mature leaves as K^+ is one of the most mobile element. Such mobility or retranslocation of Na^+ is known to be poor. It may be inferred from the high concentration of K^+ in leaf sheaths that certain specialised cells have a higher requirement of K^+ which under salt stress retain most of the Na^+ during its translocation sparing former for more important function and thus keeping laminae relatively free from Na^+ beside its excretion. These mechanisms seem to help in regulating ionic concentration in *D. fusca* and keeping younger parts relatively free from Na^+ and favouring its growth without inhibition under such adverse edaphic environment.

5 November 1984

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MOSAIC DISEASE OF CITRUS IN INDIA

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A MOSAIC disease of citrus was reported[1,2] from Andhra Pradesh as a disorder of mosambi (*Citrus sinensis* (L) Osbeck). During our recent surveys of citrus growing regions of the country with a large scale indexing programme, mosaic symptoms were observed in citrus orchards in Andhra Pradesh, U.P. Hills, Maharashtra, Rajasthan, Meghalaya, Manipur, Assam and Arunachal Pradesh. The symptoms on the orchard trees were more or less similar to greening disease but a closer inspection of the affected trees revealed that the mosaic infection was almost uniform, whereas trees infected with greening showed irregular distribution of the disease. Budwood collected from various places was indexed at the Indian Agricultural Research Institute, New Delhi, its Regional Research Station, Pune, and Citrus Research Station, Tinsukia, Assam. Symptoms of mosaic were also observed in the experimental kagzi-lime nursery plants grown in the glass-house at Delhi. This suggested the seed-borne nature of the virus.

The disease was easily transmitted by bud and wedge grafting from the bud-woods, collected from various States. In glass-house, the symptoms of the disease appeared after 70–90 days of budding/grafting. Transmission up to 100% was observed in the bud-woods collected from north eastern States. The initial symptoms of the disease in the glass-house inoculated mosambi seedlings appeared as mild chlorosis, followed by severe mosaic pattern on the newly developed leaves (figure 1c). On mature leaves, chlorosis was severe and the leaves became leathery in texture (figure 1b). The inoculated plants were comparatively stunted and less vigorous in growth.

The disease was not transmitted by citrus psylla, *Diaphorina citri* Kuway; aphids, *Toxoptora aurantii* B.d.F, *Dactynotus jaceae* L but was transmitted by *Myzus persicae* Sulz and *Aphis craccivora* Koch in a non-persistent way. The transmission percentage was recorded up to 60% and 40% respectively.

The following citrus species and cultivars were susceptible: sweet orange (*Citrus sinensis* (L) Osbeck) cvs Mosambi, Sathgudi, Washington navel; Indian acid-lime (*C. aurantifolia* (Christm) Swingle) cvs., Kagzi nimbu, Rangpur lime (*C. limonica* Osbeck), grape fruit (*C. paradisi* Macf), mandarin (*C. reticulata* Blanco) cvs Cleopatra mandarin, Nagpur Santra, Sikkim orange, Kinnow orange, lemon (*C. limon* Burm. f.) cvs Lisbon lemon, Pummelo (*C. grandis* L. Osbeck), bale (*Aegle marmelos* Corred). The symptoms on these hosts were similar to those observed on sweet orange except in Sikkim orange. In this, symptoms appeared as chlorosis of the leaves with clear mosaic pattern, extreme reduction of the leaf lamina and wavy margin of leaves on inoculated plants within 30–40 days (figure 1d).

In an experiment, 10 plants of Sikkim orange were graft inoculated with the mosaic virus. Simultaneously another set of 10 plants of similar age were inoculated with greening. Typical mosaic symptoms appeared much earlier and quite conspicuous in Sikkim orange compared to typical greening. Therefore, Sikkim orange be considered as a differential host for detection of greening and mosaic viruses. Further distinction can be made by inoculating, bale plant which is susceptible to mosaic but not to citrus greening.

