

A total of 18 discernible bands was obtained in Tama, and the other lines lacked one or two of them. The bands were labelled 1a to 6, with 6 nearest the origin, as shown in Fig. 1. The genotypes (or lines) differed from one another quantitatively rather than qualitatively. Line 1 was characterized by the absence of 1b and 1d. Lines 2 and 3 resembled each other, but line 3 was differentiated by the absence of the 2d band. Line 4 has the 3d band characteristically faint. Both lines 5 and 6 had faint bands at 1b and 1d, but line 6 differed from line 5 in having a strong 2b and faint 2d bands. It was of interest that all the protein bands in line 5 tended to distribute in slower side of column, while in the hybrid of line 5 x Tama the proteins were normally distributed, losing this tendency.

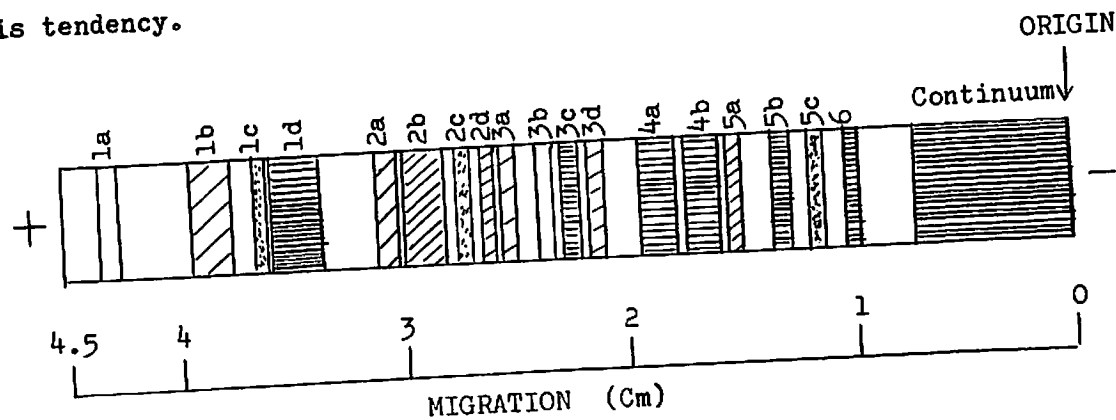


Fig. 1. Idiogrammatic pattern of the protein bands of the Tama embryo.

The minute inspection of protein bands including their qualitative and quantitative nature may reveal molecular relationships between genotypes within species.

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2. Receptivity to gametes in the female inflorescence and the time elapsed from pollination to fertilization in maize.

The female inflorescence in maize loses the ability to receive male gametes if it is maintained intact for a long time without pollination. In the present experiment, H-73, a homozygous diploid line, was

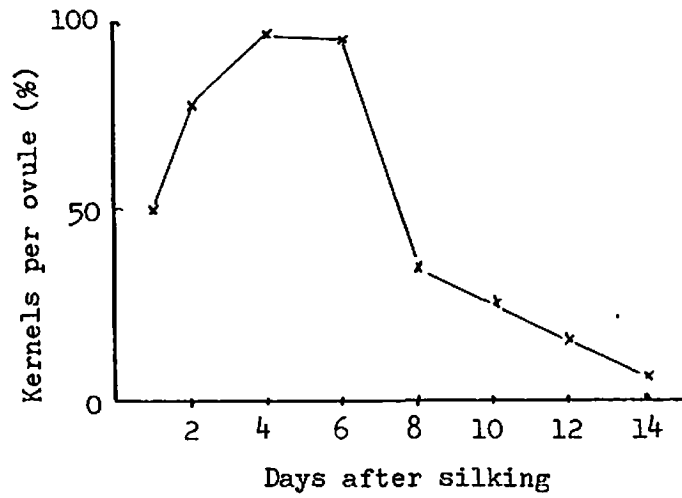


Fig. 1. The time of pollination and the receptivity of female inflorescence.

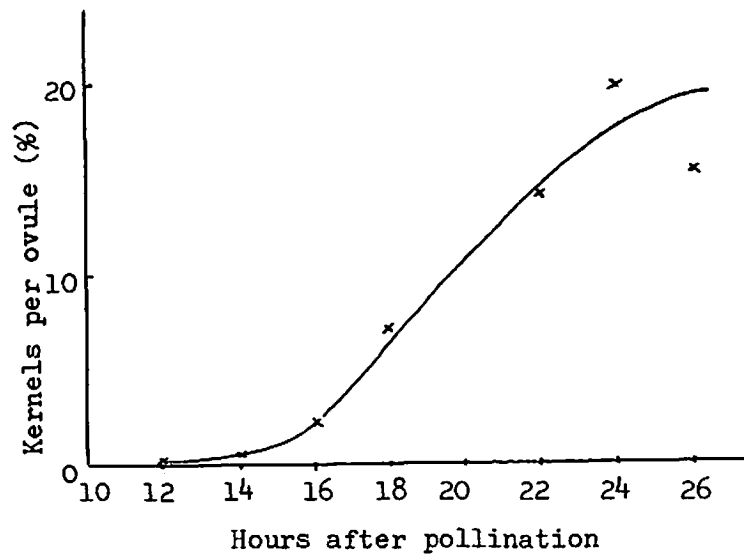


Fig. 2. The time required for fertilization.

used. The silks were cut off together with the uppermost part of the husks at various times after silking and pollinated on the following day. In Fig. 1, the kernels per ovule in percent, which were counted one month after pollination, were plotted against the time of pollination. The figure shows that the kernels per ovule rose until 4 to 6 days after the start of silking, then diminished gradually. The early rise in receptivity coincided with the increase in the number of silks emerged; the kernels usually crowded around the middle part of the cob following early pollination, while the filling of the tip with kernels was achieved by pollination at a rather advanced time. The silks were cut off at 1 cm above the husks and then pollinated. At various times after pollination, the silks were carefully removed from all ovules on the stripped inflorescences; then the inflorescences were wrapped again in husks and paper envelopes. The results were examined one month later. No kernels set on the ears where silks had been removed up to 12 to 16 hours after pollination, while the numbers of kernels increased as the time of removal of silks was prolonged. Since the curve in Fig. 2 roughly coincided with the cumulative frequency curve of silk length, the time necessary from pollination to fertilization may be proportional to the length of the silks.

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3. Mutation frequencies of five endosperm loci induced by u.v. irradiation of maize pollen.

Pollen grains of Tama (inbred flint stock), homozygous for  $\underline{Sh}_1$ ,  $\underline{Bt}_1$ ,  $\underline{O}_2$ ,  $\underline{Su}_1$ , and  $\underline{Wx}_1$ , were irradiated with ultraviolet light from germicidal lamps in a dark room under the following conditions, and stored within black vials placed in a cool environment:

Year	intensity (ergs/mm <sup>2</sup> /sec)	dosage (ergs/mm <sup>2</sup> )
1968	1080	1.8 - 4.5 x 10 <sup>3</sup>

Four recessive tester stocks ( $\underline{la} \underline{su}_1 \underline{Tu} \underline{gl}_3$ ,  $\underline{a}_2 \underline{bm}_1 \underline{bt}_1 \underline{bv} \underline{pr}$ ,  $\underline{o}_2 \underline{v}_5 \underline{ra}_1$ , and  $\underline{c} \underline{sh}_1 \underline{wx}_1 \underline{gl}_{15}$  in genotype, respectively) were pollinated by the irradiated dominant pollen. Immediately after pollination the treated ear was wrapped in aluminum foil for 24 hours, and the pollen was