



Arctic BIOSCAN: Survey of an Arctic Arthropod Community and Implications for Future Monitoring

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A **pilot survey** of terrestrial arthropod communities in Nunavut has evaluated the efficiency of several standard collecting methods in the Canadian Arctic and has begun to gather important baseline biodiversity data.

“Arthropod communities are projected to have a cascade effect on critical ecosystem parameters, such as decomposition, nutrient cycling, and primary productivity,” said Mikko Pentinsaari, lead author of the study. “Monitoring insect diversity is essential for documenting changes in community structures and to detect the arrival of new species, and even disease vectors.”

The 2018 study employed DNA barcoding – an approach that uses standardized short DNA markers to assess the species-level identity of organisms and to cluster them into genetic species proxies, known as Barcode Index Numbers, or BINs. The six-week survey completed in the summer of 2018 documented 1264 arthropod BINs in the vicinity of Ekaluktutiak (Cambridge Bay), Victoria Island, Nunavut – an impressive figure for the middle arctic tundra bioclimatic zone.

Baseline data are a fundamental requirement for monitoring Arctic ecosystem health; yet, there is also significant need for accurate, cost-effective, and ongoing methods for biodiversity monitoring in regions such as the Arctic. This survey combined multiple arthropod collecting methods with DNA barcoding to identify optimal sampling techniques that would be feasible for community-based monitoring, while still providing a good representation of the overall arthropod diversity. The results show a potential way to overcome many logistic and taxonomic obstacles typically faced by Arctic researchers and to scale up monitoring coverage with reasonable effort.

Building on this successful ground work, the Arctic BIOSCAN (ARCBIO) project was launched in the end of 2018. Funded by Polar Knowledge Canada (POLAR) and led by the Centre for Biodiversity Genomics (CBG) at the University of Guelph, ARCBIO completed its first field season last summer, focusing its research activities in the area in and around the hamlets of Ekaluktutiak and Kugluktuk. Collected materials from terrestrial, marine, and freshwater environments are currently being DNA barcoded.

“The goal of our project is to create a reference library of Arctic species, therefore we wanted to cover the maximum amount of diversity with our sampling,” said Alex Borisenko, ARCBIO’s project manager. The data collected by ARCBIO researchers contribute to an online database called BOLD and are made publicly available.

ARCBIO is the flagship project for the global BIOSCAN research program, which has brought together researchers and organizations from more than 30 nations around a worldwide effort to track biodiversity in 2,000 sites across the planet.

Source: [International Barcode of Life](#)



Mikko Pentinsaari conducting fieldwork in the Arctic. Photo courtesy of the CBG.

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