

Abstract

Although heterosis has perhaps been exploited to the fullest extent in maize than in any other crops, the molecular basis of this phenomenon still remains largely elusive even in this crop. Maize had long been regarded and studied as a diploid, but recent sequencing and genomic data clearly indicated its polyploidy origin. The intrinsic nature of genetic and epigenetic liability often associated with polyploidy as demonstrated in other plants may bear relevance to novel gene expression pattern, and hence, heterotic phenotypes, in interstrain hybrids of maize, given the exceptionally nonsyntenic property between maize inbred lines. Thus, the new knowledge and understanding of maize as a structurally and functionally diploidized ancient polyploid may promote our understanding on the molecular basis of heterosis in this important crop from a new perspective.