TMV 3. The symptoms appeared on the seventh day after inoculation. Numerous pustules were seen mostly on the lower side but occasionally on the upper side. These were amber-brown in colour. A yellow halo was seen surrounding each pustule. The pustules were scattered all over the blade.

**Fig. 2. Matureduredospores.**

I am grateful to Dr. R. Narayana Swamy for his guidance, Professor C. V. Subramanian for a critical discussion and Professor T. S. Sadasivan for providing facilities. Thanks are also due to Director of C.M.I. and Dr. J. L. Mulder, Mycologist of C.M.I., Kew, for supplying the material for comparison.

University Botany Lab., K. S. BHAMA.
Madras-5, November 9, 1971.

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INHERITANCE OF CERTAIN MORPHOLOGICAL CHARACTERS IN ROSELLE (HIBISCUS SABDARIFFA L.)

Genetical studies in roselle started in India as early as 1906 and anthocyanin pigmentation was the most important topic of study to many workers. Inheritance of leaf character and stem hairiness were also studied. The present investigation was undertaken to study the inheritance of some morphological characters, namely, bushiness, edible nature of calyx and leaf shape in roselle.

Two distinct types, HS 4288 and RT 768 were chosen for the study. HS 4288, already established as a high fibre yielder is a green-pigmented, tall growing, less branching, bristled type with inedible thin calyces and having long narrow palrnately lobed leaf. Whereas, the other type, RT 768 is a wild, red, dwarf, bushy, smooth type with long, succulent (fleshy) edible calyces and characterised by short, broad partially trilobed leaf. Crosses were made between these two types during 1968. F1's were raised in 1969 and backcrosses to both the parents along with the fresh crosses were made. F1, F2 and backcross progenies along with the parents were grown in 1970.

The study revealed that both bushy habit and edible calyx were monogenic dominant since F1's were all showing bushy habit and edible nature of calyce while F2 (after selfing F1's) segregated into 3 : 1 (3 bushy : 1 non-bushy and 3 edible : 1 inedible calyx) ratio as shown in Table I. This was also confirmed by the testcross ratio of 1 : 1 in both the cases. It is, therefore, suggested that factor pairs, Bu-bu and Eb-eb, control the habit (Bu—bushy and Bu—non—bushy) and calyx nature (Eb—edible and Eb—inedible calyx) respectively. Joint segregation of habit and calyx nature showed independent assortment into four types, two parental types and two recombinant ones resulting in 9 : 3 : 3 : 1 ratio (Table I). It indicated that there was no linkage between Bu-bu and Eb-eb.

As regards the leaf character, it was observed that leaves of F1 plants were medium long and broad palmately lobed. F2 progenies segregated into three phenotypes, viz., one F1 type and two parental types in 9 : 3 : 4 ratio. And chi-square test proved goodness of fit to the ratio (Table I), which was also confirmed by the backcross ratio of 1 : 1 to both the parents (1 F1 type : parental type corresponding to the type of parent used in the backcross). From this study it appears that the character leaf shape is controlled by two pairs of factors present separately in two parents. When both the dominant factors come together they interact producing a new phenotype, viz., medium long and broad palmately lobed leaf. The double recessive shows the phenotypic expression of short broad
**Letters to the Editor**

**TABLE I**

*F₂ segregation of some morphological characters in roselle*

<table>
<thead>
<tr>
<th>Habit</th>
<th>Calyx nature</th>
<th>Joint segregation</th>
<th>Leaf shape</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bushy</td>
<td>Non-bushy</td>
<td>Edible</td>
</tr>
<tr>
<td>Number of plants</td>
<td>693</td>
<td>201</td>
<td>599</td>
</tr>
<tr>
<td>Fit to the ratio</td>
<td>3 : 1</td>
<td>3 : 1</td>
<td>9 : 3 : 3 : 1</td>
</tr>
<tr>
<td>X²</td>
<td>0.0419</td>
<td>0.2937</td>
<td>0.6755</td>
</tr>
<tr>
<td>F</td>
<td>0.90-0.80</td>
<td>0.70-0.50</td>
<td>0.90-0.80</td>
</tr>
</tbody>
</table>

*MLBP* = Medium long and broad palatomally lobed; †LNPT = Long and narrow palatomally lobed; ‡SBT = Short and broad partially lobed.

partially lobed leaf. The factorial representation of the parents may be given as follows:
1. Long narrow palatomally lobed—LLww.
2. Short, broad partially lobed—llWW.

In this connection it might be mentioned that Deshpande¹ and Sanjay and Dutta⁶ reported monogenic ratio of palatomally lobed to partially lobed leaf in roselle.

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Jute Agricultural Research Institute, K. Chakravarty.
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**DETECTION OF ANDROGENETIC MONOPOIDS IN MAIZE**

**ABSTRACT**

The efficiency of a technique for detection of androgegetic monoploids in maize in the seed stage is demonstrated. The method involves examination of seeds from a gene-marked C' C' x C C cross to screen for the kernels showing purple or red scutellum colour and colourless endosperm (aleurone). This technique is quite effective for isolation of paternal monoploids for experimental purposes, and not for commercial utilization of the derived monoploids.

Androgegetic monoploids in maize have been observed occasionally by various workers². They occur spontaneously in nature with an extremely low frequency of about one per eighty thousand fertilizations¹. Paternal monoploids provide potentially valuable genetic tools for quick substitution of cytoplasm and this phenomenon can be gainfully utilized for conferring cytoplasmic male sterility to inbred lines³, and for fundamental studies into genome-plasmid relationships.

For effective utilization of these androgegetic monoploids, satisfactory solutions to two main problems are needed. They are, (i) to raise the frequency of their occurrences appreciably, and (ii) to find an effective method for isolating such monoploids through seed screening. Kermicle⁶ (1969) has recently reported a mutation, indeterminate gametophyte (ig), which when present in homozygous or heterozygous condition in the female parent, conditions a very high frequency of androgegenesis. For effective detection of paternal monoploids, Sarkar and Coe⁷ proposed to extend their coloured-scutellum technique for detection of maternal haploids (Coe and Sarkar⁴), but failed to demonstrate the efficiency of the method as there was no paternal monoploids in the limited population observed. The present paper reports the successful utilization of the screening technique for detecting such monoploids in the seed stage.

**EXPERIMENTAL METHODS**

The technique utilizing scutellum colour as a marker for detection of androgegetic monoploids is depicted in Fig. 1. The males used in the marked crosses have a genotype, C C, which in combination with other complementary genes produces coloured aleurone and coloured scutellum. The females carry C', a dominant inhibitor allele at the C locus. In kernels resulting from normal fertilizations in