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CHLOROPLAST AS AN INDICATOR FOR IDENTIFICATION OF POLYPLOIDY IN ABELMOSCHUS

An investigation on stomata and guard cell chloroplast was carried out in *Abelmoschus esculentus*, *A. tetraphyllus* and in the induced amphidiploid raised by treating the interspecific F_1 hybrid with colchicine. Choudhari and Barrow (1975) reported that chloroplast count technique is a reliable method of determining the ploidy levels in plant species. So, it become imperative to assess the chloroplast count in the parental species and the amphidiploid.

It is easy to study chloroplasts in the guard cells following reduction of silver nitrate. The staining principle is based on Molisch reaction (Plumer, 1978). This method requires an immediate count as the stained chloroplasts lose their colour when exposed to light. If the preparation is kept longer, the entire epidermal layer becomes reddish brown. A method to prepare permanent mount was standardised by Jambhale and Nerkar (1980) and that was followed.

Adaxial epidermis of leaves of parental species and the amphidiploid, exposed to sunglight for 4h was striped off and placed on a glass slide. A drop of 2 per cent silver nitrate solution was added on the strip for a minute. The strip was then washed thoroughly with distilled water and fixed for 5 min in a few drops of hypo solution (25 g sodium thiosulphate and 0.1 g potasium metabisulphate dissolved in 200 ml of distilled water). After washing the strip in distilled water, free of hypo, it was dehydrated by passing through butanol-acetic acid series (1:1,3:1) and finally through n-butanol, keeping for 2 min in each. Then it was mounted in DPX and observed under a microscope.

The amphidiploid induced in the present study when compared to the parental species, showed increase in length of stomata and number of chloroplast in the guard cell (Fig. 1,2 and 3) while the frequency of stomata per unit area was less (Table 1). These observations are in agreement with

Table 1. Stomatal feature of *A. esculentus*, *A. tertraphyllus* and the amphidiploid

Genotypes	Length of stomata (mm)	Number of stomata/mm^2	Number of chloroplasts in the gurard cell
A. esculentus	26.28 ± 0.34	22.48 ± 0.30	14.40
A. tetraphyllus	24.38 ± 0.42	28.24 ± 0.25	24.11
Amphidiploid	33.41 ± 0.25	14.22 ± 0.20	30.52

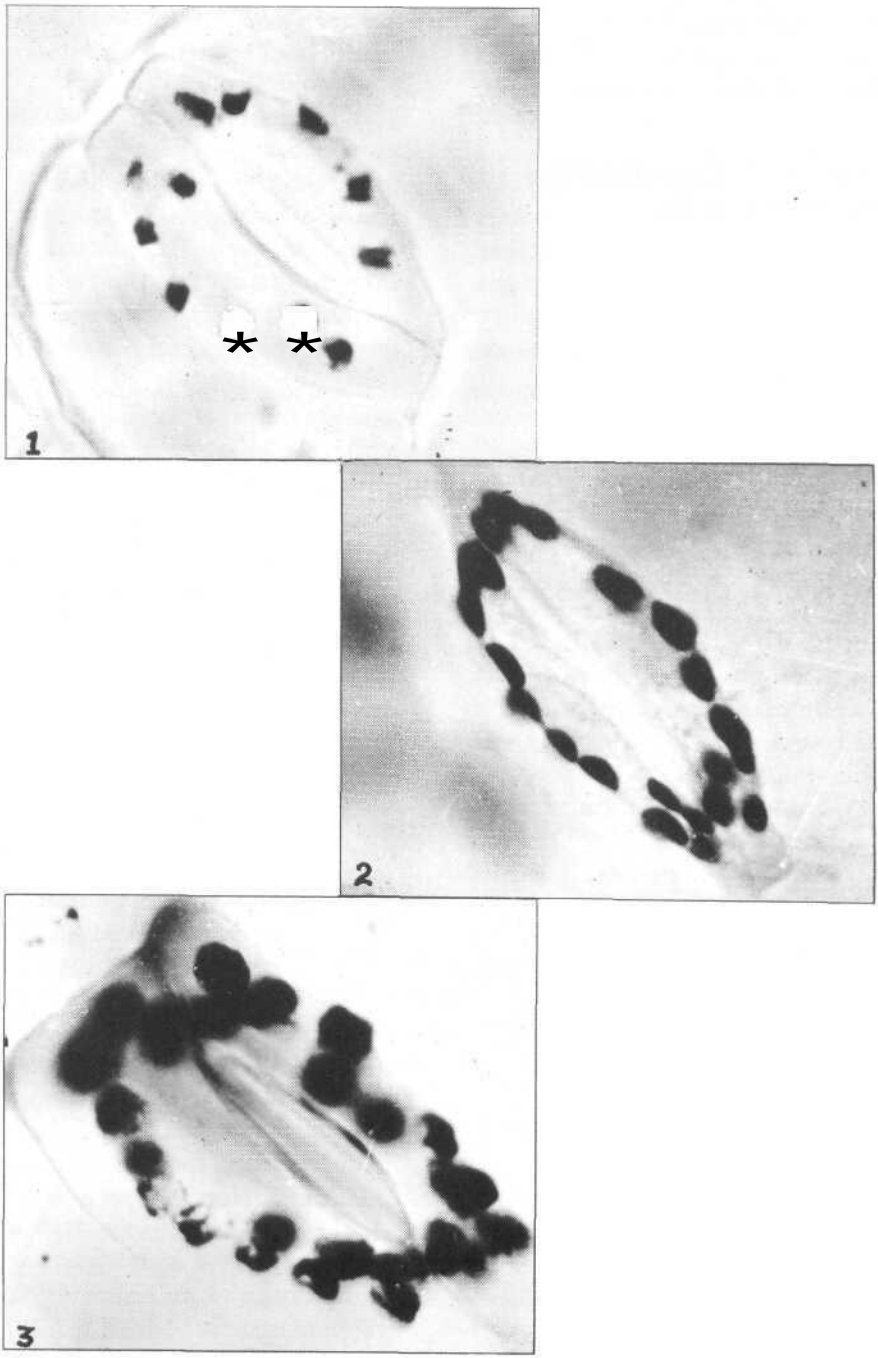

Fig. 1, 2 & 3. Guard cell of *A. escukntus*, *A. tetraphyllus* and the amphidiploid respectively (x 4000)

Jambhale and Nerker (1982) who synthesised an anphidiploid from the cross *A. esculentus* x *A. manihot* ssp. *manihot*. This further confirms Butterflass (1960) who observed that the relation between the increase of ploidy levels and the number of plastids applies to amphidiploid also.

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