

The chromosomes of reindeer (*Rangifer tarandus*)

Ulla Gripenberg¹, Maija Wessman¹ and Mauri Nieminen²

¹ Department of Genetics, University of Helsinki, Arkadiankatu 7, 00100 Helsinki, Finland

² Finnish Game and Fisheries Research Institute, Koskikatu 33 A, SF-96100 Rovaniemi, Finland

The karyotypes of *Rangifer t. tarandus* L. and *Rangifer t. fennicus* Lönnb. have been established. The chromosomes have been stained by several methods (G-, C-, Q- and R-banding, NOR-staining). The chromosome number is 70, NF is 74. The autosomes consist of 33 acrocentric pairs and one submetacentric pair (no. 34). The sex chromosomes, X and Y, are of giant size. The karyotype is identical in both subspecies (Gripenberg et al. 1984). The largest autosomes (nos. 1 and 2) have tiny satellites; satellite associations are frequently observed in the metaphases.

The idiogram of the reindeer is compared to the idiogram of the moose (*Alces alces*) (Gripenberg et al., in press). Several similarities are found. The chromosome number in the moose is 68 as a consequence of a fusion between two acrocentric chromosomes forming a large new metacentric chromosome (no. 32). NF is 74 as in the reindeer. Many of the reindeer autosomes have G-band patterns identical with the patterns of corresponding moose chromosomes. The most obvious difference between reindeer and moose concerns the amount and distribution of heterochromatin (C-bands). The autosomes of the reindeer have small C-bands; the C-bands of the moose autosomes are large, comprising approximately 40% of the total amount of the chromatin. Heteromorphic C-bands are frequently seen in the moose karyotype. The two largest autosomes of the moose are satellited as the corresponding chromosomes of the reindeer.

The large arms of X and Y chromosomes of the reindeer have huge heterochromatic blocs; in moose the sex chromosomes have insignificant C-bands. The X chromosome of the moose has during evolution developed through an inversion of an originally acrocentric X chromosome. This ancient X chromosome is still present in those cervids with the original karyotype (Neitzel 1982). This X chromosome differs according to its banding pattern decisively from the common mammalian X chromosome. Polymorphic Y chromosomes have furthermore been observed in the moose.

The submetacentric autosomes (no. 34 in the reindeer and no. 33 in the moose) are identical. They lack C-bands. This chromosome originates from a large acrocentric autosome, which has undergone a pericentric inversion.

Satellite DNA has been isolated from the reindeer and moose genomes. *In situ* hybridisation of the cloned DNA fraction is in progress.

References:

- Gripenberg, U., Söderlund, V., Wahlberg, C. & Blomqvist, L.: The banded karyotype of the reindeer, *Rangifer tarandus*. — *The 8th International Chromosome Conference, Lübeck 1983 (Abstract)*.
- Gripenberg, U., Nygren, T., Tommerup, N. & Väinölä, R.: Polymorphism in the karyotype of the moose (*Alces alces*). — *1. Symposium über Wildtiergenetik, Giessen 1985 (In press)*.
- Neitzel, H. 1982: Karyotypenevolution und deren Bedeutung für den Speziationprozess der Cerviden. — *Thesis. Berlin*.