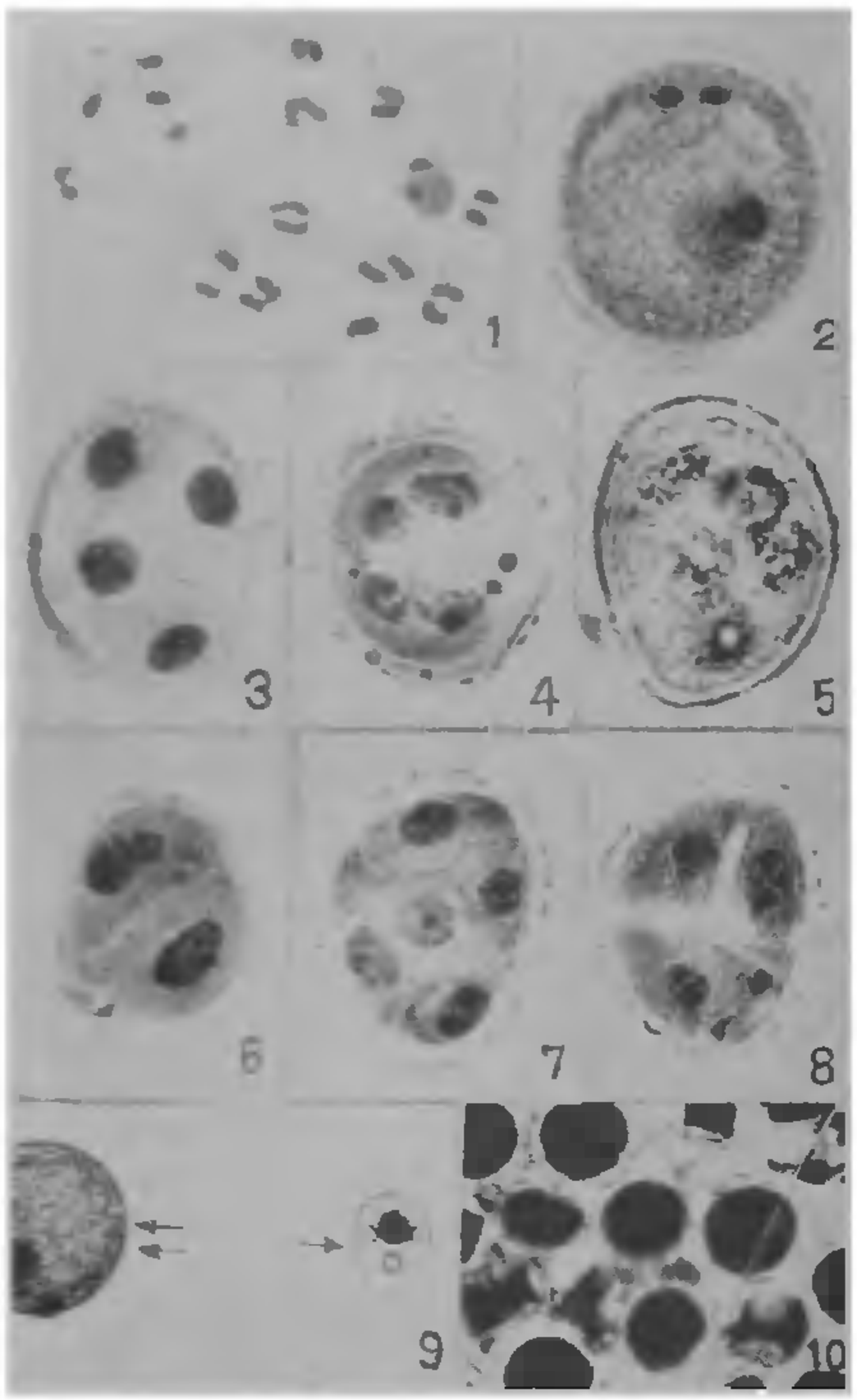
the mature anthers the pollen fertility was found to be only 48% (Fig. 10).



FIGS. 1–10. 1. Diakinesis with 14 bivalents, × 800. 2. Normal pollen with 3 nuclei, × 240. 3. Young microspore with 4 nuclei, × 400. 4. Microspore with incipient exine and showing 4 nuclei and vacuolation, × 400. 5. Pollen with 5 nuclei, × 400, 6. Young microspore with a cross wall, × 400, 7. Microspore with 5 cells, × 400, 8. Multicelled microspore showing deep clefts among the cells, × 400, 9. Normal pollen (⇇) and micropollen (→), × 150. 10. Fertile and sterile pollen, × 90.

Supernumerary divisions in the microsporocytes have been widely reported in a number of plant species[2-4] and as a consequence of these divisions the microsporocytes could produce groups on 16–20 cells. Pollen grains having eight nuclei and closely resembling the embryo sacs and known as 'Nemec Pollen' are known to occur in a few plants under special conditions and attributed the origin of abnormality to the duplication of generative nuclei[3-5]. Though, the multinucleate pollen observed in the present study did not resemble in any way with the embryo sac, the phenomenon of multicellular microspores and consequent liberation of micropollen from them is rather interesting and being reported for the first time.

The polymitosis in the elephant foot yam represent an interpolation of events not represented in its normal life history and attributed to the absence of some regulatory factor controlling the nature and stage of divisions as suggested in maize[2]. The polymitotic character of maize has been shown to be due to a recessive mendelian gene[1]. The occurrence of polymitosis in about half of the microspores makes one to suspect, the plant itself is heterozygous for this attribute and consequent of meiosis and segregation in PMC's half the microspores developed into normal pollen grains while the remaining half of the microspores which received the recessive gene responsible for polymitosis became polymitotic because it found immediate expression due to the haploid status of microspores.

