

Figures 1, 2. 1a. Normal capsule, b. Mutant capsule, 2a. Mutant capsule showing 11 locules and b. Normal capsule showing 5 locules.

Table 1 Mean value of pod characters

| | JRO 632 | Mutant |
|----------------------|---------|--------|
| Carpel number | 6 | 15 |
| Length of pod (cm) L | 5.6 | 3.1 |
| Diameter (cm) D | 0.46 | 1.0 |
| Ratio L/D | 14.28 | 2.56 |
| No of seeds per pod | 150 | 225 |
| No of seed per g wt. | 670 | 544 |
| Seed wt per pod (mg) | 224 | 414 |

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CYTOLOGY OF OCTOPOLOID *GLORIOSA SIMPLEX* L.

J. L. KARIHALOO

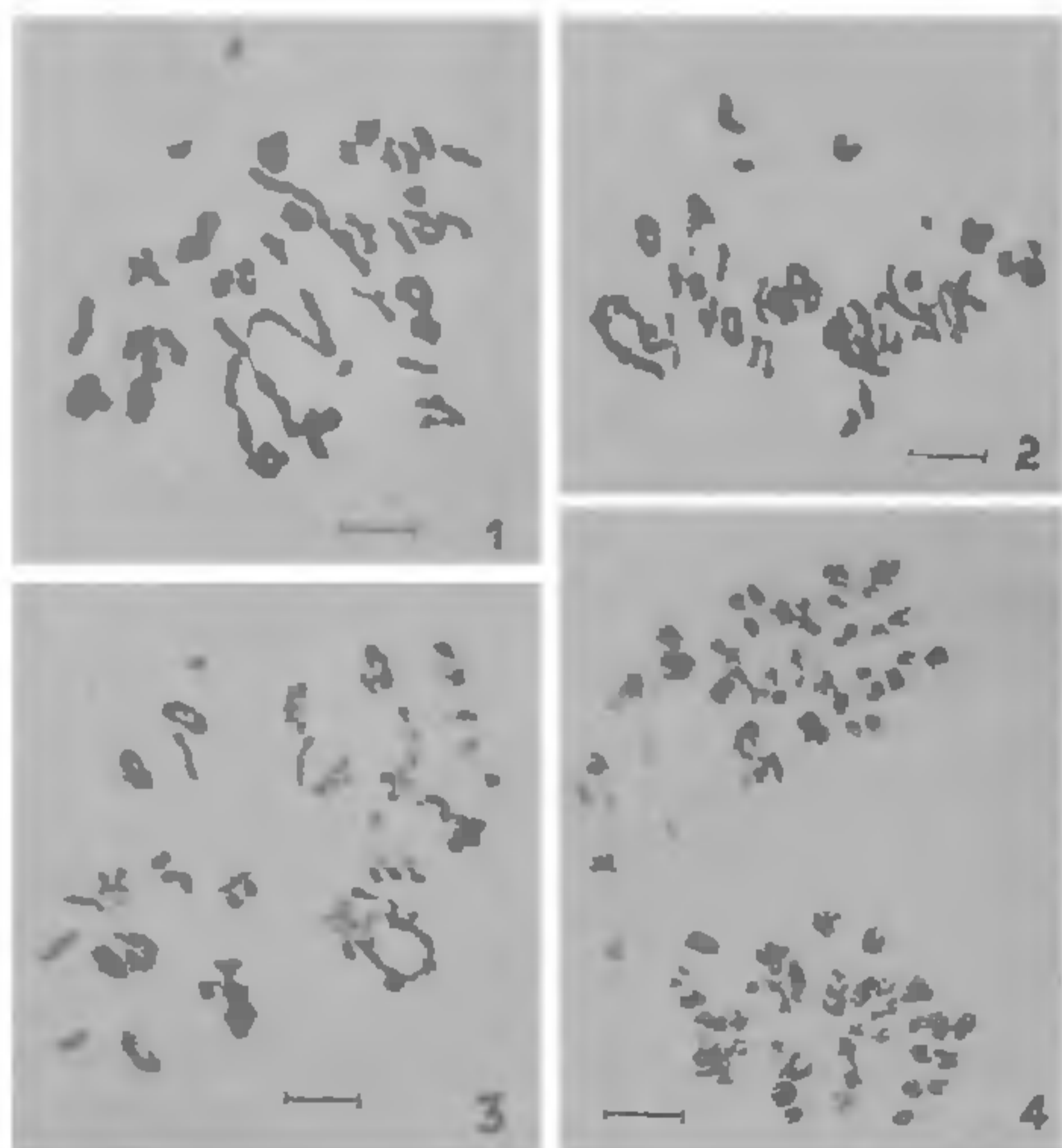
Division of Ornamental Crops, Indian Institute of Horticultural Research, Hessaraghatta Lake, Bangalore 560089, India.

