



## Wolf spiders as biomonitors of mining derived contamination in Arctic ecosystems

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The emission and spread of global contaminants such as Pb, Cd, Hg, U and rare earth elements (REE) are of high global concern as they pose a serious health risk to humans and wildlife alike. Although the Arctic is a known hot-spot for deposition of globally transported organic and inorganic contaminants, Greenland is often viewed as pristine with little influence of local emission sources. This perception is, however, flawed as Greenland hosts numerous former, active and prospected mining activities, many of which have a profound adverse impact on the surrounding environment. Detailed monitoring before, during, and after mining activities is thus essential to evaluate the environmental health status of a mining area and to minimize the potential spread of mining derived contaminants.

Arthropods constitute the majority of the terrestrial Arctic species diversity, which facilitates sampling for environmental assessment. With documented abilities to accumulate contaminant metals (e.g. Cd, Ag, Hg), we show that spiders play a key role in bioaccumulation and biomagnification processes. Acting as both predator and prey, and by linking food webs in the aquatic to the terrestrial environment, spiders can enable a continued transfer of contaminants up the food chain. Moreover, and because arthropods are an important food source for migrating birds, there is a strong potential for a further geographical spread of contaminants. However, the extent to which contaminant bioaccumulation occurs in Arctic spiders, and their role in global contaminant cycles, remain unclear.

The aim of this project and presentation is to examine the use of wolf spiders (e.g. *P. glacialis*, *P. furcifera* and *P. hyperborea*) as biomonitors of metal and radiogenic contamination near Arctic mine sites. Particular focus will be given to the globally prioritized elements Pb and Hg (incl. isotopic signatures), as well as contaminants of local concern such as U (incl. decay series) and REEs. Further, we discuss the role of spiders in local- to global contaminant cycles by linking the contamination transfer through onsite food webs to location data from migrating birds (e.g. GPS-trackers). Combining contamination- and location-data will allow us to model movement of biota, and inherent mining derived contamination, to and from arctic ecosystems on an annual basis.