

2. Chromosome arm differences between corn and Tripsacum.

Two cases have appeared where genes on one arm of a corn chromosome correspond to a different Tripsacum chromosome than those from the other arm. These involve the arms of chromosomes 2 and 4. The results from two species of Tripsacum, T. dactyloides and T. floridanum, were identical.

In the case of chromosome 2 of corn, the v₄ locus on the long arm has a dominant counterpart in Tripsacum on a different chromosome than the short arm genes lg₁ gl₂ as well as a third locus, ws₃, tested by Maguire (1962). In our "addition monosomic" (20+1) stocks on lg₁ gl₂ v₄ corn, the extra chromosome from Tripsacum has dominants which covered only lg₁ gl₂ but never v₄ in some stocks, while in other stocks the v₄ locus is covered but never lg₁ gl₂.

Maguire (1962) noted that while the three loci (ws₃, lg₁, gl₂) are on the short arm of a corn chromosome, they are on the long arm of a Tripsacum chromosome. This agrees with our location of the v₄ locus on a different Tripsacum chromosome than the other three genes mentioned. Apparently an ancient removal of all or part of the v₄ locus arm from the original chromosome 2, changed the relative length relationships of its arms in present day Tripsacum, at least in T. dactyloides and T. floridanum.

In the case of chromosome 4 of corn, the su₁ locus on the short arm has a dominant counterpart in Tripsacum on a different chromosome than the gl₃ locus on the long arm. Thus, as in the previous example, the extra chromosome originally from Tripsacum can cover sugary but not glossy-3 whereas a different extra chromosome in other stocks covers glossy-3 but not sugary. Furthermore, the Gl₃^T chromosome of Tripsacum has been observed by Chaganti to be smaller and distinct from the Su₁^T chromosome of Tripsacum.

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3. Gross translocations or fragmentation in Tripsacum chromosomes?

In discussing Tripsacum as a possible ancestor of modern corn, Cutler (Lloydia 10:229-234, 1947) mentions that the chromosome number in present day Tripsacum