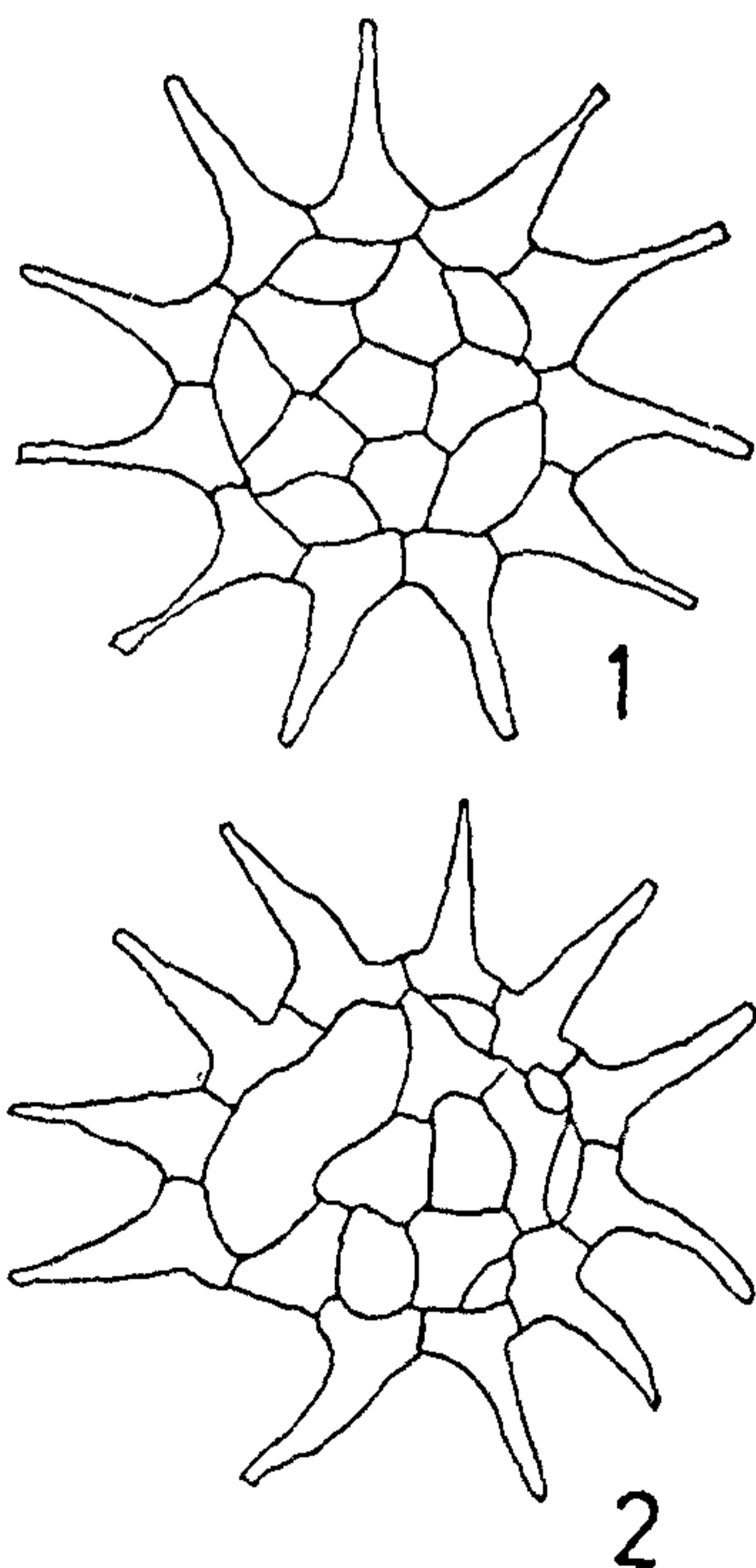


# ABNORMALITY IN GROWTH OF *PEDIASTRUM SIMPLEX* VAR. *CLATHRATUM*

A SINGLE specimen of the coenobium phytoplankton *Pediastrum simplex* var. *clathratum* with abnormal growth was collected from the Karnafuli River, Chittagong (Bangladesh), in April, 1975. The abnormality may be of interest to the taxonomist.

Normally the coenobia are 8, 16 or 32-celled. In 16-celled coenobia generally 11 cells are peripheral and 5 internal or 12 are peripheral and 4 internal. The inner cells are completely surrounded by the peripheral cells. The cells are deeply emarginate and arranged symmetrically in the coenobia; perforations are large and round or oval. The peripheral cells as well as the inner cells are of almost equal size and shape. Peripheral cells taper outward. The inner cells are 9–17  $\mu$  in diameter; the peripheral cells are 7–15  $\mu$  broad and 20–29  $\mu$  long. Coenobia are 140–173  $\mu$  in diameter.



FIGS. 1-2. *Pediastrum simplex* var. *clathratum*. Fig. 1. Normal specimen, Fig. 2. The abnormal specimen.

