



Abstract

Natural Diversity of Telomeric DNA Sequences in Bryophytes [†]

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Abstract: Telomeres are important specialized nucleoprotein structures at the ends of linear eukaryotic chromosomes involved in protecting DNA from damage. The functional characteristic of telomeres is the length. Changes in telomere structure is of enormous evolutionary importance as they can affect whole-genome stability. However, plants remain a poorly studied group in light of telomere biology. Bryophytes are a prospective plant group for understanding the protection and evolution mechanisms of plant telomeres. The aim of this work was to determine natural variability of telomere lengths in different bryophyte species and ecotypes. We used axenic cultures of moss *Physcomitrium patens* ecotypes (Gransden, Reute, Villersexel, Kaskaskia), moss *Ceratodon purpureus* (male R40 and female GG1), as well as natural isolates *Sphagnum fallax* MW, *S. girgensohnii* and *Sphagnum* sp. The analysis of the telomeres was carried out by the TRF method. It was found that different ecotypes of *P. patens* plants have different telomere lengths ranging from 1000 to 1500 bp. The mean telomere length in a female plant *C. purpureus* was 480–500 bp, and in a male plant 900–1000 bp. The telomere lengths of *S. fallax* MW and *S. girgensohnii* were mean ~2000 bp. However, telomeres were slightly shorter in isolates of *Sphagnum* sp., whose telomere length ranged from 1100 to 1500 bp. In addition, it was found that all studied bryophytes had differences in the location of specific telomeric sequences. Thus, we have shown that the telomere lengths of bryophytes can vary both between species and within one species. Furthermore, interstitial telomeric DNA is a distinguishing characteristic of bryophyte genomes.

Keywords: telomeres; bryophytes; moss; *Physcomitrium patens*; *Ceratodon purpureus*; *Sphagnum*



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