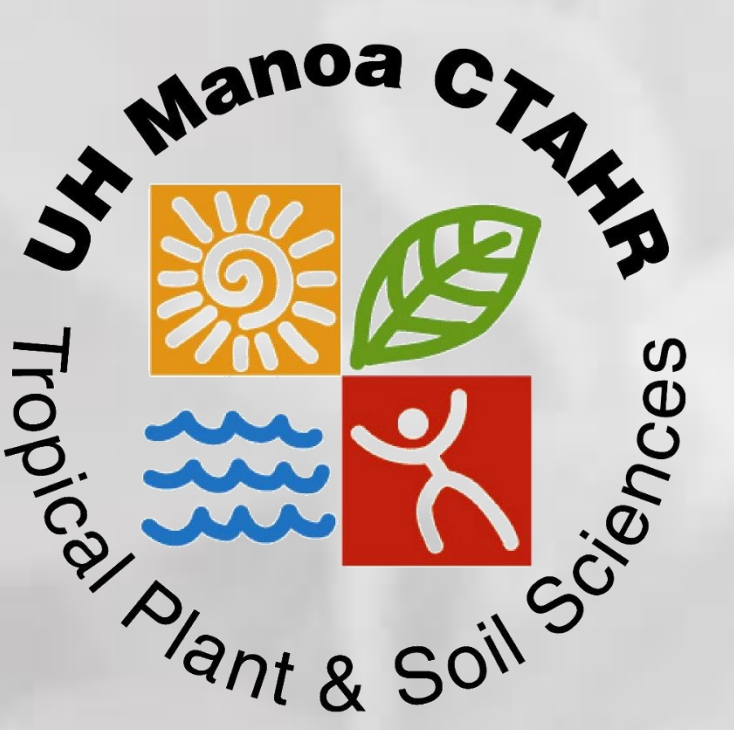




Rooting response of native Hawaiian *Peperomia* leaf cuttings to indolebutyric acid application

Aleta K. Corpuz¹ and Orville C. Baldos²

¹Department of Tropical Plant and Soil Sciences, University of Hawaii at Mānoa, email: aletac@hawaii.edu
²Department of Tropical Plant and Soil Sciences, University of Hawaii at Mānoa, email: obaldos@hawaii.edu



Introduction

In Hawaii, the use of native plants as ornamentals has greatly increased in the last 20 years due to issues on invasive species, biodiversity conservation and the enactment of state laws (HB206/SB435) that promote landscaping with native plants.

While these issues and efforts encourage the ornamental use of native Hawaiian plants, research to develop plant selections for different ornamental applications have been limited.

The potential use of native Hawaiian species as indoor plants is one particular area that has not been fully explored.

Species of the genus *Peperomia* have been cultivated as houseplants since the 1930s. Hawaii possesses 23 endemic and 2 indigenous species. Some of these are highly ornamental with different leaf shapes, colors and growth habit.

Propagation by whole leaf cuttings is a common method used in many ornamental *Peperomia* species. The use of whole leaf cuttings may have potential use for propagating Hawaiian *Peperomia* species.

P. leptostachya: Indigenous. Mostly terrestrial. Found on all major islands except Kaho'olawe in dry to wet forests at elevations of 10-610 m.

P. sandwicensis: Endemic. Terrestrial or epiphytic. Found in mesic valleys or wet forests on Kaua'i, Oahu and Moloka'i at elevations of 250-1,220 m.

P. cookiana: Endemic. Terrestrial or epiphytic. Found in wet forests to mesic shrublands at elevations of 460-1,980 m on Kaua'i, Moloka'i, Maui and Hawai'i Island.

P. oahuense: Endemic. Usually epiphytic. Found in mesic valleys at elevations of 300-500 m in the Ko'olau Mountains on Oahu or Ha'upu Ridge and Kamo'oloa Stream on Kaua'i.



Objectives

To evaluate the use of whole leaf cuttings as a viable means of propagating four Hawaiian *Peperomia* species (*P. leptostachya*, *P. cookiana*, *P. oahuense*, and *P. sandwicensis*).

To evaluate the use of indolebutyric acid for improving rooting of *P. leptostachya*, *P. cookiana*, *P. oahuense*, and *P. sandwicensis*.

