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Seed propagation of nutritionally rich selected underutilized tropical fruit species

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ABSTRACT

Tropical countries harbor numerous fruit species with unexplored commercial potential. To reintroduce these species into cultivation, it is crucial to establish effective propagation systems to ensure continuous supply. This research aims to determine the suitability of seeds for the mass propagation of 10 underutilized yet nutritionally rich fruit species in Sri Lanka. We investigated key seed characteristics of the 10 fruit species, including viability, water imbibition, germination, and the necessity of dormancy-breaking methods, to develop standard seed propagation protocols. Seed viability was assessed using three different concentrations of triphenyl tetrazolium chloride (TTC) solution, and viability percentages were calculated. Water imbibition, moisture content, and in vitro and in vivo germination percentages were measured for all species. Except for Antidesma ghaesembilla, all seeds were viable. The highest water absorption was recorded for Syzyzgium caryophyllatum over 48 hours. Microcos paniculata exhibited the highest seed moisture percentage (75.1±0.66 %), while Ziziphus oenoplia had the lowest (6.8±0.03 %). Under in vitro conditions, seeds of S. caryophyllatum and Cynometra cauliflora showed 100 % germination, followed by Antidesma alexiteria with 13.3 %. In vivo, S. caryophyllatum, A. alexiteria, Baccauria motleyana, C. cauliflora, and Phoenix pusilla exhibited more than 50 % germination. However, dormancy-breaking methods were unsuccessful for ungerminated seeds both in vivo and in vitro conditions. The propagation of S. caryophyllatum, A. alexiteria, B. motleyana, C. cauliflora, and P. pusilla through seeds can be recommended as a suitable method for large scale propagation and commercialization.

Keywords: Seed germination, seed propagation, seed viability, underutilized.