



Effects of assortative mate choice on the genomic and morphological structure of a hybrid zone between two bird subspecies.

<https://arctichealth.org/en/permalink/ahliterature289901>

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Keywords: Animals
Biological Evolution
Feathers
Genetic markers
Genetics, Population
Hybridization, Genetic
Kazakhstan
Mating Preference, Animal
Models, Genetic
Passeriformes - genetics
Phenotype
Polymorphism, Single Nucleotide
Reproductive Isolation
Selection, Genetic
Siberia
Uzbekistan

Abstract:

Phenotypic differentiation plays an important role in the formation and maintenance of reproductive barriers. In some cases, variation in a few key aspects of phenotype can promote and maintain divergence; hence, the identification of these traits and their associations with patterns of genomic divergence is crucial for understanding the patterns and processes of population differentiation. We studied hybridization between the *alba* and *personata* subspecies of the white wagtail (*Motacilla alba*), and quantified divergence and introgression of multiple morphological traits and 19,437 SNP loci on a 3,000 km transect. Our goal was to identify traits that may contribute to reproductive barriers and to assess how variation in these traits corresponds to patterns of genome-wide divergence. Variation in only one trait-head plumage patterning—was consistent with reproductive isolation. Transitions in head plumage were steep and occurred over otherwise morphologically and genetically homogeneous populations, whereas cline centres for other traits and genomic ancestry were displaced over 100 km from the head cline. Field observational data show that social pairs mated assortatively by head plumage, suggesting that these phenotypes are maintained by divergent mating preferences. In contrast, variation in all other traits and genetic markers could be explained by neutral diffusion, although weak ecological selection cannot be ruled out. Our results emphasize that assortative mating may maintain phenotypic differences independent of other processes shaping genome-wide variation, consistent with other recent findings that raise questions about the relative importance of mate choice, ecological selection and selectively neutral processes for divergent evolution.

PubMed ID:

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Demographic inference from whole-genome and RAD sequencing data suggests alternating human impacts on goose populations since the last ice age.

<https://arctichealth.org/en/permalink/ahliterature289902>

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Keywords: Agriculture
Animals
Conservation of Natural Resources
Denmark
Ecosystem
Geese - genetics
Genetics, Population
Human Activities
Humans
Iceland
Polymorphism, Single Nucleotide
Population Density
Population Dynamics
Svalbard

Abstract: We investigated how population changes and fluctuations in the pink-footed goose might have been affected by climatic and anthropogenic factors. First, genomic data confirmed the existence of two separate populations: western (Iceland) and eastern (Svalbard/Denmark). Second, demographic inference suggests that the species survived the last glacial period as a single ancestral population with a low population size (100-1,000 individuals) that split into the current populations at the end of the last glacial maximum with Iceland being the most plausible glacial refuge. While population changes during the last glaciation were clearly environmental, we hypothesize that more recent demographic changes are human-related: (1) the inferred population increase in the Neolithic is due to deforestation to establish new lands for agriculture, increasing available habitat for pink-footed geese, (2) the decline inferred during the Middle Ages is due to human persecution, and (3) improved protection explains the increasing demographic trends during the 20th century. Our results suggest both environmental (during glacial cycles) and anthropogenic effects (more recent) can be a threat to species survival.

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Association between Weight Change and Mortality in Community Living Older People Followed for Up to 14 Years. The Hordaland Health Study (HUSK).

<https://arctichealth.org/en/permalink/ahliterature289903>

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Publication Type: Journal Article

Keywords: Aged
Body Weight - physiology
Cohort Studies
Community Medicine
Female
Humans
Male
Mortality
Norway
Prospective Studies
Time Factors
Weight Gain

Abstract: To study the importance of weight change with regard to mortality in older people.
Prospective cohort study.
The cohort includes participants in the Hordaland Health Study, Norway, 1997-99 (N=2935, age 71-74 years) who had previously participated in a survey in 1992-93.
Participants with weight measured at both surveys were followed for mortality through 2012. Cox proportional hazards models were used to calculate risk of death according to changes in weight. Hazard ratios (HR) with 95% confidence intervals (CIs) for people with stable weight (± 3 kg were significantly associated with increased risk of mortality. Thus, weight should be routinely measured in older adults.

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Rare earth elements in freshwater, marine, and terrestrial ecosystems in the eastern Canadian Arctic.