Materials and Methods

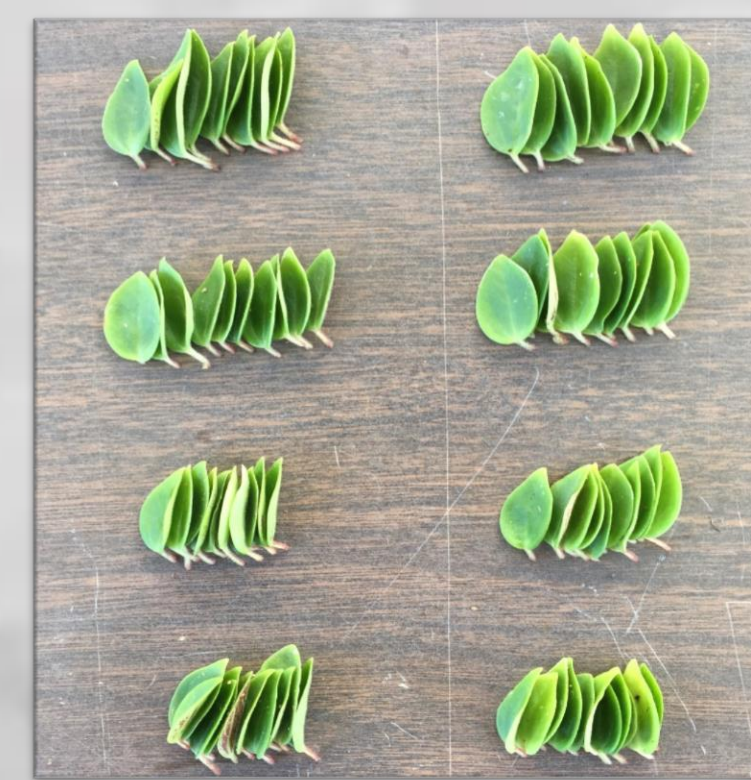


Figure 2. Graded *P. cookiana* leaf cuttings



Figure 3. *P. leptostachya* leaf cuttings treated with 1000 ppm IBA



Figure 4. *P. cookiana* leaf cuttings planted in perlite : vermiculite media

Whole leaf cuttings of *P. leptostachya*, *P. cookiana*, *P. oahuense*, and *P. sandwicensis* were harvested and graded according to size (Figure 2).

Whole leaf cuttings from each species were treated with or without 1000 ppm indolebutyric acid [IBA] (Hormex Rooting Powder #1, Brooker Chemical Corporation) (Figure 3). Ten cuttings were used per experimental unit.

P. leptostachya leaf cuttings were planted in 15.2 cm pots (n=5) with a 1:1 mix of perlite:peat moss. *P. sandwicensis*, *P. oahuense*, and *P. cookiana* leaf cuttings were planted in 7.6 cm pots (n=4) containing a 1:1 mix of perlite:vermiculite (Figure 4).

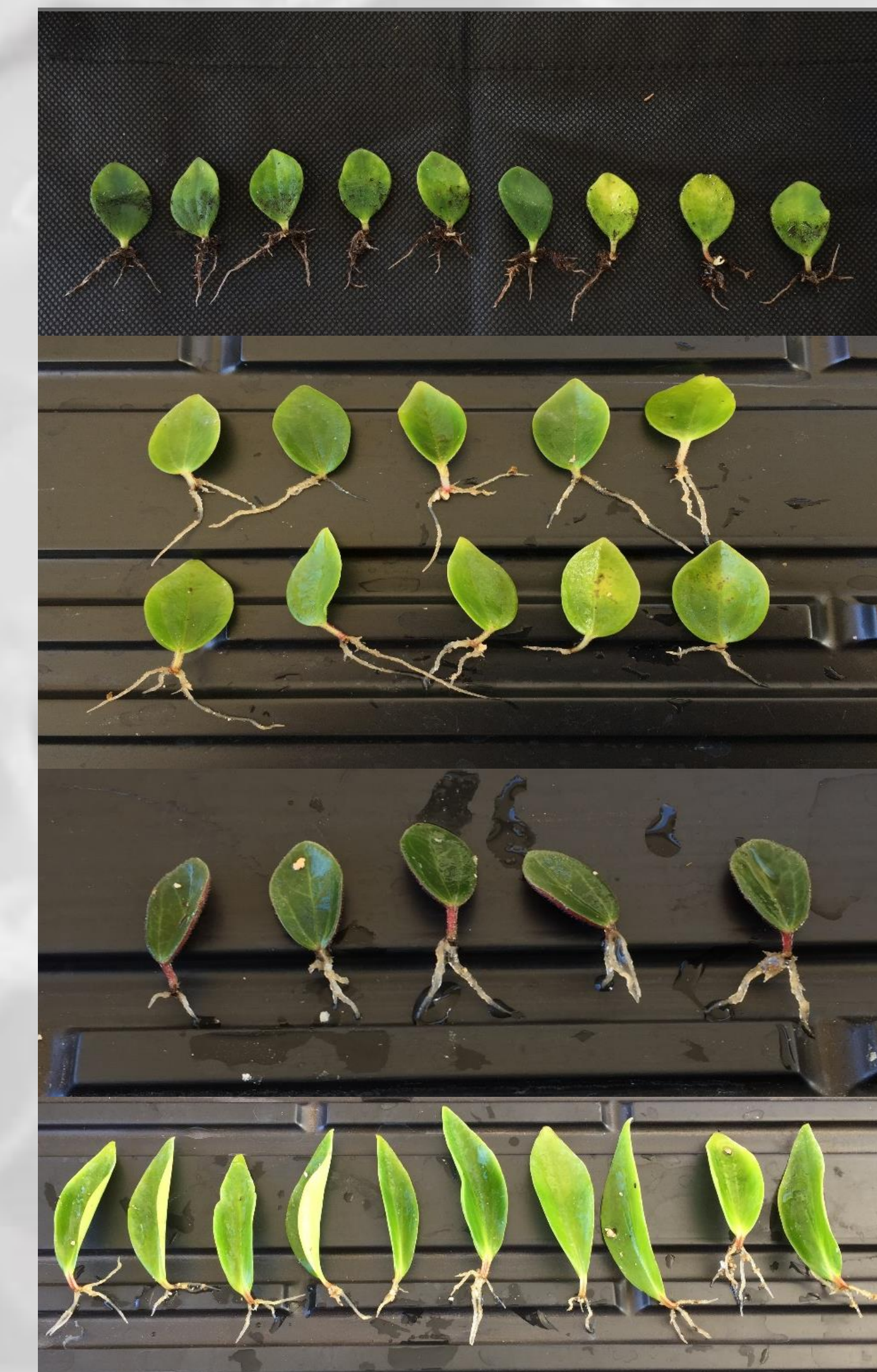
P. leptostachya leaf cuttings were rooted under 80% shade and sprinkler irrigation (twice a day for 10 minutes). *P. sandwicensis*, *P. oahuense*, and *P. cookiana* cuttings were rooted on a shaded mist bench (15 seconds every five minutes). Each experiment was laid out in a Randomized Complete Block Design (RCBD).

