

5. Prehistoric maize from the Ica Valley, Peru.

These specimens come from the Los Cerillos site in the Ica Valley on the south coast of Peru which was excavated by Dr. Dwight Wallace, then of the University of California. The maize is estimated to be about 2300-2500 years old. The ears, which are among the oldest and best preserved of any prehistoric corn yet found, have been briefly described by Grobman and Mangelsdorf in MNL, 1959. At that time we thought this maize, because of its predominantly brown pericarp color might be related to the Chapalote race of Mexico. Additional studies recently made suggest that this is probably not true. The majority of the cobs do have kernels with brown pericarp color but in other respects they are quite different from Chapalote. The ears are globular in shape and bear irregular rows of kernels. The cupules are similar to those of the predominating type in the Huaca Prieta site. Staminate tips or the stumps of such tips are rare. Except for its brown pericarp color, which may be the universal "wild" color, this maize is quite different in several respects from any prehistoric maize found in Mexico or the southwestern United States. We conclude that the Los Cerillos maize, like the Huaca Prieta maize, has descended from a different race of wild corn than that found in the Tehuacán caves in Mexico and probably stems from a wild Peruvian maize which also gave rise to the Peruvian highland race, Confite Puneño. The Los Cerillos maize considered with the Huaca Prieta maize suggest that there may once have been at least two wild races of maize, one Mexican and the other Peruvian. There may have been still a third wild race, the ancestor of the pointed-seeded popcorn of the Toluca Valley of Mexico, Polomero Toluqueño.

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6. Meiosis in diploid interspecific hybrids of *Tripsacum*.

Three interspecific hybrids involving *T. floridanum*, *T. dactyloides* and *T. zopilotense* have been studied to obtain data on chromosome synapsis and fertility relationships.

The hybrids of *T. dactyloides* and *T. floridanum* showed an intimate synapsis at pachytene. A minute duplication has been observed in this hybrid by Chaganti (1965). Post pachytene stages were found to be normal. Eighteen bivalents were regularly observed both at diakinesis and metaphase I. Chiasma frequencies obtained at diakinesis showed no significant differences from the parents. The mean chiasma frequency is approximately the same as in the parents (Table 2). The hybrids are vigorous and highly fertile.

The hybrids of *dactyloides-zopilotense* are partially sterile and showed various meiotic abnormalities. The most common phenomenon is intense pycnosis of the nuclei observed at different stages of meiosis. At the pachytene stage in some nuclei, all the chromosomes formed a confluent mass of chromatin material. In others, only a part of the nucleus was affected and the other part showed normal bivalents. In addition to pycnosis, the pachytene chromosomes showed a loose association or more

Table 2

Table showing the frequency distribution of bivalents with different numbers of chiasmata in three diploid ($2n = 36$) species of *Tripsacum* and their inter-specific hybrids (stage of analysis-Diakinesis)

Parents and hybrids	Number of cells analyzed	Bivalents with				Total xta	Average xta per cell	Percentage of stainable pollen
		3 xta	2 xta	1 xma	0 xma			
<u>T. floridanum</u> (Collier Co., Fla.)	30	--	452	88	--	992	33.06	96.6
<u>T. dactyloides</u> (Bussey clone, Manhattan, Kansas)	30	36	425	79	--	1037	34.55	95.3
<u>T. dactyloides</u> x <u>T. floridanum</u> (F_1)	15	--	210	60	--	480	32.00	94.8
<u>T. zopilotense</u> (25101; 65-1218)	30	--	409	131	--	949	31.63	91.3
<u>T. floridanum</u> x <u>T. zopilotense</u> (F_1)	30	--	270	174	96	714	23.8	58.1
<u>T. dactyloides</u> x <u>T. zopilotense</u> (F_1)	30	--	368	109	63	845	28.2	63.2

often a pairing failure. Approximately 30 per cent of the cells suffered from pycnosis and degeneration. At diakinesis all the 18 bivalents were seldom observed. The mean chiasma frequency was found to be lower than in the parents (Table 2).

The hybrids of floridanum-zopilotense are also partially sterile, in fact more sterile than the preceding hybrids (some of the plants never exerted the anthers). At pachytene a minute duplication, a deletion, interlocking and terminal pairing failure have been observed. In none of the diakinetetic nuclei were all the 18 bivalents observed. The data on the various types of associations classified as those with two, one and zero chiasmata are given in Table 2. A maximum of 12 univalents was observed. The most frequent type of association is 14 bivalents and 8 univalents. Lagging chromosomes were observed in both the hybrids.

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