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OCCURRENCE OF *CRUCIGENIA MITRII* TIWARI *et* PANDEY, FROM POONA

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CRUCIGENIA mitrii Tiwari *et* Pandey, a member of Chloroccocales occurred in a small puddle in Aundh, Pune. Observations of the alga were made both in field material and in culture. It appeared as mucilaginous coenobia of 3–8 cells; multiple coenobia of 16 cells or even more not uncommon. The coenobia were of various sizes and shapes. The cells are not compact, but rather free from each other and may form a small rectangular or triangular space at the centre. The cells are oval-cordate to almost triangular with rounded corners; the shape appears due to mutual compression. Cells measure 8–20 μ in breadth and 8–15 μ in length. The chloroplast is parietal and almost entirely fills up the cell; embedded in it is a single pyrenoid.

Reproduction is by autocolonies formed by simultaneous divisions of the protoplast into four daughter cells which become arranged to form a cruciate coenobium with a central space. Very often, formation of two autocolonies from a single mother cell was also observed (figure 8). The two daughter coenobia lie one above the other or side by side, while still enclosed in the parent cellwall. The daughter coenobia are liberated by rupture of the parent cellwall, remaining attached to the new coenobia (figures. 7, 9–11). Liberation is usually delayed until the daughter coenobia mature. Though four-celled coenobia (figures 3–6) are usual, two-celled, coenobia as also the solitary state (figures 1,2) have been observed (for figure please see Page No. 1146).

Our form agrees closely in all respects with the type described from Allahabad by Tiwari and Pandey[1]. It may be pointed out here that, *C. mitrii* comes very near to *Suxenella* Srivastava *et* Nizam[2] differing from it only in the absence of mucilage and also in the cells being all in one plane. Tiwari and Pandey have discussed this point in detail and suggested that a critical reinvestigation of *Suxenella* is necessary to decide whether *Suxenella* is distinct from *Crucigenia mitrii*. We are inclined to agree.

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STUDIES OF AREOLES IN ASCLEPIADACEAE AND PERIPLOCACEAE

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THE leaf architecture and venation pattern have attracted the attention of several botanists in recent years. Hickey[1] exploited the features for identifying the foliage of living and fossil dicotyledons. The architectural pattern and venation of leaves of Bignoniaceae have been examined by Jain[2]. The comparative venation studies of Apocynaceae have been presented by few workers[3–7]. The venation pattern is certainly helpful in the diagnostic and taxonomic consideration of plants[8,9]. Further, these characters have been of great value in identifying plant materials used in drugs.

The present work deals with the areole pattern of 35 species and 4 varieties of the Asclepiadaceae and Periplocaceae. An attempt has been made to find out the taxonomic significance of areoles and free vien endings.

The taxa investigated are listed in the text, The leaf bits, between the margin and the midrib and in the midway between the tip and the base of the lamina, were cut and treated in 10% KOH solution and cleared. But in *Genianthus*, *Hoya*, *Decalepis* and *Hemidesmus* the leaves were treated with Stock Well's bleach solution for 1–2 hours. This was followed by a treatment with saturated chlorolhydrate solution until the tissue

Figures 1–11. *Crucigenia mitrii* Tiwari *et* Pandey. **1–6.** Autocolonies of the alga, **8.** 8-celled autocolony, **7, 9, 10.** Daughter colonies with presistant cell wall pieces of the parent cell. **11.** Liberated autocolonies from parent envelope. (scale bar = 25 μ).

