Abstract. Total immersion of *Pseuderanthemum atropurpureum*, *Sanchezia speciosa*, *Strobilanthes dyeranus*, and *Auburn University, AL 36849-4201*


5. Fery, R.L. 1981. Cowpea production in the tropical shrubs that are occasionally grown as potted plants. Rapid growth, large plant size, and absence of freely branching habit have limited the use of such Acanthaceae as purple false eranthemum, Persian shield, height control, growth retardants, growth inhibitors, morphactins


Prepropagation Dips of Acanthaceae Cuttings in Growth Regulators to Retard Subsequent Growth

Kenneth C. Sanderson1, Willis C. Martin, Jr2., and Richard D. Patterson3

Department of Horticulture, Alabama Agricultural Experiment Station, Auburn University, AL 36849–4201

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Abstract. Total immersion of *Pseuderanthemum atropurpureum* L. H. Bailey, *Sanche­zia speciosa* J. Leonard, and *Strobilanthes dyeranus* M. T. Mast. cuttings in aqueous solutions of the morphactins chlorflurenol and chlorflurenethol prior to propagation retarded plant growth 16 weeks after rooting. Height of *Sanchezia* and *Strobilanthes* also was reduced by dips of chlorfluren and dichlorflurenol and chlormequat chloride. Morphactins caused abnormal growth on *Pseuderanthemum* and *Strobilanthes* Dips of PBA reduced the height of *Pseuderanthemum* and *Strobilanthes*. *Pseuderanthemum* height also was reduced by ancydimidol and ethephon dips, and height was reduced on *Strobi­lanthes* by oxathiin and piproctanyl bromide. Chlorflurenol dips reduced plant dry weight of *Strobilanthes* also was reduced by chlorofluren, chloroflurenol, oxathiin, and PBA immersion. Ethephon, PBA, and chlorflurenol dips also reduced *Pseuderanthemum* dry weight. Chemical names used: 2-chloro-9-hydroxy-9H-fluorene-9-carboxylic acid (chlorflurenol); 2-chlorofluorencarbonic acid (9)-methylester (dichloroflurenol); 2-chloro-9-hydroxyfluorene-carbonic acid (9)-p-chlorophenoxyethylester (chloroflurenethol); 2-chloro-N,N,N-trimethylthianaminium chloride (chlormequat chloride); N-(phenylmethyl)-9-(tetrahydro-2H-pyran-2-yl)-9H-purin-6-amine (PBA); α-cyclopropyl-α-(4-methoxyphenyl)-5-pyrimidinemethanol (an­cydimidol); 2-chloroethenylphosphonic acid (ethephon); 2,3-dihydro-5,6-diphenyl-1,4-oxathiin (oxathiin); 1-(3,7-dimethylctyloxy)-1-(2-propenyl)pyperidinium bromide, (piproctanyl bromide).

The Acanthaceae contains many colorful tropical shrubs that are occasionally grown as potted plants. Rapid growth, large plant size, and absence of freely branching habit has limited the use of such Acanthaceae as purple false eranthemum (*Pseuderanthemum atropurpureum*) L. H. Bailey, Sanchezia (*Sanchezia speciosa* J. Leonard) and Persian shield (*Strobilanthes Dyeranus* M. T. Mast.). Growth regulators have been used to adapt *Acanthaceae* to pot culture (3, 11). Preliminary work reported to be effective (12). Entire immersion of rooted cuttings in butanedioic acid mono(2,2-dimethylhydrazide) (diaminozide) has been successful in controlling the height of *chrysantherum*; however, ancydimidol dips resulted in excessive height reduction (4). Prepropagation or pretransplanting dips of cuttings are presently used by many chrysanthemum growers to control the height of tall-growing cultivars (14). Several growth-retarding chemicals were tested as prepropagation dips to control the height of *Pseuderanthemum, Sanchezia*, and *Strobilanthes* plants. Double-eye cuttings of *Pseuderanthemum, Sanchezia*, and *Strobi­lanthes* were submerged completely for 10 sec in the growth regulators listed in Table 1. The selection of growth regulators and rates was based on previous work by Shu and Sanderson (8, 9) and others (4, 7). Treated cuttings were placed in plastic bags, refrigerated overnight at 7°C, and then propagated under mist (10 sec out of every 100 sec) at 21°C. Cuttings were inserted directly into a final growing medium consisting of 1 sand, 1 sphagnum peat, 1 pine bark medium (by volume) amended on a cubic-meter basis with 11.2 kg dolomitic limestone, 2.6 kg Perk minor element additive, 2.8 kg CaSO₄, 1.8 kg ureaformaldehyde fertilizer 31N-0P-0K, and 2.6 kg granular Aqua-Gro wetting agent. One cutting was propagated and grown in an 8 × 8-cm round plastic pot as an experimental unit. Two pots were used for each of the 13 treatments, which were replicated four times in a randomized block design. Each species was a separate experiment. Upon rooting (about 3 weeks), the plants were moved from mist into full sun (90 µmol·m⁻²·s⁻¹ PAR) and grown at a temperature of 17°C. Sixteen weeks after treatment, the plant height and dry weight were determined.

