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Seed Dormancy and Germination Requirements of Two Endemic Palm Species of Sri Lanka

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Abstract

Sri Lankan endemic lowland rain forest palm species *Areca concinna* and *Oncosperma fasciculatum* are considered to be threatened due to habitat loss. Seed dormancy and germination behavior of these species are poorly understood. Therefore, the present study was conducted to identify the dormancy, germination requirements and the effect of storage time on dormancy alleviation of these species. Ripe fruits of *A. concinna* and *O. fasciculatum* were collected from home-gardens and natural populations. Initial moisture contents of fruits were measured. The effects of different gibberellic acid (GA_3) concentrations (0, 250, 500, 1000, 2000, 3000 and 4000 ppm) and the removal of fruit coats and/or operculum on seed germination of both species were tested *in vitro*. The effects of wet storage (moist coir dust in sealed bags) at 25^0 C and dry storage (open trays) at ambient room temperature (approx. 29º C) on seed dormancy break and seed viability were tested after 0, 3, 9 and 12 months. Fruit moisture of *A. concinna* and *O. fasciculatum* were approximately 15% and 30%, respectively. Intact fruits of *A. concinna* treated with 500 ppm GA_3, showed a significantly higher germination percentage (88%) than 0 ppm (33%) ($P<0.05$).Intact fruits of *O. fasciculatum* did not respond to GA_3 treatments, with <4% germination. The highest germination percentages were achieved by removing pericarp+mesocarp+endocarp and 1000 ppm GA_3 application in *A. concinna* (89%), and removing pericarp+mesocarp and operculum in *O. fasciculatum* (36%). Seed viability of fresh *A. concinna* was 87% and remained high even after 12 months of dry storage while that of *O. fasciculatum* has declined to 2% from 85% after 6 months of dry storage. Seed germination percentages of intact *A. concinna* and *O. fasciculatum* after 12 months of dry storage were 20% and 0% respectively. Seeds of *A. concinna* stored wet at 25ºC germinated slowly during 12 month period reaching 22%. Seeds of *O. fasciculatum* showed a similar pattern reaching 36%. It can be concluded that both species exhibit physiological dormancy. *O. fasciculatum* was identified as recalcitrant while *A. concinna*as orthodox. Seed germination of *A. concinna* can be promoted by removing all fruit coats and GA_3 treatment whereas in *O. fasciculatum* by removing the operculumor storing seeds in moist coir dust for >6 months. These findings will be useful in producing seedlings for restoration of these species.

***Keywords*:** *Areca, Oncosperma,* Orthodox, Physiological dormancy, Recalcitrant