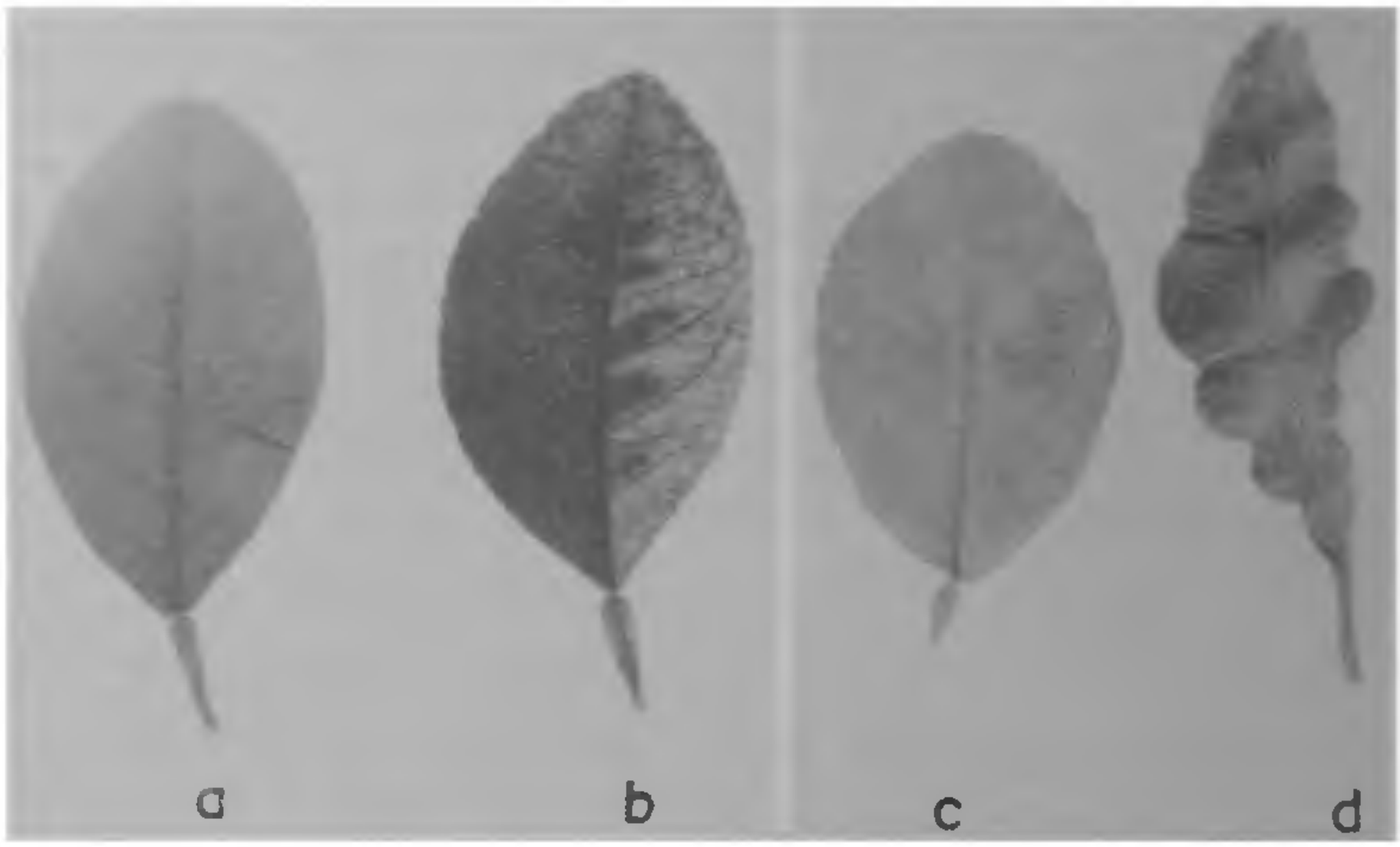

Figure 1a–d. a. Healthy mosambi leaf, **b.** Mature leaf symptoms of mosaic on mosambi, **c.** Young leaf of mosambi showing mosaic symptoms, **d.** Sikkim orange leaf showing wavy margin due to mosaic infection.

Vector transmission is also of help in differentiating these disorders.

The mosaic infection can be assured by close observation of the field trees and can be clearly detected by inoculating on differential host(s) or vector transmission. The transmission of the mosaic disease by aphids, *i.e. M. persicae* and *A. craccivora* has been established for the first time. Kegzi lime and other citrus species were found susceptible to the mosaic.

28 January 1985; Revised 26 April 1985

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SIGNIFICANCE OF CELL WALL PHENOLS IN THE RESISTANCE OF RICE AGAINST BLAST

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THE presence of phenolic acids in cell walls has been already reported[1–4]. The cell wall-bound phenols may participate in the resistance of plants against pathogens[5,6]. Correlations between resistance of rice to the blast fungus, *Pyricularia oryzae* and the concentration of ethanol extractable phenols have been shown[7–10]. In this paper, we report the presence of two cinnamic acid derivatives in the leaf blade cell walls of blast resistant and susceptible rice cultivars.

Rice (*Oryza sativa* L) cultivars, Carreon, Tetep and IR-8 resistant and Karuna, CO-13 and Benibhog susceptible to blast were grown from seeds in shallow earthen pots (30 cm in diameter) containing 5 kg of alluvial soil under natural photoperiodic conditions. The disease reaction of plants was confirmed with 21-day-old seedlings artificially inoculated with the fungus. The pots were watered daily. The fully matured third and fourth leaf blades from the 25-day-old plants were harvested. Leaf blade samples (200 g) were