Rhizoctonia Blight on Waterhyacinth in the United States

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ABSTRACT

A foliar blight of waterhyacinth (Eichhornia crassipes) caused by the Rhizoctonia sp. stage of Aquathamniphyllum pendulus was found occurring on plants collected at Butte Bayou in south central Louisiana. This fungus has previously been isolated from diseased waterhyacinth in the Canal Zone of Panama and in Puerto Rico. However, this is the first record of its occurrence in the United States.

The floating waterhyacinth (Eichhornia crassipes (Mart.) Solms.) is a noxious aquatic plant of considerable importance throughout the tropical and subtropical regions of the world. Since 1970, its biological control with plant pathogens has been investigated at the University of Florida. One of the first pathogens found to have biocontrol potential was a Rhizoctonia sp. isolated from diseased anchoring waterhyacinth (E. azurea (Swartz.) Kunth) from the Canal Zone of Panama (1). This isolate (designated RhEa) was also highly virulent on E. crassipes. The same fungus was later found naturally occurring on this plant in Panama and Puerto Rico. Joyner and Freeman (2) later found RhEa to belong to the R. solani Kuehn (Thametophorus cucumeris (Frank.) Donk) group, but they did not find the perfect stage. Later, Tu and Kimbrough (3) induced the perfect stage of RhEa. Although they noted that the mycelial state was "almost indistinguishable" from T. cucumeris, the basidiospores were uniquely borne on a highly modified basidium. Therefore, they established a new monotypic genus to accommodate the fungus and named it Aquathamniphyllum pendulus Tu and Kimbrough (4). They noted that the imperfect stage of RhEa differed from R. solani only in having more nuclei per cell and in the pitted nature of the sclerotia. The purpose of this note is to report the first occurrence of this unusual fungus in the United States.

Despite numerous surveys in Louisiana and Florida for diseases affecting waterhyacinth in 1971-1979, the Rhizoctonia-incited blight noted in Panama and Puerto Rico was not found. However, in September 1979, E. Addor collected diseased waterhyacinth from Butte Bayou in south central Louisiana and sent them to the senior author for diagnosis. Among the samples were plants with foliar lesions resembling those incited by RhEa (Fig. 1). In addition, welts of buff-colored mycelium and immature sclerotia were evident on the lesions. These signs also were similar to those noted on RhEa-infected plants.

Isolations were made by transferring fungal material from the diseased leaf tissue directly into water agar. A fungus (isolate RhEc) was found that was similar to RhEa in all cultural respects except sclerotial size (Fig. 2). Sclerotia of RhEc were smaller but had the characteristic pitted nature, although not as prominent, as those noted in RhEa by Tu and Kimbrough (4). Waterhyacinth plants inoculated with RhEc developed lesions typical of those noted on the diseased plants from Louisiana. Furthermore, the lesions were identical to those on plants simultaneously inoculated with RhEa. The fungus was reisolated from diseased tissue.

To verify further the identity of the Louisiana fungus, the number of nuclei per cell in RhEc was compared with that in RhEa, isolate 672, from waterhyacinth in Puerto Rico and with an R. solani isolate belonging to the AGI group (obtained from N. A. Anderson) that was pathogenic on waterhyacinth. Nuclei were stained using the method described by Tu and Kimbrough (3). All three isolates from waterhyacinth contained about three times as many nuclei per cell as the isolate of R. solani (Table 1). This

Table 1. Number of nuclei in cells of Rhizoctonia spp. pathogenic on waterhyacinth

<table>
<thead>
<tr>
<th>Isolate</th>
<th>Range</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>RhEc</td>
<td>7-20</td>
<td>13.0</td>
</tr>
<tr>
<td>RhEa</td>
<td>8-20</td>
<td>14.2</td>
</tr>
<tr>
<td>672</td>
<td>8-16</td>
<td>11.4</td>
</tr>
<tr>
<td>R. solani (AGI)</td>
<td>2-5</td>
<td>3.9</td>
</tr>
</tbody>
</table>

*a* Isolates RhEc, RhEa, and 672 were isolated from waterhyacinth in Louisiana, Panama, and Puerto Rico, respectively. The R. solani isolate was provided by N. A. Anderson.

*b* Nuclei counted in 25 cells for each isolate.

Fig. 1. Symptoms of Rhizoctonia blight on waterhyacinth leaf (shown at 75% of actual size) collected from Louisiana.

Fig. 2. Rhizoctonia sp. isolate RhEc (left) compared with isolate RhEa (right). Seven-day-old cultures were grown on Difco potato-dextrose agar in 9-cm-diameter petri dishes.

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finding agrees with the results reported by Tu and Kimbrough (4).

Based on the studies reported herein, we concluded that the waterhyacinth disease found in Louisiana was caused by the same fungus that had previously been found infecting this plant in Canal Zone, Panama, and Puerto Rico. This is the first report of the occurrence of this unusual fungus in the United States.

LITERATURE CITED