

disintegrate. At this stage certain groups of small cells are also seen in the mesocarp in between the enlarged cells that are filled with juice. These groups of small cells are formed due to the pressure of the surrounding enlarging cells (Fig. 4).

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NEUTRON INDUCED VARIEGATED MUTATION IN TAPIOCA

THIS is a report on a variegated mutant obtained in the neutron irradiated population of tapioca.

Fresh cuttings of a promising tapioca (*Manihot esculenta* Crantz) var. H-97 (obtained from Dr. N. Hrishi, Director, Central Tuber Crops Research Institute, Trivandrum) were exposed to fast neutrons using Standard Neutron Irradiation Facility (SNIF) in the APSARA Reactor of the Bhabha Atomic Research Centre. The dose rate was 71 rad/min and 12 cuttings were exposed per treatment. The radiation dose ranged from 25 to 250 rad. The cuttings along with untreated control were planted in the field immediately after treatment.

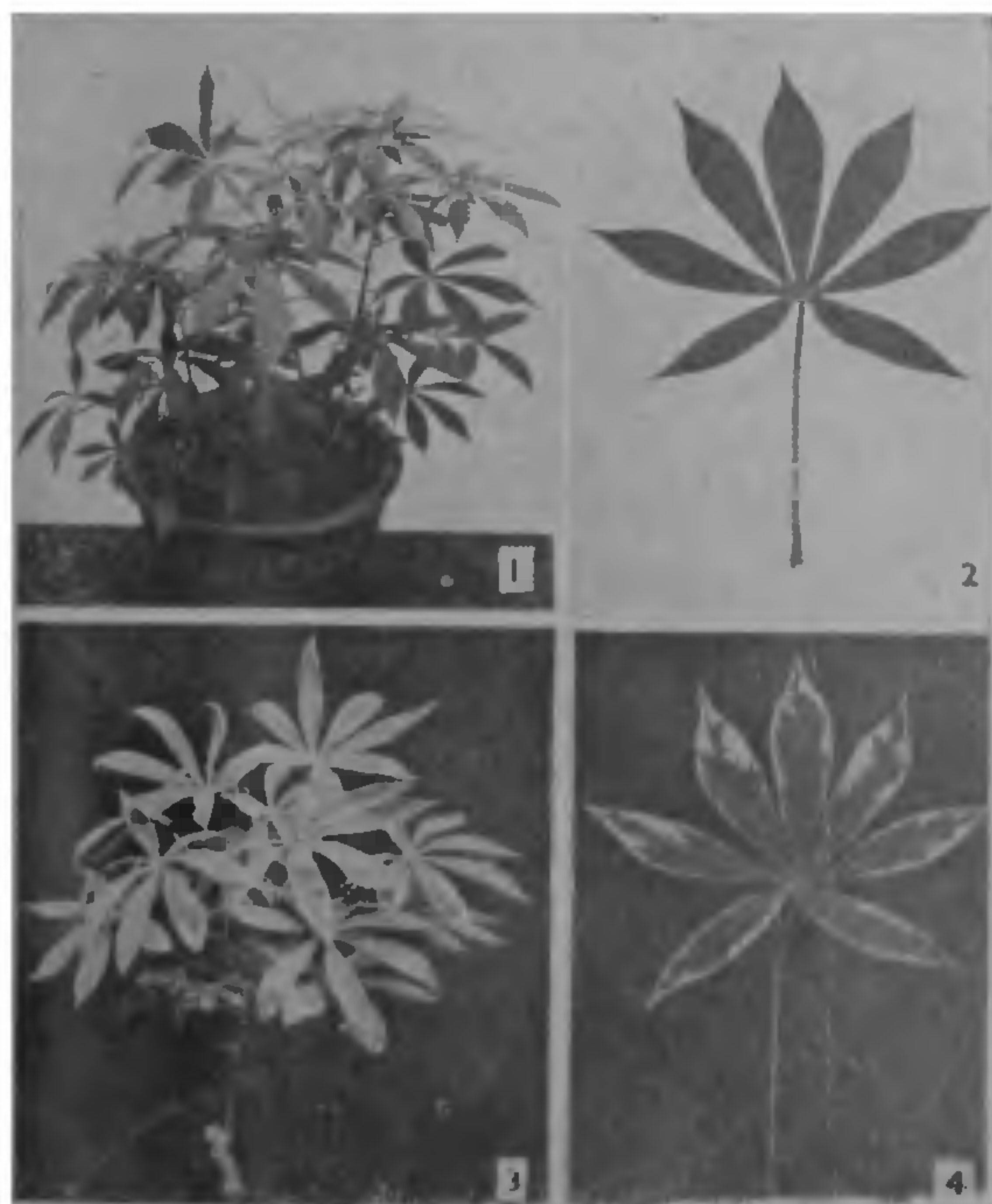


FIG. 1. Tapioca var. H-97 and the variegated mutant. A and B—Plant and leaf of parent H-97. C and D—Plant and leaf of the Variegated mutant.

