



Hvorfor har forskjellige plantearter ulik følsomhet overfor oksidativt stress?

Why do different plant species exhibit differential sensitivity towards oxidative stress?

A wide range of stressors, including ionising radiation, induce formation of reactive oxygen species (ROS), resulting in oxidative stress that may damage vital macromolecules such as DNA, proteins and lipids. While the model plant *Arabidopsis thaliana* is highly resistant towards radiation stress, conifer species such as Norway spruce and Scots pine are highly sensitive (Fig. 1).

We are interested in understanding why these plant species exhibit such different sensitivity to radiation stress. In preliminary studies using transmission electron microscopy (TEM), we have observed that organelle integrity (mitochondria, chloroplasts) is severely impaired in conifer seedlings exposed to ionising radiation in contrast to in *A. thaliana* where the organelles appear undamaged.

In this master project you will investigate organelle functionality in such plants by studies of expression of marker genes of organelle function. In addition, to evaluate differences between the two species in protection mechanisms, antioxidant-related gene expression will be investigated. You will then relate the results of these studies to the degree of oxidative stress by analyses of ROS levels in corresponding plant materials as well as ultrastructural studies of organelles by TEM.

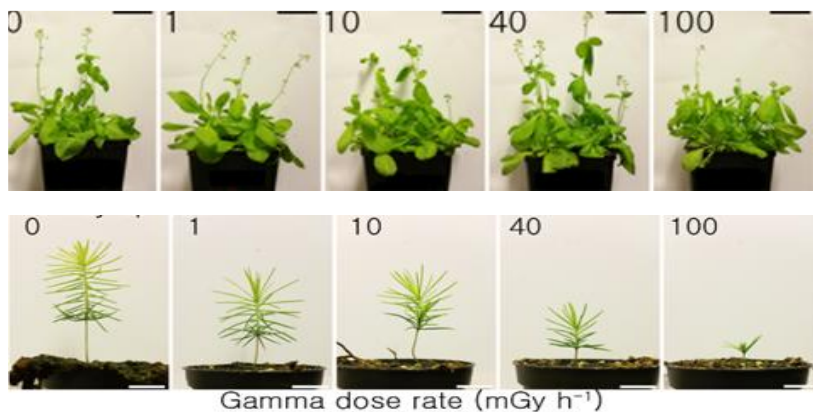


Fig. 1. *Arabidopsis thaliana* and Norway spruce (*Picea abies*) exposed to different dose rates of ionising (gamma) radiation for 6 days.

Subject area (keywords): Plant biology, plant science, molecular cell biology, biotechnology

Language thesis: English or Norwegian

Master thesis

Credits: 30 or 60

Please contact

Jorunn E. Olsen (jorunn.olsen@nmbu.no)

Collaboration with staff of the Centre of environmental radiation (CERAD)