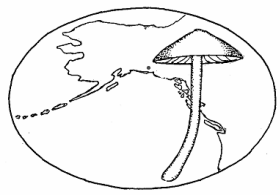
# Pacific Northwest Fungi



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## First report of white rust of *Aurinia saxatilis (Alyssum saxatile)* caused by *Albugo candida* in Washington State

**Dean A. Glawe**

*Department of Plant Pathology, Washington State University, Puyallup Research and Extension Center, 7612 Pioneer Way East, Puyallup, WA 98371-4998*

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Corresponding author: Dean A. Glawe, glawe@wsu.edu

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**Abstract**: *Albugo candida*, cause of white rust, is reported to occur on *Aurinia saxatilis (*synonym*: Alyssum saxatile).* The pathogen was found on landscape plants growing in a private garden in Seattle, WA where it over-wintered on infected leaves. This appears to be the first report of *A. candida* on this host in the USA.

Key Words: *Alyssum saxatile compactum* 'Goldkugel', Brassicaceae, white rust, plant pathogen, obligate plant parasite, Oomycetes, Peronosporales, Albuginales, Chromista, Peronosporomycetes

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**Introduction:** *Aurinia saxatilis* (L.) Desv. *(*synonym*: Alyssum saxatile* L.*)* (Brassicaceae) (common name: Basket of Gold) is a popular ornamental plant grown in rock gardens in the Pacific Northwest where it has a reputation for being resistant to pests (Beck and Binetti, 2000). During 2005 and 2006, symptoms of white rust were observed on four perennial plants of *A. saxatilis* (sold as *Alyssum saxatile compactum* 'Goldkugel') grown in a home garden in Seattle, King Co., Washington. *Albugo candida* (Pers.) Kuntze (Chromista, Peronosporomycetes *fide* Thines and Spring, 2005) was found on symptomatic plant material using light microscopy. This pathogen is not listed on *A. saxatilis* in the National Fungus Collection database (Farr et al., n. d.) but in 1997 (Stobbs, 1997) the pathogen was reported in a list of disease records for that year in British Columbia. No other reports of *A. candida* on *A. saxatilis* in North America were found. This report documents the occurrence of *A. candida* on *A. saxatilis* in Washington State. This appears to be the first report of this disease on *A. saxatilis* in the USA.

**Materials and Methods:** Samples of diseased *A. saxatilis* leaves were examined and photographed using a Leica DMR compound microscope and a Leica MZ95 stereo microscope, both equipped with Leica DC300 digital cameras. Voucher material was deposited with the Mycology Herbarium in the Department of Plant Pathology, Washington State University (WSP).

**Results and Discussion:** The disease was observed during the growing seasons of 2005 and 2006. Sori also were found during the intervening winter on live leaves. Sori mostly formed on abaxial surfaces but also were present on adaxial surfaces. Numerous sori were present on older leaves by the time of anthesis in May.

Disease symptoms included chlorotic lesions that began as pale greenish areas and eventually became yellow; disease signs included white to cream-colored, blister-like sori on leaves (Figs. 1, 2). Sori initially were whitish (Fig. 3) and enlarged to 0.5-2 mm and ruptured to release sporangia (Fig. 4). Sori contained palisades of sporangiophores (Figs. 5, 6) that ranged from curved or bent to nearly straight, typically were narrowed at the base and widened toward the apex, often exhibited a thickened wall (Fig. 6), and measured (29.5-)30.5-45(-51.5) x 10(-10.5)-15.5(-17) µm. Sporangia (Figs. 7-9) were produced in chains, were nearly spherical to angular in outline, subhyaline, frequently vacuolate, exhibited finely punctate walls, and measured 14.5-18(-19) x 13-15.5(-16.5) µm.

The causal agent was determined to be *A. candida* on the basis of the morphology of sori, sporangiophores, sporangial chains, and sporangia, as well as host family (Mukerji, 1975; Choi and Priest, 1995; Thines and Spring, 2005). This pathogen recently was reported (Glawe et al., 2004) on plants of *Lunaria annua* L. (common name: Money Plant) growing about 10 meters from the *A. saxatilis* plants on which that earlier report is based. Because *A. candida* is known to infect a broad range of Brassicaceae, it is possible that infected *L. annua* plants served as the source of inoculum for the infections observed on *A. saxatilis*.