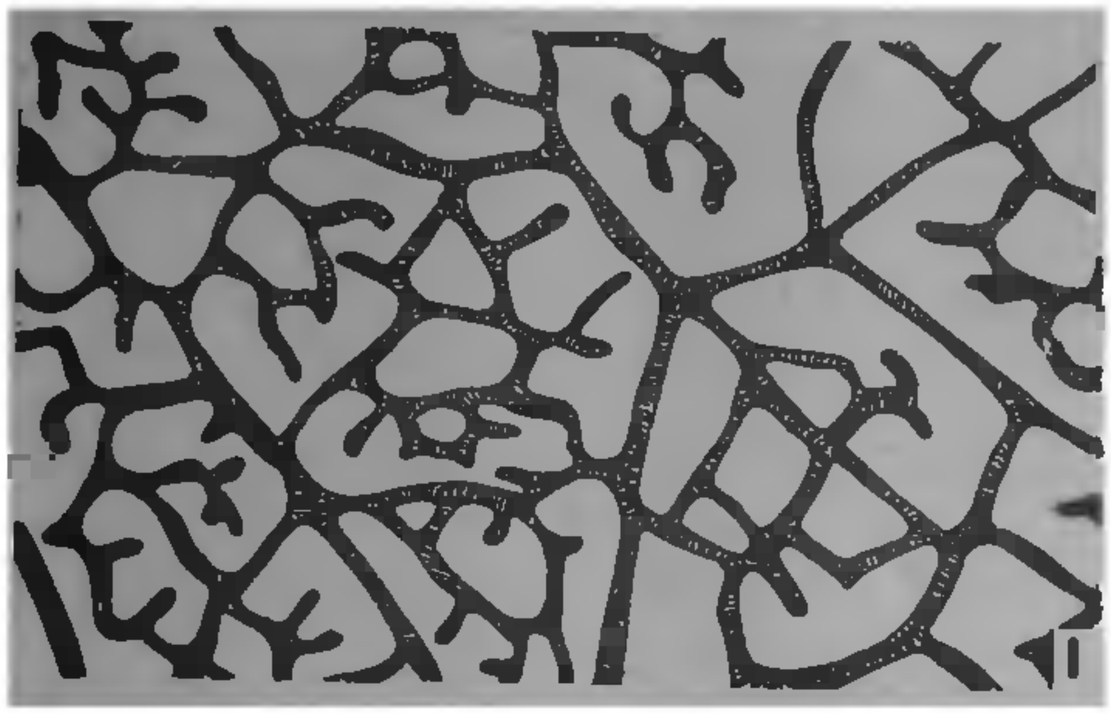

Figure 1. *Holostemma annulare* × 100

was completely cleared. The bits were stained in 2% safranin. Semipermanent slides were prepared using glycerine jelly as the mountant.

Based on the orientation, size, shape, number of areoles and free vein endings within the areole, the foliar areole pattern of the taxa studied falls into the following categores.

Type - 1: Areoles oriented at random, 100–400 μm in diam., triangular to multiangular, 15–75 in 1 sq. cm area. Free vein endings 25–77, simple or branched once or thrice, straight or curved (figure 1).

Eg. Calotropis gigantea (L.) R. Br., *C. procera* (Ait.) R. Br., *Cynanchum alatum* Wt. & Arn., *C. callialata* Ham., *C. tunicatum* (Retz.) Alst., *Holostemma annulare* (Roxb.) K. Schum., *Pergularia daemia* (Forsk) Chiov., (ASCLEPIADEAE); *Secamone emetica* (Retz.) R. Br., (SECAMONOIDEAE); *Cosmostigma racemosum* (Roxb.) Wt., *Gymnema sylvestre* (Retz.) R. Br., *Wattakaka volubilis* Hassk., (MARSDENIEAE); *Decalepis hamiltonii* Wt. & Arn., *Hemidesmus indicus* (L.) R. Br., *H. indicus* (L.) R. Br., var. *pubescens* Hook. f., (PERIPLOCACEAE).

Type - 2: Areoles oriented at random, 300–600 μm in diam., triangular to multiangular, 4–33 in 1 sq. cm area. Free vein endings 7–24, simple or branched once or thrice, straight or curved with blunt or tapered ends (figure 2).

Eg. Asclepias curassavica L., *Pentatropis capensis* (L. f.) R. Br., (ASCLEPIADEAE); *Brachystelma ciliatum* Arekal & Ramakrishna, *Ceropegia bulbosa* Roxb., *C., candelabrum* L., *C. elegans* Wall. var. *elegans*, *C. hirsuta* Wt. & Arn., *C. tuberosa* Roxb., (CEROPEGIEAE); *Genianthus laurifolius* Hook. f., (SECAMONOI-

