SCIENTIFIC NOTES

VERTICILLIUM LECANII, A NEW FUNGAL PARASITE OF THE SCALE PHILEPHEDRA TUBERCOLOSA N. SP. (HOMOPTERA: COCCIDAE) IN FLORIDA

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Philephedra tuberculoso n. sp., (Homoptera: Coccidae) (Nakahara and Gill 1985), is a new pest of many ornamentals and tropical fruit trees in Florida (Pena et al., data unpublished). The scale population peaks are found during the months of July-October coinciding with the rainy season in Southern Florida, where relative humidity ranges 80 ± 10%. The fungus Verticillium lecanii (Zimmenn) Viegas, was found throughout most of the Dade County area during August-October, 1983, infesting scale immature and adult stages. An epizootic of V. lecanii did not begin until after three moderate to heavy rains. The same pattern was observed during July-October, 1984, where approximately 4,000 fungus infected female scales were collected from leaves, petioles and branches of Colophylhum sp., and Annona squamosa (L.). Verticillium lecanii was isolated from the infected scales, and morphologically differs from the usual Verticillium lecanii form (B. L. Brady, Commonwealth Mycological Institute, U.K.) (McMillan and Pena 1985).

Although the fungus has previously been found on Saissetta oleae (Homoptera: Coccidae) in Florida (C. McCoy, Lake Alfred, IFAS, University of Florida, pers. comm.), it was not previously known to parasitize Philephedra n. sp. The fungus has also been reported on Hoploclampa testudinea Klug (Hymenoptera: Tenthredinidae) (Jaworska 1979), on Coccus viridis Green (Kohler 1980) and its use is considered promising against Thrips tabaci Lindeman (Binns et al. 1982). According to Ekborn (1981) 16 h of 100 RH are needed to obtain mycelial growth and to cause whitefly (Trialeurodes vaporiorum Westwood) death under green house conditions.

In a preliminary greenhouse experiment (27 ± 3°C, 75-86% RH, Photophase 14:10) a suspension of ca. 30,315 spores/ml was sprayed to a scale population infesting A. squamosa (6 month old) potted plants. An average of 1.4 females and 18 immature stages per leaf were observed before treatment. Percent survival of the population was observed every week during ca. 40 days. Percent survival ranged from 50-35% during the first 8 days and differed significantly (P < 0.05) from the control at 15 (14% survival), and 25 (12% survival) days after treatment. Thereafter, in a laboratory test (24°C 75 RH) four groups of 64 gravid female scales, field collected from A. squamosa leaves were confined into (100 × 25 mm) petri dishes and inoculated with V. lecanii suspensions (100, 1,000, 10,000 spores/ml, and control replicated 4 times). Five days after treatment, dosis of 1,000 and 10,000 spores/ml proved to cause higher infection than 100 spores/ml or the control (Table 1). Mortality rate in all treatments was significantly higher (P < 0.05) from the control at 10 and 15 days after treatment. The mortality levels were at least 1.6 times as high as the level of the control. The mortality rate for the control (48%) was expected since no antifungal agents had been used. However, the average of crawlers emerging from the nontreated scales was 23.6 times higher compared to the treated ones. Based on these results, V. lecanii is one of the most promising biotic mortality factors for Philephedra n. sp. in Florida.

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TABLE 1. Mortality of *Philephedra tuberculosa* n. sp. exposed to different spore suspensions of *V. lecanii*.

<table>
<thead>
<tr>
<th>Isolate spores/ml</th>
<th>% Scale mortality at days after treatment&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Average crawlers emerging/female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>100</td>
<td>5</td>
<td>66</td>
</tr>
<tr>
<td>1,000</td>
<td>13</td>
<td>45</td>
</tr>
<tr>
<td>10,000</td>
<td>9</td>
<td>63</td>
</tr>
<tr>
<td>Non-infected (Check)</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

<sup>a</sup>Means in the same column followed by different letters were significantly different (P < 0.05) by the Student-Newman Test.

REFERENCES CITED


