

FUNGAL DECAY IN HISTORIC STRUCTURES AT SVALBARD

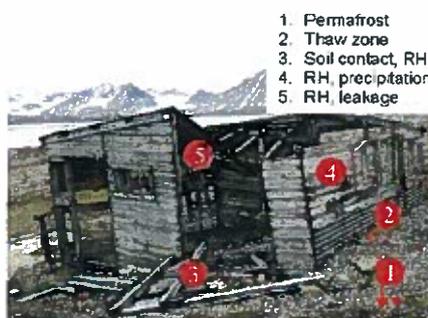
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The cultural heritage at the archipelago of Svalbard represents 400 years of European and North American exploitation of nature. The historic remains from this period are mostly wooden structures spread all over the archipelago. Due to the climate conditions fungal decay in cultural heritage has previously been regarded as a non existing problem at Svalbard. However research during 2002 – 2009 has shown that this is not the case.

During the summer of 2009 we investigated types of damages caused by fungal decay in some 20 historic buildings and structures mainly on the west coast of Spitsbergen. More than 100 samples of decayed wood were collected.



Sites where samples have been collected



Most common risk areas regarding biodeterioration

1. Permafrost
2. Thaw zone
3. Soil contact, RH
4. RH precipitation
5. RH leakage



An old whaler clinging to his coffin, at North-west Svalbard

Results

- The temperatures of the microclimate were strongly correlated to the sun exposure
- The relative humidity may be very high during the summer
- There were an extensive occurrence of wood decaying fungi in the majority of the structures that were exposed for moisture.
- The most common wood-decaying fungi is a brown rot fungi but we also found soft-rot fungi
- The most extensive damages were found in the floor constructions and at the lower parts of external walls
- The 2. most extensive damages occurs nearby leakages through roofs and in areas exposed to periods of extra high relative humidity like crawlspaces.
- Wood in close contact with the permafrost are only rarely decayed by rot fungi

Conclusions

Every building has an individual pattern of appearance and distribution of damages. However there are some characteristic features:

- Most damages have been developed through several years and through a combination of wet soil against the construction and lack of maintenance.
- Local building traditions seems to make favourable conditions for the growth of wood-decaying fungi
- The growth of the fungi is almost as fast as in the temperate climate in the southern part of Norway
- Permafrost slows the decaying processes down
- The dry climate and the rough conditions on the surface of the structures work against the growth of microorganisms. Even so lack of maintenance leads to a great risk for damages



Protected cablecar fundamentals characterize the environment in Longyearbyen



The remains of a trappers hut at Forlandet National Park



The remains of a floor at the Marble city of Ny-London