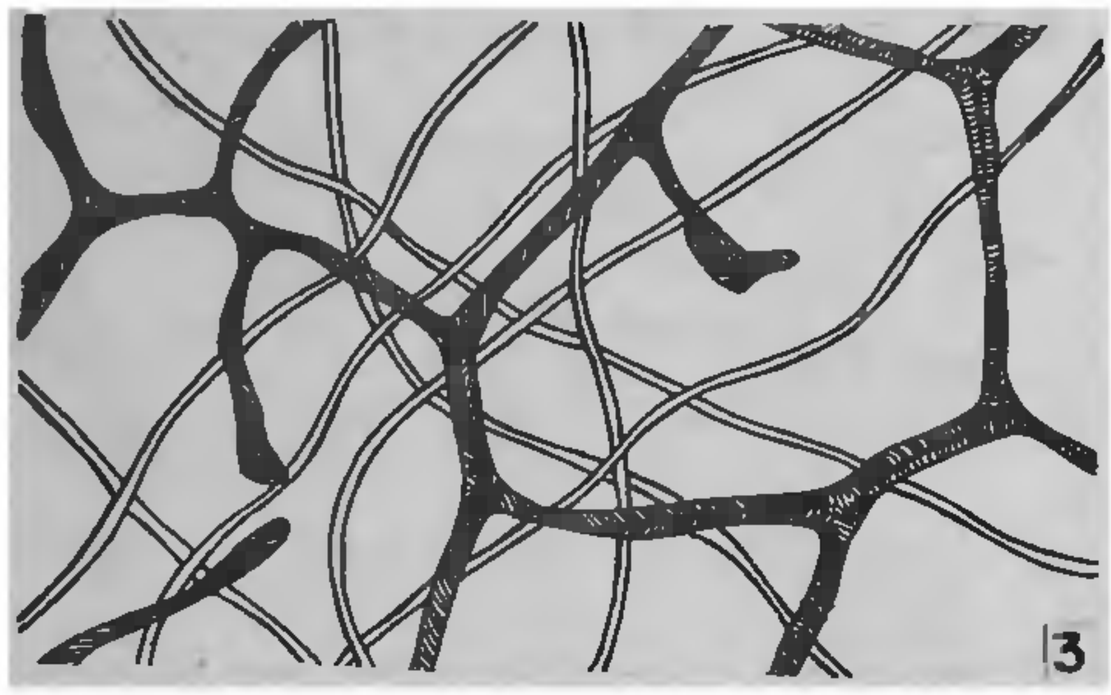

Figure 3. *Hoya wightii* × 100

DEAE); *Leptadenia reticulata* (Retz.) Wt. & Arn., *Tylophora capparidifolia* Wt. & Arn., *T. dalzellii* Hook. f., *T. indica* (Burm. f.) Merr., *T. indica* (Burm. f.) Merr. var. *glabra* (Decne.) Huber, *T. pauciflora* Wt. & Arn., *T. rotundifolia* Ham., (MARSDENIEAE); *Cryptolepis buchananii* Roem. & Schult. and *Cryptostegia grandiflora* R. Br., (PERIPLOCACEAE).

Type - 3: Areoles oriented at random, 500–1500 μm in diam., quadrangular to multiangular, 1–7 in 1 sq. cm area. Free vein endings 1–9 straight or curved, simple or branched once only. Sclerids traverse at random within the areoles (figure 3).

Eg. Hoya ovalifolia Wt. & Arn., *H. pauciflora* Wt., H. retusa Dalz., *H. wightii* Hook. f., (MARSDENIEAE).

Type - 4: Areoles oriented parallel, triangular to rectangular, 5–52 in 1 sq. cm area. Free vein endings