One of the two sprouts developing from one cutting in 125 rad treatment was a sectorial chimera with variegated leaves in early growth period in the MV₁ generation. After harvest, the stem which had variegated leaves was made into ten cuttings and planted. In the MV₂ generation, two sprouts in the population had all their leaves variegated; the lobes were light green with white border (Fig. 1). Three other sprouts in early stages of growth were chimeric and had variegated leaves as in the MV₁ generation. One of these sprouts later developed normal green leaves while in the other two, the leaves later developed were variegated. All the other sprouts in the population were normal green.

There is a garden variety of tapioca (*M. esculenta* Crantz var. *variegata* Hort.) which is having variegated leaves with yellow middle region and green border. The variant obtained in the present study is conspicuously different from the existing variegated type with respect to chlorophyll distribution and its nature. On account of low chlorophyll content, the growth was less vigorous in the variegated mutant. As the palisade cells did not possess chlorophyll and were mostly empty the leaves appeared light green especially on the ventral side.

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PROTEIN CONTENT IN HEALTHY AND YELLOW MOSAIC INFECTED SOYBEAN SEEDS

DURING a survey of important soybean growing areas of Uttar Pradesh in 1971 and 1972 soybean was found infected with yellow mosaic everywhere, except in the hills. Its incidence varied from 10–30% in different areas. The samples from these areas were collected and studied at University of Gorakhpur. The effect of yellow mosaic disease on protein content of seeds of some important soybean varieties was studied in the present paper.

Four varieties of soybean, viz., Bragg, Clark-63, Lee and Local-2 were selected. For each variety two lots each of 20 seedlings were taken. One lot was treated with white flies (*Bemisia tabaci* Gennadius) already fed on the diseased leaves. The other lot was left healthy. The plants were kept in insect proof conditions. When they attained maturity the seeds were collected separately and subjected to protein estimation which was done by the following method.

One hundred mg of dried seeds were crushed with 10 ml of trichloroacetic acid. This was then centrifuged at 1600 rpm. To the residue 1 ml of digestion mixture (2.4 g of selenium/litre of conc. H₂SO₄) was added. It was mixed well and allowed

to stand for 30 minutes. Four drops of 50% sodium thiosulphate solution followed by 5 ml of another digestion mixture (32 g salicylic acid/litre of conc. H_2SO_4) were then added. After the digestion was complete, about 5 drops of 10% perchloric acid was added and the contents were heated slowly till the solution became clear. The solution was then made up to 100 ml. In a colorimetric tube 1 ml of this solution, 8.5 ml of Nessler's reagent and 0.5 ml of gum-ghati solution were added. The contents were mixed thoroughly. The ammonia thus evolved was estimated in 'AIMIL' Biochem Absorptiometer using filter No. 42.

The value of organic nitrogen thus obtained was then multiplied by a factor 6.25 to obtain total protein content.

The results given in Table I show that yellow mosaic increased the protein content in the seeds in all the four varieties tested. Maximum increase was recorded in the variety Local-2 and it was least in Bragg. The increase was dependent upon the susceptibility of the varieties the most susceptible variety having the maximum protein.

TABLE I
Protein content in healthy and yellow mosaic infected seeds

Varieties	% protein in the healthy seed	% protein in the diseased seed	% increase
Bragg	40.6	43.0	2.2
Clark-63	42.5	45.5	3.0
Lee	41.2	46.7	5.6
Local-2	36.3	42.5	6.9

Increased protein content in virus affected plant parts has been reported by some workers¹⁻⁶ while some others have reported a reduction in protein content due to virus disease^{1,7}.

In the present study protein content of the seeds is increased in all the varieties of soybean affected by yellow mosaic. This increase appears to be due to the increased amount of free amino acids and total nitrogen which have led to an increased rate of protein synthesis through condensation of amino acids.

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A NEW LEAF SPOT DISEASE OF *CENTELLA ASIATICA* L.

