dark; conidia produced within 48 hours and mature perithecia within a week; growth intermediate. Aerial hyphae pale brown to hyaline, branched, thin walled, septate and nearly all ends terminating into endoconidiophores, 2-6 μ in width. Submerged hyphae similar except darker and much interwoven. Endoconidiophores pale brown, hyaline at the tip, 25-125 × 4-6 μ, endoconidia of two types: one hyaline, cylindrical, truncate at the ends, 11-16 × 4-5 μ and the other pale brown to olive brown, barrel-shaped to sub-globose, smooth to rough walled, 9-16 × 6-13 μ.

Perithecia superficial to immersed, the bases brown to black, globose, sometimes flattened, 130-200 μ in diameter, unornamented or with undifferentiated hyphae attached, neck black, hyaline at the tip, slender up to 850 μ long and 20-35 μ in diameter at the base and 10-20 μ at the tip, ostiolar hyphae hyaline, slender, tapered to a blunt tip, 8-15 in number, 50-90 × 2-3 μ. Asc not seen; ascospores with gelatinous sheath often forming a brim, hat-shaped structure, 4.5-8 × 2.5-5.5 μ.

The fungus has been identified as Ceratocystis fimbrata Ellis & Halst. (Hunt, 1956) and confirmed by the Commonwealth Mycological Institute, Kew (IMI 166925).

When spore suspension of C. fimbrata was sprayed on surface sterilized, healthy oranges under aseptic conditions, no symptoms appeared. It seemed that the pathogen enters through wounds or injuries caused during harvesting, transportation, storage or by insects, hence, the injection technique was adopted to test the pathogenicity. 0.5 ml of spore suspension was injected in each of the six healthy fruits with hypodermic syringe and inoculated at 25°C separately in polythene bags. Equal number of fruits injected with sterilized distilled water were kept as control. After 7-8 days of inoculation, fruits lost their hardness and became pulpy. Soft rot condition developed after 11 days with a rancid odour and complete change in colour while in the control fruits remained healthy. The pathogen was reisolated and was identical with the original isolate.

This is the first report of soft rot of sweet orange incited by Ceratocystis fimbrata Ellis & Halst.

The authors express their thanks to Dr. D. L. Hawksworth of C.M.I. for confirming the identification.

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TABLE I

Rate of dry matter production (g/m²/month) and energy content (Cal/g) of the aboveground (AG) and underground (UG) parts of Desmostachya bipinnata in the control (CP) and clipped (CIP) plots during the grand growth period

<table>
<thead>
<tr>
<th>Months</th>
<th>Rate of production</th>
<th>Energy content</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control AG UG</td>
<td>Clipped AG UG</td>
</tr>
<tr>
<td>July</td>
<td>+100 +164</td>
<td>+186 —</td>
</tr>
<tr>
<td>August</td>
<td>+162 +215</td>
<td>+265 +184</td>
</tr>
<tr>
<td>September</td>
<td>+197 +253</td>
<td>+317 ± 225</td>
</tr>
<tr>
<td>October</td>
<td>+189 +152</td>
<td>+205 +213</td>
</tr>
</tbody>
</table>

+ Production of dry matter; — Loss of dry matter.

TABLE II

Rate of energy capture (K Cal/g) and % Energy conserving efficiency of the AG and UG parts of Desmostachya bipinnata in the CP and CIP during the grand growth period

<table>
<thead>
<tr>
<th>Months</th>
<th>Solar radiation K Cal/m²</th>
<th>Energy captured</th>
<th>% Energy conserving efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control AG UG</td>
<td>Clipped AG UG</td>
<td>Control AG UG</td>
</tr>
<tr>
<td>July</td>
<td>149110 659-9 715-3</td>
<td>788-4 —</td>
<td>0.55 0.88</td>
</tr>
<tr>
<td>August</td>
<td>142290 857-6 1010-1</td>
<td>525-1 —</td>
<td>0.92 1.25</td>
</tr>
<tr>
<td>September</td>
<td>140100 989-9 1295-2</td>
<td>866-9 —</td>
<td>1.12 1.41</td>
</tr>
<tr>
<td>October</td>
<td>139800 808-8 822-4</td>
<td>587-6 —</td>
<td>1.08 1.16</td>
</tr>
</tbody>
</table>

higher than that of the underground ones in both the stands. This is in concurrence with the findings of Golley\textsuperscript{7,8} for temperate grasslands and Gupta\textsuperscript{2} for tropical grasslands.

