16% of the added radioactivity from the carbonyl-labelled carbofuran was recovered as $^{14}CO_2$ as against less than 1% from ring-^{14}C-carbofuran. Our results clearly suggest that with a lag of 20 days, carbofuran degradation is fairly rapid even in problematic rice soils such as 'kari'.

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POST-INFECTION CHANGES IN ASCORBIC ACID CONTENTS OF MANGO AND AMLA CAUSED BY TWO FRUIT-ROT FUNGI

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ASCORBIC acid is believed to act as one of the biological oxidative-reductive substances. It is known to contribute resistance to host against pathogenic organisms, and is also decarboxylated with fungal enzyme system. Hence, in the present study changes in the ascorbic acid content of the two fruits (mango and amla) were studied during the pathogenesis of the two fruit-rot fungi.

Healthy and semi-ripe fruits of mango (*Mangifera indica* Linn.) and amla (*Phyllanthus emblica* Linn.) were inoculated with *Phomopsis mangiferae* Ahmad. and *Phoma exigua* Desm. respectively. Mango fruits were inoculated as described by Granger and Horne[1], while Amla fruits were infected with scalpel injury. They were wrapped with sterilized polythene bags and stored at 25 ± 2°C. On every alternate day, fruit pulp weighing 5 g was ground in a mortar with glass fibre and 50 ml of 5% metaphosphoric acid was added slowly while grinding, and filtered through Whatman No. 42 filter paper. The filtrate was centrifuged at 2000 g. Ten ml of this was titrated against the 2-6-dichlorophenol-indophenol reagent as suggested by Bessey and King[2]. The experiment was conducted in triplicate and repeated three times. The other details were similar to earlier methods[3] and the results are given in table 1.

Table 1 shows a gradual decrease in the ascorbic acid content as the incubation progressed in both the fruits. The vitamin C content of mango fruits showed a gradual decrease with increase in storage period. In

Table 1 *Post-infection changes in ascorbic acid (mg/100 g) of mango and amla fruits due to infection of two fruit rot fungi*

Fruit	Pathogen		Days of incubation 0 (fresh)	2	4	6	8	Percentage* of loss
Mango	*Phomopsis mangiferae*	Healthy	98.2	89.2	85.1	82.3	79.1	19.5
		Infected	98.2	72.7	57.4	23.7	2.7	97.5
Amla	*Phoma exigua*	Healthy	402.7	401.3	396.2	390.4	386.4	6.6
		Infected	402.7	210.0	163.2	121.5	52.3	87.0

* Total loss of ascorbic acid during the incubation of 8 days.

contrast to this, the fall in vitamin content was drastic when the fruits were attacked by *Phomopsis mangiferae* and brought down the vitamin content of the fruit to 2.7 mg 100 g. Similarly amla fruits which are the richest source of vitamin C, also lost the vitamin under storage conditions. However, the loss was not significant. When the amla fruits were attacked by *Phoma exigua* the content has gone down to 52.3 mg 100 g. Gradual decrease in ascorbic acid content during incubation period may be due to ripening of fruits[4]. Similar rapid decline in ascorbic acid content in mangoes[6] and in amla was noted when they were infected with *Botryodiplodia theobromae* and *Aspergillus niger* respectively. The loss of vitamin C under pathogenesis may be due to production of suitable ascorbic acid degenerating enzymes either by the fungus or by the host-pathogen complex[6].

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INDUCED PISTILLODY IN *TURNERA SUBULATA*

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VARIOUS aspects of heteromorphic incompatibility in *Turnera subulata* J. E. Smith have been studied[1-9]. There is, however, no work on the effect of chemical mutagens on heterostylous plants; although induced self-compatibility and its crossing relationship have recently been reported in *T. subulata* following Hydroxylammonium chloride (HA) treatment[5,6]. This report deals with the pistillody mutant in *T. subulata*.

Seeds (200) of *T. subulata* were soaked in distilled water for 24 hr and treated with 0.01–1.0% aqueous solutions of hydroxylammonium chloride (HA) and hydrazene (HZ) separately for 24 hr at regular intervals of 6, 12, 18 and 24 hr. After a thorough washing the seeds were sown in pots and 30 days after sowing, the plants along with controls were transplanted in the experimental field to study the M_1 generation. Since the species *T. subulata* is self-incompatible, M_2 plants were raised by allowing the pin and thrum plants to open-pollinate. For the study of carpellary pistillode and gynoecium characteristics, whole mount preparations were made in 10% glycerine and measurements made. Controlled pollinations on pistillodes were made using its own pollen, normal thrum and pin pollen; and the pollen tube growth was observed following the technique used earlier[4].

Pistillode mutants were screened only in thrum plants in both the M_1 and M_2 generations after 0.01, 0.1 and 1.0% HA treatment for 12 hr and 0.1% HZ treatment for 12 and 18 hr respectively. The pistillodes occur intermixed with the seeds in the capsules of thrum plants. The percentage of these mutants is 5% in all the concentrations and durations of the two mutagens tested but 6% mutation frequency was noted in 0.1 and 1.0% of HA in M_1 generation.

The average number of capsules containing pistillodes ranged from 37–50% on each plant of the pistillode mutant. Comparison of pistillode mutant and normal pin and thrum flowers is given in tables 1 and 2 and is shown in plates 1 and 2. Vegatative and floral characteristics of pistillode mutants and normal plants are apparently similar but a close observation reveals that the ovary of pistillode mutant contains several pistillodes in addition to normal seeds, unlike the normal ovary which contains only the seeds. There are 3 placental masses per capsule, each carrying 8–15 seeds in a normal plant whereas in induced pistillode plants 1–8 pistillodes develop from any of the three placental tissue in a capsule. Each pistillode is characterised by structure akin to gynoecium with a short filliform "style", "stigma" and "ovary", which are devoid of ovules and hence sterile. Abnormal pistillodes show twin "ovaries" with styles and stigma and sometimes without pistil or stigma (plate II, figures 3 & 4). Unlike the stigma of normal thrum which is brush-like with several large multicellular glandular papillae, the stigma of pistillode mutant is characterised by 3–8 small finger like multicellular papillae (plate II, figures 3–7). Numerous unicellular trichomes akin to those of thrum gynoecium occur on the pistillode.