Fruit rot of tomato caused by Gilbertella persicaria.

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With Plate I—II.

A storage rot of tomato fruits caused by *Gilbertella persicaria* var. *indica* Mehrotra & Mehrotra, was observed in the local market in January, 1963. The genus *Gilbertella* was previously described by Eddy (1925) as a species of *Choanephora*, viz., *C. persicaria*. He reported the occurrence of the organism on the fruits of peach. Recently Hesseltine (1960), after a careful study of Eddy's species has changed the generic epithet and named it as *Gilbertella persicaria*. He tested the pathogenicity of the strain NRRL 2700 (Eddy's original strain) and found that it was still pathogenic to peaches. Besides, he made some pathological experiments on some of his strains of *G. persicaria* and also reported the occurrence of the organism on the fruits of peach and mulberry.

There is no previous report from India about a fruit rot of tomato by this organism and thus it appears to be the first record of the disease from this country.

The rot of tomato first appears in the form of a small, nearly circular, olive grey patch. The spot appears slightly sunken as compared to the healthy portion of the fruit. The diseased area rapidly increases and the whole fruit is rotted completely within 4—5 days. The sporulating structures appear at several places. A lot of watery substance with foetid odour is exuded, as a result of the rupture of the fruit wall, during the later stages of rotting.

Both ripe and unripe fruits were selected for their lack of any bruises or skin breaks. The fruits were first carefully sterilized. The pathogenic nature of the fungus was confirmed by inoculating healthy tomato fruits. The following procedures were used to inoculate the tomatoes: (1) incisions were made a little deep to insert the fungus and the skin flap was pressed back into place and the wound was sealed with wax, (2) a fine needle dipped in the spores was used to puncture the surface once, and finally (3) for control some tomatoes were only injured and sealed but not inoculated with the fungus. All tomatoes were placed in a moist chamber at 25° C $\pm$1. By the end of 1 or 2 days, infection appeared in treatments 1 & 2 as large purple areas about the site of inoculation. When the experiment was terminated at 6 days, observations were as follows. The untreated

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controls showed no infection. Every fruit was infected when the fungus was inoculated after inflicting slightest injury to the host. In general, the fruits rotted completely within 3—5 days. All fruits used in the treatment 1, were covered with sporangia at several places, while in treatment 2 the fruits were covered with copious mass of hyphae in addition to sporangia. Fruits inoculated by puncture developed a deep crack. The skin could be peeled off from the fruit easily. When pieces of tissue were aseptically removed, pure cultures of *G. persicaria* var. *indica* were isolated. Pathogenicity of the organism was also tested on the following fruits.

1. *Solanum melongena* L. — 2. *Musa paradisiaca* L. var. *chini champa* — 3. *Cucumis melo* L. — 4. *Solanum tuberosum* L. — 5. *Momordica charantia* L. — 6. *Carica papaya* L.

From the cross inoculation studies it was found that the present organism could infect only *Solanum melongena* L. and *Musa paradisiaca* L. var. *chini champa* while the rest of the fruits were not attacked. Rotting in *Solanum melongena* L. was rapid and severe while in *Musa paradisiaca* L. var. *chini champa* it was gradual and not severe.

Morphology.

Sporangiophores often slightly roughened a short distance below the sporangium, frequently branched, generally with a septum below a branch, upto 16,5—39,6 μ in diam. and upto 1,2 cm in height; sporangia at first white later becoming black, globular to dorsiventrally flattened, generally circinately borne, 36,5—216 μ mostly 84—126 μ in diam.; sporangial wall granular, minutely roughened, breaking into two equal halves; columellae hyaline, variable in shape, oval to cylindrical and sometimes pyriform, 14,8—135×13,2—99 μ; sporangiospores oval to irregular in shape with a papilla at either end, with 4 or 5 appendages 4,5—21×4,0—16,5 μ; chlamydospores not seen; zygospores formeμ when mated with a brown strain isolated from soil, 38,5—98,5 d mostly 63,5—78 μ in diam.

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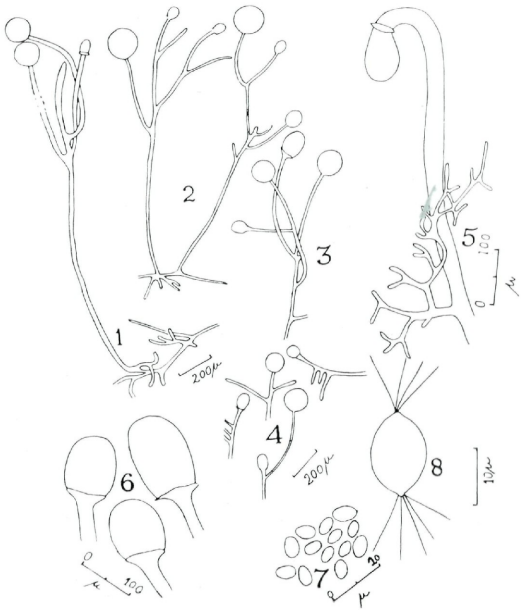

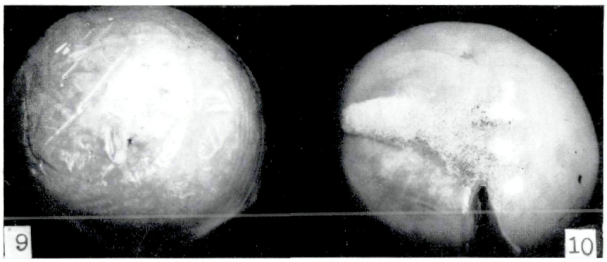

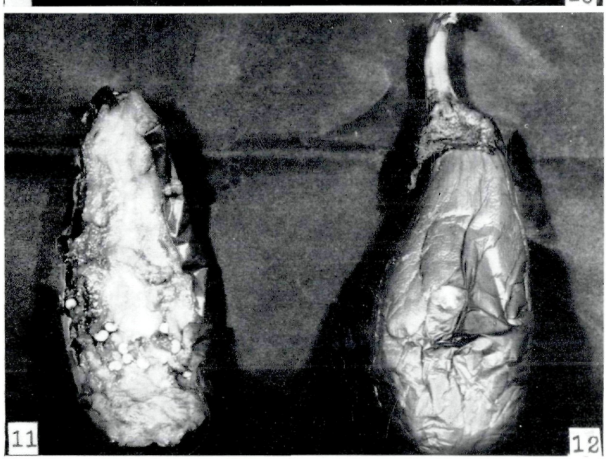

Explanation of Plates.

Plate I.

1.—4. Showing branched sporangiophores. The branches also bear sporangia at their tip. — 5. A sporangiophore with a columella at its circinate tip & a sterile branch. — 6. Three columellae showing variation in size and shape. — 7. A number of spores showing the range in size and shape. — 8. An enlarged sporangiospore with appendages at either end.

Plate II.

9. A diseased tomato fruit with no crack. — 10. A diseased tomato fruit with a crack & a copious mass of hyphae & sporangia. — 11. A longitudinally cut diseased brinjal fruit showing deformed tissues. — 12. A diseased brinjal fruit with distorted surface, showing sporulating structures on the intact calyx. — 13. A banana fruit (after removal of the fruit wall) showing the infected portion.