

Rhizoctonia Blight on Waterhyacinth in the United States

T. E. FREEMAN, Professor, R. CHARUDATTAN, Associate Professor, R. E. CULLEN, Biologist, Plant Pathology Department, University of Florida, Gainesville 32611, and E. ADDOR, formerly Biologist, U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS 39180

ABSTRACT

Freeman, T. E., Charudattan, R., Cullen, R. E., and Addor, E. 1982. Rhizoctonia blight on waterhyacinth in the United States. *Plant Disease* 66:861-862.

A foliar blight of waterhyacinth (*Eichhornia crassipes*) caused by the *Rhizoctonia* sp. stage of *Aquathanatephorus 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) considered RhEa to belong to the *R. solani* Kuehn (*Thanatephorus cucumeris* (Frank) Donk) group, but they did not find the perfect stage. Later, Tu and Kimbrough (4) 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 *Aquathanatephorus 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, wefts 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 onto 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 AG1 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

Isolate ^a	Range	Average ^b
RhEc	7-20	13.0
RhEa	8-20	14.2
672	8-16	11.4
<i>R. solani</i> (AG1)	2-5	3.9

^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.

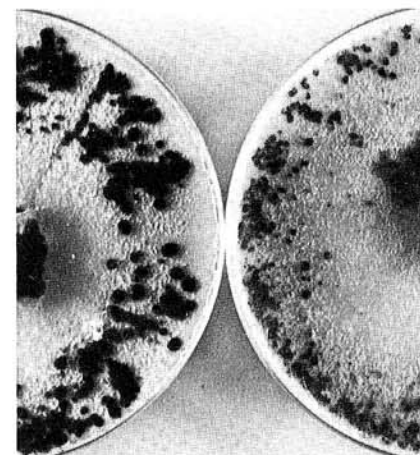


Fig. 2. *Rhizoctonia* sp. isolate RhEa (left) compared with isolate RhEc (right). Seven-day-old cultures were grown on Difco potato-dextrose agar in 9-cm-diameter petri dishes.

Florida Agricultural Experiment Station Journal Series 3560.

Supported in part by U.S. Army Corps of Engineers contract DAC-39-C-00 97 and Florida Department of Natural Resources contract DNR 28A.

Accepted for publication 12 March 1982.

The publication costs of this article were defrayed in part by page charge payment. This article must therefore be hereby marked "advertisement" in accordance with 18 U.S.C. § 1734 solely to indicate this fact.

0191-2917/82/09086102/\$03.00/0
©1982 American Phytopathological Society

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

1. Freeman, T. E., and Zettler, F. W. 1971. *Rhizoctonia* blight of waterhyacinth. (Abstr.) *Phytopathology* 61:892.
2. Joyner, B. J., and Freeman, T. E. 1973. Pathogenicity of *Rhizoctonia solani* to aquatic plants. *Phytopathology* 63:681-685.
3. Tu, C. C., and Kimbrough, J. W. 1973. A rapid staining technique for *Rhizoctonia solani* and related fungi. *Mycologia* 65:941-944.
4. Tu, C. C., and Kimbrough, J. W. 1978. Systematics and phylogeny of fungi in the *Rhizoctonia* complex. *Bot. Gaz. (Chicago)* 139:454-466.