

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.

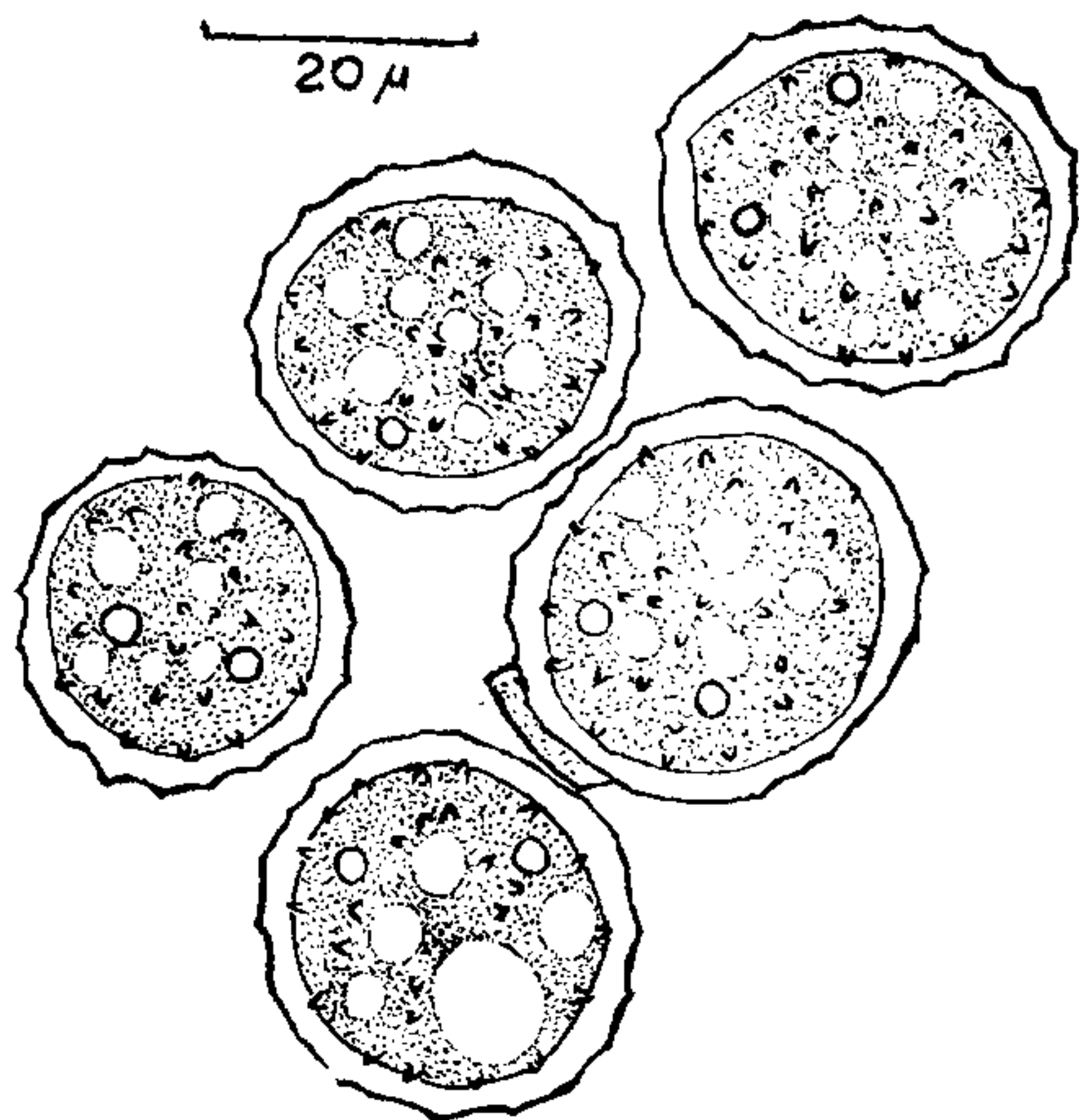


FIG. 2. Matured uredospores.

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

* Memoir No. 136 from the Centre for Advanced Studies in Botany.

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

GENETICAL studies in roselle started in India as early as 1906³ and anthocyanin pigmentation was the most important topic of study to many workers^{1,4-5,7}. Inheritance of leaf character and stem hairiness were also studied^{1,6}. 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 yielder² is a green-pigmented, tall growing, less branching, bristled type with inedible thin calyces and having long narrow palmately 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. F₁s 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 F₁s were all showing bushy habit and edible nature of calyx while F₂ (after selfing F₁s) 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 recombined 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

TABLE I
F₂ segregation of some morphological characters in roselle

	Habit		Calyx nature		Joint segregation				Leaf shape		
	Bushy	Non-bushy	Edible	Inedible	Bushy		Non-bushy		MLBP*	LNP†	SBT‡
					Edible	In-edible	Edible	In-edible			
Number of plants	593	201	589	205	443	150	146	55	448	151	196
Fit to the ratio	3 : 1		3 : 1		9 : 3 : 3 : 1				9 : 3 : 4		
X ²	0.0419		0.2837		0.6755				0.9608		
P	0.90-0.80		0.70-0.50		0.90-0.80				0.70-0.50		

* MLBP = Medium long and broad palmately lobed;

† LNP = Long and narrow palmately lobed;

‡ SBT = Short and broad partially trilobed.

partially trilobed leaf. The factorial representation of the parents may be given as follows :

1. Long narrow palmately lobed—LLww.
2. Short broad partially trilobed—llWW.

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

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DETECTION OF ANDROGENETIC MONOPLUIDS IN MAIZE

ABSTRACT

The efficiency of a technique for detection of androgenetic monoploids in maize in the seed stage is demonstrated. The method involves examination of seeds from a gene-marked C¹C¹ × CC 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.

ANDROGENETIC 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 fertilizations^{1,5}. 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 lines⁵, and for fundamental studies into genome-plasmon relationships.

For effective utilization of these androgenetic 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 androgenesis. For effective detection of paternal monoploids, Sarkar and Coe⁷ proposed to extend their coloured-scutellum technique for detection of maternal haploids (Coe and Sarkar¹), 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 androgenetic 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 C¹, a dominant inhibitor allele at the C locus. In kernels resulting from normal fertilizations in