The data in Table II indicate a contrasting behaviour of the aboveground and underground efficiencies of the two experimental plots. While the clipping enhances the calorific values, net production and efficiency of the aboveground parts ($r^* = 4.243$) it retards them for the underground parts ($r^* = 3.277$). This is probably due to the increase in the aboveground dry matter production, at the expense of the underground parts\textsuperscript{1}. Statistical analysis also revealed a positive correlation ($r = +0.895$) between the efficiency and the dry matter production.

The maximum efficiencies by the aboveground and the underground parts were recorded in September (Table II). For the grand growing period the efficiencies were 0.68% and 0.70% for the same plots respectively. The values were similar to those obtained by Gupta\textsuperscript{2} for the Dichanthium community (CP = 0.65%, CIP = 0.98%) at Gyanpur and Asthana (unpublished data) for Cynodon community (CP = 0.71%, CIP = 0.84%) at Gorakhpur. Comparatively much lower values (0.33%, 0.35%) were recorded by Singh and Misra\textsuperscript{1} for the undisturbed and biotically disturbed grasslands at Varanasi and 0.38% and 0.33% for the natural Dichanthium and Sehima communities at Ujjain and Ratlam respectively by Mall et al.\textsuperscript{3}.

The study thus shows that the Desmostachya stands in the grasslands of Gorakhpur are highly productive and the productivity can be enhanced by clipping.

The authors are thankful to Prof. K. S. Bhargava, Head of the Botany Department, Gorakhpur University, for providing laboratory and library facilities. Department of Botany, University of Gorakhpur, Gorakhpur 273001, India, March 7, 1974.

* Significant at 5% level.
A NEW BASE NUMBER FOR THE GENUS CHEIRANTHUS L.

Species of the genus Cheiranthus (family Cruciferae) are popular garden ornamentals. Except for a doubtful count of 40–42 chromosomes in Cheiranthus allionii L., the remaining seven species possess numbers multiple of 7 (Fedorov²). The genus, obviously, is monobasic.

Cheiranthus cheiri L. has in the past been worked out by Jaretzky³ (1928), Manton⁴ (1932) and Sakai⁵ (1935) who report it as a diploid with 2n = 14. While making a chromosome survey of the cultivated plants, two cultivated populations of Cheiranthus cheiri L. were found to have 2n = 12. With regard to their behaviour, the plants were quite stable. At prophase the chromosomes pair perfectly and form six bivalents. At metaphase two bivalents are slightly larger in size than the other four (Fig. 1). Most of the bivalents have a single chiasma. The distribution of chromosomes at anaphase-I is quite regular. On account of normal meiosis, the plants produce viable pollen and s.t. abundant seed indicating that the plants are amphimictic. This, therefore, creates the possibility of a second base number x = 6 not only for this species but for the genus as a whole.

The tribe Hesperideae to which Cheiranthus belongs is polybasic with x = 7, 8, 10, 12 and 13 (Fedorov², Darlington and Wylie¹). The present count for Cheiranthus cheiri is interesting because 6 is the smallest number so far known in the tribe.

In view of the existence of diverse base numbers, aneuploidy seems to have played a major role in evolution within this tribe. Hybridization of the two cytotypes of Cheiranthus cheiri should form a very interesting line of investigation as it is likely to reveal the relationship between the two chromosome races.

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RHIZOPUS STOLONIFER, CAUSING SOFT ROT OF SQUASH (CUCURBITA PEPER L.)

Soft rot disease caused by Rhizopus stolonifer (Fr.) Lind. is severe under storage and transit conditions but it is not true always. Reports are available to support the view of its being a disease causing agent under natural conditions (Singh et al.)⁴.

During the course of investigations of diseases of cucurbits in the month of July and August, 1973, a severe rotting of squash fruits (var. Patty Pan) was observed at Experimental Farm, Hessaraghatta, Bangalore. The infection may commence from any point of the fruit. The fungus was found to attack on young to mature fruits and flowers. The disease is characterised by water-soaked areas on the surface of the fruit which in turn covers the entire surface and makes the fruit soft. The affected tissues disintegrate and make the flesh soft and pulpy. After about 3–4 days whisker like sporangiospores develops which bears sporangia on their tips. The mycelial growth is fluffy and continue to grow until entire surface of the fruit is covered. The infected fruits turn completely black and become soft and watery (Fig. 1). The humid weather favours the severity of the disease. Approximately 20–25% of the flowers and fruits were found to be infected under natural conditions.