

## 7. Morphology and behavior of B chromosomes in *Tripsacum*.

The presence of B chromosomes which has been established in maize (Randolph, 1928; McClintock, 1933) and teosinte (Longley, 1937) is now known to occur also in *Tripsacum*. During the course of study of pachytene chromosome morphology in *Tripsacum* species, a single B chromosome was observed in *T. floridanum*, *T. maizar* and *T. zopilotense*. The B chromosomes of *T. maizar* and *T. floridanum* are as long as the shortest member of the A complement while that in *T. zopilotense* appeared as a small fragment. In their morphology the B chromosomes of *T. floridanum* and *T. maizar* resembled the B chromosomes of maize at the pachytene stage and like those often showed 'fold back' pairing.

The B chromosomes of *T. maizar* and *T. zopilotense* were found to be scattered in the nucleus while the B chromosome of *T. floridanum* often showed a nonhomologous 'association' with the centromere of one of the chromosomes of the regular complement. In all three species the B chromosomes showed a precocious movement to one of the poles while the bivalents of the regular complement were still on the metaphase plate.

One of the characteristic features of the B chromosomes is their nondisjunction at mitosis (Randolph, 1941). In the present study, a variation in the number of B chromosomes was observed in the pollen mother cells of the same plant of *T. zopilotense*. This variation could have come about by nondisjunction of the B chromosomes at the premeiotic mitosis.

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## 8. Pachytene chromosome morphology and meiosis in *Tripsacum maizar*.

The pachytene chromosomes of *T. maizar* are differentiated into proximal heterochromatic and distal euchromatic regions. The heterochromatic regions gradually merge into the distal euchromatic regions. The pachytene chromosomes are characterized by constant and reproducible quantitative features such as their relative lengths, position of the centromere and the arm ratios. Data obtained on these characters showed that the longest chromosome in the complement measures on an average 73.10 microns while the shortest is 13.20 microns long. Chromosomes 2, 5, 6, 11, 16, 17 and 18 have nearly median centromeres while those of chromosomes 4 and 7 are more nearly subterminal and the values for the arm ratios are large. The nucleolus organizing chromosome is assigned the 16th position in the idiogram. The nucleolus organizing body itself is in the long arm near the centromere. Only three knobs have been observed in the complement. Detailed data on the relative lengths, arm ratios and the position of knobs are given in Table 3.

At diakinesis 18 bivalents are regularly observed. Both ring and rod types are found, the former in greater proportion (71.12%). At metaphase I, occasionally a bivalent was replaced by two univalents. These cases were considered to represent precocious terminalization of a chiasma in one of the shorter bivalents since no meiotic abnormalities were found. The rest of the stages of first and second division are normal.

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Table 3  
Table showing the lengths and arm ratios of the 18 chromosomes of T. maizar. (All measurements in microns)

Chromosome number	Total length	Length of the long arm	Length of the short arm	Arm ratio
1	73.10	52.08	20.83	2.5:1.0
2	62.49	36.46	23.96	1.5:1.0
3	58.33	42.71	14.58	2.9:1.0
4	58.08	44.79	10.94	4.1:1.0
5	46.35	27.08	18.23	1.5:1.0
6	41.66	25.52	15.10	1.7:1.0
7	39.06	30.21	7.81	3.9:1.0
8	36.46	24.28	10.42	2.3:1.0
9	35.25	23.96	9.89	2.4:1.0
10	31.25	21.87	7.81	2.8:1.0
11	30.62	15.62	13.02	1.2:1.0
12	26.04	16.67	7.81	2.1:1.0
13	26.04	16.14(K)	7.82	2.0:1.0
14	23.96	16.14(K)	6.25	2.6:1.0
15	23.91	16.67	5.73	2.9:1.0
16	23.44	9.37	7.81	1.2:1.0
17	21.87	11.62	10.09(K)	1.3:1.0
18	13.20	7.92	4.16	1.9:1.0

(K) indicates the presence of a terminal knob in the arm.

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