Mercury levels and effects in marine pelagic food webs from Svalbard

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Introduction
Mercury (Hg) pollution still constitutes a serious problem both in local and global perspectives. Mercury emitted to the atmosphere in industrial areas enters the global wind systems, and may be transported to the Arctic. There is evidence that levels of Hg in arctic biota have been increasing over the last decades¹. This might be related to the high deposition of reactive Hg-II from the atmosphere during the Arctic spring (March-May)². Both organic and inorganic Hg may enter the food chain and accumulate to possible adverse concentrations in animals by the process of biomagnification.

Methods
During the field season of 2007 sampling was carried out in May, July and October. Zooplankton were collected from two stations in Kongsfjorden using WP3 and MK-nets. Fish were caught in ground nets and by trawling. Birds were hunted near Ny-Ålesund. In 2008 and 2009 sampling will be carried out in July from the same stations in Kongsfjorden, and in addition one station in Rjpfjorden.

Analysis of inorganic mercury and other metals will be done by High Resolution ICP-MS. Methyl mercury will be determined by cysteine extraction followed by HPLC ICP-MS at NILU, Kjeller. Stable isotopes will be analyzed at the Institute of Energy Technology (IFE) in Kjeller.

Aim of study

• Establish basal levels of annual and seasonal variation in mercury uptake and transport in arctic marine food webs.

• Is there a link between high deposition of atmospheric mercury during arctic spring and mercury levels in biota?

• Determine how mercury exposure affects individuals of selected species at the molecular level.

• Validate molecular responses as possible biomarker for mercury exposure.

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Biological analysis: Magnus Brunvoll Kongsrud.

References
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