Copepods of the genus *Calanus* are small free floating crustaceans that are regarded as the key components of zooplankton in the Arctic and Atlantic waters. Due to their high calorific content they are responsible for the sustainability of large stocks of fish, birds, and sea mammals in the Arctic region. Although particular *Calanus* species are morphologically very similar, they have different life cycle strategies and roles in the ecosystems. The proper recognition between two sibling species, *C. finmarchicus* and *C. glacialis* is still a matter of debate and it is definitely not just a matter of taxonomical curiosity, but it is a principal ecological difference if one or the other species prevail in the ecosystem. These two species, due to their various life history strategies and different centres of distribution are highly valued as great biological indicators of the hydrographical-ecological regimes and consequently of the effects of the ongoing climatic changes. However, due to problems with proper *Calanus* species identification the knowledge about their ecological plasticity and functioning in various oceanic conditions is still very limited.

The aim of the project is to verify the actual differences between *C. finmarchicus* and *C. glacialis* with regard to their morphology, genetics and ecological plasticity. All these will be tested both in the waters from each particular species originate from (the Atlantic domain of the Polar Front in the case of *C. finmarchicus* and the Arctic domain of the Polar Front in the case of *C. glacialis*) as well as in the waters in which they coexist (inside Hornsund fjord, Spitsbergen). Our hypothesis is that the studied species' traits (e.g. size, pigmentation, population demography, lipid content, diet) will differ depending on the fact if particular species (*C. finmarchicus* versus *C. glacialis*) inhabit the preferable water mass or exist in suboptimal conditions (due to temperature, competition).

It is the first study to incorporate so many aspects (various species identification methods and crucial traits of life history strategies) in order to improve our taxonomical and ecological species recognition, which is regarded as the main prerequisite for predicting future ecosystem shifts in northern hemisphere. Species identification will be validated by incorporating all known species recognition methods, i.e. size measurements, detailed analysis of the curvature of the inner edge of the fifth pair of swimming legs, red pigmentation, molecular tools).The proper identification of species will be then related to their life strategies and ecological plasticity traits, i.e. population demography, gonad maturation, lipid storage and utilisation strategies and diet.

If we are to understand the actual and to predict the future functionality of north polar marine ecosystems, we definitely need to identify the key species properly and to know the ecological consequences of their appearance. Consequently, we will provide new, ground truth data for better understating of particular *Calanus* species ecological plasticity, which has great implications for the functioning of the whole Arctic ecosystems affected by the climate oscillations.