The present specimen is a coenobium of 16 cells of which 11 are peripheral, 4 are internal but one cell is neither completely internal nor does it show an outward projection like other peripheral cells. Size and shape of the cell resemble other inner cells but one surface is exposed outside the colony and takes part in ring formation by the peripheral cells rather than in ring formation by the inner cells. Due to the position of this cell and due to the dissimilar size and shape of the other cells, the coenobium has lost its symmetry.

The present specimen agrees in general with the descriptions and measurements of *Pediastrum simplex* var. *clathratum* given by earlier workers<sup>1,2</sup>, and is interesting on account of its abnormal growth.

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# MOSAIC DISEASE OF *PETUNIA VIOLACEA* LINDL. 'HYBRIDA'

*Petunia violacea* Lindl. 'Hybrida' an ornamental winter annual exhibited light green to dull yellow mosaic on the dark green background of the leaves in winter. In summer, however, bright yellow patches were observed along with the dark green islands on the surface of the leaves in the beginning, while at acute stages the yellow areas changed to white patches which continued to increase in size till they coalesced and turned into white leaves. About 40–45% plants showed disease symptoms during the year 1977–78 at the National Botanical Research Institute, Lucknow. The affected plants remained dwarf and produced flowers of small size and faint colour as compared with those of healthy plants. In extreme cases, however, the infected plants died before blooming. Present communication deals with mechanical transmission, host range and bio-physical properties of the causal agent of mosaic in petunia.

The culture was obtained from young, naturally infected leaves of petunia and maintained on petunia as well as on *Nicotiana tabacum* L. var. White Burley. Sap from infected leaves was prepared in 0.1 M phosphate buffer at pH 7 in the ratio of 1:1 (w/v) and centrifuged at 5,000 rpm for 10 minutes at 15°C. The supernatant, thus obtained, was used as the standard extract for further studies. Mechanical inoculations were made as usual using carborundum powder (600 mesh) as an abrasive.

TABLE I

*Reaction of some host plants to virus infecting petunia*

Family	Host	Symptoms*	Incubation period
Chenopodiaceae	1. <i>Chenopodium amaranticolor</i> Coste and Reyn.	NLL	3-5 days
Nyctaginaceae	2. <i>C. album</i> L.	NLL	4-5 days
	<i>Boerhaavia diffusa</i> L.	Chlorotic lesion	6-7 days
Solanaceae	1. <i>Datura metel</i> L.	NLL	6-7 days
	2. <i>Nicotiana tabacum</i> L. var. White Burley, Turkish, Xanthii and NP 31.	Mosaici turning Yellow patches	6-8 days
	3. <i>N. tabacum</i> L. var. Samsun NN.	Light green patches	6-8 days
	4. <i>N. glutinosa</i> L.	Yellow patches	7-8 days

\* Symptoms on normal green background of the leaves.

NLL<sub>l</sub> = Necrotic local lesions.

The host range studies were carried out by mechanical inoculation on 34 plant species belonging to 10 families, viz., Apocyanaceae, Asteraceae, Chenopodiaceae, Cruciferae, Cucurbitaceae, Leguminosae, Malvaceae, Moraceae, Nyctaginaceae and Solanaceae. Observations were recorded till two months after inoculation, followed by back inoculation tests made from each plant separately on local lesion host, *Chenopodium amaranticolor* Coste and Reyn., to ascertain the apparent as well as latent virus infections.

Dilution end point, thermal inactivation point and longevity *in vitro* were carried out using *N. tabacum* L. var. White Burley and *C. amaranticolor* Coste and Reyn., as donor and recipient hosts of the virus respectively.

Out of the thirty-four plant species tested, the virus, was transmitted by mechanical means to petunia and seven other plants only (Table I, Figs. 1, 2, 3 and 4).



FIG. 1. Leaves of *Petunia violacea* Right = Healthy leaf; Left = Infected leaf showing yellow mosaic with green islands



FIG. 2. *Nicotiana tabacum* var. White Burley showing yellow mosaic symptoms.

*Abelmoschus esculentus* Moench., *Amaranthus caudatus* L., *Beta vulgaris* L., *Brassica campestris* L., *B. oleracea* L., *Chrysanthemum morifolium* (Ram.) Hemsl., *Citrullus vulgaris* Schard., *Cucumis melo* L., *Cucurbita pepo* L., *Crotalaria spectabilis* Roth., *Datura stramonium* L., *Lablab purpurens* (L.) Sweet, *Ficus religiosa* L., *Gomphrena globosa* L., *Lagenaria vulgaris* Ser., *Momordica charantia* L., *Nicotiana clevelandii* Gray., *Phaseolus mungo* L., *P. radiatus* L., *P. vulgaris* L. var. Pinto, *Pisum sativum* L., *Raphanus sativus* L., *Solanum melongena* L., *S. nigrum* L., *Tagetes erecta* L., *Vigna sinensis* L. and *Zinnia elegans* Jacq., neither developed any symptom till two months after inoculation nor the virus could be recovered from them by back inoculation tests.



FIG. 3. *C. amaranticolor*—Leaf showing necrotic local lesions.

Standard extract lost the infectivity when diluted to  $10^{-3}$ , heated at  $60^{\circ}\text{C}$  for 10 minutes and stored at  $28^{\circ}\text{C}$  and  $10^{\circ}\text{C}$  for 48 hours and 8 days respectively.

