2. Summary

While cereals have continuously accompanied man since the rise of early agriculture, as a crucial source of nutrients, the gene pool of cultivated species of cereals has been narrowed throughout to thousands years of cultivation and domestication. Thus, the wild relatives of wheat (*Triticum aestivum* L., $2n = 6x = 42$, AABBDD) are potential sources of genes and their alleles for bread wheat and triticale (×*Triticosecale* Wittmack, $2n = 6x = 42$, AABBRR). Over the recent years, introgression lines of cultivated cereals, encompassing both addition and substitution lines, have become valuable tools for chromosome engineering, allowing the enrichment of the genetic variability of cultivated cereal species by introducing genes, from closely related wild taxa, into the genomes of widely cultivated species.

The continuous evolution of new races of pathogenic fungi *Puccinia triticina* Eriks. and *Puccinia striiformis* f. sp. tritici Westend., causing respectively brown and yellow rusts, is a factor causing a significant decline in global triticale production. Several important genes for resistance to leaf rust and yellow rust have already been introduced into the bread wheat genome by chromosome manipulations, leading to integration of an alien chromatin fragment, carrying desirable genes, into the genome of wheat.

The main goal of this study was to induce the same effect on the 2R chromosome of winter triticale and introduce there, by means of a Robertsonian translocation, the long arm of the $2S^k$ chromosome. The arm, originating from the non-cultivated species of goatgrass - (*Aegilops kotschyi* Boiss), carried two valuable genes of resistance to leaf rust and stripe rust – *Lr54* and *Yr37*, respectively. The substitution line was derived by crossing the nullisomic line 2R (N2R, 2n = 40) with the monosomic addition line of triticale ($MA2S^k$; 2n = 43). Chromosome translocation was obtained by crossing the substitution line of triticale $2S^k(2R)$ with ditelosomic line Dt2RS and Dt2RL (derived from Institute of Plant Genetics PAS Poznan), in which the long and short arms of the 2R chromosomes were in telosomic condition. Introgression plant carrying the chromatin of *Ae. kotschyi* revealed high level of leaf rust resistance, comparing to control samples.