

Studies in the spruce natural, plantation and mixed forests ecosystems in southwestern China and Poland under global climate change contexts (warming and drought) will allow identifying generalities and the underline effects paths of the following research hypothesis:

(1) The difference in soil organic matter quality mediated by the inconsistent community composition of spruce natural, mixed forest and plantation forest will drive all microbial community structure and the abundance of key microbial communities.

(2) The abundance and composition of soil microbial predators (bacterivorous and fungivorous nematodes, omnivorous-predaceous nematodes) will be different between spruce natural, mixed forest and artificial pure forest forest.

(3) Warming, drought and their interaction may lead to changes in the composition, quantity and abundance of the key microbes.

Field simulation experiments of warming, drought and interaction will be set up in the spruce natural, mixed and pure plantation forests in Southwestern China and Poland, respectively. The key bacteria and predators of β -glucosidase will be monitored. The changes in quantity and composition will reveal the rebalancing process of β -glucosidase key microbes-predators trophic cascade. The key factors affecting the key microbes of β -glucosidase will be identified and the technical measures to increase the structural stability of the micro-food webs of plantation forests will be proposed.

This project can provide more materials for the study of plantation forest management in both Poland and China. Further, it can promote the construction of ecological disciplines for both sides. It will provide a new perspective for Polish partner to understand forest management from the perspective of underground ecology. Moreover, it will provide more opportunities for Polish and Chinese researchers to carry out series of scientific investigation on the changes in biodiversity in forest ecosystems under future climate change.