

ABSTRACT

Cascinium fenestratum Colebr. (Menispermaceae) a dioecious liana, common in disturbed forest of low country wet zone. It is a widely used medicinal liana in Sri Lanka and a potential foreign market, due to the presence of alkaloids such as berberine, jatrorrhizine and palmatine in it. While the water extraction of its stem provides a decoction for treatment of body aches, pains, common colds, tetanus, dressing wounds and ulcers because of its antiseptic properties.

As a result of illegal over exploitation, destructive collection, relatively slow growth rate, seed predation, low seed germination and low percentage of seedling survival, natural populations of this species are decimated and /or are disappearing at an alarming rate. To meet the increasing demand and overcome short supply of this species, development and simple cost effective propagation techniques is one of the primary impediments for mass cultivation.

Seeds of this species show relatively long period of dormancy (2-15 months) and under natural conditions seed germination were found to be less than 20 %. This study examined how *C. fenestratum* seeds could be propagated using simple and cost effective methods and attempts were made to develop techniques to overcome seed dormancy. *C. fenestratum* fruits were collected by bagging the mature fruit bunches still intact to the parent liana from disturbed forest fringe in Sinharaja MAB Reserve. Fruits were depulped manually and washed with tap water before the seeds were used for a range of experiments.

The moisture content of fresh seeds was 31 ± 0.61 % and the subsequent moisture loss of seeds stored under different conditions such as in a humid chamber, polythene sealer bags, paper bags and in open areas were examined. The experimental design was a randomized block design (3 replicates; n = 120). These experiments were carried out under laboratory conditions where the average moisture content was 76 ± 1.39 %. The highest moisture loss was when seeds were stored in open areas and the lowest was found to be when seeds were stored in humid chamber. Seeds stored for 40 days were examined for viability under humid condition and room condition. Viability was 89% under humid conditions and it was 30%

under room condition. Seeds of *C. fenestratum* were categorized under "recalcitrant seed" taking in to consideration of the initial moisture content, moisture losses and viability.

Bioassays carried out using seeds of *Brassica juncea* revealed presence of germination inhibitors in *C. fenestratum* seeds (endosperm & the embryo). *B. juncea* seeds were the germinated on blotting papers soaked in 5% water extracts of endosperm and 5% water extracts of embryo. Germination percentage of *B. juncea* grown on endosperm and embryo extracts were 17% and 25% respectively while 80% and 88% germination percentage was observed in control where the blotting paper was soaked in water.

Seed germination experiments were carried out under plant house conditions (maximum light $800 \mu\text{mol}^{-1}\text{s}^{-2}$ and Relative humidity $81 \pm 1\%$). The experimental design was a completely randomized design (3 replicates; $n = 20$). Seed experiments in order to evaluate the seed germination, seed soaked in gibberlic acid 1500 ppm, 2000 ppm, 2500 ppm and 3000 ppm concentrations, the mechanical treatments included cracking of the seed coat, soaking in tap water and distilled water for 12-24 hours, seed exposure to sunlight followed by soaking in tap water. Another set of seeds ($n = 60$) collected from forest floor were soaked in gibberlic acid 2000 ppm. Of this experiments *C. fenestratum* seeds collected from the forest floor & subsequently treated with Gibberlic acid 2000 ppm gave the best germination percentage (27%).

Comparison of wood anatomy and morphology in *C. fenestratum* and *Anamirata cocculus*, which is commonly used as a substitute for *C. fenestratum* was carried out by using the cross sections obtained from a range of stem diameter classes (1 cm, 2 cm, 3 cm) of there two species, for study woods stems of both species showed anomalous growth. But in *A. cocculus* anomalous growth was present in secondary wood structure and in *C. fenestratum* it was absent. The bark thickness of *C. fenestratum* was lower than *A. cocculus*. Vessels diameter of *A. cocculus* ($20.3 \pm 1.5 \mu\text{m}$) was higher than *C. fenestratum* ($19.03 \pm 2.5 \mu\text{m}$).