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# plant disease

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## DISEASE NOTES

### First Report of *Puccinia thaliae* Causing Rust on *Canna* spp. in Europe

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## ABSTRACT

In August and September 2015, rust symptoms were observed on naturalized *Canna indica* L. plants near Faial da Terra and Feteira villages on São Miguel Island in the Azores archipelago and also on *Canna × hybrida* plants in a garden at Funchal in Madeira Island, both in Portugal. No rust symptoms were detected in canna on the Portuguese mainland. Disease symptoms were observed on both leaf surfaces, with orange-yellow pustules frequently uniformly covering the entire surface. Infection spots became necrotic with time, and many small holes (3 to 5 mm diameter) developed on older leaves as a result of such necroses. At the Azores, disease incidence was high, with most plants exhibiting disease symptoms, and severity was mostly high, with the surface of many leaves in each plant covered with spore masses. At Madeira, incidence was low, with only a few plants showing symptoms, but severity was moderate, with some leaves per plant exhibiting partial or nearly total coverage by pustules. Microscopic examination of pustules revealed the presence of urediniospores and teliospores. Urediniospores were subglobose, ovoid or piriform, echinulate, 25 to 37 × 18 to 27 μm, with two equatorial pores. Teliospores were clavate to cylindrical, with rounded apex, frequently slightly constricted at the sept, pale-brown, 43 to 67 × 15 to 18 μm, with a short pedicel, matching the description of *Puccinia thaliae* Dietel (Sivanesan 1970). Infected plant material was stored in the fungal collection of the João de Carvalho e Vasconcelos herbarium (LISI-Fungi) under Accession Nos. LISI-

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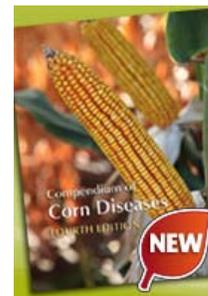
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Fungi-00049 and LISI-Fungi-00057 (for Azores and Madeira material, respectively). For the fulfillment of Koch's postulates, the lower leaf surface of healthy *Canna* × *hybrida* plants was inoculated by rubbing a piece of an infected leaf with sporulating urediniospore masses. Inoculated plants were sprayed with sterile water, maintained in a wet chamber under darkness for 24 h at approximately 20°C, and left under glasshouse conditions until appearance of symptoms. Chloroses were visible one week after inoculation and uredinia were observed 15 to 18 days after inoculation. Symptoms and the morphology of urediniospores were similar to those observed in field infections. *Canna* is a monocotyledonous genus in the family Cannaceae originating from tropical and subtropical regions of America, with several species naturalized in other parts of the world including regions of temperate climate. Plants of *Canna* × *hybrida* are popular garden ornamentals in many parts of the world, regarded by horticulturalists as easy to cultivate and virtually disease-free. *Canna* rust has been reported from different areas of the Americas (Brito and Garrido 2011; Kaur et al. 2011) but also in Australasia (Jeeva et al. 2003; Neo and Tham 2009). This represents the first report of this disease in Portugal and in Europe, raising concern for its dissemination into European and North African *Canna*.



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Section:

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