

Ref.#: Te\_18

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## ABSTRACT

### Radial growth of dwarf shrubs and herbaceous plants in Ebbadalen (central Spitsbergen)

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Global warming observed nowadays causes an increase in geomorphic activity in polar regions. Habitat conditions, in particular water availability and stability of the deposits, have a significant influence on tundra expansion and the rate of shrub succession within newly deglaciated areas.

Dwarf shrubs and herbs growing within an alluvial fan and raised marine terraces in Ebbadalen located in central Spitsbergen, has been selected to assess their dendrochronological potential. The goal of the study was to determine how geomorphic activity affects the lifespan and wood anatomy of most dominant shrub and herb species.

Within the investigated area, microforms differentiated by origin, age, sediment type and stability were selected to analyse the influence of different habitat conditions on longevity of dwarf shrubs of *Salix polaris* and herbs such as *Cerastium arcticum*, *Draba corymbosa*, *Pedicularis hirsuta*, *Erigeron humilis*. Traditional dendrochronological methods were used, including measurements of annual ring widths. Additionally, observations were made to investigate changes in wood anatomy and morphology of annual growth rings of dwarf shrubs indicating mechanical stress caused by geomorphic activity.

The oldest individual of *Salix polaris* was found on remnants of raised marine terraces within the area of the alluvial fan and was at least 78 years old. Severe root injuries caused by cryoturbation, typical for shrubs growing within this habitat, prevent accurate determination of the age of the plant. The oldest perennial plant found in the study was *Draba corymbosa* growing within unstable habitat affected by water erosion and represented the age of more than 30 years. Dwarf shrubs collected from the microsites located within the alluvial fan showed severe changes in wood anatomy such as tension wood, irregular and partially missing rings, multiple scars, and partially injured root.

KEYWORDS: DENDROCHRONOLOGY, HERBCHRONOLOGY, DWARF SHRUBS, HABITAT

CONDITIONS, SPITSBERGEN