



First report of *Chrysomyxa ledicola* attacking spruce (*Picea* spp.) in Greenland

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Small conifer plantations have been established in the Tasermiut, Igaliko and Tunulliarfik fjord regions of South Greenland. In August 2019 spruce trees in an extensive area in a plantation in Kuusuaq (Tasermiut) showed symptoms resembling those of spruce needle rust. The plantation (60° 16' N, 44° 43' W) was established from 1960 onwards and covers an area of 5.5 ha with mainly *Picea glauca*, *Picea × lutzii*, *Pinus contorta* and *Larix sibirica* partly mixed, partly planted in blocks/rows.

The infection was observed primarily on *Picea × lutzii* (progeny from a hybrid swarm on the Kenai Peninsula, Alaska). Symptoms included yellowing of the current year's needles, entire branch systems turning yellow to whitish, and needles being covered by aecia with white papery fracturing peridia (Fig. 1). Minor infection was observed on *P. glauca* with scattered shoots showing symptoms. The most prominent attacks were observed where *P. × lutzii* was planted in blocks, and in particular where the alternate host *Rhododendron groenlandicum* (bog Labrador tea) was growing in dense stands amongst the trees. Here, almost all *P. lutzii* (an area of 1 ha in total) were showing symptoms, even to the tops of the trees (Fig. 2).

The pathogen responsible was identified as *Chrysomyxa ledicola* based on morphological characteristics of the aeciospores: bright orange, globose, 22-30 µm wide, up to 50 µm long, with a thick hyaline and heavily sculptured wall. The identification was confirmed by ITS rDNA sequence analysis performed by CABI (Surrey, UK). A sample of the collected material was deposited in herbarium C at the University of Copenhagen.

To our knowledge, this is the first record of *C. ledicola* attacking *Picea* in Greenland. The fungus has, however, previously been observed on *R. groenlandicum* in Greenland (pers. obs., 1976) in the absence of *Picea* spp. Furthermore, this is the first report of this pathogen infecting *P. × lutzii*. The record is remarkable because of the extent of the observed attack. Widespread infections of *Picea* spp. are known from Canada and Alaska (Yukon Forest Health, 2009; Mulvey, 2019). In North America, infection rarely causes mortality but repeated infections may impair growth. It should be noticed that heavy infections of *Picea* in North America generally do not

occur at a distance of more than 300 m from bog Labrador tea (Hennon, 2001).

In South Greenland, *P. × lutzii* is considered one of the best adapted conifers, growing vigorously in several plantations, and hence one of the most promising types for forest plantations in Greenland (Normand *et al.*, 2013). Therefore, the present record of spruce needle rust should be considered when planning future forest plantations in South Greenland.

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Figure 1

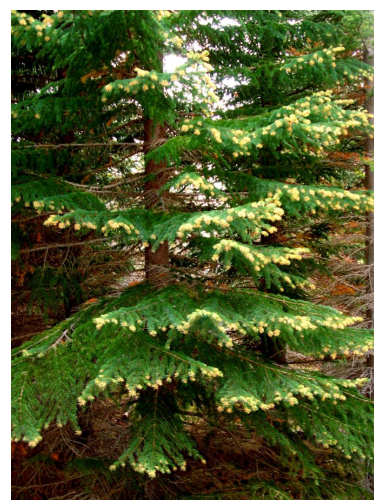


Figure 2

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