

Root Conversion From Aerial to Subterranean Roots of *Philodendron* Lemon Lime (*Philodendron domesticum* cv. lemon lime T.) Stem Cuttings Under Different Growing Media

Reyno Vicente S. Guirindola and Roden D. Troyo

Department of Horticulture, Faculty of Agriculture and Food Science, Visayas State University

(rvicenteguirindola@gmail.com)

INTRODUCTION & AIM

Stem cutting is a common propagation method in ornamental horticulture that relies on successful root establishment for plant survival and growth. In *Philodendron* Lemon Lime (*Philodendron domesticum* cv. Lemon Lime T.), aerial roots can serve as initial structures for the development of subterranean roots.



Figure 1. *Philodendron* lemon lime

However, the ideal conditions for root conversion, considering the maturity of aerial roots and the type of growing medium, remain to be determined.

Objectives/Aim:

- To investigate the optimal maturity level of aerial roots for successful root conversion.
- To identify the most effective growing medium for root conversion.
- To examine the growth patterns of roots following successful conversion.

METHOD

Uniform *Philodendron* Lemon Lime stem cuttings from acclimatized mother plants were standardized to three nodes with up to two aerial roots. The experiment followed a 2×5 split-plot arrangement in a Randomized Complete Block Design (RCBD) with three replications and ten samples per treatment, totaling 300 cuttings.

Two aerial root maturities served as the main plot factors, while five growing media were assigned to the subplots. Data on survival, root conversion, root development, growth rate, and stress tolerance were analyzed using ANOVA (Statistix 10.0), and treatment means were compared using Tukey's HSD test at a 5% significance level.



Figure 2. Experimental site and set-up

Experimental Factors:

Main plot: Aerial root maturity

F1: Mature aerial root

F2: Young aerial root

Subplot: Growing media

T1: Pure garden soil (Control)

T2: Coco cubes

T3: Coco peat

T4: Coco cubes x Rice hull x Vermicast (3:2:1)

T5: Coco peat x Rice hull x Vermicast (3:1:1)

RESULTS & DISCUSSION

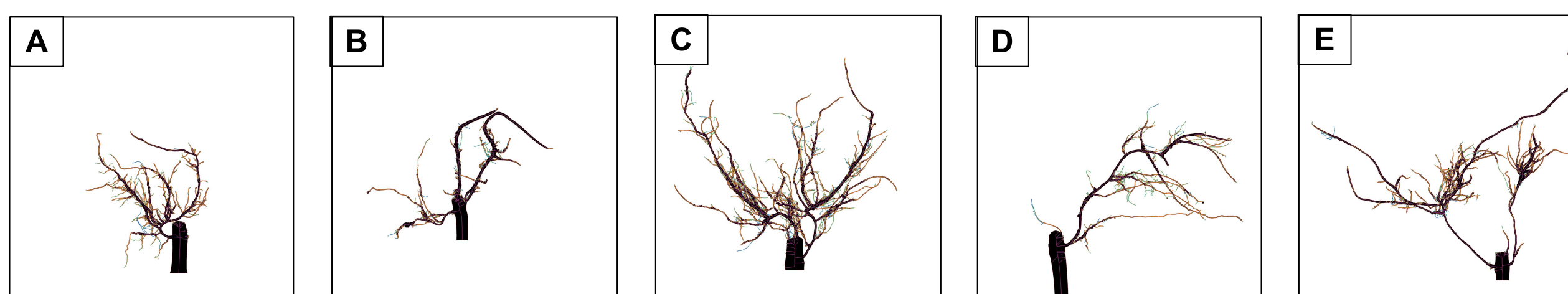


Figure 3. Scanned root architecture of *Philodendron* Lemon Lime stem cuttings under different growing media treatments.

- Treatment 1, exhibited the greatest number of root tips.
- Treatment 2, showed the poorest root development performance.
- Treatment 3, produced the highest number of roots.
- Treatment 4, recorded the largest root surface area.
- Treatment 5, attained the greatest root volume.

