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Low cost medium for germination of spores of *Cyathea walkerae* Hook

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A germination medium of sand, compost and brick pieces and MS medium are commonly used for germination of fern spores with low level of germination percentage and poor growth and development of gametophytes, which hindered large scale production of ferns and studies on their reproductive biology and hybridization. Therefore, the objective of this study was to identify a low cost medium for germination of spores of *Cyathea walkerae* Hook. which is an endemic tree fern in Sri Lanka. Spores for germination were collected from Kanneliya Man and Biosphere reserve. Three media: (i) medium prepared with 1:1:1 mixture of sand: compost: brick pieces; (ii) 0.5 MS medium with three sterilization protocols; and (iii) four concentrations of Albert solution (0.5, 1.0, 1.5 and 2g/l) were used in the experiment. All media were placed in sterilized Petri dishes with 4 replicates for each medium. About 0.01 g of spores were evenly distributed throughout the surface of germination media and kept at room temperature (28-30 ^{0}C; 70-80% RH) and at low light intensity in the laboratory. Spore germination and gametophyte development were observed weekly using a light microscope. The green colored area of each medium was measured to estimate the germination percentage. The width and the number of cells in each gametophyte were determined under a light microscope.

Spores of *C. walkerae* were germinated within 7-12 days after sowing (DAS) of spore in all media. About 90 DAS, 50% of germination was observed in sand: compost: brick medium. However, gametophytes in this medium were difficult to observe and to separate from brick pieces for growth and developmental studies, because spores were firmly attached to brick pieces. Only 0.5 MS medium where spores were dipped in an absolute ethanol for 1-3 seconds before sowing was successful with 70% germination. Although germination was successful, observation of individual gametophytes, high cost and contamination are major problems associated with the MS medium. The concentrations of 1.5 and 2.0 g/l of Albert solution showed 100% germination of spores. The size of gametophyte and their growth rate were significantly higher in Albert solution when compared to others. Individual gametophytes can be easily separated and observed in Albert solution thereby facilitate studies on growth and development of gametophyte and their reproductive biology while allowing large scale production of plants.

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