The role of tapetum in the resulting partial pollen sterility can be ruled out because both fertile and sterile pollen were present inside the same anther sacs. Hence the 52% pollen sterility encountered in the present clone is due to the occurrence of polymitosis in about half of the microspores.

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COCHLIOBOLUS NODULOSUS, A NEW RECORD TO INDIA

A FUNGUS with black fruiting bodies was found by the authors on dry culms, leaves and leaf sheaths of *Eragrostis pilosa* (Linn.) Beauv. during September–October, 1974. The fungus was identified as *Cochliobolus noduosus* Luttrell which has not been reported previously from India on this host. However, it has been reported by Luttrell[1] from Georgia on *Eleusine* sp. Isolation was made on PDA. Numerous pseudothecial bodies of the fungas developed after 10 days, incubation, measuring 155·10–564·00 μ × 183·30–705·00 μ. Ostiolar beak 78·70–141·00 μ × 169·00–282·62 μ;

asci 124·80–170·60 μ × 12·48–18·72 μ, 7-spored; ascospores 88·82–157·56 μ × 4·68–6·24 μ, 7 to 10 septate (mostly 9 septate), germinating from all the cells.

The culture and slides of the fungus (containing pseudothecia, asci and ascospores) have been deposited in the CMI, Kew, Surrey (No. IMI 206845) and the organism has been identified as *Cochliobolus nodulosus* Luttrell. This is a new host record and new report from India.

The authors wish to express their gratefulness to Mr. A. Johnston, Director, CMI, Ferry Lane, Kew, Surrey, for confirming the identification of the fungus and Dr. P. N. Bajpai, Head, Department of Horticulture of this University, for providing facilities. The senior author is also thankful to C.S.I.R., New Delhi, for financial assistance.

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THREE NEW LEAF-SPOT DISEASES OF *KALANCHOE* SPP.

DURING July, September 1975 and 1976 three new leaf-spot diseases of *Kalanchoe* spp. were recorded at Jabalpur. All the three diseases have not so far been recorded from India.

Leaf-spot of Kalanchoe mortagei

Diseased leaves showed water-soaked, sunken, greyish, circular spots. Gradually they increased in size and the centre of the spots assumed greyish brown colour while the peripheral region became dark brown in colour. Healthy and diseased areas of the lamina were well demarcated. Sometimes many smaller spots coalesced to form bigger spots. The infected portion finally dried up and then very minute pinkish fruiting bodies were seen on the surface of lamina. The causal organism was identified as *Colletotrichum* state of *Glomerella cingulata* Spauld. & v. Schr.

The specimen has been deposited at the Herb. IMI, Kew, No. 189290 *a*, also in HPP, AUJ, No. 124.

Leaf-spot of Kalanchoe pinnata

At first small pinhead sized water soaked spots were formed on the upper surface of the leaves. The spots gradually increased in size and became amphigenous. The mature spots had a circular outline greyish brown in colour. There was a sharp demarcation between the healthy and diseased portion of the leaf. The demarcation was more pronounced on account of the presence of a narrow but distinct dark coloured raised ring. The spots may coalesce and form larger ones. At later stages, the spotted areas of the leaves became thin, dry and membranous, and very minute black fruiting bodies were clearly visible. In many cases this dried portion got detached from the healthy tissues. Isolations from the diseased leaves constantly yielded *Bartalinia robillardoides* Tassi.

The specimen has been deposited at Herb, IMI, Kew, No. 189292, also in HPP, AUJ., No. 125.

Leaf-spot of Kalanchoe fedischenkoi

Water-soaked, grey coloured spots, gradually increased in size covering the entire leaf. The cream coloured fruiting bodies were arranged in rings amphigenously. Later the diseased tissues got separated from healthy parts leaving a shothole. In severe infections the leaves shed off.

The pathogen responsible for this disease was identified as *Myrothecium roridum* Tode ex Fr.

The specimen has been deposited in HPP, AUJ, No. 126.

Pathogenicity tests were carried out in the case of all the three fungi by spraying an aqueous suspension of conidia from 10–15 days old culture on PDA with suitable controls. The disease symptoms on respective host appeared within 7–10 days. The same pathogen was obtained on reisolation in each case.

The authors express their thanks to Mr. A. Johnston, Director, Drs. M. B. Ellis and E. Punithalingam of C.M.I., Kew, for their help in the confirmation of the species.

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INVESTIGATIONS INTO THE CAUSES OF CHURDA MURDA (MALFORMATION) DISEASE OF CHILLI IN VIDARBHA

CHILLI (*Capsicum annuun* L.) grown in the Vidarbha region of the Maharashtra State suffers annually from a disease called 'malformation'. The disease is manifested as general stunting, reduced leaf size and upward or downward curling of leaves. Such plants also show mosaic-mottling, especially during the months August–September. Symptoms of this type being caused by varied agencies, *viz.*, (*a*) tobacco lead curl virus[1,4,5], (*b*) infestation of thrips and mites[1] and (*c*) mosaic viruses[2,3,6]. An attempt was therefore made to identify the casual complex responsible for the malformation syndrome in chilli, as it occurs in the Vidarbha region of the Maharashtra State.