

asci 124.80–170.60 μ \times 12.48–18.72 μ , 7-spored; ascospores 88.82–157.56 μ \times 4.68–6.24 μ , 7 to 10 septate (mostly 9 septate), germinating from all the cells.

The culture and slides of the fungus (containing pseudothecia, asci and ascospores) have been deposited in the CMI, Kew, Surrey (No. IMI 206845) and the organism has been identified as *Cochliobolus nodulosus* Luttrell. This is a new host record and new report from India.

The authors wish to express their gratefulness to Mr. A. Johnston, Director, CMI, Ferry Lane, Kew, Surrey, for confirming the identification of the fungus and Dr. P. N. Bajpai, Head, Department of Horticulture of this University, for providing facilities. The senior author is also thankful to C.S.I.R., New Delhi, for financial assistance.

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THREE NEW LEAF-SPOT DISEASES OF *KALANCHOE* SPP.

DURING July, September 1975 and 1976 three new leaf-spot diseases of *Kalanchoe* spp. were recorded at Jabalpur. All the three diseases have not so far been recorded from India.

Leaf-spot of Kalanchoe mortagei

Diseased leaves showed water-soaked, sunken, greyish, circular spots. Gradually they increased in size and the centre of the spots assumed greyish brown colour while the peripheral region became dark brown in colour. Healthy and diseased areas of the lamina were well demarcated. Sometimes many smaller spots coalesced to form bigger spots. The infected portion finally dried up and then very minute pinkish fruiting bodies were seen on the surface of lamina. The causal organism was identified as *Colletotrichum* state of *Glomerella cingulata* Spauld. & v. Schr.

The specimen has been deposited at the Herb. IMI, Kew, No. 189290 a, also in HPP, AUJ, No. 124.

Leaf-spot of Kalanchoe pinnata

At first small pinhead sized water soaked spots were formed on the upper surface of the leaves. The spots gradually increased in size and became amphigenous. The mature spots had a circular outline greyish brown in colour. There was a sharp demarcation between the healthy and diseased portion of the leaf. The demarcation was more pronounced on account of

the presence of a narrow but distinct dark coloured raised ring. The spots may coalesce and form larger ones. At later stages, the spotted areas of the leaves became thin, dry and membranous, and very minute black fruiting bodies were clearly visible. In many cases this dried portion got detached from the healthy tissues. Isolations from the diseased leaves constantly yielded *Bartalinia robillardoides* Tassi.

The specimen has been deposited at Herb, IMI, Kew, No. 189292, also in HPP, AUJ., No. 125.

Leaf-spot of Kalanchoe fedtschenkoi

Water-soaked, grey coloured spots, gradually increased in size covering the entire leaf. The cream coloured fruiting bodies were arranged in rings amphigenously. Later the diseased tissues got separated from healthy parts leaving a shothole. In severe infections the leaves shed off.

The pathogen responsible for this disease was identified as *Alyrothecium roridum* Tode ex Fr.

The specimen has been deposited in HPP, AUJ, No. 126.

Pathogenicity tests were carried out in the case of all the three fungi by spraying an aqueous suspension of conidia from 10–15 days old culture on PDA with suitable controls. The disease symptoms on respective host appeared within 7–10 days. The same pathogen was obtained on reisolation in each case.

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INVESTIGATIONS INTO THE CAUSES OF CHURDA MURDA (MALFORMATION) DISEASE OF CHILLI IN VIDARBHA

CHILLI (*Capsicum annuum* L.) grown in the Vidarbha region of the Maharashtra State suffers annually from a disease called 'malformation'. The disease is manifested as general stunting, reduced leaf size and upward or downward curling of leaves. Such plants also show mosaic-mottling, especially during the months August–September. Symptoms of this type being caused by varied agencies, viz., (a) tobacco leaf curl virus^{1,4,5}, (b) infestation of thrips and mites¹ and (c) mosaic viruses^{2,3,6}. An attempt was therefore made to identify the causal complex responsible for the malformation syndrome in chilli, as it occurs in the Vidarbha region of the Maharashtra State.

Malformation syndrome consisted of three types of foliar symptoms occurring singly or in combination, *i.e.*, (1) upward curling and crinkling, (2) downward curling, (3) Mottling, crinkling and puckering, (4) combination effect of 1-3 (Fig. 1). The upward curling was due to infestation of thrips (*Anaphothrips dorsalis* Hood.) and the downward curling was due to white mites (*Hemitarsonemus latus* Blank). Foliar sprays with monocrotophos (1.5 ml/l) helped such plants to regain healthy new growth.



FIG. 1. Chilli plant showing 'Malformation' syndrome.

A few plants, which failed to recover even after rigorous spraying with the insecticide, harboured a viral infection. The virus was serologically related to CMV-1 as evidenced from chloroplast agglutination test. The virus in the leaf extract was sap transmissible to *Citrullus vulgaris* L. and *Datura metel* L. causing mild systemic mosaic in 3-4 weeks, and chlorotic, local lesions in 3-4 days respectively. Transmission by rub-inoculation between chillies, seemed to take a longer time. Seed transmission was negative. The virus was found to get transmitted to healthy chilli seedlings in 10-15 days, when the latter were caged along with malformed plants harbouring thrips, mites and the virus. This aspect is being verified further for obtaining direct evidence.

A feeler trial conducted in the field indicated that foliar sprays with 'Nuvocton' (Monocrotophos), 1.5 ml + 'Cuman L' (Ziram), 2 ml/l of water given at

10 days intervals effectively improved growth and productivity of NP46-A cultivar of chilli by arresting the development of malformation syndrome.

The problem of 'Churda Murda' or malformation disease of chillies, as it occurs in Vidarbha region, has thus been identified. The casual complex consists of infestation due to thrips and mites accompanied at times by infection due to a CMV-1 related mosaic virus. The virus can be detected in chilli plants by using *Datura metel* L. as a local lesion host.

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QUALITY OF CINNAMONS MARKETED IN INDIA

ALTHOUGH true cinnamon derived from the bark of the plant *Cinnamomum zeylanicum* is admitted to be superior in flavour to cassia derived from *C. aromaticum*, *C. burmanni* or *C. loureirii*, very little of the true cinnamon is being marketed in India. Indigenous production is very little and the imports from Sri Lanka, the biggest producer (4,500 tons per annum) of this spice, is negligible¹. Cassia is being imported from China, Indonesia and Malaysia to the tune of 50 to 60 tons annually, and sold at exorbitant prices. There is a large export of 'Indian cassia' obtained from the forests of North-Eastern India to the tune of 500-600 tons and some of this finds its way into the Indian market also. This is supposedly derived from the plant *C. tamala* whose leaves are dried and sold as the spice, *tejpatta*. But the wild trees in Assam and Manipur from which Indian cassia is obtained, do not bear much resemblance to *C. tamala*. Indian cassia is poor in flavour. Some wild cinnamon from *C. iners* and *C. obtusifolium* and barks dipped in cinnamaldehyde are also sold by wayside vendors as 'dalchini' or cinnamon. All this leaves the consumer confused regarding the true cinnamon. Macroscopic and microscopic examination