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Publication Type: Journal Article

Keywords: Animals
Arctic Regions
Canada
Carbon Isotopes - analysis
Ecosystem
Environmental Monitoring - methods
Environmental Pollutants - analysis
Food chain
Fresh Water - chemistry
Geologic Sediments - chemistry
Metals, Rare Earth - analysis
Mining
Nitrogen Isotopes - analysis
Seawater - chemistry

Abstract: Few ecotoxicological studies exist for rare earth elements (REEs), particularly field-based studies on their bioaccumulation and food web dynamics. REE mining has led to significant environmental impacts in several countries (China, Brazil, U.S.), yet little is known about the fate and transport of these contaminants of emerging concern. Northern ecosystems are potentially vulnerable to REE enrichment from prospective mining projects at high latitudes. To understand how REEs behave in remote northern food webs, we measured REE concentrations and carbon and nitrogen stable isotope ratios ($\delta^{15}\text{N}$, $\delta^{13}\text{C}$) in biota from marine, freshwater, and terrestrial ecosystems of the eastern Canadian Arctic (N = 339). Wildlife harvesting and tissue sampling was partly conducted by local hunters through a community-based monitoring project. Results show that REEs generally follow a coherent bioaccumulation pattern for sample tissues, with some anomalies for redox-sensitive elements (Ce, Eu). Highest REE concentrations were found at low trophic levels, especially in vegetation and aquatic invertebrates. Terrestrial herbivores, ringed seal, and fish had low total REE levels in muscle tissue (?REE for 15 elements

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Norwegian study on microbial source tracking for water quality control and pollution removal in constructed wetland treating catchment run-off.

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Language: English

Publication Type: Journal Article

Keywords: Bacteria - classification - isolation & purification
Environmental monitoring
Feces - microbiology
Humans
Norway
Quality Control
Water - analysis
Water Microbiology
Water Pollution - analysis
Water Quality
Wetlands

Abstract: This study describes the first Norwegian microbial source tracking (MST) approach for water quality control and pollution removal from catchment run-off in a nature-based treatment system (NBTS) with a constructed wetland. The applied MST tools combined microbial analyses and molecular tests to detect and define the source(s) and dominant origin(s) of faecal water contamination. Faecal indicator bacteria *Escherichia coli* and host-specific Bacteroidales 16 s rRNA gene markers have been employed. The study revealed that the newly developed contribution profiling of faecal origin derived from the Bacteroidales DNA could quantitatively distinguish between human and non-human pollution origins. Further, the outcomes of the MST test have been compared with the results of both physicochemical analyses and tests of pharmaceutical and personal care products (PPCPs). A strong positive correlation was discovered between the human marker and PPCPs. Gabapentin was the most frequently detected compound and it showed the uppermost positive correlation with the human marker. The study demonstrated that the NBTS performs satisfactorily with the removal of *E. coli* but not PPCPs. Interestingly, the presence of PPCPs in the water samples was not correlated with high concentrations of *E. coli*. Neither has the latter an apparent correlation with the human marker.

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Social Environment of Older People during the First Year in Senior Housing and Its Association with Physical Performance.

<https://arctichealth.org/en/permalink/ahliterature289910>

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Publication Type: Journal Article

Keywords: Activities of Daily Living
Aged
Aged, 80 and over
Exercise
Female
Finland
Hand Strength
Housing for the Elderly
Humans
Male
Middle Aged
Social Environment

Abstract: Increasing numbers of older people relocate into senior housing when their physical performance declines. The change in social environment is known to affect their wellbeing, providing both challenges and opportunities, but more information on the relations between social and physical parameters is required. Thus, we elicited perceptions of the social environment of 81 older people (aged 59-93 years, living in northern Finland) and changes in it 3 and 12 months after relocation to senior housing. We also measured their physical performance, then analysed associations between the social and physical variables. Participants reported that they had freedom to do whatever they liked and generally had enough contact with close people (which have recognized importance for older people's wellbeing), but changes in their physical condition limited their social activity. Moreover, their usual walking speed, dominant hand's grip strength and instrumental activities of daily living (IADL) significantly decreased. The pleasantness of the residential community, peer support, constraints on social activity imposed by changes in physical condition, meaningful activity at home and meeting close people all affected these physical performance parameters. Clearly, in addition to assessing physical performance and encouraging regular exercise, the complex interactions among social factors, physical performance and wellbeing should be considered when addressing individuals' needs.

