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Optimizing growth conditions for vegetative propagation of Near Threatened (NT) epiphytic Cactus *Rhipsalis baccifera* sub sp. *Mauritiana* (DC.) Barthlott. (Cactaceae)

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The Cactaceae family exhibits a diverse range of adaptations, making it popular among horticulturists and Cactus growers. *Rhipsalis baccifera* sub sp. *mauritiana* (DC.) Barthlott., an epiphytic cactus, is valued both as an ornamental plant and a medicinal plant. As it is categorized as a “nearly threatened species” (National Red List, 2020) steps must be taken for conservation. Prior studies have not determined the use of commercial growth hormones, the use of naturally available growth media such as compost, soil, and wood, and the effect of shade to increase the successful establishment of stem cuts. We hypothesized that there is an effect of growth hormones, media type and shade level on the growth of the plant. Therefore, this research aimed to determine the optimal shade, growth media, and hormone combination for the vegetative propagation of *R. baccifera* due to the scarcity of information. Freshly plucked twigs of *R. baccifera* were utilized as explants for vegetative propagation experiments. Six soil combinations that include Compost (Co), Brick Powder (BP) + Powdered Roof Tile (RT) (1:1), Soil (S) + Co (1:1), S + Sand (Sa) (1:1), S + Co + Sa + BP (2:1:1:1), and S + Co + BP (3:3:2) were assessed to identify the most suitable growth medium for vegetative propagation. *R. baccifera* planted in each combination was grown in shade net houses with the following shade levels (80%, 60%, and 40%) at room temperature for three months. The successful growth media (Co) and 80% shade level were subsequently employed. It included 16 treatments with 10 replicates randomly for each treatment (160 total), incorporating four types of new growth media that include Co as the base component (Co, Co + S, Co + Wood, and Co + S + Wood) and three types of growth hormones (powder form Rapid Root, Clonex[®], a commercial liquid fertilizer). The growth hormone level was 0.3% w/w. The control treatment included no growth hormones. Fresh stem cuttings with a few nodes about 6 cm in length were planted in the above media. Watering was conducted once a week over a three-month period. The length of the plant was recorded at the end of each month as the growth increment parameter. Upon statistical analysis ($p=0.05$), it was found that there was no significant difference between the average growth rate for any growth media type ($p\geq 0.05$), and therefore the inclusion of “compost” in any growth media combination resulted in the best growth. Additionally, the powdered growth hormones "Rapid Root" (5.5 ± 0.4 cm) and "Clonex[®]" (7.2 ± 0.4 cm), proved to be the most effective, compared to the control (0.9 ± 0.2 cm) for stem cuttings ($p<0.05$). This study successfully identified optimal conditions for the vegetative propagation of *R. baccifera* sub sp. *mauritiana* that includes compost as a growth media and powdered hormone types Rapid Root or Clonex[®] as the growth hormone, at 80% shade. The findings contribute practical insights for the cultivation of nearly threatened species of *Rhipsalis baccifera*.

Keywords: *Rhipsalis baccifera*, Vegetative propagation, Growth medium, Growth hormones, Cactus

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