Although white rust lesions are unsightly on *A. saxatilis*, it is uncertain whether the disease eventually might contribute to decline or death of infected plants. The combination of cosmetic damage, and possible long term effects on survival of this perennial host, suggests that *A. candida* has the potential to be a significant problem on this popular ornamental plant, especially if it were to

occur in commercial nurseries. The apparent ability of this obligate parasite to overwinter on leaves of *A. saxatilis* suggests that infected plants might serve as a source of primary inoculum to infect other hosts. Further research on the host range and life cycle of this pathogen could provide useful information on epidemiology and control.

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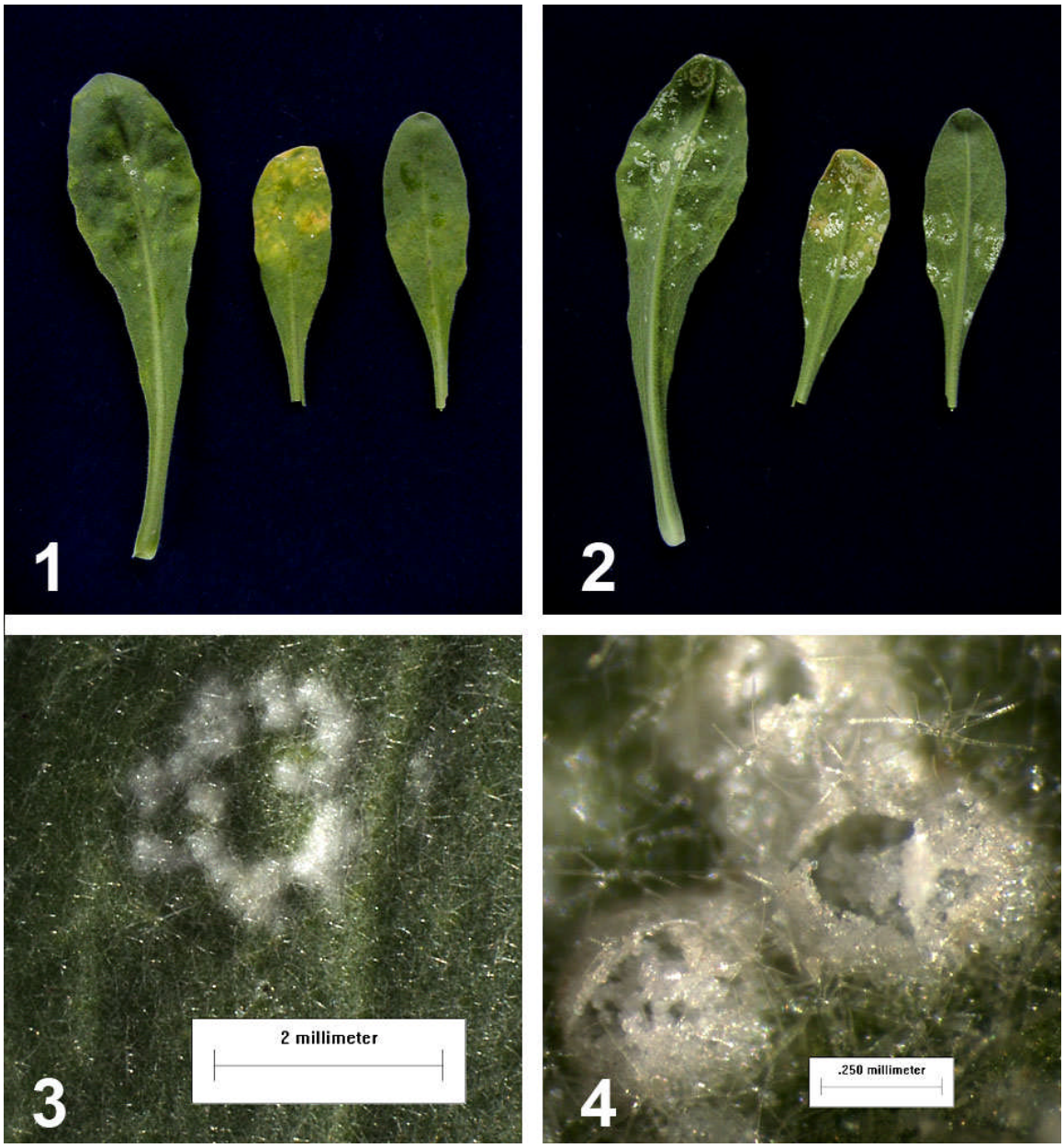
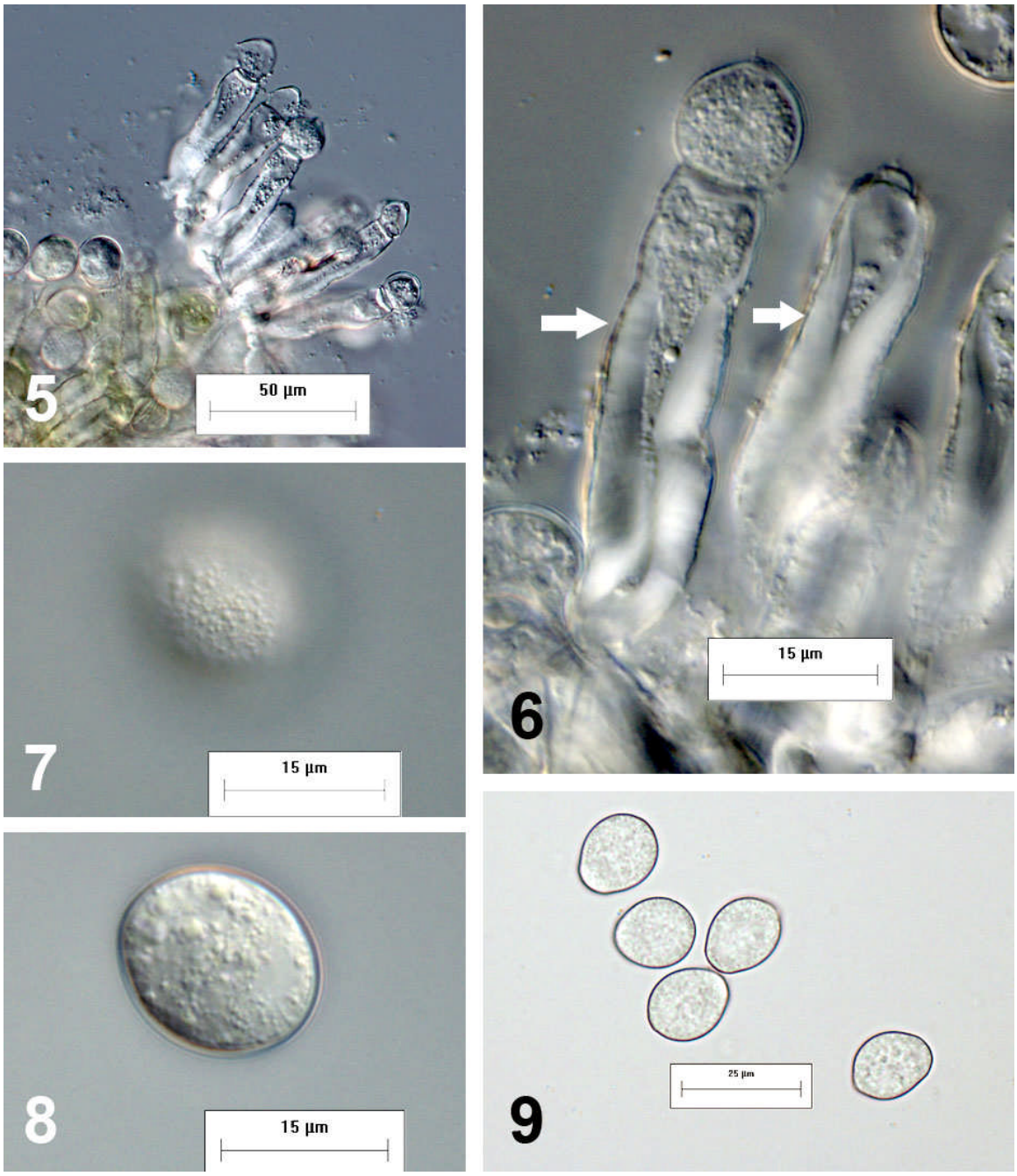



Figs. 1-4. *Albugo candida* on *Aurinia saxatilis*. Fig. 1. Symptoms and signs on adaxial leaf surfaces. Fig. 2. Symptoms and signs on abaxial surfaces of leaves shown in Fig. 1. Fig. 3. Group of developing sori. Bar = 2 mm. Fig. 4. Sori that have ruptured to release sporangia. Bar = 0.25 mm.




Figs. 5-9. *Albugo candida*. Fig. 5. Sporangiophores. Bar = 50 µm. Fig. 6. Sporangiophores; note wall thickings (arrows). Bar = 15 µm. Fig. 7. Roughened sporangium wall. Bar = 15 µm. Fig. 8. Medial optical section through the sporangium shown in Fig. 7. Bar = 15 µm. Fig. 9. Sporangia. Bar = 25 µm. Figs. 5-8 by differential interference contrast microscopy. Fig. 9 by brightfield microscopy.