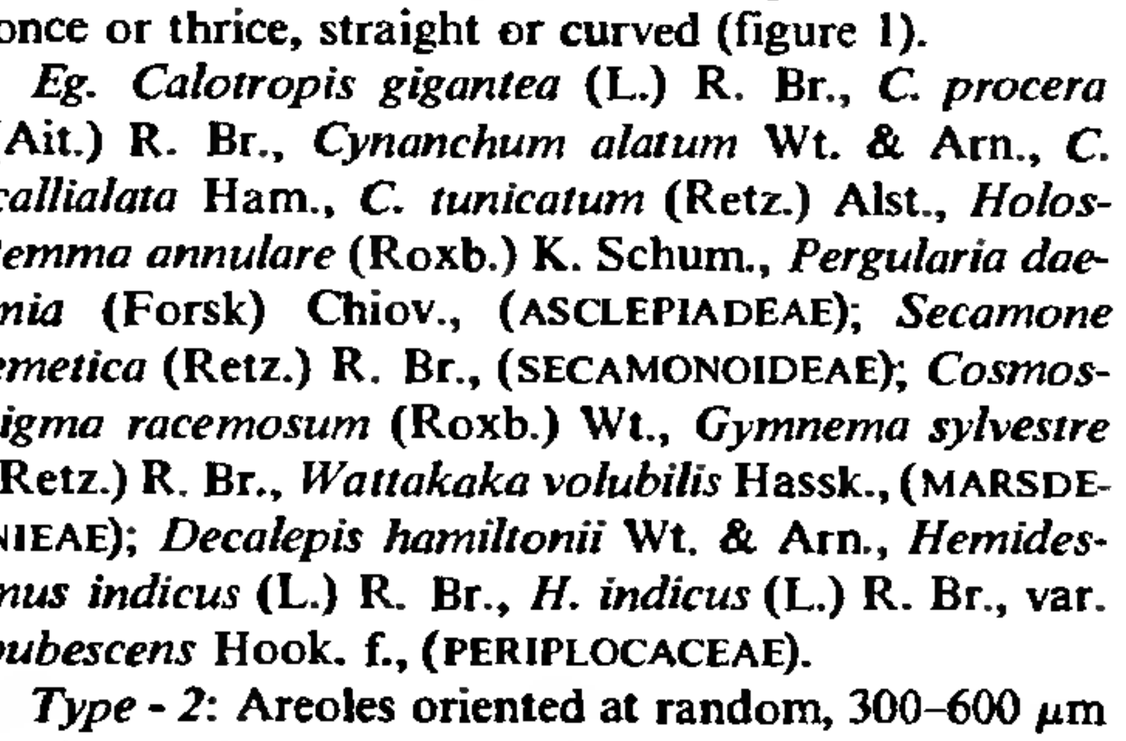

Figure 2. *Tylophora pauciflora* × 100

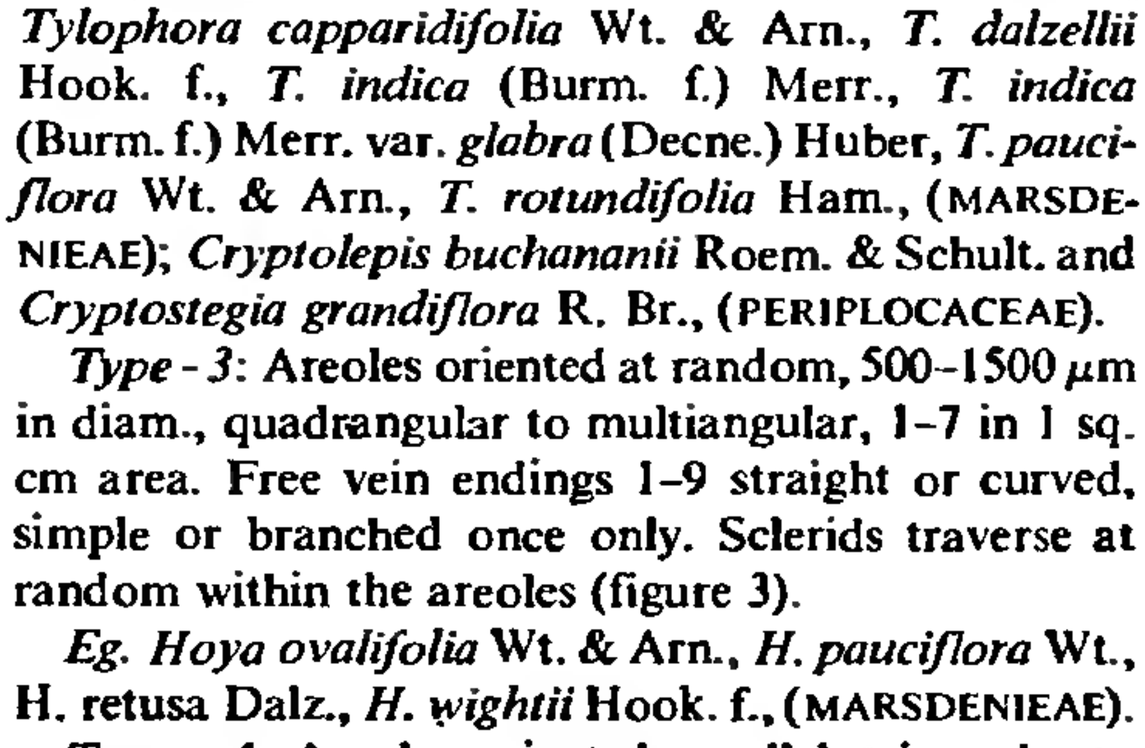

Figure 4A. *Ceropegia juncea* × 100

5–38 straight or curved, simple or branched once or rarely thrice.

Type - 4A: Areoles oriented parallel to the midrib (figure 4A) *Eg. Ceropegia bulbosa* Roxb. var. *lushii* Hook. F., *C. juncea* Roxb. (CEROPEGIEAE).

