New Disease Reports

First report of *Sphaeropsis sapinea* on Scots pine (*Pinus sylvestris*) and Austrian pine (*P. nigra*) in Sweden

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In January 2013, an infected *Pinus sylvestris* cone was detected in Fjällnora (central Sweden: 59° 50' 0.05" N, 17° 54' 46.19" E). The cone displayed abundant pycnidia on the scales (Fig. 1). Conidia, 30-37 µm x 12-15 µm, were dark-brown, subglobose, mostly non-septate, although septate and even triseptate conidia were observed. These characteristics matched well with those reported for *Sphaeropsis sapinea* (syn. *Diploidia pinea*) (Punithalingam & Waterston, 1970). Single spore isolates were grown on 2% malt extract agar (MEA) with chloramphenicol (200 mg/l). Cultures on MEA were initially white with profuse aerial mycelia that after one week turned grey to blackish. DNA was extracted with a regular CTAB protocol (3%) from cultures and scales, and amplified by PCR using specific primers of both *D. pinea* and *D. scrobiculata* (Smith & Stanosz, 2006). Only the *D. pinea* primers gave positive results amplifying a product of 700 bp in all cases. *S. sapinea* was later also found causing tip blight (Figs. 2, 3) on three Austrian pines (*P. nigra*) in Alnarp (southern Sweden: 55° 39' N, 13° 5' E) as well as infection on cone scales. Isolations showed the same morphological characters while PCR revealed the same diagnostic 700 bp band as the samples retrieved from *P. sylvestris*. A total of 60 isolates were deposited in the Department of Forest Mycology and Plant Pathology collection under the codes DP1-60. Pathogenicity tests were run and Koch's postulates fulfilled by inoculating six two-year-old *P. sylvestris* seedlings with a 1 cm agar plug from a two-week-old culture of DP1 growing on MEA at an incision made in the seedling tip. After three weeks, shoot necrosis was observed on average 3 cm beyond the infection point of all inoculated seedlings (Fig. 4b) from where *S. sapinea* was re-isolated. Control plants, inoculated only with MEA plugs, remained healthy (Fig. 4a).

This is the first report of *S. sapinea* affecting forest pines in Sweden. The only previous report in Sweden mentioned that the fungus was isolated from nursery stock (Molin *et al*., 1961). However, no data on the species identification procedure or isolates were available from this study. Interestingly, *S. sapinea* has never been definitely identified as causing damage in nurseries in the last 40 years (E. Stenström, P. Barklund, *pers. comm*.). While widespread in Central and Southern Europe, *S. sapinea* has not been reported in neighbouring countries such as Norway or Finland, denoting its observation in Fjällnora as the northernmost report of this pathogen in Europe to date. *S. sapinea* can cause severe damage to stressed pines, especially during drought (Stanosz *et al*., 2001). The prevalence of *S. sapinea* on cones has been linked to high winter temperatures and rainy summers (Fabre *et al*., 2011), conditions that may become more prevalent in Sweden due to the changing climatic conditions. Our observations, together with the recent discovery in Estonia (Hanso & Drenkhan, 2009) support the suggested northward range expansion of this pathogen from southern Europe.

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Figure 1

Figure 2

Figure 3

Figure 4

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