



### Observations

**Morphology:** The shape of the leaves are in general linear-oblong to linear-obovate with slightly wavy margins and with a characteristic twist in the triploids; they are dark green and thicker than those of diploids. In the diploid forms, the leaves are mostly linear-acute and coriaceous (Fig. 1). The petioles of triploids are longer than those of diploids. The mean size of leaves are given in Table 1.



Fig. 1. Leaves of diploid (a) and triploid (b) forms of *P. guajava*.

The mean values for

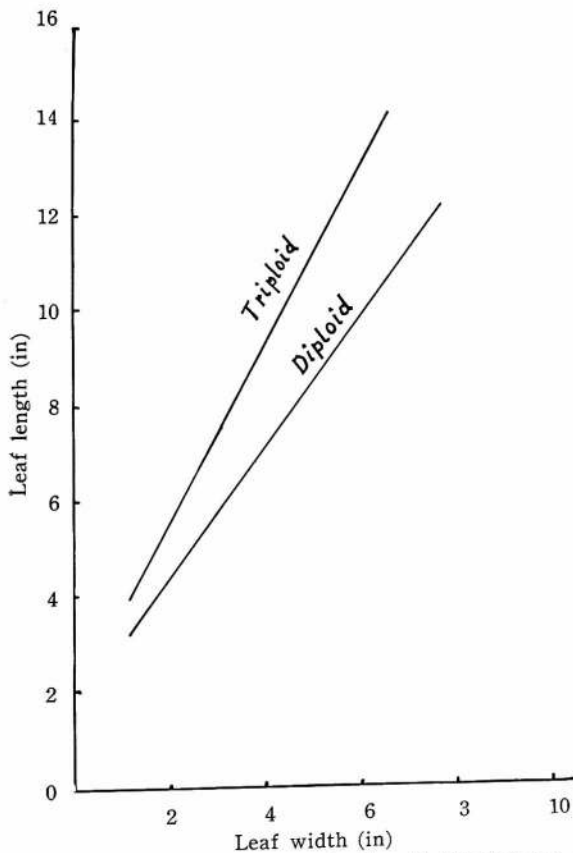


Fig. 2. Relationship between leaf-length (Y-axis) and leaf-width (X-axis). Diploid,  $r = 0.7950$ . \*\*.  $Y = 1.92 + 1.34x$ . Triploid,  $r = 0.6066$  \*\*.  $Y = 1.99 + 1.84x$ .

the length and width of leaves in triploids are found to be higher than the corresponding values of the diploids. The maximum size is observed in triploids and the minimum in diploids. The statistical scrutiny has shown that the increase in length, in general, is significant in the triploids than in diploids even though there is considerable overlapping between the mean values of the two chromosomal forms. The width of the leaf also showed a trend similar to that of the length of leaf (Fig. 2). No significant differences in the size of the stomata were noticed between the two forms, though in two of the three triploids studied, the length of the guard



Table 2. Chromosome association in triploid guavas

Chromosome association			Name of variety of accession			No. of cells
III	II	I	'Nagpur seedless'	'Anakapalli'	'Bhavanisagar'	
5	6	6	—	—	2	2
6	5	5	2	1	1	4
7	4	4	2	1	3	6
8	3	3	2	4	4	10
9	2	2	6	5	9	20
10	1	1	12	8	11	31
11	—	—	38	12	24	74
Average association			$10.2_{III} + 0.7_{II} + 0.7_{I}$	$9.3_{III} + 1.19_{II} + 1.19_{I}$	$10.4_{III} + 0.57_{II} + 0.57_{I}$	147 Total

varieties computed at diakinesis and MI are given in Table 2.

In triploids also the secondary association of five groups of trivalents are frequently observed at MI. The secondary association is in the nature of  $3(2) + 1(4) + 1(1)$  with five groups. The separation of chromosomes at AI is unequal and the disjunction ranged from 13/20 to 15/18 (Fig. 5). The frequency of chromosome distribution is presented in Table 3.

One to four lagging chromosomes are noticed at AI. Less frequently chromatin bridges are seen. Very rarely 1 to 2 univalents also exhibited division. Consequently irregular distribution of chromosomes resulted in the formation of super-numerary spores (31 per cent). Monads, dyads, and triads were noticed in 12 per cent of the cells examined. Fifty seven percent of the cells constituted normal tetrads. Micronuclei were also noticed. The mean pollen diameter and fertility are furnished in Table 4.

