

expression of notching in some of the progenies of such grains.

Sixty grains were set in the haploid clones, out of which approximately half were notched. Five notched and five unnotched healthy grains were raised and studied. Plants raised from notched or unnotched grains had notching; but the percentage of notched kernels was not same. The highest percentage was found in Pl. No. 2 (89-8) and the lowest in Pl. No. 3 (61-3). The present study has revealed that the notching can be present at more than one point on the kernel. As stated earlier, notch generally appears on the ventral side slightly above the embryo. It may either be present at the apical portion of the kernel, on dorsal side of the kernel, on dorsal and ventral sides of the same kernel or at two places on the same side (Fig. 1). The occurrence of these new types of notching was not very frequent in the population and their proportion was also not definite. Notching was, however, not found on the flat portion of the kernel.

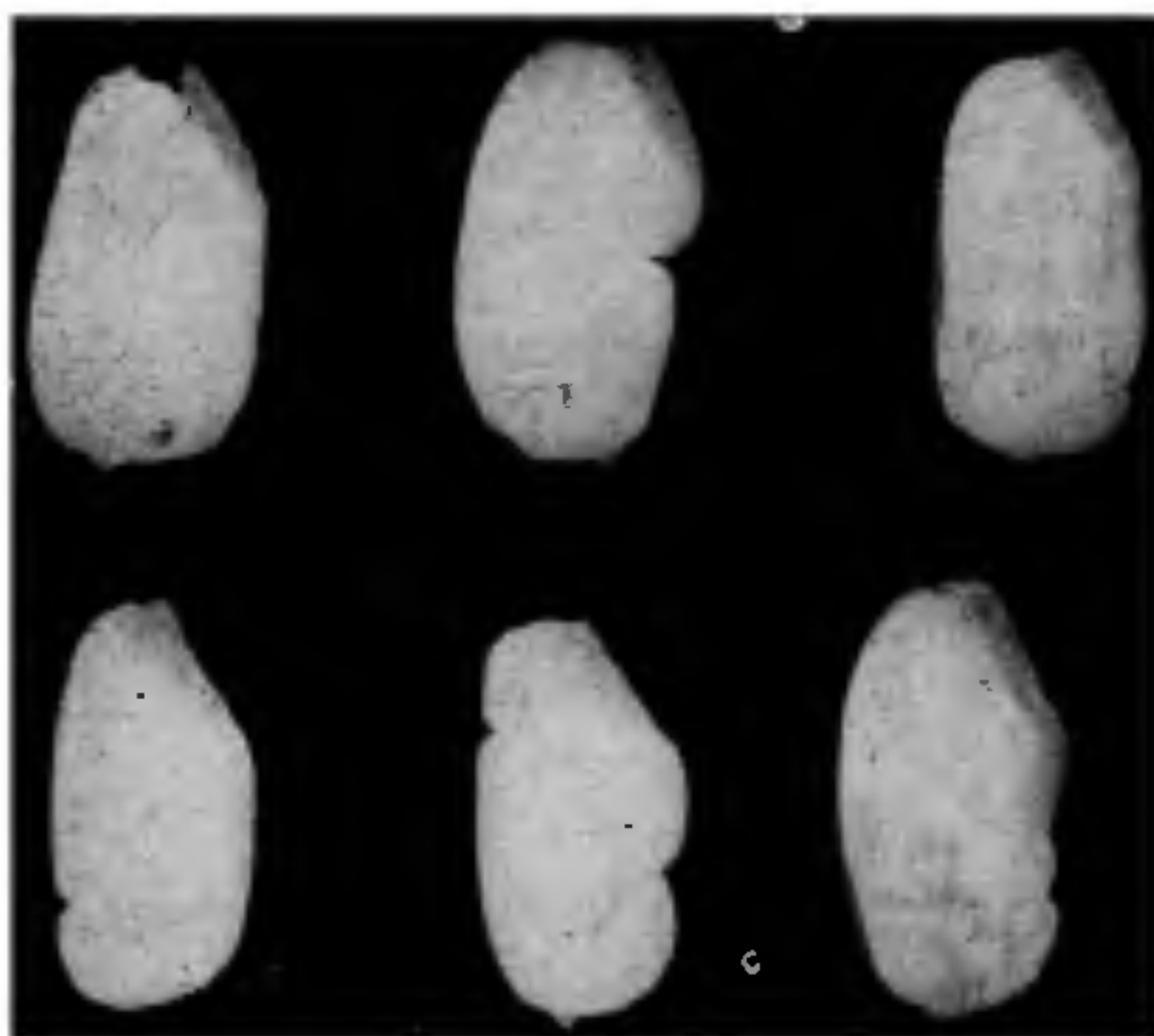


FIG. 1. Kernels exhibiting notching at different points.

The average higher expression in true diploid plants is in contrast to the maternal parent J.B.S. 820. Complete homozygosity in this case has been associated with high degree of expression of the character. More data are needed to verify whether this phenomenon is more common in the other varieties also. The notch expression has earlier been shown to be influenced by environment². None of the plants, in fact, show cent per cent expression even in the completely homozygous plants.