A SEVERE leaf spot disease of *Centella asiatica* L. was observed during summer season around Madanapalle in Chittoor District. The disease manifests itself in the form of leaf spots which are elongated or circular, yellowish brown when young and becoming dark brown with age, with a greyish white centre bordered by deep brown margin. In cases where the infection starts from the apex of the leaf the patch may extend and cover about half of the lamina (Fig. 1).

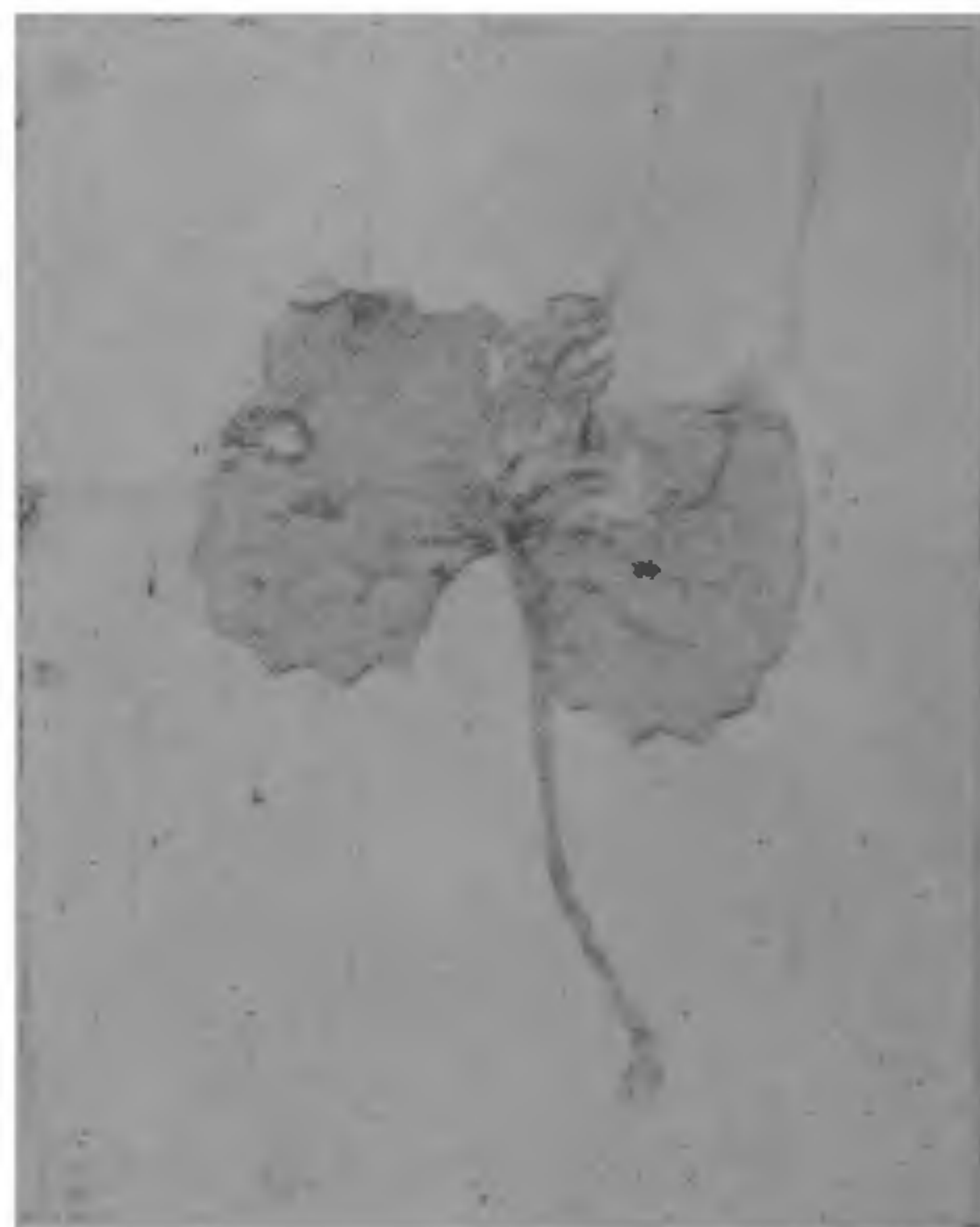


FIG. 1

The fungus was isolated in pure culture from the necrotic spots of the leaves and on inoculation to healthy leaves proved to be a virulent pathogen. The organism consistently produced the typical symptoms and its morphological and cultural characteristics were exactly similar to the previous isolate.