ABNORMALITY IN GROWTH OF PEDIASTRUM SIMPLEX VAR. CLATHRATUM

A single specimen of the coenobium phytoplankton *Pediastrum simplex* var. *clathratum* with abnormal growth was collected from the Karnafuli River, Chittagong (Bangladesh), in April, 1975. The abnormality may be of interest to the taxonomist.

Normally the coenobia are 8, 16 or 32-celled. In 16-celled coenobia generally 11 cells are peripheral and 5 internal or 12 are peripheral and 4 internal. The inner cells are completely surrounded by the peripheral cells. The cells are deeply emarginate and arranged symmetrically in the coenobia; perforations are large and round or oval. The peripheral cells as well as the inner cells are of almost equal size and shape. Peripheral cells taper outward. The inner cells are 9-17 μ in diameter; the peripheral cells are 7-15 μ broad and 20-29 μ long. Coenobia are 140-173 μ in diameter.

The present specimen is a coenobium of 16 cells of which 11 are peripheral, 4 are internal but one cell is neither completely internal nor does it show an outward projection like other peripheral cells. Size and shape of the cell resemble other inner cells but one surface is exposed outside the colony and takes part in ring formation by the peripheral cells rather than in ring formation by the inner cells. Due to the position of this cell and due to the dissimilar size and shape of the other cells, the coenobium has lost its symmetry.

The present specimen agrees in general with the descriptions and measurements of *Pediastrum simplex* var. *clathratum* given by earlier workers¹,², and is interesting on account of its abnormal growth.

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MOSSIC DISEASE OF PETUNIA VIOLACEA LINDL. 'HYBRIDA'

*Petunia violacea* Lindl. ‘Hybrida’ an ornamental winter annual exhibited light green to dull yellow mosaic on the dark green background of the leaves in winter. In summer, however, bright yellow patches were observed along with the dark green islands on the surface of the leaves in the beginning, while at acute stages the yellow areas changed to white patches which continued to increase in size till they coalesced and turned into white leaves. About 40-45% plants showed disease symptoms during the year 1977-78 at the National Botanical Research Institute, Lucknow. The affected plants remained dwarf and produced flowers of small size and faint colour as compared with those of healthy plants. In extreme cases, however, the infected plants died before blooming. Present communication deals with mechanical transmission, host range and bio-physical properties of the causal agent of mosaic in petunia.

The culture was obtained from young, naturally infected leaves of petunia and maintained on petunia as well as on *Nicotiana tabacum* L. var. White Burley. Sap from infected leaves was prepared in 0.1 M phosphate buffer at pH 7 in the ratio of 1 : 1 (w/v) and centrifuged at 5,000 rpm for 10 minutes at 15°C. The supernatant, thus obtained, was used as the standard extract for further studies. Mechanical inoculations were made as usual using carborundum powder (600 mesh) as an abrasive.

Figs. 1-2. *Pediastrum simplex* var. *clathratum*, Fig. 1. Normal specimen, Fig. 2. The abnormal specimen.
### TABLE I

**Reaction of some host plants to virus infecting petunia**

<table>
<thead>
<tr>
<th>Family</th>
<th>Host</th>
<th>Symptoms*</th>
<th>Incubation period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenopodiaceae</td>
<td>1. <em>Chenopodium amaranticolor</em> Coste and Reyn.</td>
<td>NLL</td>
<td>3–5 days</td>
</tr>
<tr>
<td></td>
<td>2. <em>C. album</em> L. <em>Boerhaavia diffusa</em> L.</td>
<td>NLL</td>
<td>4–5 days</td>
</tr>
<tr>
<td>Nyctaginaceae</td>
<td>1. <em>Datura metel</em> L.</td>
<td>Chlorotic lesion</td>
<td>6–7 days</td>
</tr>
<tr>
<td>Solanaceae</td>
<td>2. <em>Nicotiana tabacum</em> L. var. White Burley, Turkish, Xanthil and NP 31.</td>
<td>Mosaic turning Yellow patches</td>
<td>6–7 days</td>
</tr>
<tr>
<td></td>
<td>3. <em>N. tabacum</em> L. var. Samsun NN.</td>
<td>Light green patches</td>
<td>6–8 days</td>
</tr>
<tr>
<td></td>
<td>4. <em>N. glutinosa</em> L.</td>
<td>Yellow patches</td>
<td>7–8 days</td>
</tr>
</tbody>
</table>

* Symptoms on normal green background of the leaves.
NLL* = Necrotic local lesions.

The host range studies were carried out by mechanical inoculation on 34 plant species belonging to 10 families, viz., Apocynaceae, Asteraceae, Chenopodiaceae, Cruciferae, Cucurbitaceae, Leguminosae, Malvaceae, Moraceae, Nyctaginaceae and Solanaceae. Observations were recorded till two months after inoculation, followed by back inoculation tests made from each plant separately on local lesion host, *Chenopodium amaranticolor* Coste and Reyn., to ascertain the apparent as well as latent virus infections.

Dilution end point, thermal inactivation point and longevity in vitro were carried out using *N. tabacum* L. var. White Burley and *C. amaranticolor* Coste and Reyn., as donor and recipient hosts of the virus respectively.

Out of the thirty-four plant species tested, the virus, was transmitted by mechanical means to petunia and seven other plants only (Table I, Figs. 1, 2, 3 and 4).

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**Fig. 1.** Leaves of *Petunia violacea*. Right = Healthy leaf; Left = Infected leaf showing yellow mosaic with green islands

**Fig. 2.** *Nicotiana tabacum* var. White Burley showing yellow mosaic symptoms.

Standard extract lost the infectivity when diluted to 10⁻², heated at 60°C for 10 minutes and stored at 28°C and 10°C for 48 hours and 8 days respectively.

Virus diseases of petunia have been reported by Misra and Chenulu¹, Shyama Rani et al.², and Naqvi and Mahmood³. Petunia mosaic virus reported by Misra and Chenulu¹ did not produce local lesion on C. amaranticolor and D. metel, whereas the present virus produced necrotic local lesions on these plants. The virus under investigation differs from that described by Shyama Rani et al.³, as it neither produced ring-spots on N. glutinosa and N. tabacum var. Xanthii Turkish and NP 31 nor infected G. globosa, A. caudatus, S. nigrum and Z. elegans. Naqvi and Mahmood² reported A. caudatus and D. stramonion as hosts of petunia mottle virus. Both plants, however, did not react with the present virus. It is, therefore, apparent that the causal agent of mosaic in petunia tentatively named as Petunia mosaic virus-yellow strain is quite different from the earlier records. Further identification is being attempted through serology and electron microscopy.

Authors are thankful to Dr. K. M. Srivastava for his valuable suggestions and critically going through the manuscript.

Plant Virus Laboratory, National Botanical Research Institute, Lucknow, (U.P.), September 28, 1978.