Four unusual notch expressions indicate that the gene has variable expressivity. This has not been observed earlier.

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THE EFFECT OF COLCHICINE ON SEX EXPRESSION IN MUSKMELON

SEX expression in muskmelon can be modified by exogenous application of auxins^{1,3,8,10} gibberlins^{3,8,10}, cytokinins^{3,4}, morphactins⁵ and ethrel^{6,7} as well as by mineral nutrition^{2,9} and environmental conditions such as light^{1,8} and temperature³. The work described here was undertaken to isolate the effect of colchicine on sex expression in muskmelon.

Seeds of andro-monoecious variety of muskmelon (*Cucumis melo* L., variety, Hara Madhu) were sown in 30 metre long and 3 metre wide plots at a depth of 2 cm with spacing 80 cm between plants. They were later thinned out in a manner so that three replicates of ten plants were left in each plot. Plants were sprayed four times with aqueous solution of colchicine at 0.1, 1, 10 and 100 ppm since two true leaved stage at weekly intervals by hand atomizer. Observations were recorded regarding the position and production of both staminate and hermaphrodite flowers. Sex ratio was calculated from this data and pollen sterility was isolated by staining them in iodine. During experiments minimum temperature was 25° C and maximum temperature was 38° C. Plants were grown in natural daylength of 11-13 hours.

The results are documented in Table I. The data pinpoint a marked tendency towards female sex expression in plants treated with colchicine. The first staminate flower differentiated on the 6.6, 6.9, 7.5, 9.0 node and the first hermaphrodite flower appeared on the 9.2, 8.0, 7.3, 15.1 in 0.1, 1, 10 and 100 ppm colchicine treatment respectively. Colchicine treatment increased the number of hermaphrodite flowers and decreased the number of staminate flowers over control (Table I) in muskmelon. The ratio of staminate/hermaphrodite flowers was 18.1 : 1, 12.2 : 1, 8.9 : 1 and 6.1 : 1 in 0.1, 1, 10, and 100 ppm colchicine application respectively. Colchicine application also induced pollen sterility which increased with increase in concentration in both staminate and hermaphrodite flowers (Table I). In case of hermaphrodite flowers 100% pollen sterility was noticed in 100 ppm treatment. Most of the flower buds showed various stages of

TABLE I
Effect of colchicine on sex expression in muskmelon (*Cucumis melo* L.)
(Values are mean with \pm SE of mean)

Observations	Control	Colchicine concentration in ppm			
		0.1	1	10	100
Position of node bearing first staminate flower	5.1 \pm 0.31	6.6 \pm 0.75	6.9 \pm 0.29	7.5 \pm 0.38	9.0 \pm 0.33
Staminate flowers	205 \pm 6.2	200 \pm 5.9	183 \pm 5.1	161 \pm 4.8	153 \pm 4.6
Position of node bearing first hermaphrodite flower	14.8 \pm 0.47	9.2 \pm 0.38	8.0 \pm 0.35	7.3 \pm 0.11	15.1 \pm 0.22*
Hermaphrodite flowers	10 \pm 0.22	11 \pm 0.19	15 \pm 0.44	18 \pm 0.36	25 \pm 0.20
Ratio of staminate/hermaphrodite flowers	20.5 : 1	18.1 : 1	12.2 : 1	8.9 : 1	6.1 : 1
Pollen sterility % of staminate flowers	12	30	42	47	69
Pollen sterility % of hermaphrodite flowers	76	81	85	94	100

* Not significant.

fusion and reduction in the size as well as in number of stamens. Some of the hermaphrodite flowers showed complete abortion of stamen, therefore, forming pistillate (female) flowers. The ovule fertility was not affected by colchicine treatment unlike pollen fertility. The plants treated with colchicine produced viable seeds. The viability of seeds was tested with T.C.C. test and 100% viability was recorded in various concentrations of colchicine like control.

The present observations clearly demonstrate that colchicine suppresses appearance as well as further development of staminate flowers and induces differentiation of hermaphrodite flowers at lower node on the main vine and also increases the number of hermaphrodite flowers in muskmelon. It is also an interesting point to mention here that colchicine has properties opposite to gibberellins and similar to those of auxins, cytokinins and morphactins in relation to sex expression. As gibberellins are known to stimulate male sex expression^{3,8} auxins, cytokinins and morphactins are well known to induce femaleness in muskmelon^{1,3,4,5,8,10}. Therefore it is possible that colchicine reverses the influence of endogenous gibberellin, acts through auxin metabolism or may have an independent activity which modifies the sex expression in muskmelon.

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MICRODISSECTION STUDIES ON THE DEVELOPING LEAF PRIMORDIA OF *PHOENIX SYLVESTRIS* L.

The genus *Phoenix* is unique among the palms in its leaf morphology. This refers not only to the induplicate leaflets, but also to the presence of a peculiar tissue referred to as the Haut. The haut develops very early and covers the entire series of leaflets, grows along with the leaflets but dries up when the leaf unfolds. The haut had been the subject of much research since Von Mohl² published an account of leaf development in palms. According to his account the haut is part of the lamina and not a secondary product. Later workers expressed varied opinions on the nature of the haut.