

Studies of genetic variation in Arctic species.

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Species inhabiting the Arctic have experienced large environmental changes. Intervals of warm and cold periods during pleistocene have affected their distribution, which has in turn marked their genetic variation, genealogy and population structure, and even led to speciations. New habitats and harsh conditions have furthermore resulted in various adaptations. Genetic studies of several species at high latitudes reflect the patterns of colonization of areas and expansion in population sizes following the last glaciation, and these species are generally characterized by little genetic variation and shallow genealogies. Species inhabiting the high Arctic may have had a different history where some species may even had a wider distribution during the last cold period of iceage. Clear genetic boundaries have been described among groups within several species, or among sibling species. Such groups may have diverged in allopatric refugia, but as a result of population expansion the groups will make a new contact or hybrid zone, depending on the stage of their reproductive isolation. In Europe about 30 such zones have been described where hybridization of different species occurs, and several such areas are known around the Northern hemisphere. In Iceland we may have a hybridization of two gull species. Other hybrid zones, such as found among birch species, may be limited to ecological factors and will not show as clear geographical patterns. Hybridizations among plant species and among freshwater crustaceans is thought to be one cause of changes in ploidy numbers and the high frequency of asexual reproduction together with fixed heterozygosity, often observed in these regions. Marine fishes do not show as clear boundaries, possibly due to high dispersal and lack of geographic boundaries. Studies of molecular geographical patterns of species have been accumulating in the recent years and have added new knowledge about their evolutionary history. I will present some data, mainly from two marine fishspecies, but they have been underrepresented in the studies of the phylogeography of the Arctic.