6. Amino acid profile of an Himalayan primitive corn variety SP 2.

An attempt has been made to find whether the amino acid profile of a typical primitive corn variety like SP 2 (a variety from Himalayas) differs from that of the evolved maize. SP 2 corn flour was defatted and 5 mg of kernel protein hydrolyzed at 110°C for 24 hours by refluxing with 20 ml of 6 N HCl. One milligram portions of hydrolyzed protein were placed on the short and long columns of an automatic amino acid analyzer. Norleucine was used as an internal standard. This profile for the variety SP 2 is presented in Table 1. For the sake of comparison, similar observations on whole corn flour of two of the commercial maize hybrids have been included in this Table. These data have been presented by Prakash and his collaborators (Prakash et al., 1970) and Mertz and his associates (Mertz et al., 1965). The results (Table 1) do not show any marked differences between SP 2 and the two evolved types Ganga-3 and Indiana 453, for most of the amino acids. The only observation of some interest is that SP 2 has a higher content of aspartic acid and a lower content of proline compared to the two evolved commercial hybrids. It may be added that the protein content in SP 2 is considerably higher than in the two improved hybrids.

References

Mertz, E. T., O. A. Veron, L. S. Bates and O. E. Nelson (1965) Growth of rats fed on opaque-2 maize. Science 148:1741-1742.

Prakash, V., J. Singh and M. S. Naik (1970) Improvement of amino acid balance of protein of maize and sorghum. Indian J. Genet. 30: In press.

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