Abstract

The protein disulphide isomerases (PDI), enzymes that catalyse the formation, cleavage and isomerisation of disulphide bonds, are suggested to be involved in regulating the folding and deposition of storage protein bodies in the wheat endosperm, thus potentially playing an important role in influencing grain quality. However, limited information exists on the PDI genes in wheat and their possible roles in this process. Via innovative combinations of various experimental approaches such as exploitation of sequence variations between alleles, RFLPs in cDNAs and genomic copies, and direct isolation of gene fragments, we have characterised the individual PDI genes from the common wheat, *T. aestivum*, the diploid progenitor of its D genome, *Ae. tauschii*, and the tetraploid progenitor of its A and B genomes, *T. turgidum*. Ae. tauschii, durum wheat and common wheat exhibit one, two and three PDI gene(s), respectively, and the additional PDI gene suggested to reside on chromosome 1B, if at all present, appears to be a partial, nonexpressed copy. All genes consist of 10 exons and nine introns, with the *Ae. tauschii* PDI gene showing near complete identity to the corresponding one in common wheat but more limited identity to the A and B genome PDI genes of common wheat and *T. turgidum*, and the two genes of T. turgidum showing higher degrees of conservation with their counterparts in common wheat rather than between themselves. The sequence variations are being employed for mapping of these genes to find their association with any QTLs.