POLYPLOID CHROMOSOME NUMBERS IN THE GENUS NITELLA

It is held that polyploidy has arisen in response to cataclysmic changes in nature and polyploids are regarded as expert colonizers since they are better equipped with their greater number of chromosome sets for adaptation to the new environment. Besides, polyploidy plays a significant role in the evolution of species.

Figs. 1–5. Fig. 1. _N. dulis_ var. _pullbellata_ f. _superba_, a metaphase plate showing 9 chromosomes. Fig. 2. _N. kydina_ var. _kydina_ f. _kydina_, a metaphase plate showing 15 chromosomes. Fig. 3. _N. acuminata_ var. _acuminata_ f. _muraliana_, a metaphase plate showing 18 chromosomes. Figs. 4 and 4'. _N. pseudoflabellata_ var. _nucoza_ f. _stabilis_, a metaphase plate and its drawing respectively showing 21 chromosomes and Fig. 5. _N. gracilis_ subsp. _gracilis_ var. _confervaceae_ f. _confermis_, a metaphase plate showing 36 chromosomes. All × 3900.

_N. dulis_ is recognized by the general lack of aneuploid chromosome number and the integrity of its functional genomes. However, a few aneuploid chromosome numbers, viz., _n_ = 14, 16, 17, 28, and 34 have been recorded by Karling, Sato, Imahori and Kato and Guerlesquin in various taxa of _Nitella_. In India, no such case of aneuploidy has been reported so far in this genus. A polyploid series appears to exist in its various taxa so far investigated. The present finding of 5 and 6 of chromosome numbers, viz., _n_ = 9 ( _N. dulis_ var. _pullbellata_ f. _Superba_ R.D.W.) Fig. 1, _n_ = 15 ( _N. kydina_ var. _kydina_ f. _kydina_ R.D.W.) Fig. 2, _n_ = 18 ( _N. acuminata_ var. _acuminata_ f. _muraliana_ R.D.W.) Fig. 3, _n_ = 21 ( _N. pseudoflabellata_ subsp. _pseudoflabellata_ var. _nucoza_ f. _stabilis_ R.D.W.) Fig. 4, and _n_ = 36 ( _N. gracilis_ subsp. _gracilis_ var. _confervaceae_ f. _confermis_ R.D.W.) Fig. 5 vividly reveal that _n_ = 3 might be the basic number in this genus. From the viewpoint of monobasic chromosome number, all the species of _Nitella_ appear to be closely related and to have been evolved from a common ancestral stock.

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EFFECT OF PHYLLOSPHERE FUNGI ON THE SPORE GERMINATION OF _ALTERNARIA ALTERNATA_ FR. CAUSING LEAFBLIGHT OF SUNFLOWER

During the year 1976 a blight disease on the leaves of sunflower was observed in the local fields around Bhipuri (Agra). The causal organism was isolated, purified and subjected to Koch's postulate which confirmed its pathogenicity. Out of the 20 phyllosphere fungi isolated from the local variety of sunflower six fungi, viz., _Monilia cincta_, _Rhizoctonia solani_, _Cladosporium herbarum_, _Puniceum sp._, _Aspergillus_...
TABLE I

Percentage of germination length and number of germ tube per spore of Alternaria alternata in the various fungus diffusate at 25° C ± 2
(Mean of 20 observations)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of fungus</th>
<th>Percentage germination</th>
<th>Length of germ tube in μ</th>
<th>No. of germ tube per spore</th>
<th>Nature of the fungus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Control</td>
<td>100</td>
<td>66.0</td>
<td>Single</td>
<td>..</td>
</tr>
<tr>
<td>2</td>
<td>Monilia citrophila</td>
<td>100</td>
<td>181.5</td>
<td>2-3</td>
<td>Synergistic</td>
</tr>
<tr>
<td>3</td>
<td>Rhizoctonia solani</td>
<td>100</td>
<td>131.0</td>
<td>2-3</td>
<td>Synergistic</td>
</tr>
<tr>
<td>4</td>
<td>Cladosporium herbarum</td>
<td>100</td>
<td>99.0</td>
<td>Single</td>
<td>Synergistic</td>
</tr>
<tr>
<td>5</td>
<td>Aspergillus sulphureus</td>
<td>87</td>
<td>8.3</td>
<td>Single</td>
<td>..</td>
</tr>
<tr>
<td>6</td>
<td>Pencellium sp.</td>
<td>86</td>
<td>19.8</td>
<td>Single</td>
<td>..</td>
</tr>
<tr>
<td>7</td>
<td>Aspergillus niger</td>
<td>No germination</td>
<td>..</td>
<td>..</td>
<td>Antagonistic</td>
</tr>
</tbody>
</table>

sulphureus and A. niger were present almost throughout the season were selected for testing their antagonistic nature, against the blight pathogen. The crude culture filtrates were centrifuged and used separately to determine the percentage germination of the spores of Alternaria alternata and length and number of germ tubes following the usual 'Slide Germination Method'. The results summarised in the table indicate that out of the six fungi tested Aspergillus niger was highly antagonistic against the pathogen as the spore germination in the filtrate of this fungus was totally checked. Monilia citrophila and Rhizoctonia solani on the other hand were found to be synergistic. In both these cases not only was there recorded a cent per cent germination of the spores but the length of the germ tubes also increased to 2-3 times the length observed in control.

The active principle(s) in the culture filtrate of Aspergillus niger lost its activity almost completely at 100° C kept for 10 minutes and at 1:10 dilution.

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DEFUNCTIONAL SECRETIONS FROM THE
REPUGATORIAL GLANDS OF A
POLYDESmoid MILLIPEDE

DURING our experiments, we observed that the bites of the ants and termites of a dust splendicis Verheoff to discharge, which ultimately dispersed these insects, and left the millipede free to move away un molested. We wanted to examine the causes for this behaviour which must be sought in the role of defensive secretions of the repugnatorial glands that are present in many polydesmoid millipedes. The purpose of this note is to present the results of our experiments on the nature of these secretions of this soil feeding polydesmoid millipede.

The millipedes were electrically stimulated (1 volt D.C., 0.2 m sec duration) and the droplet released at the gland opening was absorbed on to a piece of Whatman filter paper. It was immediately eluted into 7 pH phosphate buffer (for enzyme assays) or into toluene (for other analyses). The structure of the repugnatorial gland was studied by microscopic examination of 5 μ paraffin sections stained in haematoxylin. The presence of benzaldehyde and HCN in the secretion was detected by spot tests. The cyanogenesis was quantified in the apparatus described by Eiser et al.

The gas was trapped into 0.005 N AgNO₃ and estimated spectrophotometrically. The protein content of the secretion was estimated colorimetrically. The phagocytosis activity was followed according to Hestor et al. and the mandelomethyl thioanisole activity was assayed by measuring the HCN production when the secretion was mixed with the nitrile in Warburg flasks. Chromatography of the secretion was done in Silica gel G-TLC plates developed in butanol: ethanol: water