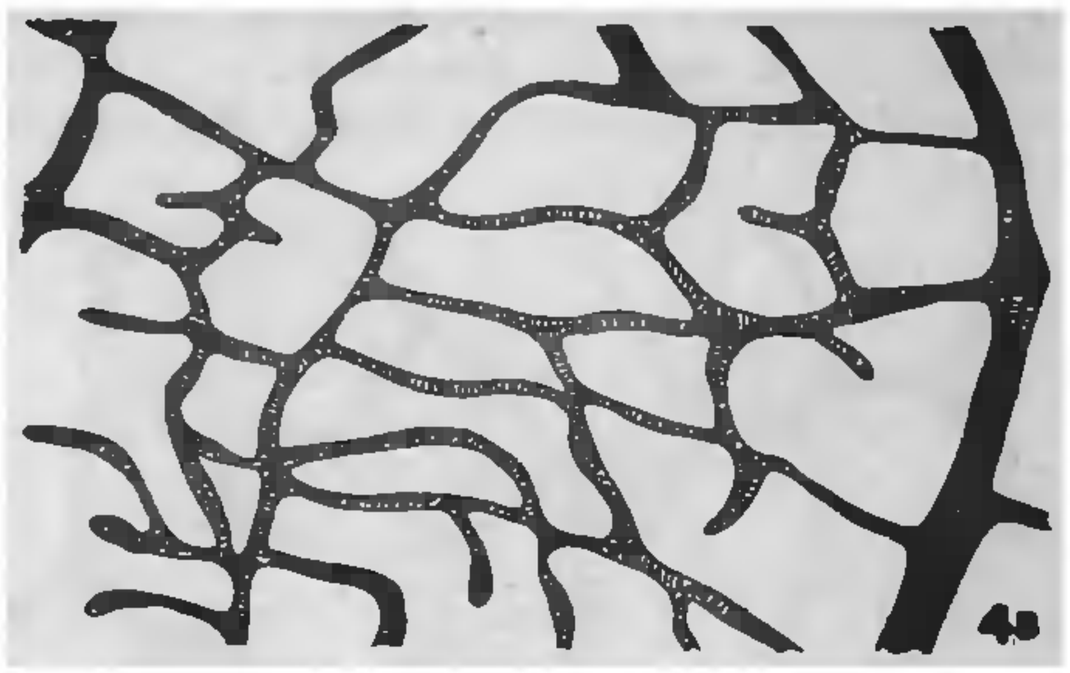

Figure 4B. *Oxystelma esculentum* × 100

Type 4B: Areoles oriented parallel to the secondary veins (figure 4B) *Eg. Oxystelma esculentum* (L. f.) R. Br., (ASCLEPIADEAE).

All the four types of areoles occur at random in species of both the Periplocaceae and Asclepiadaceae. The members of Periplocaceae fall under the type 1 and 2 and those of Asclepiadeceae include all the 4 types of areole pattern. The subfamily Secamonoideae of Asclepiadaceae represents two types of areole pattern such as type 1 & 2 just as in Periplocaceae.

Further, the members of the tribe Asclepiadeae could be conveniently placed under the categories 1, 2 and 4B and of Marsdenieae, in 1 & 2. Moreover, species of the genus *Hoya* (Marsdenieae) fall under the type 3 and of *Ceropegia* (Cerpegieae) in 2 and 4A. The varieties in the areole pattern clearly indicates that there is no clear cut uniformity among the genera or the tribe of the Asclepiadaceae and Periplocaceae and therefore it cannot be considered as a reliable systematic character in the two families Asclepiadaceae and Periplocaceae.

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A NEW MALFORMATION DISEASE OF GANDHARAJ (*GARDENIA JESMINOIDES* ELLIS)

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DURING an excursion around Messrs. Tribeni Tissue Limited in Hooghly district, West Bengal, severe malformations of floral and vegetative parts of a number of Gandharaj plants (*Gardenia jesminoides* Ellis) were recorded specially during the rainy season. The causal agent, isolated from different parts of the infected plants, was identified as *Fusarium graminearum* Schw. and this appeared to be highly pathogenic to 'Japan' cultivar of the host whereas the 'China' and 'Local' cultivars showed no disease symptoms.

Symptoms of the vegetative malformation are characterised by numerous abnormal wart-like outgrowths on the surface of the stem (figure 1). The affected plants exhibited a bushy appearance with reduced internodes and small terminal leaves in clusters. The apical bud was somewhat malformed producing occasionally much smaller leaves. Drying and death of the affected branches were almost simultaneous. The affected plants failed to flower. The floral malformation was characterised by transformation of floral head into compact mass of sterile leaf-like flowers (figure 2). The whole mass ultimately appearing like a broom remained as such for a long time in the mother plant.