Percent rooting and length of longest root were collected on the following days after planting (DAP): 30 DAP (*P. leptostachya*), 41 DAP (*P. cookiana*), 34 DAP (*P. sandwicensis* and *P. oahuense*). T-tests were used to examine the differences of treated and untreated leaf cuttings.

Results

Species	Average Percent Rooting			Length of Longest Root (cm)		
	0 ppm IBA	1000 ppm IBA	P Value	0 ppm IBA	1000 ppm IBA	P Value
<i>P. leptostachya</i>	84.0 ± 5.1	94 ± 4	0.1614 ^{ns}	2.21 ± 0.09	2.15 ± 0.06	0.5965 ^{ns}
<i>P. cookiana</i>	97.5 ± 2.5	97.5 ± 2.5	1.0000 ^{ns}	1.95 ± 0.19	1.99 ± 0.09	0.8599 ^{ns}
<i>P. sandwicensis</i>	15.0 ± 2.9	5 ± 11.9	0.4454 ^{ns}	0.67 ± 0.39	0.73 ± 0.43	0.9279 ^{ns}
<i>P. oahuense</i>	97.5 ± 2.5	97.5 ± 2.5	1.0000 ^{ns}	1.91 ± 0.08	2.31 ± 0.12	0.0323*

Table 1. Rooting and length of longest root of four Hawaiian *Peperomia* species. Means and standard error are presented. **P. oahuense* showed significantly longer roots with IBA application. ^{ns} Treatment effects were not significant.



Percent rooting of treated and untreated whole leaf cuttings within each species were not significantly different.

Percent rooting of *P. leptostachya*, *P. cookiana*, and *P. oahuense* of whole leaf cuttings were above 84%. *P. sandwicensis* leaf cuttings exhibited low rooting percentages (Table 1).

Length of longest root between treated and untreated whole leaf cuttings in each species were not significantly different (Figure 5).

Figure 5. Root growth in whole leaf cuttings of untreated Hawaiian *Peperomia* species (top-bottom: *P. leptostachya*, *P. cookiana*, *P. sandwicensis*, *P. oahuense*)

Discussion

Application of 1000ppm IBA was not necessary for root initiation of *P. leptostachya*, *P. cookiana*, *P. oahuense*, and *P. sandwicensis*.

Low rooting success of *P. sandwicensis* leaf cuttings were due to leaf rot (Figure 6).



Figure 6. *P. sandwicensis* leaf rot due to wet conditions

Conclusion

Whole leaf cuttings can be a viable propagation method for *P. leptostachya*, *P. cookiana*, *P. oahuense*, and *P. sandwicensis*.

Conditions for rooting *P. sandwicensis* need to be improved to prevent rotting of whole leaf cuttings.

Future Studies

Evaluation of *P. sandwicensis* at reduced mist frequencies or under a humidity dome to increase percent rooting.

Experiment with spray application of benzyladenine to hasten shoot initiation of root *Peperomia* whole leaf cuttings.

Acknowledgements

We would like to thank Lyon Arboretum for providing the plant materials and the Magoon Research Station for use of its facilities. Funding for this project was provided by the USDA National Institute of Food and Agriculture, Hatch projects HAW08040-H, managed by the College of Tropical Agriculture and Human Resources.