GLORIOSA L. (Liliaceae), a genus of 5–6 species, is native to Asian and African tropics¹. Basic chromosome number of the genus is 11. Euploids with $2n = 22, 44, 66, 77$ and 88 chromosomes have been recorded^{2–4}. *G. simplex* and its synonyms, *G. plantii* and *G. virescens*, have been reported earlier as diploid and tetraploid ($2n = 22, 44$)^{3–6}. In this communication, male meiosis of an octoploid ($2n = 8x = 88$) cytotype of this species is presented.

Anthers at proper stages of meiosis were fixed in Carnoy II fluid. Squashes were prepared in 1% acetocarmine and studies made from temporary slides.

All microspore mother cells were found to bear 88 chromosomes which associated into configurations ranging from univalents to octovalents (figures 1–3). Thirty cells studied at metaphase I showed average per cell association of $0.27 \text{ VIII} + 0.27 \text{ VI} + 2.13 \text{ IV} + 0.13 \text{ III} + 36.50 \text{ II} + 2.33 \text{ I}$. Of the 51 cells scored at anaphase I, 11 showed regular 44:44 separation. Irregularities were found in the form of unequal separation (upto 41:47), laggards, precociously dividing univalents and occasional bridges (figure 4). Pollen stainability with 1% acetocarmine was 64.2%. Fruit set in self pollinated flowers was 20%.

Allopolyploid nature of the present octoploid is evident from the high frequency of bivalents (36.5 out of a maximum possible of 44 per cell). It may, however, be pointed out that the basic karyotype of *Gloriosa* has 2–3 long and 8–9 quite small chromosomes. It was observed that the majority of multivalent associations were formed by long chromosomes whereas the short chromosomes paired mostly into bivalents. Since chiasma frequency depends on chromosome length, small chromosomes are less likely to form multivalents



Figures 1–4. Stages of male meiosis in octoploid *C. simplex*. 1. M I showing 1 VIII + 2 IV + 34 II + 4 I. 2. M I showing 4 IV + 34 II + 4 I. 3. M I showing 3 IV + 37 II + 2 I. 4. A I showing 41:4:43 distribution. Note the chromatid bridge. (scale 10 μ)

inspite of the possible genetic homology⁷. As such, pairing behaviour cannot always be taken as an index of the nature of polyploidy.

The present record of octoploidy alongwith earlier reports of diploidy and tetraploidy indicate that a polyploid series exists in *C. simplex*. Same is the case with other species, *C. superba*, *C. carsonii* and *C. rothschildiana*, in which different euploid numbers have been recorded from time to time²⁻⁴. Polyploidy thus seems to have played a prominent role in the evolution and distribution of this genus. Perpetuation of polyploids, in spite of irregular meiosis, is ensured through vegetative propagation by tubers.

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RUBBERY WOOD—A HITHERTO UNRECORDED DISEASE OF CITRUS

Y. S. AHLAWAT and V. V. CHENULU

Division of Mycology and Plant Pathology, Indian Agricultural Research Institute, New Delhi 110012, India.

A DISEASE with unusual flexibility of branches of a Lisbon lemon tree was observed in Darjeeling hills as early as 1973¹. During later surveys, a similar disease was observed in Rajasthan and Assam. In one orchard at Kota, the incidence of the disease as high as 50% was observed in Kagzi lime. The affected trees were characterised with bending of their shoots towards ground and the affected branches were unusually flexible or elastic. The affected trees were totally unproductive. Since no fungus or bacterium could be isolated from highly diseased samples, the disorder was considered to be caused by virus-like organism. Results of transmission studies are presented here.

Samples collected earlier from Darjeeling hills, when wedge-grafted to Lisbon lemon, developed numerous flexible branches in 60% of the inoculated plants in the glasshouse at Kalimpong. Samples obtained from Rajasthan and Assam were indexed at IARI, New Delhi.

Ten plants of Kagzi lime and five of Eureka lemon were wedge-grafted and maintained in the glasshouse for observation. Suitable controls were maintained for the experiment. In the host range studies, five plants each of Khasi mandarin, mosambi (sweet orange), Rangpur lime, sweet lime and sour orange were wedge-grafted with diseased scions.

In lime and lemon, the first visible symptom of the disease appeared as bending of the main shoot towards ground after one year of inoculation. The disease was transmitted to 70 and 40% of inoculated lime and lemon plants respectively. After two years of infection, inoculated plants developed willowing habit due to elasticity in their branches (figure 1a). The leaves showed veinal and interveinal chlorosis and a habit of downward and inward curling. Leaf lamina was much reduced as compared to healthy control. During the following years, numerous thin branches