

## Microscopical analyses of cankers on twigs and stems of Norway spruces from the Orlicki Hory (“Adlergebirge”), Czech Republic

Samples from August, 21<sup>st</sup> and 22<sup>nd</sup>, 2000

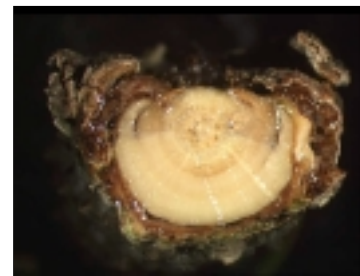
The flora of microfungi was investigated via identification of fruiting structures. Isolation trials were not conducted.

1. Stand no. 815: 730m sea level, spruces 1-2m, some under cover of older trees. Necroses and cankers predominantly from 1999 and 1998. Lower parts of the crowns with frequent dieback of twigs, leader often with older cankers, resin flow, and callus formation. Twigs with high numbers of cankers of variable length with resin flow, cankers more often in the proximal half of the shoots.



Canker, infection from 1998B

Canker on a 1999 year's shoot. Wound callus, resin. A



Canker from 1998:C,D

Dependent on the extension of the cankers outer parts of the shoots either already dead, dying or at least partially or totally defoliated. Twigs sometimes with poorly developed lateral shoots, if the infection dates back to 1998. The highest amount of dieback 1999 with cankers 1998, or cankers 1999 with dead buds 2000.



Pycnostromata of *Phomopsis* sp., visible as narrow slits in the bark: E, F

6 of 16 dying twigs did not show any fructifications of microfungi other than the surface flora of bud scales and the periderm. Another 6 shoots were colonised by pycnostromata of *Phomopsis* sp. (exclusively alpha-conidia).

On 3 shoots pycnidia of *Brunchorstia pinea* were identified. One shoot was damaged by *Dasyneura* sp., a gall midge.

2. Samples from the highest point of Orlicki Mountains

The spruces from the highest elevation of the „Adlergebirge“ are characterised by intense dieback of the lower crown which significantly extends upwards. In addition, these trees reveal a second common symptom: at the level of about 1m50 the stem shows cankers up to 10cm long, some with the wood lying open. Shoots or branches are lacking in this region and the stem is often distorted.

The centre of these wounds is very often marked by a dead twig, which is partially torn off (probably by ice or snow) and which can be interpreted as the place of the primary infection. Sometimes in the uppermost region of the crown branches and twigs are again abundant, showing scattered twig dieback. From the investigated shoots and twigs with primary infections 15 didn't show any fungal fructifications, 7 were colonised by



Conidiomata of *Brunchorstia pinea*. Note the more prominent shape and the dissolving upper half: G, H, I, J, K

*Phomopsis* sp.-pycnostromata only (Alpha-conidia), but on 17 shoots *Brunchorstia pinea* was present. The latter were numerous on the needle bases, from where a reddish necrosis extended into the bark, sometimes they also grew just below the terminal bud.

Rarely tip moths (*Dioryctia* sp.) occurred in the wounds as an additional factor (feces).

Again, the greatest number of cankers on the twigs originated from the end of the 1998 and 1999<sup>th</sup> season. From the two stem cankers investigated one could be dated back to



Canker  
from  
1997L,M



winter 1997/1998.

In this case, there was a reduced production of wood in 1998, but in 1999 and 2000 the wound sealing was much enhanced. The canker on the second stem sample developed in 1996 (infection at the end of 1995). In 1996 and 1997 there was a massive production of wound closing-wood, the wood of 1998 and 1999 is characterised by intense production of resin, the annual wood of 2000 shows a normal structure again.



Canker from 1995:N,O