First Report of Powdery Mildew on *Caragana arborescens* and *Caragana grandiflora* in Alaska caused by *Microsphaera (Erysiphe) palczewskii*

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During August 2004, the authors surveyed sites in and near Fairbanks, AK for powdery mildew diseases and found a powdery mildew previously unreported in Alaska on two specimen plants of the introduced ornamental species *Caragana arborescens* Lam. (Siberian pea tree) and *C. grandiflora* DC. The causal agent was determined to be *Microsphaera palczewskii* Jacz. This report provides the first documentation of *M. palczewskii* in AK and includes information on the morphology and taxonomy of this species.

Signs of the disease included effuse to dense patches of white to grayish-brown mycelia on leaf surfaces. The fungus formed superficial hyphae with lobed appressoria (Fig. 1); conidiophore foot cells (Fig. 2) were cylindrical and measured (15-) 15.5-21.5 (-21.5) × (4.5-) 5.5-7 (-8) µm; conidia were short-cylindrical to barrel-shaped, formed singly, lacked fibrosin bodies, and measured (22.5-) 24.5-34.5 (-36.5) × (10-) 11-16 (-17) µm. Mature chasmothecia were found in the specimen collected from *C. arborescens* and were dark brown to black, convex, 100-125 (-155) µm in diameter; dichotomously-branched chasmothecial appendages (Fig. 3) measured (95-) 155-270 (-325) µm; chasmothecia contained multiple asci that were short-stipitate to saccate and measured (54.5-) 56-63 (-64.5) × 31.5-43.5 (45) µm. Asci (Fig. 4) contained 6 to 8 ovoid, pale yellowish ascospores measuring (15.5-) 16-22 (-24) × 10-14.5 µm. Voucher specimens were deposited with the Mycological Herbarium of the University of Alaska, Fairbanks (ALA).
The host genus and morphological characteristics of the fungus matched the features described by Braun (1) for *M. palczewskii*, also designated as *Erysiphe palczewskii* U. Braun & S. Takamatsu (2). The fungus was described in 1927 from the Russian Far East and some 50 years later was noted in Eastern Europe where it is now widespread (3). The first report of this fungus in North America was made in 2003 (4) from *C. arborescens* in northern ID and eastern WA. The present account appears to be only the second report from North America. Because of the distinctive, highly-branched chasmothecial appendages (Fig. 3) the fungus is easily distinguished from other *Microsphaera* species. It therefore seems unlikely that past researchers in AK confused it with another fungus. Present evidence suggests that, similar to the case in Europe, the fungus may have been brought into AK along with one or more of its introduced hosts. However, the route and means by which the fungus entered AK is unclear. Occurrence of the teleomorph in AK, and its putative origin in a region with similarly severe winter conditions (3), suggests that perennation of the fungus can occur in AK conditions. Perennation in infected buds occurs in this species (3) and might offer an alternative to ascocarps as a means of perennation in AK.

Given the restricted host range, known history of dissemination across Europe, and distinctive morphology, this species may have potential as a model organism to assess dissemination of exotic powdery mildews in North America through human activities or other means.

**Literature Cited**