

Complete Chloroplast DNA Sequences of Georgian Endemic Polyploid Wheats

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Abstract : Three types of plasmon (A, B and G) is typical for genus *Triticum*. In polyploid species - *Triticum turgidum* L. and *Triticum aestivum* L. plasmon B is detected. In the forthcoming paper, complete nucleotide sequence of chloroplast DNA of 11 representatives of Georgian wheat polyploid species, carrying plasmon B was determined. Sequencing of chloroplast DNA was performed on an Illumina MiSeq platform. Chloroplast DNA molecules were assembled using the SOAPdenovo computer program. All contigs were aligned to the reference chloroplast genome sequence using BLASTN. For detection of SNPs and Indels and phylogeny tree construction computer programs Mafft and Blast were used. Using *Triticum aestivum* L. subsp. macha (Dekapr. & Menabde) Mackey var. paleocolchicum Dekapr. et Menabde as a reference, 5 SNPs can be identified in chloroplast DNA of Georgian endemic polyploid wheat. The number of noncoding substitutions is 2, coding substitutions - 3. In comparison with reference DNA two - 38 bp and 56 bp inversions were observed in paleocolchicum subspecies. There were six 1 bp indels detected in Georgian polyploid wheats, all of them at microsatellite stretches. The phylogeny tree shows that subspecies macha, carthlicum and paleocolchicum occupy different positions. According to the simplified scheme based on SNP and indel data, the ancestral, female parent of the all studied polyploid wheat is unknown X predecessor, from which four lines were formed. 1 SNP and two inversions (38 bp and 56 bp) caused the formation of subsp. paleocolchicum. Three other lines are macha, durum and carthlicum lines. Macha line is further divided into two sublines (M_1 and M_4). Carthlicum line includes subsp. carthlicum and *T. aestivum* - C_1 - C_2 - A_1. One of the central question of wheat domestication is which people(s) participated in wheat domestication? It is proposed that the predecessors of Georgian peoples (Proto-Kartvelians) must be placed, on the evidence of archaic lexical and toponymic data, in the mountainous regions of the western and central part of the Little Caucasus (the Transcaucasian foothills) at least 4,000 years ago. One of the possibility to explain the 'wheat puzzle' is that Kartvelian speakers brought domesticated wheat species and subspecies from Fertile Crescent further north to South Caucasus.

Keywords : chloroplast DNA, sequencing, SNP, triticum

Conference Title : ICWSR 2019 : International Conference on Wheat Science and Research

Conference Location : Tokyo, Japan

Conference Dates : January 07-08, 2019