Bacterial Top and Stalk Rot of Maize in Brazil

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ABSTRACT

A population of sweet corn (Zea mays) grown during the 1979–1980 rainy seasons in Brasília was heavily attacked by a bacterium causing top and stalk rot. About 37% of the plants showed symptoms, and 24% died within 45 days of planting. The bacterium was identified as Erwinia chrysanthemi pv. zeae. This is believed to be the first report of this pathogen on corn in Brazil.

RESULTS AND DISCUSSION
Symptoms. Only the two test bacterial species produced symptoms in corn plants. The initial symptoms were water-soaked lesions in the leaf sheath; the lesions commonly extended into the leaf lamina as streaks. From these lesions, the decay progressed into the pith, causing its disintegration. The most characteristic symptom was the breaking or toppling of plants above the fourth or fifth node. These symptoms resembled those shown by naturally infected plants as well as those described by Hoppe and Kelman (5).

Characterization of the pathogen. The gram-negative bacterium consistently isolated from diseased tissues was a single rod measuring 1.7–2.4 × 0.7–1.0 μm (average 2.2 × 0.8 μm) with peritrichous flagella. It had the following characteristics: facultative anaerobe, potato slice soft rot (+), catalase (+), gelatin hydrolysis (+), H₂S production (+), indole (+), lecithinase (+), oxidase (−), phosphatase (+), utilization of lactose (−), arabinose (+), ethanol (+), glucose (+), mannitol (+), and sucrose (+). Neither dark blue insoluble pigment (1) nor fluorescein was produced. The
pathogen was sensitive to erythromycin. Colonies on PDA (pH adjusted to 6.5) resembled fried eggs (umbonate with undulate margins).

Based on comparisons of our two unknown strains with the three known Erwinia species tested and on biochemical, cultural, and morphological characteristics, the bacterium was identified as *E. chrysanthemi* pv. *zeae* (Sahet 1954) Victoria, Arboleda & Muñoz (2, 3). One of our isolates (E-20) has been deposited at the National Collection of Plant Pathogenic Bacteria, Harpenden, England, as strain no. 3144.

Locally, this top and stalk rot disease has been named *quebra cana* (Portuguese for stalk breaker). Although we are not sure of its distribution or severity, similar symptoms observed in previous years suggest that the pathogen is widespread in Brazil. Because of the prevailing climatic conditions (high humidity and temperature and heavy rains) during the corn-growing season (November-March), the disease is considered potentially serious in localized cornfields, particularly fields of sweet corn, which is more susceptible than field corn lines.

We believe this is the first report of *E. chrysanthemi* pv. *zeae* virulent on corn in Brazil.

ACKNOWLEDGMENTS

We wish to thank E. W. Kitajima for electron microscope observation of flagella, C. Andreoli for providing seeds, and H. C. Santos for technical assistance.

LITERATURE CITED