

Are North African Barleys of Type Eastern or Western?

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Abstract: Perhaps the first step in the domestication of barley would have been the development of a tough rachis. Wild barley has complementary genes, *Btr1* and *Btr2*, for the formation of brittle rachis, located on chromosome 3HS. Cultivated barley carries recessive alleles at either of the loci, resulting in non-brittle rachis. 'Occidental type W' (= *btr1Btr2*) is frequent in Europe, Turkey and Ethiopia, whereas 'Oriental type E' (= *Btr1btr2*) is frequent in Japan, Korea, China, Nepal and 'North Africa'. Little is known about the connection between North African cultivars and Asian cultivars. In this study e09m25-08, an AFLP marker tightly linked to the *btr1/btr2* loci (0.21 cM), was converted to an STS, and DNA sequence of a barley BAC selected by the STS was analyzed. Primers were designed at conserved regions that allowed amplifying alleles from all cultivars and wild barley lines. A high-level diversity of DNA sequence of the alleles was observed, and phylogenetic analyses resulted in a distinctive separation of cultivars of type W and type E. Wild barley lines were also clearly separated and merged into the two clades. We developed a co-dominant marker diagnostic to the type W and type E and, using the marker, analyzed about 800 accessions of landraces which were collected mainly in Morocco, Tunisia and Algeria and preserved as germplasm in the Gene Bank of NIAS. Type E shared 84% and type W 16% of the North African accessions, and one accession of an unique haplotype was detected. The materials used in this study were different from those used in the former study by Dr. R. Takahashi (1955). Our study provides support at the molecular level for his theory of geographical difference of distribution of the type E and W cultivars.