

KARYOLOGY AND AMOUNTS OF NUCLEAR DNA IN *Luzula* L. – A GENUS WITH HOLOKINETIC CHROMOSOMES

EWA DUBAS¹, ELŻBIETA KUTA¹, BORUT BOHANEC², LILIJANA VIZINTIN² and LESŁAW PRZYWARA¹

¹Department of Plant Cytology and Embryology, Jagiellonian University, Grodzka 52, 31-044 Cracow, Poland, ²Biotechnical Faculty, University of Ljubljana, Jamnikarjeva 101, 1000 Ljubljana, Slovenia

The nature of holokinetic chromosomes is specific. They cannot fuse with abnormalities in mitotic divisions, and they also undergo fragmentation without producing acentric fragments. Each holokinetic chromosome fragment behaves as a chromosome, and is not eliminated during the division. Both of these structural chromosome alterations accompanied by polyploidy, aneusomy, and hybridization caused wide numerical and structural chromosome variation within *Luzula* species. Chromosome fusion and fragmentation result in karyotype changes (chromosome number and structure), but not in changes in the amount of DNA.

In *Luzula*, the chromosome length is described using symbols according to Nordenskiöld (1951): AL – standard chromosomes; BL – 1/2 of AL chromosome length; CL – 1/2 of BL chromosome length. In the three species studied: *Luzula luzuloides* ($2n=12AL$), *L. nivea* ($2n = 12AL$) and *L. multiflora* ($2n = 36AL$), the chromosome numbers and karyotype were established in the leaf meristematic tissue. Great intraspecific karyological variability was found, even within one leaf. The range of chromosome number was: $2n=10-14$ in *L. nivea*, $2n=8-24$ in *L. luzuloides*, and $2n=12-84$ in *L. multiflora*. Karyotype analysis revealed that structural chromosome mutations (fragmentation, fusion), along with polyploidy and aneusomy, caused karyological variability. An investigation into nuclear DNA amount was carried out using DAPI and propidium iodide flow cytometry. Nuclear DNA contents measured using DAPI staining ranged from 1.796 to 1.864 (mean 1.818) pg in *L. luzuloides*, 3.124 to 3.271 pg (mean 3.183) in *L. multiflora*, and 1.737 to 1.847 pg (mean 1.8) in *L. nivea*. Variability in DNA amount within a particular plant occurred even within individual leaves. The DNA data obtained seem to confirm karyological variability.