (Myers et al., 2000). The species is exclusively associated with swampy conditions and habitat destruction seems to be the major threat. *Gymnacranthera canarica* belongs to Myristicaceae (or nutmeg), a family one among the primitive flowering plants. It is a large evergreen tree. Grows about 35 meters of height. It has characteristic knee roots. Bark smooth and has lenticels on its outer surface. Leaves oblong and glaucous beneath. Male flowers are smaller and female flowers are larger. Fruits are globose. Seeds have pale brown colour seed coat. The seeds contain much fat, probably as an adaptive mechanism for dispersal and survival under swampy conditions. In past few decades due to conversion of swamps into areca gardens and diversion of water for agricultural purpose, regeneration and survival of *Gymnacranthera canarica* is drastically affected.

The present study aims to assess the effective seed treatment that would enhance seed germination under simple Nursery conditions and thereby facilitate conservation of *G. canarica* an Vulnerable tree species through re-introduction or enrichment planting through local community.

Materials and methods

Mature seeds of *Gymnacranthera canarica* Warb. were collected from Kathlekan forest, Siddapura range (14° 16' 250, 74° 44' 880) of Uttara Kannada in Karnataka during September-October 2010. The seeds were washed in water and bulked before imposing the treatments. The seeds were allowed to germinate in pots containing sand under ambient conditions at Nursery of College of Forestry, Sirsi. Seed bed is covered with germination paper to retain the moisture. Totally 9 treatments were imposed including control with six replications of 60 seeds and details as follows;

- 1) Control Whole seed without any treatment),
- 2) Removal of seed coat,
- 3) Hay covering (Traditional method)

- 4) Kept in sealed polybag for 10 days,
- 5) Cow dung slurry +Accelerated aging for 5 days,
- 6) GA3 50 ppm for over night
- 7)GA3+ Hay covering,
- 8) Kept in sealed polybag for 10 days+GA3 50 ppm for over night
- 9) Cow dung slurry +Accelerated aging for 5 days+ GA3 50 ppm for over night .

Results and discussion

Seed germination is a complex process that leads to the resumption of active growth in the embryonic axis, rupturing of seed coat and emergence of the young plant. The ability of seed to retain its germination capacity over along time is also attributed its moisture content. Moisture content of *Gymnacranthera canarica* seed is 42% while sowing. Pre sowing treatments have been shown to enhancing seed germination in many species. The effect of seed treatment on germination of *Gymnacranthera canarica* after four months has been shown in figure 1. Per cent germination of seeds with 9 treatments varied from 0 to 83 per cent. Control shows 16% germination. As seed coat removal shows 8% of germination. Seed coat does not effect on germination compare to control with seed coat. This indicates that permeability of seed coat good and its not effecting on dormancy of seed. Seed Kept in the sealed polybag shows maximum germination of 83%.However, there is negligible difference in germination is observed in seeds kept in sealed polybag for 10days followed by GA3 50ppm is 83%. This again proved that poly bag treatment is the best for *Gymnacranthera canarica* Warb. Cow dung slurry+ accelerated aging for 5 days shows 0% germination. For

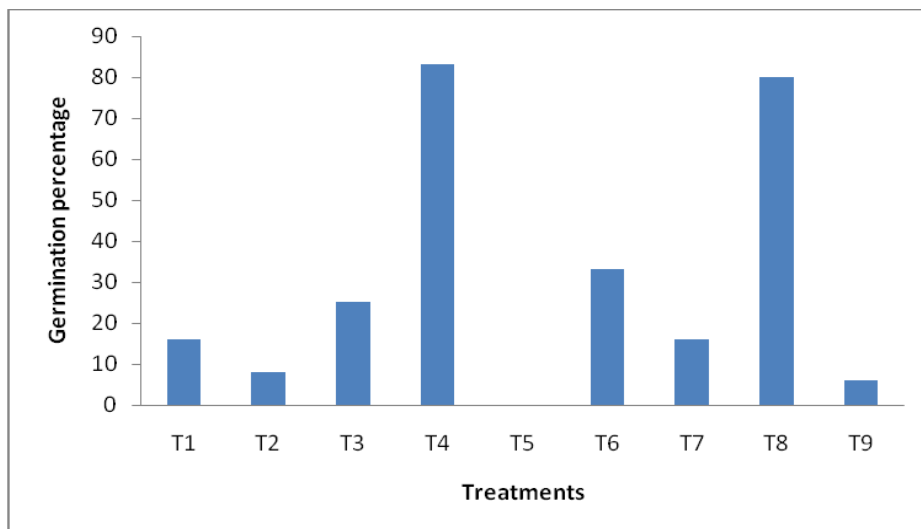


Figure 1. Mean seed germination (%) in *Gymnacranthera canarica*.

T1: Control, T2 Seed coat removed, sealed Polybag for 10 days, T5: Cow aging, T6: GA3 50 ppm alone, T7: Polybag+GA3 50 ppm, T9: Cow dung 50 ppm.



as influenced by the treatment

T3: Hay covering , T4: Kept in dung slurry+ Accelerated Hay covering+ GA3 50ppm, T8: slurry+ Accelerated aging+GA3

Conclusion:

Gymnacranthera canarica is an obligatory swampy species thus may contain certain inhibitory compounds in the seeds, which are leached out due to the continuous flow of water in the natural swampy habitat. Now, due to anthropogenic activity the natural habitats have been disturbed thus natural germination process is affected. With regards to improved germination our results indicate that seed germination can be enhanced up to 83 per cent using very simple method through sealed poly bags. In the present scenario our results provide an alternative and cheaper method to enhance the seed germination, thus helps in conservation and restoration of a habitat specific, endemic and vulnerable tree species of the Western Ghats, India. Further this method is made to know to the local communities and is followed in community nursery.



Traditional Method

Poly bag Treatment



Cow dung slurry treatment



Germinated seed



Stages of germination

Seedbed





Fresh fruits of *Gymnacranthera canarica*