

Genome sequencing reveals extensive inbreeding in Scandinavian wolves

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Researchers from Uppsala University and others have for the first time determined the full genetic consequences of intense inbreeding in a threatened species. The large-scale genomic study of the Scandinavian

wolf population is reported in *Nature Ecology & Evolution*.

The Scandinavian wolf population was founded in the 1980s by only two individuals. This has subsequently led to intense inbreeding, which is considered a long-term threat to the population. To reveal the genetic consequences of inbreeding, the whole genome of some 100 Scandinavian [wolves](#) has now been analysed.

'Inbreeding has been so extensive that some individuals have entire [chromosomes](#) that completely lack genetic variation', says Hans Ellegren, Professor at the Evolutionary Biology Centre, Uppsala University and leader of the study. 'In such cases identical chromosome copies have been inherited from both parents.'

A surprising discovery was that also some immigrant wolves were partly inbred, and related. This was the case, for example, for two wolves that 2013 were translocated by management authorities from northernmost Sweden, due to conflict with reindeer husbandry, to southern Sweden. This is counter to the often-made assumption of unrelated and non-inbred founders when inbreeding is estimated from pedigrees.

'The degree of inbreeding determined at high precision with genome analysis agreed rather well with inbreeding estimated from established pedigrees', says Hans Ellegren. 'However, for stochastic reasons, some wolves were found to be a bit more, and others a bit less, inbred than estimated from pedigrees.'

Moreover, wolves were generally more inbred than expected from recent mating between relatives in the contemporary [population](#). This is because the two copies of a chromosome in an individual can originate from one and the same ancestor further back in time.

More information: Marty Kardos et al, Genomic consequences of

intensive inbreeding in an isolated wolf population, *Nature Ecology & Evolution* (2017). [DOI: 10.1038/s41559-017-0375-4](https://doi.org/10.1038/s41559-017-0375-4)

Provided by Uppsala University

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