

13. Effect of unequal chromatids on recovery of complementary cross-overs.

Translocations having unequal exchanged pieces and an interstitial segment of appreciable length are being tested for non-random segregation of crossover chromatids.

The first results are with T6-9b (6L.1 - 9S.37) in tests with Y sh Wx gl₁₅. The recovered complementary crossover classes are very unequal in the Wx - gl₁₅, Y - Wx and Wx - gl₁₅ regions.

L. A. Snyder

C. R. Burnham

Those assisting in the above work are: L. L. Inman, O. L. Miller, and P. Yagyü.

MISSOURI BOTANICAL GARDEN
St. Louis 10, Missouri

1. Collection of North American Indian corn.

The collection of corn made by Collins, Kempton, Longley, and others for the Department of Agriculture which formed the basis of Longley's paper on chromosomes of North American Indian corn is now at the Missouri Botanical Garden. While the seed is no longer viable, the ears provide valuable information for people desiring to study the corn.

Hugh Cutler

NATIONAL INSTITUTE OF AGRICULTURAL SCIENCES
Hiratsuka, Japan

1. Characteristics of native races of maize in the orient.

Last year (in the 1956 Land and Crop of Nepal Himalaya 2: 373-530), a comprehensive survey of the morphological characteristics of oriental races was given in which the oriental races were classified into five types. They are (1) North American, (2) European, (3) Caribbean, (4) Persian, and (5) Aegean. This classification has been further re-examined by using other races of different sources from both the cytological and morphological view-points. Some evidence was obtained to support this classification.

Firstly, all of the flint races native to the southeastern region of the orient including Java and Siam were proved to be different from the five types described above, and they are called the "Javanese type". This is an intermediate form between the two types, Caribbean and Persian. In addition, plants in every race of this type are more vigorous than those of the latter two types. They may be described as follows: Plants tall and robust, late in maturity; stalk thick in diameter, with a lot of short internodes; tillers always lacking, but prop-roots prolific; tassels usually covered by upper leaves even when matured; tassel branches slender, delicate, and numerous (about 33 on the average), arising in a wide space on the main axis, and hanging down during anthesis; paired spikelets small and sparsely born in the node, shedding abundant pollen; ear placed very high on the stalk, small in size, conical in shape, light in weight, never exerted from the leaf-sheath during anthesis; row number 12 or 14, having no sterile tip; shank having a ribbed surface and enlarged node; husks few in number and flag leaves usually absent; kernels small in size, light in weight, spherical in shape, and orange in color; denting absent, and quality excellent.

Secondly, a karyotypic analysis of oriental maize of the six types was carried out with respect to difference in the number and position of chromosome knobs at mid-pachynema of meiosis in PMC. The karyotypic comparison is set forth in Table 1, where the abbreviations E, Af, Ad, C, Na, Np, Jv, and Jp correspond to the following types: "European flint" and "North American flint and dent" from northern Japan, "Aegean flint" from northern China and central Nepal, "Persian flint" from central Nepal, "Javanese flint" from Indonesia and "Caribbean flint" from southern Japan, respectively. As can be seen in this table, both the number and position of knob occurrence differ markedly in different types. In number, they are extremely variable ranging from nearly zero (E and Af) to nine (Jp), and their order is the following-- $Jp > Jv \gg Np = Ad > Na = C \gg Af = E$. In position, some striking peculiarities also exist among them. The frequency of occurrence of a particular knob is not related to the overall frequency of knobs in that group. For instance, the average frequency of the terminal knob on the short arm of chromosome 9 is about 0.54 in Af or E, and 0.2 in Jp, although the former has the lowest average number of knobs and the latter has the highest number. The Continental races comprising Np, Na and C show the highest occurrence of knobbed chromosomes 9 in spite of the intermediate number (3 to 5) of total knobs. The Javanese races give an average of 0.3 for chromosome 9 knobs, being intermediate in frequency between the two types, Caribbean and Continental flint.

From these morphological and cytological findings, it may therefore be concluded that the present Javanese type could have arisen through hybridization between races of the Caribbean and Persian flint.

Table 1. Frequency of occurrence of chromosome knobs in 74 maize races.

Type of No. of races	1		2		3		4		5		6		7		8		9		10		Total	
	S	L	S	L	S	L	S	L	S	L	S	L	S	L	S	L	S	L	S	L		
E	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	3
{av.																		0.5	0.5	-	-	1.5
Af	12	-	-	-	-	-	-	-	1	4	-	-	-	3	-	-	-	1.5	7	0.5	-	17
{av.									0.1	0.3	-	-	-	0.3	-	-	-	0.1	0.6	0.1	-	1.3
Ad	5	-	-	-	-	-	1	1	2	7	-	-	-	3	-	-	-	3	1	1	-	25
{av.							0.2	0.2	0.4	1.4	-	-	-	0.6	-	-	-	0.6	0.2	0.2	-	5.0
C	8	1	-	-	-	-	3	-	1	5	-	-	-	1	-	-	-	7	4	3	-	28
{av.		0.1	-	-	-	-	0.4	-	0.1	0.6	-	-	-	0.1	-	-	-	0.9	0.5	0.4	-	3.5
Na	15	-	-	-	-	-	3	-	6	-	-	-	-	11.5	-	-	-	5.5	11	1.5	-	47.5
{av.							0.2	-	0.4	-	-	-	-	0.8	-	-	-	0.4	0.7	0.1	-	3.2
Mp	13	-	-	-	-	-	5	-	10	6	-	-	1	7.5	-	-	-	9	11	2	-	65.5
{av.							0.4	-	0.8	0.5	-	-	0.1	6.0	-	-	-	0.7	0.9	0.2	-	5.0
Jv	6	-	-	-	-	-	5	-	6.5	9	-	-	-	5	-	-	-	7	2	2	-	46.5
{av.							0.8	-	1.1	1.5	-	-	-	0.9	-	-	-	1.2	0.3	0.3	-	7.8
Jp	15	1	2	3	14	-	7	-	12	32	-	-	1	13	-	-	-	25	3	8	-	130
{av.		0.1	0.1	0.2	0.9	-	0.7	-	0.8	2.1	-	-	0.1	0.9	-	-	-	1.7	0.2	0.5	-	8.7