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Seed Biology of Three *Strychnos* Species (Loganiaceae) from Sri Lanka, Towards Their Conservation

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Abstract

Knowing seed germination phenology is important in propagation and thus conservation of plant species as many of the plants regenerate through seeds naturally and easily. Knowledge on seed biology of a species plays a vital role in both ex-situ and in-situ conservation. Thus, we aimed to study seed biology of three *Strychnos* species from Sri Lanka which are of conservation importance, *S. potatorum* L.f. and *S.nux-vomica* L. in dry zone and S. *benthamii* C. B. Clarke in wet lowlands and montane regions. Seed moisture content was determined for study species by an oven dry method. Desiccation sensitivity of seeds was determined using 100 seed method proposed by Pritchard et al. (2004). Effect of different temperatures (32 and 25^{o} C) and Gibberellic acid (GA3) concentrations (500 and 100 ppm) on seed germination was evaluated. Seeds were incubated in Petri dishes on moistened (with distilled water or GA3) tissue papers in light/dark (12/12hr) condition. Embryo length: seed length ratio (E: S ratio) of fresh seeds, seeds just after radicle emergence and of seeds before shoot emergence was studied. The moisture content of *S. nux-vomica*, *S. potatorum* and *S.benthamii* at dispersal was 42.02, 34.9 and 45.93%, respectively. Hundred seed test for *S. nux-vomica*, and *S. potatorum* revealed that their seeds could tolerate desiccation, while *S. benthamii* seed could not survive desiccation. Radicle emergence of *S. nux vomica* and *S. potatorum* incubated at 32^{o} C initiated after 34 and 59 days, respectively. Radicle emergence of *S. benthamii* initiated after 11 days at 25^{o} C. GA3 treated seeds of S. *nux-vomica* and S. potatorum emerged radicle quickly than those incubated on distilled water ($p<0.001$and $p<0.001$, respectively), while there was no GA3 effect on *S. benthamii* seeds. Further, when the shoot emergence was considered a considerable delay in shoot emergence was observed in seeds of all the three species indicating that they have epicotyl dormancy. The size of the embryos of S. *nux vomica*, *S. potatorum* and *S. benthamii* seeds have increased by 38.24, 34.48 and 25.49% by the time of radicle emergence. Thus, seeds of the three study species also have a morphological component to their dormancy. Thus, their dormancy can be classified as morphophysiological epicotyl dormancy. Although the GA3 has increased the shoot emergence rate, seeds of all the study species emerged shoot within 4 months. Thus, we recommend sawing of seeds 4 months prior to seedling requirements to obtain necessary seedlings for seed restoration. Determination of dormancy type and storage type of these species is vital in seed handling and storage for restoration activities.

Keywords: Strychnos, Morphophysiological, Epicotyl dormancy, Seed dormancy, Seed storage