

1. Fragments at metaphase;
2. Bridges at anaphase;
3. Dicentric chromosomes;
4. Chromatid breaks;
5. Aberrant spindle fiber development.

To enhance the incorporation of BUdR into DNA, in a further experiment FUdR has been combined with BUdR (5 ug/ml + 100 ug/ml, respectively). We are in the process of recording mitotic indices and chromosome aberrations from this experiment.

References

- Djordjevic, B., and W. Szybalski. 1960. *J. Expt. Med.*, 112: 509.
 Engel, W., and W. Wole. 1967. *Mutation Res.*, 4: 353.
 Kit, S., C. Beck, O. L. Graham, and A. Gross. 1958. *Cancer Res.* 18: 598.
 Szybalski, W. 1959. In: *Brookhaven Sym. in Biol.* 12: 75.
 Zakharov, A. F. and N. A. Egolina. 1972. *Chromosoma* 38: 341.

Ram S. Verma

2. Nuclear cycle: a parameter for selection?

During the last five years, we have reported extensive data on the nuclear cycle in 'Seneca 60', chromosome 9 tester, and W23 stocks of Zea mays L. The present report describes the duration of the nuclear cycle and its component phases in KYS. This stock was chosen as an exemplar, late maturity stock to complement 'Seneca 60', and W23 as early and medium maturity material, respectively.

The experiment was conducted at 25°C. Autoradiographs were prepared according to the schedule reported earlier (MGCNL 43: 186-190; 44: 192-195). A minimum of four slides, one root-tip per slide, from each collection period, were coded and scored blindly.

The classification data are presented in Table 1. Employing the proportion method, the nuclear cycle duration and its components were estimated and are presented in Table 2. Table 3 contains the S.D. of the nuclear cycle components. The duration of the nuclear cycle and its component phases of KYS were compared with 'Seneca 60', W23, and the 9 tester stock; it was found that the nuclear cycle in the several stocks was of similar duration.

Table 1

Frequency of labelled and unlabelled nuclei from primary root-tips following pulse labelling (^3H -TdR, 30 min) at 25°C in KYS

Stock	Interphase		Prophase		Metaphase		Anaphase		Telophase	
	Lab.	Unlab.	Lab.	Unlab.	Lab.	Unlab.	Lab.	Unlab.	Lab.	Unlab.
KYS	9093	17530	654	654	199	238	64	73	242	282

Table 2

Duration of the nuclear cycle in the root-tips of Zea mays L. (KYS) at 25°C

Phase	Duration		
	Hrs.	%	
Interphase	G ₁	1.91	18.2
	S ¹	4.7	44.8
	G ₂	2.67	25.4
	Sub-total	9.28	88.4
Mitosis	Prophase	0.66	6.3
	Metaphase	0.22	2.1
	Anaphase	0.07	0.6
	Telophase	0.27	2.6
	Sub-total	1.22	11.6
Total	10.5		

Table 3
Standard deviations of the nuclear cycle component estimates
in the primary root-tips of Zea mays L. (KYS) at 25°C

Phase	Hrs.
G ₁ + Mitosis	0.53
S	0.13
G ₂ + ½ Prophase	0.05
Total nuclear cycle	0.55

Initially, consideration was given to the view that the nuclear cycle was under specific genetic (gene) control. It was proposed that maize was an excellent material in which to test the hypothesis of specific genetic control, inasmuch as a wide variety of markedly different agronomic and genetic stocks was available. If the duration of the nuclear cycle was related to the growth characteristics of a stock, judicious choice of a few stocks should permit the identification of different nuclear cycles under identical controlled conditions.

Starting with 'Seneca 60', KYS, 9 tester and W23 stocks, all possible F₁, F₂, BC₁ and BC₂ stocks were developed at our field station. Upon discovering that no differences in the nuclear cycle of the different stocks at 25°C could be described, the analysis of the F₁, F₂, BC₁ and BC₂ hybrids was discontinued. It remains to be shown whether or not stock differences can be described at temperatures other than 25°C, or under the influence of other environmental conditions, as a prerequisite for heritability studies; at the moment, we must conclude that these differences do not exist and that further information would not be contributed by analyzing the F₁ and subsequent generations.

Ram S. Verma

3. Reassociation of interchange and interstitial segments.

It has already been demonstrated (Jancey and Walden, 1972) that significant departures from an equidistribution of 'breaks' occur in the