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## Disease Notes

### First Report of Powdery Mildew (*Pseudoidium anacardii*) of Mango Trees in Sinaloa, Mexico

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#### e-Xtra

Powdery mildew of mango is an important disease in Mexico's northern Sinaloa state. Identification of the causal fungal agent has been hindered by the absence of information regarding its teleomorph, as well as a detailed morphometric analysis of the anamorph and molecular characterization. The first symptoms of the disease appear in mango inflorescences of early February, and it subsequently affects young fruits. The disease progresses during March and early April, causing significant fruit abortion and a scabby appearance in a high percentage of fruits that remain attached to the trees. We observed the disease on inflorescences but not in leaves during our sampling period. Powdery mildew specimens were collected during 2011 and 2012 and included Kent and Keith varieties from commercial orchards, and creole materials from backyards of private residences in the Ahome and Fuerte Counties of northern Sinaloa, Mexico. Symptomatic inflorescences were analyzed morphologically. Conidiophores and conidia were prepared by touching the whitish lesions with clear adhesive tape, which was then placed over microscope slides with a drop of distilled water and observed under a compound microscope. The anamorph structures of the pathogen were measured. The mycelium was septate and ramified on the surface of the host, forming a dense coat of branching hyphae. The mycelium had a diameter of 2.5 to 8.7  $\mu\text{m}$ ; conidiophores (*Pseudoidium* type) emerged from the superficial mycelium, were unbranched, and consisted of 1 to 3 cells with conidia forming singly from the apex. The length of the conidiophores varied from 30.0 to 77.5  $\mu\text{m}$ ; the foot cell of the conidiophores was straight, 10.0 to 47.5  $\mu\text{m}$  long and with a diameter of 5.0 to 15.5  $\mu\text{m}$  across its midpoint. Conidia without fibrosin bodies were

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borne singly, and were ellipsoid/ovoid, 22.5 to 46.2  $\mu\text{m}$  long and 15.0 to 27.5  $\mu\text{m}$  wide. Eighty percent of the germ tubes were forked (lobed); the rest were simple, emerged from the end, and were occasionally on the side of the conidia. Germ tubes ranged from 2.0 to 7.2  $\mu\text{m}$  at the midpoint. The surface of the conidia appeared smooth under the scanning electron microscope, and elliptical conidia appeared constricted at their ends; this, however, was not observed in the ovoid conidia. In both cases, the terminal end of the conidia was smooth. The teleomorph was not found. Molecular and phylogenetic analysis of the ITS rDNA (2) region showed that samples are closely related to specimens of *Pseudoidium anacardii* (1) (teleomorph: *Erysiphe quercicola* [4]) collected from mango trees in diverse countries. Measurements of somatic and asexual structures are in agreement with descriptions of *P. anacardii* (formerly known as *Oidium mangiferae*) from India (3). The nucleotide sequences derived from this research were deposited in GenBank (Accession Nos. JX893951 to JX893957). To our knowledge, this is the first report of *P. anacardii* associated to mango inflorescences in Sinaloa, Mexico. Due to the economic importance of powdery mildew of mango trees in Sinaloa, future research directions should focus on finding the teleomorph of the fungus to support its identity.

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