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First Report of Powdery Mildew of *Mahonia aquifolium* (Pursh.) Nutt. Caused by *Erysiphe (Microsphaera) berberidis* (DC.) Lév in Canada

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Mahonia aquifolium (Pursh.) Nutt. (syn. *Berberis aquifolium* Pursh.) (Tall Oregon Grape) is a plant native to British Columbia, Canada, and the coastal Pacific Northwest of the USA. This species is utilized by landscapers as an ornamental for its holly-like leaves, upright growth habit, colorful berries and foliage. In addition, it has been used as a medicinal plant, and as a dye and food source in North America and Europe (1,2). The first discovery of powdery mildew of *Mahonia aquifolium* in the USA was reported in Washington State in 2003, and the pathogen was identified as *Microsphaera berberidis* (DC.) Lév (*Erysiphe berberidis*) (5). In Canada, powdery mildew of Oregon grape was discovered in the early summer of 2004 in Victoria, British Columbia. The diseased leaves were covered on both sides with whitish patches of mycelium and conidia (Fig. 1). The fungal colonies infected leaves and petioles (Fig. 2); as well as sepals, berries (Fig. 3), and young stems. With severe infection, young leaves and stems were greatly damaged, desiccated, and eventually necrotic. Most of the infected leaves turned red in winter. The disease appeared to develop only in the shade, as no visual signs or symptoms were observed in open areas. Conidia of the causal fungus were cylindric (Fig. 4), with rounded ends when fresh (dried spores usually had flat ends), measuring $23\text{--}46 \times 11\text{--}17 \mu\text{m}$ (average $38 \times 13 \mu\text{m}$); the conidiophores (Fig. 5) had straight, cylindric foot-cells of $21\text{--}38 \times 6.5\text{--}8 \mu\text{m}$. Conidia were frequently found single or in short chains of 2 to 3. Short germ tubes were produced on the ends of conidia placed on water agar. No teleomorphic form of this fungus was observed. The disease symptoms and fungal morphology described here are similar, if not identical, to powdery mildew of *Mahonia aquifolium* caused by *Microsphaera berberidis* in the USA (5). According to Braun et al. (3), this mildew is therefore identified and named as *Erysiphe (Microsphaera) berberidis*. To our knowledge, this is the first record of powdery mildew caused by *E. berberidis* on Oregon grape in Canada (4). A voucher specimen was deposited at the Pacific Forestry Center Herbarium (DAVFD No: 28734).

Fig. 1. Powdery mildew infection of *Mahonia aquifolium* on leaves.

Fig. 2. Powdery mildew infection of *Mahonia aquifolium* on petiole.

Fig. 3. Powdery mildew infection of *Mahonia aquifolium* on berries.

Fig. 4. Conidia of *Erysiphe berberidis* formed on *Mahonia aquifolium*.

Fig. 5. Conidiophores of *Erysiphe berberidis* formed on *Mahonia aquifolium*.

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