All cuttings rooted and, with the exception of *Pseuderanthemum* treated with chlorflu­renethol, produced shoots from the auxillary

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1Professor.

2Research Associate.

3Former Head of Data Analysis.

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buds or "eyes". Chlorflurecol- and chlorflurenethol-treated cuttings produced *Pseudanthemum* plants with distorted, malformed, or strap-like leaves. *Strobilanthes* plants were distorted when grown from cuttings receiving dichloroflurecol. *Sanchezia* was quite tolerant of all the treatments and showed few growth abnormalities. Growth abnormalities are typical effects of morphactins on plants (6). Reduced concentrations of morphactins might eliminate growth abnormalities and reduce growth inhibition.

Height of all species was reduced when the cuttings were treated with chlorflurenethol and chlorflurecol (Table 1). Chlormequat chloride, chlorfluoren, and dichloroflurecol retarded the height of *Sanchezia* and *Strobilanthes* plants. Chlormequat chloride has shown activity on another Acanthaceae, *Pachystachys* (3). *Pseudanthemum* and *Strobilanthes* heights were reduced by growing plants from cuttings dipped in PBA. Ancymidol and ethephon reduced height of *Pseudanthemum* plants. The treatment of cuttings by total immersion in growth regulators prior to propagation is an effective, economical, and efficient method of evaluating growth-regulating chemicals on *Acanthaceae*. The efficiency of a growth regulator is increased by this method of application, as shown in *chrysanthemum* (4). While further work is suggested with reduced concentrations of morphactins, a prepropagation dip of cuttings in chlormequat was an effective growth retardant treatment for *Sanchezia* and *Strobilanthes*. Ancymidol and ethephon dips provided satisfactory height control on *Pseudanthemum*. Both *Pseudanthemum* and *Strobilanthes* were retarded by PBA cutting dips.

**Table 1. Height and dry weight of three genera of Acanthaceae plants grown from cuttings dipped in growth regulators prior to rooting.**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Amount (mg liter⁻¹ a.i.)</th>
<th>Height (cm)</th>
<th>Dry wt (g)</th>
<th>Height (cm)</th>
<th>Dry wt (g)</th>
<th>Height (cm)</th>
<th>Dry wt (g)</th>
</tr>
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<tbody>
<tr>
<td>None (check)</td>
<td>---</td>
<td>23.0 a</td>
<td>10.0 abc</td>
<td>23.4 a</td>
<td>14.9 abc</td>
<td>32.1 ab</td>
<td>16.8 abc</td>
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<tr>
<td>Daminizode</td>
<td>5000</td>
<td>19.7 abc</td>
<td>9.2 a-d</td>
<td>23.9 a</td>
<td>15.7 ab</td>
<td>31.9 abc</td>
<td>18.0 ab</td>
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<tr>
<td>Dikegulac</td>
<td>1000</td>
<td>20.3 ab</td>
<td>11.3 a</td>
<td>21.9 a</td>
<td>14.4 abc</td>
<td>28.5 bc</td>
<td>13.1 bc</td>
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<td>Ancymidol</td>
<td>67</td>
<td>18.0 bc</td>
<td>8.7 a-d</td>
<td>23.8 a</td>
<td>14.1 abc</td>
<td>34.5 a</td>
<td>19.6 a</td>
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<tr>
<td>Ethephon</td>
<td>1000</td>
<td>17.1 bcd</td>
<td>7.2 df</td>
<td>24.8 a</td>
<td>18.3 a</td>
<td>27.8 bc</td>
<td>13.2 bc</td>
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<tr>
<td>Picroctanyl bromide</td>
<td>200</td>
<td>20.6 ab</td>
<td>10.1 ab</td>
<td>25.8 a</td>
<td>16.3 ab</td>
<td>26.4 c</td>
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<td>8.2 c-f</td>
<td>25.0 a</td>
<td>17.0 ab</td>
<td>14.9 de</td>
<td>4.9 ef</td>
</tr>
<tr>
<td>Chlormequat chloride</td>
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<td>22.1 a</td>
<td>11.0 ab</td>
<td>16.9 bc</td>
<td>13.5 ab</td>
<td>11.8 ef</td>
<td>12.1 de</td>
</tr>
<tr>
<td>PBA</td>
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<td>16.0 de</td>
<td>6.3 efg</td>
<td>22.3 a</td>
<td>14.0 ab</td>
<td>7.5 fg</td>
<td>1.1 f</td>
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<td>Dichloroflurecol</td>
<td>25</td>
<td>19.5 abc</td>
<td>9.2 a-d</td>
<td>17.3 b</td>
<td>8.3 de</td>
<td>29.1 abc</td>
<td>13.3 bc</td>
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<td>Chlorfluoren</td>
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<td>5.5 g</td>
<td>4.3 ef</td>
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<tr>
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<td>3.0 ef</td>
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*Mean separation in columns by Duncan’s multiple range test, 5% level.*

**Literature Cited**