

Disease Reports

Powdery Mildew of Trident Maple Caused by *Sawadaea nankinensis* in Korea

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Trident maple (*Acer buergerianum*), native to eastern China and Taiwan, is widely planted along the streets or in gardens and parks in Korea. In July 2007, a severe outbreak of a previously unknown powdery mildew was observed on several dozens of trident maple planted along the street at Yeonbong-ro, Hongcheon, Korea. The same symptoms were also found in several trident maples in Namyangju in July 2007 and in Seoul in October 2009. Voucher specimens are deposited at Korea University, Seoul, Korea (KUS-F22741, F23096, F23845, F23895, F24243, F24773, F24774). Powdery mildew infections were prominent on young leaves and shoots, which are covered by dense white mycelial mats with abundant conidia. These later developed into necrotic lesions and finally the entire shoots died (Fig. 1A & B). Chasmothecia

from the upper half of the chasmothecium, unbranched, uncinuate to circinate at the apex, hyaline, aseptate, thick-walled at the base and thinner upwards. Asci are 12-30 per chasmothecium, 74-110×32-40 μm, 8-spored. Ascospores are 20-25×11-13.5 μm (Fig. 1C-F).

The complete ITS regions of rDNA from KUS-F23845 and F24243 were amplified with primers ITS5 and P3 as described by Takamatsu et al. (2009) and sequenced. The resulting sequences of 476 bp were deposited in GenBank with accession numbers of GU083587 and GU083588, respectively. Phylogenetic analysis was performed using MEGA4 with neighbor-joining method (using Tajima-Nei distances). The Korean isolates showed only one base substitution with the three sequences (AB353761-AB353763) of *S. nankinensis* found on *A. buergerianum* from Japan (Fig. 2).

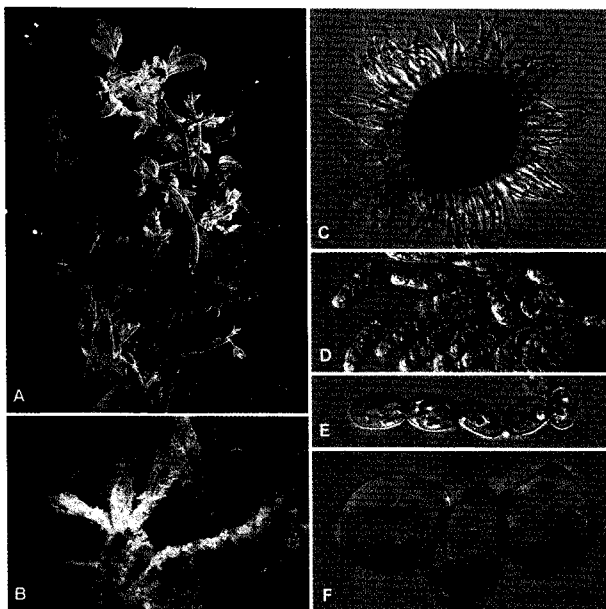


Fig. 1. A & B: Powdery mildew infections on young leaves and stems of *Acer buergerianum*. Note the necrotic lesions. C & D: Chasmothecium of *Sawadaea nankinensis* and many asci with eight ascospores each (bar=200 μm for C and 100 μm for D). E & F: Microconidia and macroconidia containing conspicuous fibrosin bodies (bar=20 μm).

formation was found in October and November since 2007.

Macroconidiophores are 80-125×7-9 μm, producing macroconidia in chains with sinuate edge-lines, with a basal septum at 3-12 μm away from the branching point of the mycelium. Macroconidia are lemon-shaped, 22-32×16-22 μm, containing conspicuous fibrosin bodies. Microconidiophores are 24-68×4-6 μm, producing 1-5 microconidia in chains. Microconidia are broadly ellipsoidal to subglobose, 9-14×5.5-8.5 μm, containing conspicuous fibrosin bodies. Chasmothecia are 210-280 μm in diam., blackish brown, depressed globose. Appendages are about 80-140 in number, arising

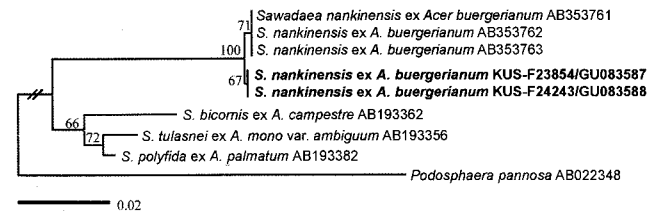


Fig. 2. Phylogenetic relationship between *S. nankinensis* on *A. buergerianum* and other *Sawadaea* species, inferred by neighbor-joining method using the ITS rDNA region. Numbers above the branches represent the bootstrap values. Bar=Number of nucleotide substitutions per site.

Based on these morphological and molecular data, the fungus was identified as *Sawadaea nankinensis* (Takamatsu et al., 2008). The powdery mildew disease of trident maple was first recorded from China (Tai, 1930) and regarded as an endemic disease. The occurrence of the disease was recorded from 1980 in Japan and formation of chasmothecia in 2003 (cf. Takamatsu et al., 2008). In Korea, however, Shin (2000) did not record the powdery mildew on trident maple despite of his extensive survey since 1982 in Korea. Recent occurrence of the disease in the newly planted trees in the three distant localities in Korea suggests the possibility that *S. nankinensis* can be spreading widely and posing a serious threat to health of trident maple in Korea.

References

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