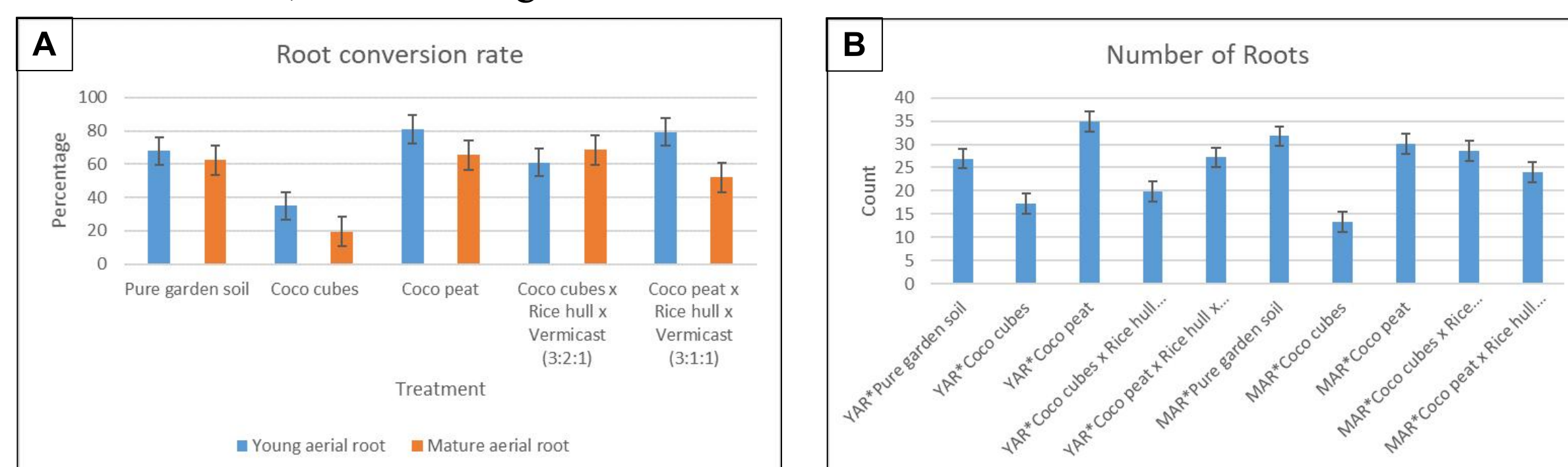


Table 1. Conversion rate (A) and number of roots (B) of *Philodendron* Lemon Lime stem cuttings under different treatments. Root conversion and rooting success were influenced by both environmental conditions and the physiological status of the plant. Lower nutrient availability appeared to reduce root thickening while promoting root initiation and development.

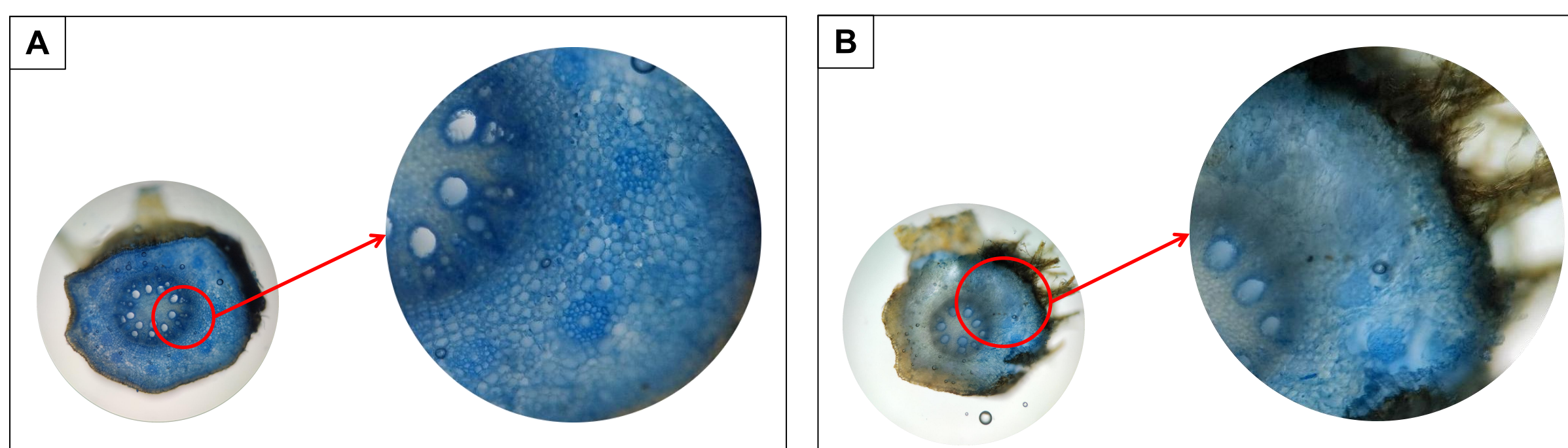


Figure 4. Cross-sectional view of *Philodendron* Lemon Lime roots showing the anatomical transition from aerial (A) to subterranean (B) roots. The aerial root exhibits a thick cortex adapted for anchorage and support, whereas the subterranean root develops root hairs and a more distinct xylem structure, reflecting its functional shift toward absorption and water transport.

CONCLUSION

The maturity level of aerial roots exhibited no significant influence on the growth performance or root conversion of *Philodendron* Lemon Lime stem cuttings. Among the tested growing media, pure coco peat demonstrated superior effectiveness by enhancing root development, plant vigor, and delaying wilting, whereas pure coco cubes showed the least favorable results, characterized by limited root growth and accelerated wilting.

FUTURE WORK / REFERENCES

- HARTMANN, H. T., and D. KESTER. 2022. Hartmann & Kester's Plant Propagation: Principles and Practices, 9th edition. Prentice Hall.
- MATHEWS, M., M. L. WEE and K. K. HO. 1997. Growth and development of aerial roots of a tropical ornamental, *Philodendron lacerum*. J. Hort. Sci., 72(1):27–34.
- SHEERAN, L. and A. RASMUSSEN. 2023. Aerial roots elevate indoor plant health: Physiological and morphological responses of three high-humidity adapted Araceae species to indoor humidity levels. Plant, Cell & Environ., 46(6):1873–1884.