MEIOSIS IN CEPHALOTAXUS DRUPACEA VAR. PEDUNCULATA

Author(s): T. N. Khoshoo


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Commonwealth Mycological Institute, Kew, as sp. of *Melanospora* and *Pyrenochaeta* respectively. The fungi were readily brought into pure culture, and since the latter appeared to be new to science, was studied in detail, and the results are presented here.

A comparison between the Indian species of *Pyrenochaeta* and *Pyrenochaeta sacchari* Bitancourt recorded from Brazil,¹ (given in Table I) would indicate that the Indian species is distinct in its morphological characters from *P. sacchari*, and accordingly it is presented here as a new species of *Pyrenochaeta*.

**Table I**

**Comparison between Indian and Brazilian species of *Pyrenochaeta***

<table>
<thead>
<tr>
<th>Species</th>
<th>Pycnidia</th>
<th>Ostiole</th>
<th>Setae</th>
<th>Spores</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>P. sacchari</em></td>
<td>50-100 μ</td>
<td>1-20</td>
<td>6-12 x 3 μ</td>
<td></td>
</tr>
<tr>
<td><em>Indian sp.</em></td>
<td>30-190 μ</td>
<td>10-15</td>
<td>3-6 x 2-5 μ</td>
<td></td>
</tr>
</tbody>
</table>

*Pyrenochaeta indica* spec. nov. Viswanathan

Foliorum maculae sordide brunneae, centro albo, fusiformes, 2-6 x 1-3.5 mm., hypophyllae, corpusculis pycnidialibus alte nigris in centro. Pycnidia globularia vel ovoidea, 30-190 μ diam., ornata uno, raro pluribus ostiolis, setosa ad ore, superficialia. Setae fusce brunneae, obtusae, numero 1 ad 50, circumscripta circum ostiolum, 5-0-71.0 μ longa, vulgo septatae. Pycnidiospores unicellulatae, hyalina, sed fusce in massa. 3-6 x 2-5 μ (Fig. 1).

FIG. 1. *Pyrenochaeta indica*—a. Pycnidium (x 420), b. Pycnidiospores (x 1,590).

Typus lectus in foliis Sacchari officinarum L. in loco Poona, in India a T. S. Viswanathan.

Type specimens have been deposited at the Commonwealth Mycological Institute, Kew, England, and Herbarium Orientalis, New Delhi (India).

The author's thanks are due to Prof. M. N. Kamat under whose guidance this work was carried out, to Prof. E. W. Mason and Dr. Brown of the Commonwealth Mycological Institute, Kew, England, for many courtesies and helpful suggestions in identification and to Prof. Santapau for the Latin diagnosis.

T. S. VISWANATHAN.

Maharashtra Association for the Cultivation of Science, Poona, December 16, 1956.

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**MEIOSIS IN CEPHALOTAXUS DRUPACEA VAR. PEDUNCULATA**

MEHRA AND KHOSHOO observed 12 bivalents in the pollen mother cells of this variety. The present report is an extension of the same study. A meiotic irregularity was observed which, to the writer's knowledge, has not been recorded so far for any gymnosperm material.

The male cones were collected from the Forest Research Institute Arboretum (Dehra Dun) and were fixed in acetic-alcohol (1:3). Pollen mother cells were squashed in aceto-carmine.

The earliest stage available was a probable case of a prometaphase which revealed 12 bivalents each with 1-2 chiasmata. The same situation prevails at metaphase I except that the bivalents are more condensed (Fig. 1). After this stage in some trees there follows a perfect anaphase I and II resulting invariably in tetrad formation. The pollen appears to be normal. About 3% pollen is diploid.

However, in other trees only about 5% pollen mother cells show normal meiosis while in the remaining 95% cells the bivalents become highly contracted, terminalized and are irregularly distributed within the cells (Fig. 2). Evidently all these changes are caused by the lack of a directive influence of the spindle. Observations on 40 cells showed that the 12 bivalents were distributed in 22 different combinations. The maximum number of bivalents seen in a group was 12 which in course of time formed a single restitution nucleus. Metaphase I passes into anaphase I rather insensibly. The 24 univalents were distributed irregularly (Fig. 3) and 12 different arrange-

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Fig. 1. Twelve bivalents at metaphase I; Fig. 2. Abnormal mataphase I showing contracted and terminalised bivalents which are distributed in three groups; Fig. 3. Anaphase I showing 24 univalents distributed in groups; Fig. 4. Anaphase II showing 48 chromatids containing 10 microspores one of which is out of focus. All approx., × 1,500.

