Cutting propagation of four Florida native taxa of wild coffee (*Psychotria* sp.) for ornamental use

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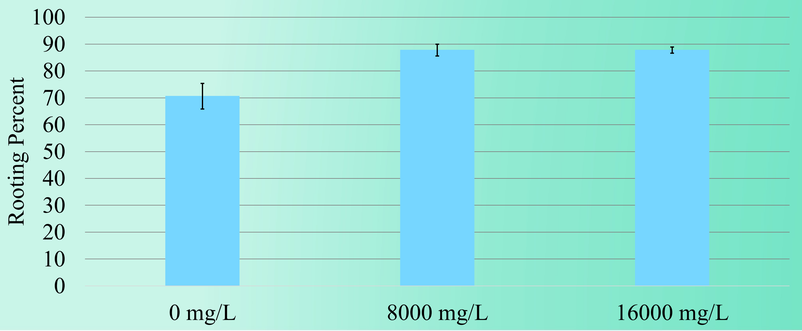
Introduction & Objectives

Native plants have been historically overlooked in their value to urban landscapes and gardens despite their importance in attracting pollinators and providing wildlife habitat (Kalaman and others 2022a). The underutilization of native plants can be attributed to inefficient or unknown propagation systems, insufficient marketing and promotion, and limited availability in consumer markets (Wilson 2020). Wild coffee (*Psychotria nervosa*), softleaf wild coffee (*Psychotria tenufolia*), and Bahama wild coffee (*Psychotria ligustrifolia*) are evergreen shrubs with attractive glossy foliage, fragrant white flowers, colorful fruit, and support wildlife. *Psychotria* seeds are difficult to collect in large volumes, have physiological dormancy, and are thought to lose viability quickly, thus propagation by stem cuttings may be a practical alternative (Godts 2022). The overall goal of this study was to widen the use of *Psychotria* taxa in landscapes by developing practical methods for commercial cutting propagation.

Our research objective was to:
1. Determine the effects of taxa and auxin concentration on optimal rooting responses of *Psychotria.*

Materials and Methodology

- Cuttings of *P. ligustrifolia*, *P. nervosa*, *P. nervosa* 'Little Psycho,' and *P. tenuifolia* were taken on the morning of 23 October 2020 for a total of 54 semi-hardwood cuttings from each taxa.
- The basal leaves were removed, and the 1.3 cm basal portion of each stem dipped in tap water prior to commercial talc rooting hormone containing either 0, 8000, or 16000 mg/L Indole- 3-butyric acid (IBA).
- After treatment application, cuttings were stuck into 6- cell trays filled with Metro-Mix 852 (6:3:1 bark:Canadian peat:perlite) and placed under intermittent mist.
- After 8 weeks, root quality was evaluated using from 0 to 4 with 0 = dead cuttings; 1 = alive cuttings with no roots; 2 = roots forming but do not hold medium; 3 = root ball partially holds plug medium, and 4 = fully formed root ball entirely holding the medium.
- Root length was determined by calculating the mean of the two longest roots.



Statistical Analysis

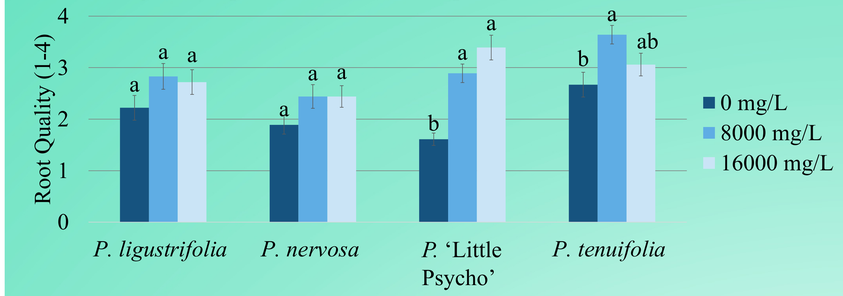
- Each auxin treatment consisted of 6 cuttings replicated 3 times (18 cuttings per treatment) in trays (blocks) that were completely randomized on the bench.
- Data were analyzed using a linear mixed model with JMP v. 16
- Taxa, auxin, and the taxa × auxin interaction were treated as fixed effects while block was treated as random effect.
- If the interaction was significant ($P \leq 0.05$) then a non-parametric Steele Dwass multiple comparison procedure was used to compare auxin treatments by taxa.

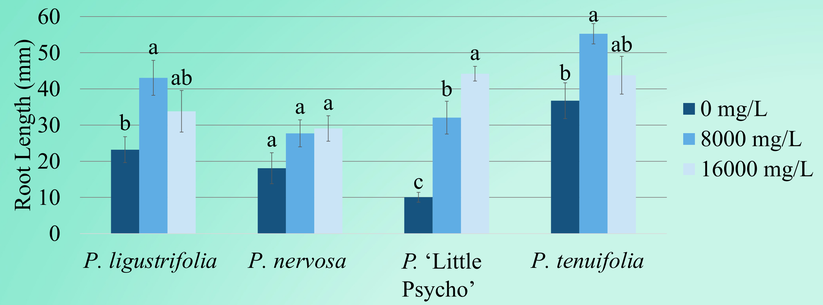
Results

- There was a significant auxin effect for percent rooting ($P<0.0001$). However, the rooting percentage did not differ by taxa ($P=0.0860$), nor was there a taxa × auxin interaction ($P=0.2849$).
- The root system quality value overall assessment value (scale of 1 to 4) was influenced by auxin application and these effects differed among taxa (taxa × auxin interaction, $P=0.0201$)
- *P. nervosa* 'Little Psycho' had ~2 times better root quality when treated with auxin compared to the control and *Psychotria tenuifolia* treated with 8000 mg/L IBA had 1.5 times higher root quality (3.6) than the control cuttings (2.7) and cuttings treated with 16000 mg/L IBA had a similar root quality (3.1) compared to cuttings treated with 0 or 16000 mg/L IBA.

Results (continued)

- Root length was influenced by auxin application and the effects of auxin differed among taxa (taxa × auxin interaction; $P \leq 0.237$).
- Cuttings of *P. ligustrifolia* and *P. tenuifolia* treated with 8000 mg/L IBA produced roots that were ~2.0 and 1.5 times longer, respectively, than control cuttings while cuttings treated with 16000 mg/L IBA had a similar root length compared to cuttings treated with 0 and 8000 mg/L IBA.
- *P. nervosa* 'Little Psycho' cuttings treated with 16000 mg/L had the longest roots, followed by 8000 mg/L, while control cuttings had the shortest roots.





Conclusion

- Propagation results demonstrate these taxa are relatively easy to produce in a propagation greenhouse under intermittent mist from fall stem cuttings leading to a finished liner within 8 weeks.
- While commercially acceptable rooting percentages (>70%) were obtained without the application of auxin, rooting percentage was greater (88%) when using 8000 mg/L IBA with only minimal improvement with the use of 16000 mg/L IBA.
- Therefore, we recommend the application of 8000 mg/L IBA or less to improve rooting percentages and root quality for these 4 *Psychotria* taxa.