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## STUDIES ON A MELON RINGSPOT VIRUS

A RINGSPOT type mosaic disease of muskmelon (*Cucumis melo* L.) has been found to be of common occurrence at Delhi. The disease is characterised by mosaic mottling of the leaves, the chlorotic areas invariably assuming a ringspot shape (Fig. 1). The young spots on the leaves consist of small yellowish brown spots surrounded by bright yellow halo or margin. The disease was found to be mechanically sap transmissible indicating its virus origin. Studies conducted on the host range, insect transmission and physical properties of the causal virus are reported in the present note.

Fig. 1, Melon Ringspot virus on *Cucumis melo* L.

The virus was transmissible to *Nicotiana tabacum* var. White burley, *N. glutinosa*, *Cucumis melo*, *C. sativus*, *Petunia hybrida and Vigna sinensis* by mechanical sap inoculations producing systemic symptoms. Typical ringspot symptoms were produced on *N. tabacum*, *N. glutinosa* and *Petunia hybrida*. On *N. tabacum* there is a tendency to recovery from the symptoms in the subsequent leaves. *Chenopodium amaranticolor* reacted with local lesions.

Insect transmission trials with *Aphis craccivora* Koch, *A. gossypii* Glov., and *Myzus persicae* Sulz. gave negative results. The virus in the crude sap was found to be infective when heated to 60° C for ten minutes but was rendered innocuous when heated to 70° C. It had a dilution end point between 1 : 1,000 and 1 : 10,000 and longevity *in vitro* of 3 days at room temperature (26° C) and 8–12 days at 8–10° C.

The symptomatology, physical properties, differential host reaction and inability of the virus to be transmitted by aphids suggest the virus to belong to nematode transmitted tobacco ringspot group[1]. Earlier tobacco ringspot virus infection was also reported on brinjal[2] and on petunia[3] from India. However, this appears to be the first record of this virus on muskmelon from India under natural conditions. Further work on purification and serology of the virus under study is in progress.

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## EFFECT OF MORPHACTIN ON THE EPIDERMAL STRUCTURES OF OKRA PODS

The foliar application of morphactin, a synthetic bioregulant[1] affects the leaf epidermis[2] of *Lycopersicon esculentum* Mill and suppresses the stomatal aperture[3] in the isolated leaf strips. The encouraging results on the control of post-harvest weight loss in

TABLE I

*Effect of morphactin on the pericarp of okra pod*

| Morphactin in ppm. | Stomatal Index ×400 | Number of Stomata/ sq. mm. | Number of Cells/ sq. mm. | Length of trichome(μ) ×100 | Number of trichomes/ sq. mm. ×400 | Stomata L × B (μ) ×400 |
|---|---|---|---|---|---|---|
| 0 | 9·85 | 13 | 119 | 392 | 2 | 32×24 |
| 2·5 | 6·25 | 8 | 120 | 704 | 3 | 36×32 |
| 5·0 | 5·80 | 8 | 130 | 736 | 4 | 36×32 |

