RESEARCH NOTE

Cultural variants of Helminthosporium stenospilum *from sugarcane*[1]

The brown stripe disease of sugarcane, caused by *Helminthosporium stenospilum* Drechs., is prevalent and destructive almost every season in Puerto Rico. In the fall of 1964, a survey of sugarcane diseases on the northern coast of Puerto Rico revealed that sugarcane grew poorly in the fields that were affected by brown stripe. Several commercial varieties of sugarcane, including P.R.980, now occupying about one-half of the cultivated cane area in Puerto Rico, have been found to be highly susceptible to the disease.[2] Since brown stripe has recently been observed on an increasing number of valuable sugarcane varieties in the Isabela area, including some newly developed varieties of sugarcane such as P.R.1186, P.R.1191, P.R.1203, and P.R.1209,[3] the increased incidence has caused concern.

Although Dreschler[4] in 1928 found that *H. stenospilum* could be distinguished from *Helminthosporium sacchari* (B. de Haan) Butler (the cause of eyespot of sugarcane) because *H. stenospilum* has much darker, thicker walled, broader, conidia, many pathologists still believe that *H. sacchari* is merely a strain of *H. stenospilum*. Parris,[5] working in Hawaii, obtained characteristic cultures of *H. sacchari* from typical brown stripe lesions. In 1924, Cook[6] observed in Puerto Rico two leaf spot diseases of sugarcane caused by *Helminthosporium* spp. One of them he called the "Manati disease" and the other the "Santa Rita disease". In October of the same year[7] he reported that both diseases were caused by *Helminthosporium sacchari*

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[2] Adsuar, J. and Liu, L. J., Incidence of brown stripe disease of sugarcane in Puerto Rico, *J. Agr. Univ. P.R. 50*(2): 73–5, 1966.

[3] Liu, L. J., Relative resistance and susceptibility of Puerto Rican sugarcane varieties to the brown stripe organism, *H. stenospilum*, 1965 (unpublished).

[4] Drechsler, C. A., A species of *Helminthosporium* distinct from *H. sacchari* causing brown stripe of sugarcane, *Phytopath. 18:* 135–6, 1928.

[5] Parris, G. K., The Helminthosporia that attack sugarcane, *Phytopath. 40:* 90–103, 1950.

[6] Cook, M. T., Sugarcane leaf spots in Puerto Rico, *J. Agr. Univ. P.R. 8*(2): 55–7, 1924.

[7] Cook, M. T., Helminthosporium leaf spot of sugarcane in Puerto Rico, (Preliminary paper) *J. Agr. Univ. P.R. 8*(4): 5–10, 1924.

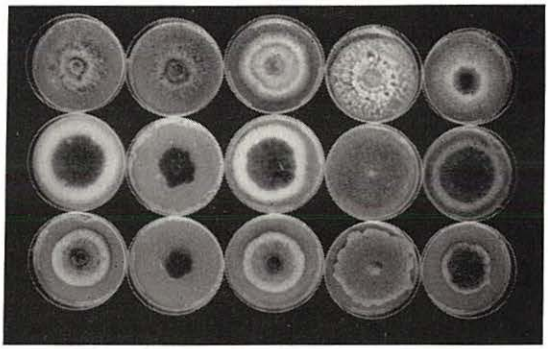

FIG. 1.—Seven-day-old cultures of 5 different isolates of *Helminthosporium stenospilum*, from left to right, on 3 different media. Isolates 1 to 5 from top to bottom, rows on nutrient agar, cornmeal agar, and potato dextrose agar.

Butler, or by closely related varieties or species of *Helminosporium*. No cultural races of *H. stenospilum* have ever been reported in Puerto Rico.

Brown stripe-affected leaves of sugarcane were obtained from the Caño Tiburones and Isabela areas of Puerto Rico for isolation studies. Small sections of diseased leaf tissue (4 x 2 mm.) from single brown stripe lesions were surface-sterilized in a 0.5-percent solution of sodium hypochlorite for 5 minutes, transferred to potato dextrose agar (PDA), and incubated at 30°C. for 1 week. Single-spore isolations were then made from diverse colony types. Five isolates with the most diverse colony characters were selected for identification of cultural races and for comparisons from the standpoint of pathogenicity and morphology of asexual reproductive structures.

In order to differentiate cultural races the isolates were grown at 30°C. on triplicate plates of PDA, cornmeal agar (CMA), and Difco nutrient agar (NA).

As shown in fig. 1, the cultural characters of the five isolates of *H. stenospilum* differed greatly on the same medium as well as on different media. However, typical cultural characters were retained by each isolate when transferred serially on the same medium. The five different isolates of *H. stenospilum* can be readily distinguished in cultures by their differences in rate of growth, zonation, relative amount of aerial and submerged mycelium, nature of mycelial growth, production of conidia, and color of mycelium. Colonies of isolate 1 on PDA are silver-gray in color and black on CMA, with a wide cottony margin. Isolate 2 can be readily recognized by its restricted black colonies on PDA. The colonies of isolates 3 and 1 were similar in color when cultured on CMA. However, isolate 3 can be

differentiated by its strikingly zonate colonies on NA. The distinguishing character of isolate 4 is a spreading white colony with tufts of mycelium forming an irregular pattern. The colonies of isolate 5 are black and sporulate heavily on PDA.

Although each of the five isolates of *H. stenospilum* represents a distinct cultural race, the isolates could not be differentiated on the basis of conidial morphology and pathogenicity on sugarcane variety M.336.

Studies have been undertaken to determine whether pathogenic races of *H. stenospilum* occur under our conditions.

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