It can safely be concluded that this meiotic irregularity is due to the non-functioning of the spindle. That this aberration is not due to environmental causes is clear from the fact that trees with normal and abnormal meiosis grow side by side. It is tempting to suggest that the cause is genetic and ever since the findings of Beadle, it has become increasingly clear that the spindle is under genetic control. Further, since both the normal and abnormal divisional cycles occur side by side within the same microsporangium, it is reasonable to presume that the genetic control is not dominant or specific. If it were so, it should have affected all the cells of microsporangium. A detailed account will appear elsewhere.

The author is indebted to Prof. P. N. Mehra for his keen interest and encouragement, to Mr. M. B. Raizada (Dehra Dun) for allowing the use of the material and to Mr. R. S. Pathania...
for the microphotographs illustrating this paper.
Botany Dept.,
Panjab University,
Amritsar, November 18, 1956.


AN AMPHIDIPLOID NICOTIANA
GLUTINOSA L. × NICOTIANA TRIGONO-
PHYLLA DUN. HYBRID

Kostoff1 and later Goodspeed2 have listed a
great number of interspecific crosses in the
genus Nicotiana, involving numerous species
combinations. Cytological, morphological and
other characters of several of these hybrids are
also on record. A few fresh combinations not
so far listed have been produced at the Central
Tobacco Research Institute, Rajahmundry. This
note relates to an amphidiploid N. glutinosa ×
N. trigonophylla hybrid established here so far
as is known to the authors for the first time.
The amphidiploid progeny was obtained by col-
chicine doubling of a branch in a sterile F1
plant.

Like both the parents, the F1 also possessed
24 somatic chromosomes. The glutinosa charac-
ters were predominant. Meiosis was irregular
and pollen production was almost lacking. Col-
chicine in 1% aqueous concentration was
applied to several of the axillary buds, but
only one bud reacted to the alkaloid and the
branch bore fertile capsules. From the seeds
of such capsules vigorous F2 (C2) seedlings
were obtained this year and a number of plants
of this amphidiploid progeny is now under
study. Their chromosome number 48 conforms
to the amphidiploid nature of the hybrid
(Fig. 1). The plants are robust and possess

more or less the F1 morphological characters,
with a slight increase in size of individual
organs. Pollen production is very good. Meio-
tic number 24 was observed in several counts
made in these plants (Fig. 2). Well-filled cap-


1. Kostoff, D., Cytogenetics of the Genus Nicotiana,
State Printing Press, Sofia.
2. Goodspeed, T. H., The Genus Nicotiana, Chronica

SECONDARY GROWTH IN THE
PETIOLES OF THE LEAVES OF
DECIDUOUS PLANTS AND THE
PARTIAL SHOOT THEORY OF THE
LEAF

Leaves of herbaceous plants, so far studied,
do not show any secondary growth when
attached to the plant, but when isolated and
rooted by the application of synthetic hor-
mones produce secondary growth in their
petioles and veins.1,2 The investigation was
extended to the examination of petioles of
leaves of deciduous plants when they were
attached to the plant. Schleicheria trijuga, Willd.
is a deciduous plant where well-formed sec-
ondary growth has been found in the petioles,
when the leaves are attached to the plant. Fig. 1
represents a transverse section of the petiole of a
young leaf of this species. It is seen that there
are a large number of vascular bundles arrang-
ed in a triangular manner, with the base of
the triangle towards the adaxial side of the
petiole. Each vascular bundle is endarch and

FIG. 1

Leaves of Schleicheria trijuga, Willd. show
secondary growth in their petioles. Fig. 1
represents a transverse section of the petiole
of a young leaf of this species. It is seen that
there are a large number of vascular bundles
arranged in a triangular manner, with the base
of the triangle towards the adaxial side of the
petiole. Each vascular bundle is endarch and

FIG. 2

Figs. 1 and 2. Somatic metaphase (2n=48) and meiotic
metaphase (n=24).

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