### Table 1

**Effect of seedling extracts of some weeds on early seedling growth of til (after 48 h) at 27° ± 2°C.**

<table>
<thead>
<tr>
<th>Plant species</th>
<th>Seedling extracts in percentage</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
</tr>
<tr>
<td><em>Alysicarpus vaginalis</em> (L.) DC.</td>
<td>3.5 ± 1.0</td>
</tr>
<tr>
<td><em>Borreria articulata</em> (L.) F. N. Will</td>
<td>8.0 ± 1.0</td>
</tr>
<tr>
<td><em>Crotalaria medicaginea</em> Lamk.</td>
<td>2.0 ± 0.5</td>
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<tr>
<td><em>Cucumis callosus</em> (Rotl.) Cogn.</td>
<td>8.0 ± 2.0</td>
</tr>
<tr>
<td><em>Indigofera cordifolia</em> Heyne ex Roth.</td>
<td>10.5 ± 0.2</td>
</tr>
<tr>
<td><em>Ipomoea pes-tigris</em> Linn.</td>
<td>7.0 ± 2.0</td>
</tr>
<tr>
<td><em>L. sindica</em> Stapf.</td>
<td>9.0 ± 1.0</td>
</tr>
<tr>
<td><em>Merremia aegyptia</em> (L.) Urban</td>
<td>5.5 ± 0.2</td>
</tr>
<tr>
<td><em>Tephrosia purpurea</em> (L.) Pers.</td>
<td>4.2 ± 0.7</td>
</tr>
<tr>
<td><em>Trichodesma sedgwicki</em>um Banerj.</td>
<td>11.5 ± 1.5</td>
</tr>
</tbody>
</table>

Control: R = 17.0 ± 1.0, H = 5.5 ± 0.5; R = radicle, H = hypocotyl, vlp = very little protrusion.

It was observed that the aqueous extracts suppressed the early growth of til (Table 1) at 1 and 5% concentrations; whereas at 10% concentration even the seed germination was inhibited. There was very little protrusion of radicle but no further growth of til in 10% extracts of *Indigofera cordifolia*, *Ipomoea sindica* and *Trichodesma sedgwicki*um. Germination of til was completely inhibited by this concentration of aqueous extracts from all other species of weed seedlings used in the present study. Extracts of the three species mentioned above were most effective even at the lower concentrations and the effect was more marked on the radicle than on the hypocotyl.

Of all the techniques and solvents employed for the extraction of inhibitors and bioassaying the extracts, the petri dish culture and the use of cold water have been regarded as the most efficient. Aqueous extracts are ecologically more significant than organic solvents. The effects of aqueous extracts of seedlings were more marked on radicle since young roots are known to be more sensitive than young shoots. The inhibitory properties of aqueous extracts of weed seedlings is attributed to the presence of germination inhibitors in the extracts since germination inhibitors are known to occur in a wide variety of mature seed plants and in their different parts. It is therefore speculated that all these 10 species of weed seedlings could affect the crop growth by producing allelopathic substances even in the field conditions. Since til is the only commercial oil crop in Indian arid zone, these weed species are agro-ecologically very significant from the very seedling stage of their appearance in the field.

**August 10, 1981**


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**MITOMYCIN C INDUCED MORPHOLOGICAL ABNORMALITIES IN A GREEN ALGA, RHIZOCOLONIUM HIEROGLYPHICUM (AG.) KUETZ. (CHLOROPHYCEAE)**

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The effects of Mitomycin C (MMC), a known mutagen are studied well in prokaryotes as well.
as in eukaryotes. But the studies with MMC on green algae are practically negligible. During the present investigation, the effects of MMC were seen on the morphology of a green alga, *Rhizoclonium hieroglyphicum* (Cladophorales).

The alga was grown in modified BBM medium designated as BBMP supplemented with 8% soil extract. The cultures were maintained in a culture chamber maintained at 21 ± 1°C and illuminated with a light intensity of C 2500 lux for 16 h daily. The actively growing filaments from culture were treated with 50, 100, 150, 200 and 300 µg/ml of MMC (Sigma, USA) prepared in culture medium for varying periods viz., 8, 16, 24 and 32 h.

The concentration of 300 µg/ml of MMC for 32 h proved lethal for the alga. Numerous morphological abnormalities were recorded in the cells of *R. hieroglyphicum* with the higher concentrations of chemical viz., 150 and 200 µg/ml applied for 24 and 32 h. These abnormalities were manifest by the formation of cells with lateral protrusions which were rounded or dumb-bell shaped (Figs. 1, 2), cone-like swelling of cells on either side of the septum (Fig. 3), curved cells and extraordinary elongation of some cells in length to about 2–3 times than the average length. Besides, shrinkage and degeneration of chloroplasts and vacuolation of cells were the common morphological effects observed with all the concentrations of MMC.

Various structural abnormalities observed in the present investigation are in conformity with the earlier features reported by Davidson on the same material but by using IAA and NAA instead of MMC. According to Smith the cells of Cladophorales have thick stratified walls composed of three concentric zones, the outermost zone consists chiefly of chitin, middle of pectic material and the innermost zone is composed of cellulose. The formation of protrusions may be due to the increase in the length of inner cellulose and pectic zones of algal walls without corresponding increase in chitinous zones, the outer layer resulting in invaginations of the inner walls on one side of the wall and simultaneously with the protrusions on the other side. At present there is no satisfactory explanation for the extraordinary elongation of some cells. It may be attributed to failure of cytokinesis or abnormal increase in the length of the cells due to some MMC activity.

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**Fig. 1, 2.** Cells showing lateral protrusions. **3.** Formation of dumb-bell-shaped cells.


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**DIAGNOSTIC TECHNIQUE FOR THE DETECTION OF BUNCHY TOP AND INFECTIOUS CHLOROSIS IN BANANA SUCKERS**

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**BANANA** is a very important and economically profitable fruit crop of India with a large in-country consumption and a very considerable export potential. With about 42,900 hectares under this crop,