Virus diseases of petunia have been reported by Misra and Chenulu<sup>1</sup>, Shyama Rani *et al.*<sup>3</sup>, and Naqvi and Mahmood<sup>2</sup>. Petunia mosaic virus reported by Misra and Chenulu<sup>1</sup> did not produce local lesion on *C. amaranticolor* and *D. metel*, whereas the present virus produced necrotic local lesions on these plants. The virus under investigation differs from that described by Shyama Rani *et al.*<sup>3</sup>, as it neither produced ring-

spots on *N. glutinosa* and *N. tabacum* var. Xanthii Turkish and NP 31 nor infected *G. globosa*, *A. caudatus*, *S. nigrum* and *Z. elegans*. Naqvi and Mahmood<sup>2</sup> reported *A. caudatus* and *D. stramonium* as hosts of petunia mottle virus. Both plants, however, did not react with the present virus. It is, therefore, apparent that the causal agent of mosaic in petunia tentatively named as Petunia mosaic virus-yellow strain is quite different from the earlier records. Further identification is being attempted through serology and electron microscopy.

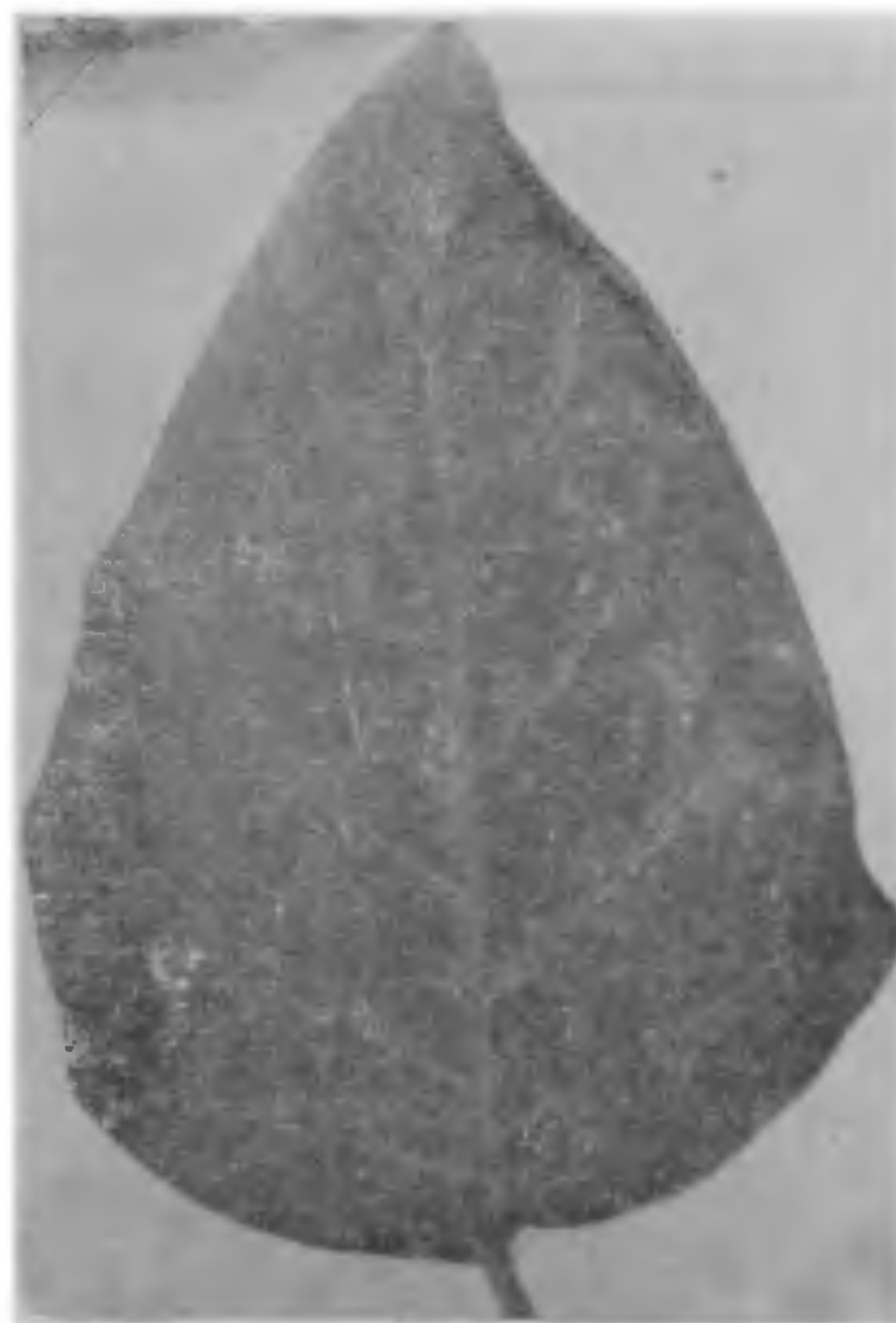


FIG. 4. *D. metel*—Leaf showing necrotic local lesions.

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