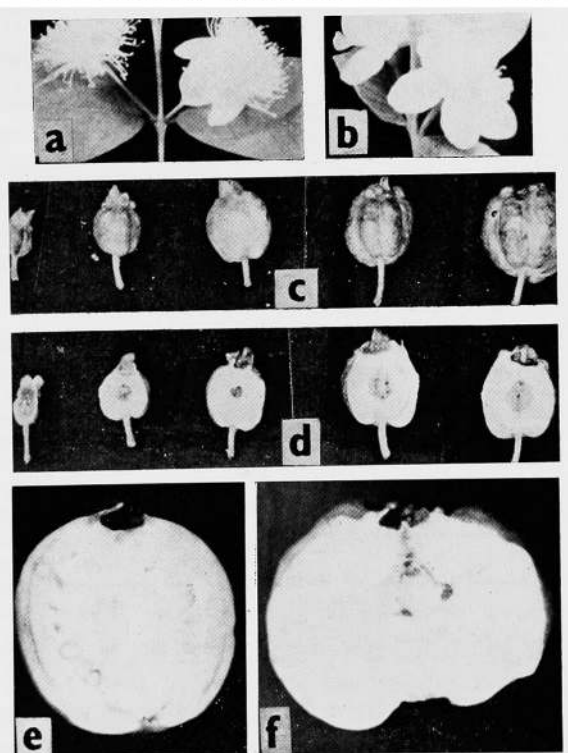


Fig. 4. Flowers of  $2n$  (a) and  $3n$  (b) forms of guava. Fruits of triploid (c and d) in different stages of development showing the progressive enlargement of the ovary wall. Ripe fruits of the diploid (e) and triploid (f) forms.

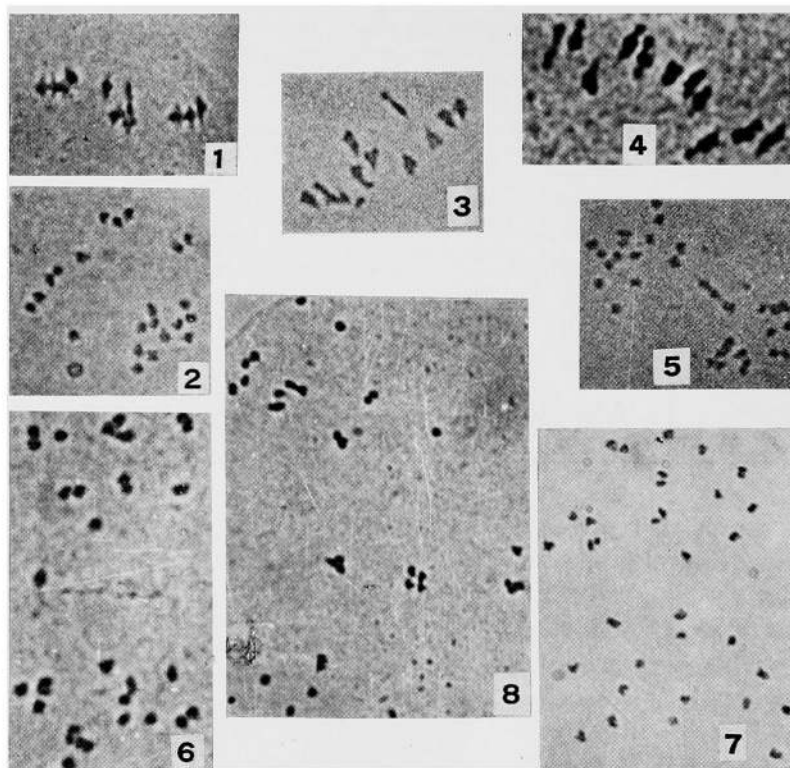


Fig. 5. Diploid: 1, metaphase I (11<sub>II</sub>). 2, anaphase I (11/11). Triploid: 3 and 4, metaphase I (10<sub>III</sub>+1<sub>II</sub>+I and 11<sub>II</sub> respectively). 5, anaphase I showing 15/15 distribution with 3 lagging chromosomes. 6, anaphase I with one laggard and a distribution of 15/17. 7, metaphase II. 15/18 at the poles. 8, anaphase II. 15/18 resulting from irregular distribution at Anaphase I.

Table 3. Chromosome distribution at anaphase I in triploid guava

	13—20	14—19	15—18	16—17	Total
No. of PMCs	3	11	26	10	50

Table 4. Pollen diameter and fertility

	Pollen diameter (in micron)	Pollen fertility (in percent)
Diploids	16.1 —19.8	71.9—94.0
Triploids	19.21—22.05	43.0—54.0

*Seed fertility*: The triploids are seedless, while the diploids are variable in respect of this feature. The developing fruits in the triploids show only a back mass of degenerated ovules in the cavity inside the fruit. The edible portion in the mature fruit is constituted mostly of the swollen wall of the ovary and little of the placenta (Fig. 4). The fruits in early stages show uneven development unlike those of diploids which are uniform. Later on they regain