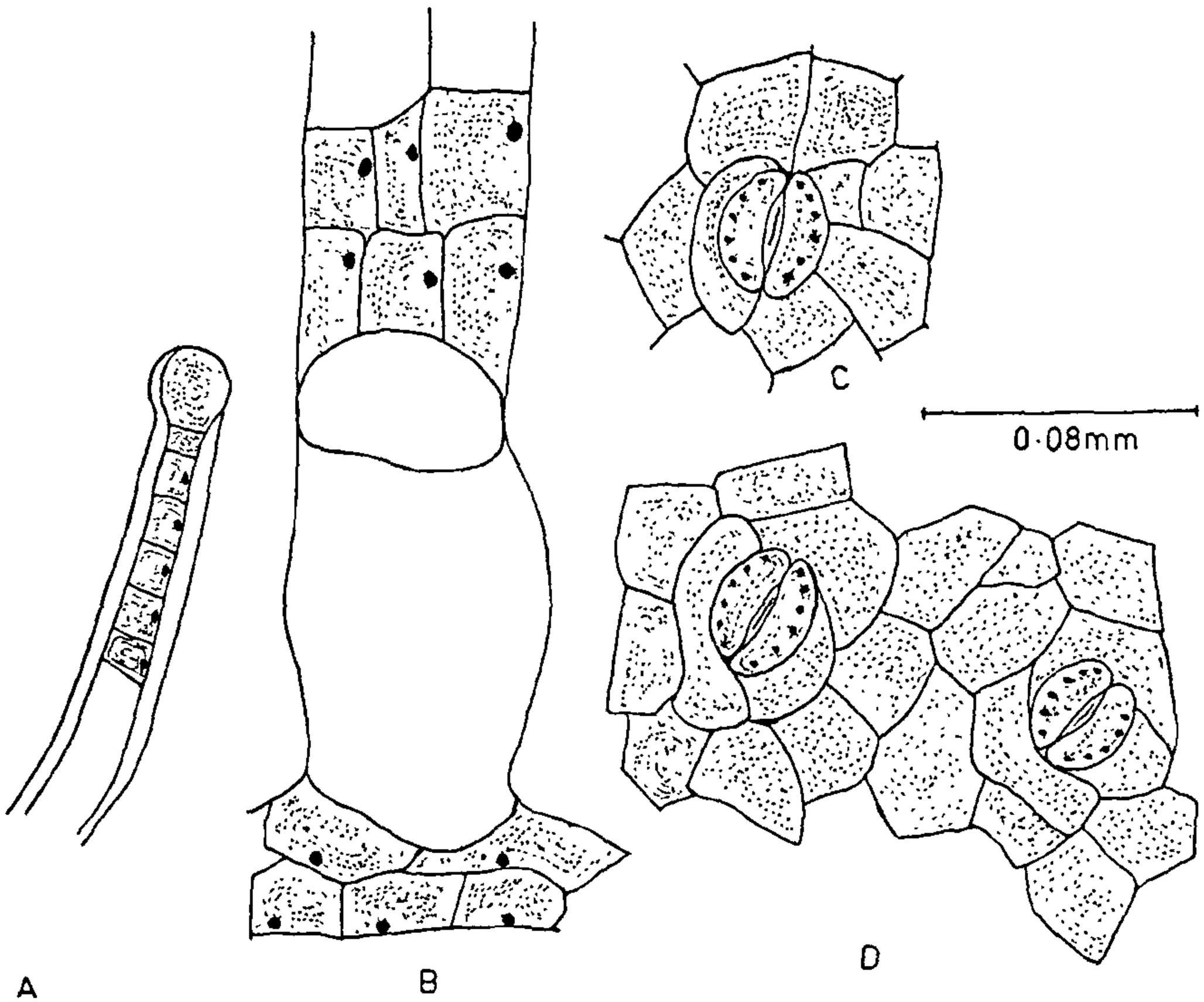


FIG. 1 A–D. Epidermis of the pericarp of untreated okra pods with stomata and trichomes. A—Trichome with glandular tip (Apex portion); B—Trichome (Basal portion); C—Anomocytic stomata; D—Anisocytic stomata.

okra pods with preharvest application of morphactin, prompted us to study the effect of foliar application of morphactin (2·5 and 5·0 ppm) on trichomes and other epidermal structures of the pericarp of okra pods. The pericarp was found to have two types of stomata, *viz.*, anomocytic and anisocytic and polygonal epidermal cells were irregularly arranged containing calcium oxalate crystals. Trichomes were glandular

and multiseriate. Morphactin treatment increased the length and the number of trichomes and size of stomata while causing a decrease in stomatal index.

The seeds of 'Pusa Sawni' okra (*Ambelmoschus esculentus* Moench L.) were sown in July in 12 beds with a spacing of 45 × 30 cm. One month old plants were given the first spray with 2·5 and 5·00 ppm morphactin containing Tween–20 (0·02%). Four plots each were taken for control for 2·5 and 5·00 ppm morphactin treatments. The control plants were sprayed with distilled water containing Tween–20 (0·02%). Two subsequent sprays were given at intervals of 7 days. In all three pickings were carried out on the 7th day after each spray. The epidermal peels from the pods (8–10 cm. long) were removed at random and temporary mounts were prepared with cotton blue and lactophenol. The observations were made at × 400 for epidermal cells, stomata and trichomes per unit area while the length of trichomes was recorded at × 100 by the conventional method[4]. The stomatal index was calculated by the formula described elsewhere[4].

Observations have been recorded in Table I and Fig. 1. Epidermal cells were polygonal or elongated and were irregularly arranged in various directions in the control and morphactin-treated pods. In both the cases two types of stomata, anomocytic and anisocytic were found. Inamdar and Chohan[5] also reported similar types of stomata in the leaves and floral parts of some members of *Malvaceae*. Inspite of these similarities, morphactin treated pods exhibited larger number of epidermal cells per unit area and guard cells were bigger as compared with the control. The size of the stomata was also increased by 2·5 and 5·0 ppm morphactin treatment without causing any abnormality (Table I). However, the number of stomata per unit area considerably decreased thereby decreasing the stomatal index in the treated pods. It was interesting to observe glandular, multiseriate trichomes which were more in number and much elongated in treated pods (Table I and Fig. 1). The decreased stomatal index, the increased size of stomata and the length of trichomes were in accordance with earlier findings on the leaf epidermis of *Lycopersicon esculentum* Mill[2].

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## CIRCADIAN RHYTHMICITY IN BRAIN AMP DEAMINASE ACTIVITY OF *BUFO VULGARIS*

*Introduction*

INVESTIGATIONS on diurnal variations in metabolic system have been of interest in the recent years[1–4]. Rhythmic fluctuations have been noticed in many animals for various biological parameters[5]. Peak periods of enzymic activities during dark hours have been reported for several nocturnal animals[6,7]. However a survey of literature reveals that studies on activity rhythms of ammonogenic enzyme systems in toads are scanty. Hence, the present study was carried out to investigate the changes in the ammonia metabolism in toad brain with the changing photoperiod of the dial cycle.

*Materials and Methods*

The medium sized toads, *Bufo vulgaris* collected locally were maintained in wooden boxes containing mud and acclimated for one week to the laboratory (25–30° C) conditions of 12 hrs light and 12 hrs dark phases of the day. The animals were fed with earthworms *ad libitum*. Brains were isolated at the following periods of the day, *i.e.*, 8·00, 12·00, 16·00, 20·00, 00·00, 4·00 hrs and 5% homogenates were prepared in ice-cold distilled water. The AMP deaminase activity was estimated by the method of Weil-Malherbe and Green[8] with slight modifications as described by Wegelin *et al.*[9]. The ammonia content was estimated by the method of Bergmeyer[10].

*Results and Discussion*

The AMP deaminase activity in brain tissue showed cyclical variation with maximal activity at 20·00 hrs (0·1802 ± 0·036) and with minimal activity at 08·00 hr (0·0589 ± 0·006; Fig. 1).

The highest level of AMP deaminase at dark phase of the photoperiod might reflect the increased adenine nucleotide deammation resulting in an inceased levels of ammonia in the brain. In evidence to this, the ammonia content also showed similar rise and fall during dial cycle with a maximal content at 20·00 hr (4·857 ± 0·429) and minimal at 04·00 hr (1·80 ± 0·169). The difference between maximal