First Report of Powdery Mildew Caused by *Leveillula taurica* of Field-Grown Sweet Pepper in the Pacific Northwest

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On 21 August 2009, a grower observed a disease affecting nearly all plants in a 2.5-ha drip-irrigated field of sweet pepper (*Capsicum annuum* L.) cv. Excalibur near Hermiston, Umatilla Co., OR. The reported symptoms included “wilting” of plants distributed throughout the field. Examination of plants revealed that they were infected by a heavily sporulating powdery mildew fungus. The fungus was determined to be *Leveillula taurica* (Lév.) G. Arnaud, previously unreported from this host in Oregon or from field-grown peppers in the Pacific Northwest. This report documents the taxonomic determination of this species and provides information about the disease outbreak, including economic impact.

Signs and symptoms included whitish mycelia and conidia typical of a powdery mildew, and chlorotic, flagging leaves that first drooped, then dehisced prematurely (Fig. 1). Peppers on defoliated plants frequently displayed symptoms of sun-scorch (Fig. 2). Conidiophores of the fungus emerged through stomata (Fig. 3) and bore conidia singly. Conidia (Fig. 4) were hyaline and dimorphic; lanceolate conidia were \((56-)59-75.5(-77.5) \times (15-)15.5-20(-22)\) µm and cylindrical conidia were \((48.5-)52-69(-74) \times (12-)15-18.5(-21.5)\) µm. The teleomorph was not observed. DNA was extracted from ectophytic hyphae and conidia of the fungus and a 674 bp ITS sequence was obtained using procedures described previously (5). BLAST searches of GenBank and the Erysiphales database (www.erysiphales.wsu.edu) revealed high (99 to 100%) similarities to ITS sequences from *L. taurica*. The sequence was identical to aligned regions of 14 submissions from *L. taurica*, including one from a strain from *Capsicum annuum* (GI:239924057).

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**Fig. 1.** Symptoms and signs of powdery mildew of sweet pepper caused by *L. taurica.*

**Fig. 2.** Powdery mildew-infected pepper plants and sunscald-damaged fruit.
On the basis of host, anamorph morphology, and ITS sequence the fungus was determined to be *L. taurica*, a species with a wide host range including *Capsicum* species (2). *Leveillula taurica* is an introduced species now occurring on a variety of economically important plants in the Pacific Northwest (1,5). The only previous report of *L. taurica* on sweet pepper in the Pacific Northwest was from plants growing in commercial greenhouses near Langley, British Columbia (3). The present report is the first of this fungus on field-grown pepper plants in the region.

Defoliation of infected plants resulted in sun scald damage to fruit, a problem associated with this disease in field-grown pepper plants and causing much of the economic loss that can occur (4). In this instance, the grower estimated yield loss at 40%, equivalent to approximately $17,297/ha. Severity of disease may have been enhanced by the low-lying topography of the field which was bordered by a hill on one side and trees on the other, reducing air movement and likely resulting in longer periods of high relative humidity. The discovery of this fungus on field-grown pepper plants is consistent with earlier suggestions that *L. taurica* has become endemic to the Pacific Northwest (1,5).

**Literature Cited**