Table 1

Amino acid composition of the Himalayan primitive corn variety SP 2 analyzed from defatted whole corn flour (expressed as gm/100gm protein)

Amino acid	SP 2 (Mean of two different samples)	Ganga-3* (After Prakash et al., 1970)	Indiana hybrid 453 (After Mertz et al., 1965)
Aspartic acid	8.52	6.85	6.7
Threonine	3.13	3.16	3.6
Serine	5.25	5.21	4.8
Glutamic acid	22.01	23.29	20.8
Proline	7.21	10.00	10.0
Glycine	2.67	2.67	3.8
Alanine	8.64	9.30	7.9
Valine	5.45	5.36	5.0
Cysteine	1.55	1.84	-
Methionine	1.49	1.49	2.0
Isoleucine	3.72	3.90	4.0
Leucine	14.29	17.24	13.9
Tyrosine	5.04	4.91	4.0
Phenylalanine	5.47	5.40	5.2
Ammonia	2.59	2.30	3.4
Lysine	2.45	1.64	2.8
Histidine	2.49	2.54	3.0
Arginine	3.99	3.26	4.8
Cystine	-	-	1.2
Protein (%)	14.50	10.27	10.5

*Data reported with permission from the authors.

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7. Karyotypic studies on Himalayan primitive varieties of maize.

SP 1 and SP 2, two varieties of maize collected from Sikkim, are known to show some of the most primitive characters associated with this plant (MNL 38:69). The two varieties were studied for their karyotype and the observations are presented on knob forming sites (Fig. 1). The

first observation of interest is that the pachytene chromosomes in SP 1 and SP 2 are somewhat smaller (Table 1) in size than chromosomes of many of the American varieties of maize as reported by Longley (1939). Evidence will be presented in another report which shows that the total DNA content of the Himalayan primitive varieties is more than that in the chromosomes of the evolved varieties of American and Indian distribution. It would, thus, appear that the reduced size of chromosomes in SP 1 and SP 2 is due to a greater degree of condensation, which, however, is not uniform in all the chromosomes.

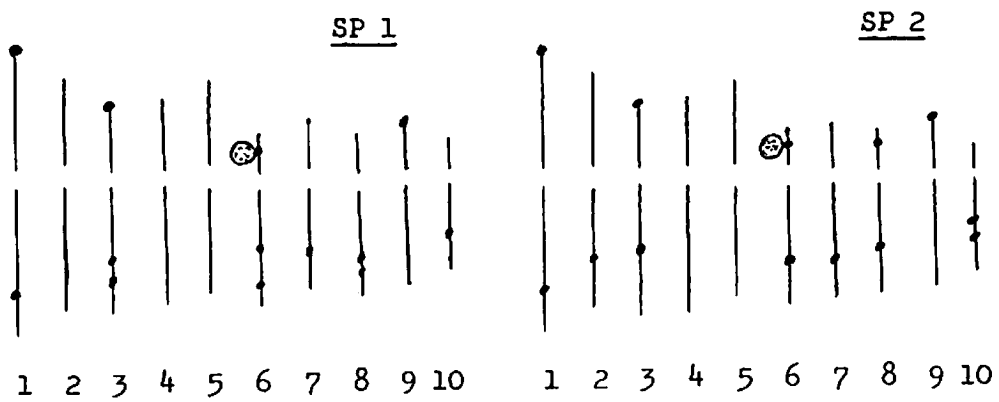

Fig. 1 - Knob sites of Sikkim primitive strains SP 1 and SP 2.

This conclusion is also supported by the observation that the arm ratio of the different chromosomes in the two primitive varieties and the evolved types is almost the same.

A second observation of interest is that while the number of knobs in the chromosomes of the primitive varieties is not very different from that reported in many of the evolved types, the Himalayan primitive varieties show a characteristic position of the knobs in the chromosomes. Thus, four of the knobs 7L, 8S, 8L and 10La, all observed in SP 2, and 10La observed in SP 1, also, appear to indicate new knob forming sites not earlier reported from the extensive observations of a large number of authors on American varieties of maize.

The knobs in the Himalayan primitive varieties SP 1 and SP 2 were found to be larger in size compared to those reported for most of the evolved varieties.

Table 1

Individual chromosome length and arm ratios at mid-pachytene in the Himalayan primitive varieties

Chromosome No.	SP 1		SP 2		Mean data after Longley (1939)	
	Total length (μ)	Arm ratio	Total length (μ)	Arm ratio	Total length (μ)	Arm ratio
1.	61.50	1.19	54.00	1.32	82.40	1.30
2.	48.75	1.26	38.00	1.23	66.50	1.25
3.	48.00	2.08	42.50	2.00	62.00	2.02
4.	53.50	1.60	52.25	1.69	58.78	1.60
5.	43.75	1.17	33.50	1.08	59.82	1.10
6.	36.50	3.18	22.50	2.85	48.73	3.10
7.	33.50	2.53	31.50	2.64	46.78	2.80
8.	44.25	3.07	31.50	3.07	47.48	3.20
9.	33.00	1.89	26.00	2.07	43.24	1.84
10.	24.50	2.73	18.50	2.75	36.93	2.80
Total	427.25		350.25		552.66	

The above observations taken as a whole would suggest that the Himalayan primitive varieties are quite distinct from the present day evolved types in their chromosome structure.

Reference

Longley, A. E. (1939) Knob positions on corn chromosomes. Jour. Agr. Res. 59:475-490.

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