

10. Additional data on chromosome-knob numbers.

Earlier studies by Longley, by Mangelsdorf and Cameron and by Reeves have indicated that diversity with respect to chromosome knobs is highest in the general region of Guatemala and decreases in proportion to distance from this center.

Additional determinations of knob-numbers have been made in maize varieties from Latin-American countries. Two new techniques employed in connection with these studies have proved useful. The first involves crossing the Latin-American varieties with an inbred strain of Wilbur's Flint whose chromosomes are knobless and possess good spreading characteristics. Cytological studies are made in material collected from the F₁ plants in which the knobs are always heterozygous and the spreading qualities usually good. Also it is much easier in these F₁ hybrids, than it is in the Latin-American varieties themselves, to estimate correctly the stage at which meiosis occurs. The delay of one generation in obtaining material for cytological study is more than compensated for by the several advantages gained.

The second technique involves the storage of cytological material at low temperature in a deep freeze. The storage is in 70 percent alcohol at 0°F. or less. The material keeps indefinitely with little or no deterioration. Excellent preparations have been made from material three years in storage.

Table 8. Chromosome-knob numbers in Latin-American maize.

Country	No. Varieties	Knob Number	Knob-number Frequencies												
			0	1	2	3	4	5	6	7	8	9	10	11	12
Mexico	57	4.72	3	4	5	5	8	8	7	4	10	2	1		
Guatemala	7	2.29	2	2	1	1						1			
San Salvador	4	5.75				1	1		1				1		
Honduras	21	6.38			1		3	3	6	1	4	2			1
Nicaragua	14	5.28	1				5	4	1			2	1		
Costa Rica	8	3.50			1	2	5								
Panama	1	5.00						1							
Colombia	43	5.74	1		3	2	3	5	13	7	3	2	2	2	
Ecuador	28	0.78	13	9	5	1									
Peru	75	1.73	30	12	12	4	8	4	5						
Bolivia	27	0.81	14	7	3	3									
Venezuela	14	5.63				4	4	5		1	2	1		2	
Brazil	7	3.71		1	1	1	1	2	1						
Uruguay	1	0.00	1												
Paraguay	4	2.75	1				1	2							
Argentina	1	5.00							1						
Total	317														

Knob numbers have now been determined in one plant each of 317 varieties from 16 different countries. The results which are shown in Table 8 are, with some exceptions, in general agreement with earlier determinations. The maize of Colombia shows a greater diversity than had previously been

recognized. The varieties of Ecuador, Peru and Bolivia are not as preponderantly knobless as previous data had indicated. Many of the varieties from Peru included in these studies and not previously studied came from the Peruvian coast.

It is planned in the near future to summarize all available data on chromosome-knob numbers in maize.

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