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Source tracing of natural organic matter bound mercury in boreal forest runoff with mercury stable isotopes.

<https://arctichealth.org/en/permalink/ahliterature289911>

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Publication Type: Journal Article

Keywords: Chemical Fractionation
Ecosystem
Environmental Monitoring - methods
Environmental Pollutants - analysis - chemistry
Humic Substances - analysis
Mercury - analysis - chemistry
Mercury Isotopes - analysis
Rivers - chemistry
Soil - chemistry
Sweden
Taiga

Abstract: Terrestrial runoff represents a major source of mercury (Hg) to aquatic ecosystems. In boreal forest catchments, such as the one in northern Sweden studied here, mercury bound to natural organic matter (NOM) represents a large fraction of mercury in the runoff. We present a method to measure Hg stable isotope signatures of colloidal Hg, mainly complexed by high molecular weight or colloidal natural organic matter (NOM) in natural waters based on pre-enrichment by ultrafiltration, followed by freeze-drying and combustion. We report that Hg associated with high molecular weight NOM in the boreal forest runoff has very similar Hg isotope signatures as compared to the organic soil horizons of the catchment area. The mass-independent fractionation (MIF) signatures ($\delta^{199}\text{Hg}$ and $\delta^{200}\text{Hg}$) measured in soils and runoff were in agreement with typical values reported for atmospheric gaseous elemental mercury (Hg^0) and distinctly different from reported Hg isotope signatures in precipitation. We therefore suggest that most Hg in the boreal terrestrial ecosystem originated from the deposition of Hg^0 through foliar uptake rather than precipitation. Using a mixing model we calculated the contribution of soil horizons to the Hg in the runoff. At moderate to high flow runoff conditions, that prevailed during sampling, the uppermost part of the organic horizon (Oe/He) contributed 50-70% of the Hg in the runoff, while the underlying more humified organic Oa/Ha and the mineral soil horizons displayed a lower mobility of Hg. The good agreement of the Hg isotope results with other source tracing approaches using radiocarbon signatures and $\delta^{13}\text{C}$ ratios provides additional support for the strong coupling between Hg and NOM. The exploratory results from this study illustrate the potential of Hg stable isotopes to trace the source of Hg from atmospheric deposition through the terrestrial ecosystem to soil runoff, and provide a basis for more in-depth studies investigating the mobility of Hg in terrestrial ecosystems using Hg isotope signatures.

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Exposure to polybrominated diphenyl ethers and perfluoroalkyl substances in a remote population of Alaska Natives.

<https://arctichealth.org/en/permalink/ahliterature289912>

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Publication Type: Journal Article

Keywords: Alaska Natives

Animals
Diet
Dust - analysis
Environmental Exposure - analysis - statistics & numerical data
Environmental pollutants - blood
Fatty Acids - blood
Fluorocarbons - blood
Food
Halogenated Diphenyl Ethers - analysis - blood
Humans
Islands
Smegmamorpha - metabolism

Abstract: Many Alaska Native communities rely on a traditional marine diet that contains persistent organic pollutants (POPs). The indoor environment is also a source of POPs. Polybrominated diphenyl ethers (PBDEs) and perfluoroalkyl substances (PFASs) are present both in the traditional diet and the home indoor environment. We assessed exposure to PBDEs and PFASs among residents of two remote Alaska Native villages on St. Lawrence Island. Ninespine stickleback (*Pungitius pungitius*) and Alaska blackfish (*Dallia pectoralis*) were used to detect accumulation of these compounds in the local environment. Concentrations of PBDEs and PFASs were measured in dust collected from 49 households on St. Lawrence Island, as well as in blood serum from 85 island residents. Resident ninespine stickleback and Alaska blackfish were used as sentinels to detect accumulation of PBDEs and PFASs in the food web. Serum concentrations of perfluorononanoic acid (PFNA) and perfluoroundecanoic acid (PFUnDA) were elevated, despite low concentrations of PFASs in dust samples. Concentrations of PBDEs in dust and serum were similar to those from the contiguous United States. Statistical associations between dust and serum concentrations are apparent for a small number of PBDEs, suggesting a possible route of exposure. Predominant compounds were similar between human sera and stickleback; however, blackfish accumulated PFASs not found in either stickleback or human sera. Household dust contributes to PBDE exposure, but not PFAS exposure. Elevated concentrations of long chain PFASs in serum are likely due to exposure from traditional foods. The presence of both PFASs and PBDEs in sentinel fish species suggests atmospheric deposition and bioaccumulation, as well as local environmental contamination.

Patient characteristics and cancer prevalence in the Danish cancer patient pathway for patients with serious non-specific symptoms and signs of cancer-A nationwide, population-based cohort study.

<https://arctichealth.org/en/permalink/ahliterature289913>

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Keywords: Aged
Cohort Studies
Denmark - epidemiology
Female
Humans
Logistic Models
Male
Middle Aged
Neoplasms - epidemiology - pathology
Prevalence
Registries

Abstract: A new cancer patient pathway for patients presenting with non-specific signs and symptoms (NSSC-CPP) was implemented nationally in Denmark in 2012. This study aims to describe, on a national level, the characteristics of patients referred to the Danish NSSC-CPP, and to estimate the prevalence and distribution of cancers and other diagnosis in this population.

A population-based cohort study using the Danish national registries, including all patients who completed a diagnostic course through the NSSC-CPP between 2012 and 2015. Cancer prevalence is presented as the percentage of included patients who were diagnosed with cancer after completing a NSSC-CPP diagnostic course. Associations between patient characteristics and cancer diagnosis were estimated in a multivariate logistic regression model.

The mean age of the 23,934 patients included in the analysis was 64.6 years and 47% where male. In total, 11% of all patients received a cancer diagnosis after completing a diagnostic course in the NSSC-CPP; the most common types were breast cancer (18%) hematopoietic and lymphoid tissue cancer (15%), and malignant melanoma (12%). The most common non-cancer diagnosis was non-specific symptoms/observation (54%). Fifty-five patients were diagnosed with cancer within six months following a non-cancer diagnosis in the NSSC-CPP.

The prevalence of cancer in the NSSC-CPP was 11%. The most common cancer diagnosis was breast cancer, hematopoietic and lymphoid cancer and malignant melanoma. A small proportion of patients receiving a non-cancer diagnosis in the NSSC-CPP were diagnosed with cancer in the six months following their NSSC-CPP course.

Plerocercoids of the cestode *Diphylobothrium ditremum* in brown trout *Salmo trutta*: substantial increase in infection after establishment of European minnow *Phoxinus phoxinus*.

<https://arctichealth.org/en/permalink/ahliterature289917>

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Keywords: Animals
Cestoda - growth & development
Cestode Infections - epidemiology - transmission - veterinary
Cyprinidae - parasitology - physiology
Diphylobothrium
Fish Diseases - epidemiology - parasitology - transmission
Host-Parasite Interactions
Introduced species
Lakes
Norway
Seasons
Trout - parasitology - physiology

Abstract: This study focuses on plerocercoids of the cestode *Diphylobothrium ditremum* in brown trout *Salmo trutta* from the subalpine lake Øvre Heimdalsvatn in south-central Norway. *Salmo trutta* was the only fish species in this lake until European minnow *Phoxinus phoxinus* was registered in 1969. The *P. phoxinus* population increased substantially in the following years. In contrast with the 1969-1972 period, when plerocercoids of *D. ditremum* were practically absent in *S. trutta*, there was a high prevalence and intensity of infection in the 2013 *S. trutta* samples. Because the life cycle of *D. ditremum* involves two larval stages, in copepods and salmonids and mature worms in piscivorous birds, such as mergansers and loons, a change in feeding ecology of *S. trutta* or changes in population densities of copepods, fish or birds might have influenced the infection pattern. No relationships between *D. ditremum* infection and muscle-tissue δ15 N signature or Hg concentration were found, indicating that infection is not a result of piscivory or cannibalism. Furthermore, consumption of copepods by *S. trutta* during summer and autumn was low. On the other hand, the number of piscivorous birds has increased, probably due to the presence of *P. phoxinus* as a new and numerous prey. An increased number of final *D. ditremum* hosts may have produced a higher output of cestode eggs, resulting in more infected copepods that in turn are consumed by *S. trutta*. Indirectly, *P. phoxinus* may therefore have caused the observed increased infection in *S. trutta* and thereby imposed further negative effects on *S. trutta* in high mountain areas.

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