Commonwealth Mycological Institute, Kew, as sp. of *Melanospora* and *Pyrenochœta* 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 *Pyrenochœta* and *Pyrenochœta 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 *Pyrenochœta*.

TABLE I

Comparison between Indian and Brazilian species of Pyrenochæta

Species	Pycnidia	Ostiole	Setæ	Pycnidiospores
P. sacchari	50–100 μ	..	1–20 5–40 × 2·5–5 μ	6–12 × 3 μ
Indian sp.	30–190 μ	10–15 μ	1–50 5·0–71·0 × 1·7–3·4 μ	3–6 × 2·5 μ

Pyrenochœta indica SPEC. NOV. VISWANATHAN

Foliorum maculæ sordide brunneæ, centro albo, fusiformes, 2-6 × 1-3·5 mm., hypophyllæ, corpusculis pycnidialibus alte nigris in centro. Pycnidia globularia vel ovoidea, 30-190 μ diam., ornata uno, raro pluribus ostiolis, setosa ad ore, superficialia. Setæ fusce brunneæ, obtusæ, numero 1 ad 50, circumscriptæ circum ostiolum, 5·1-71·4 μ longæ, vulgo septatæ. Pycnidiosporæ unicellulatæ, hyalinæ, sed fuscæ in massa. 3-6 × 2·5 μ (Fig. 1).

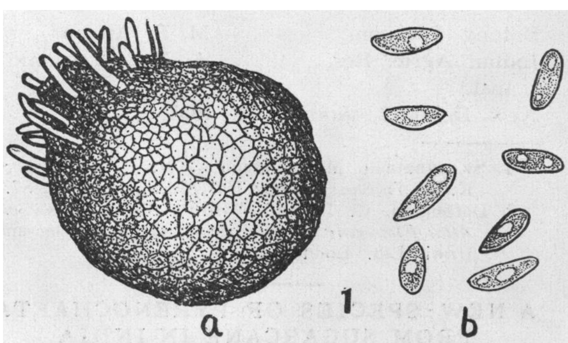

FIG. 1. *Pyrenochœta indica*—*a*. Pycnidium (× 420), *b*. Pycnidiospores (× 1,590).

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).

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T. S. VISWANATHAN.

Maharashtra Association
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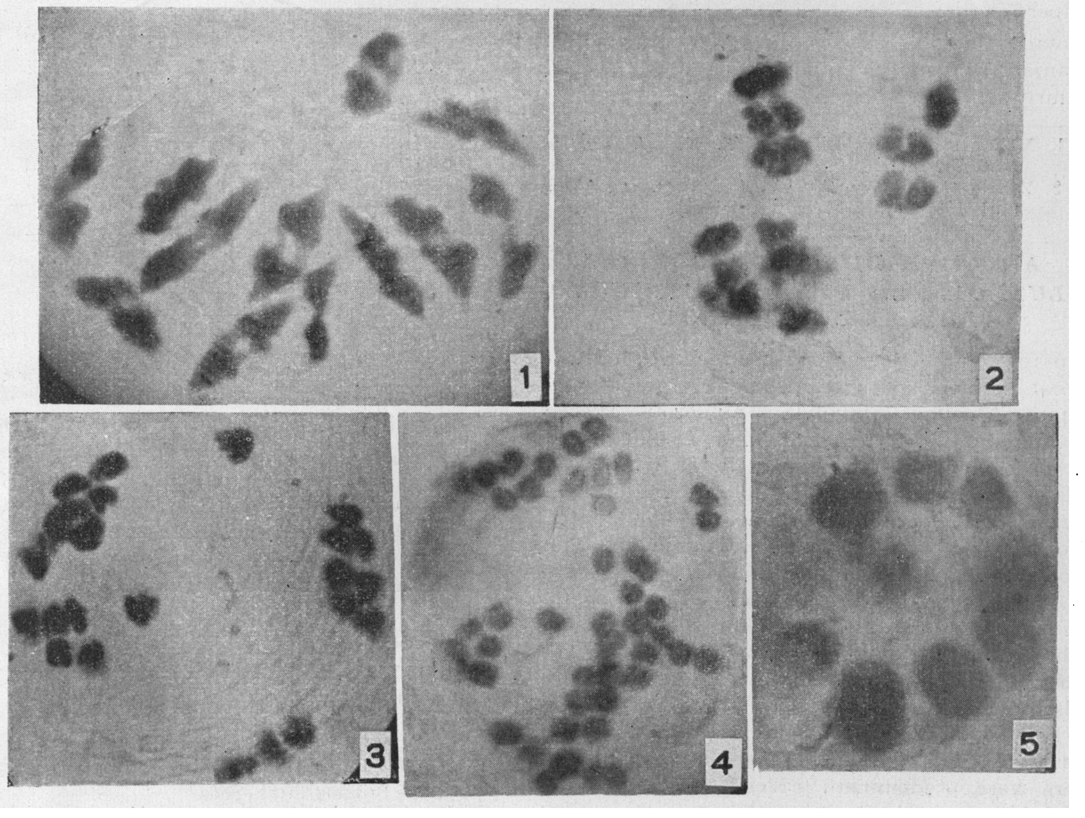
MEIOSIS IN *CEPHALOTAXUS DRUPACEA* VAR. *PEDUNCULATA*

MEHRA AND KHOSHOO[1] 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-



FIGS. 1 to 5

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 6 groups; Fig. 4. Anaphase II showing 48 chromatids which are irregularly distributed; Fig. 5. A polyad containing 10 microspores one of which is out of focus. All approx., × 1,500.

ments were observed within 20 cells. At telophase I, 1-7 nuclei were organised. There was a tendency for forming two bigger nuclei when there were more than two nuclei in a cell. The next stage to be studied was anaphase II when 48 chromatids were irregularly distributed within the cell (Fig. 4). There were noted 39 different arrangements within 50 cells. In some cases all the 48 chromatids were in a single group which ultimately resulted in a monad. At telophase II 46·7% pollen mother cells contained tetrads with equal or unequal spores. Such spores may contain micronuclei also. The remaining 53·3% mother cells contained monads, diads, triads and polyads containing upto 10 spores (Fig. 5). The cell-wall formation appears to be by furrowing. Only 10% pollen appears to be good and the remaining being very variable in size and apparently sterile.

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 genic and ever since the findings of Beadle,[2] it has become increasingly clear that the spindle is under genic 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 genic 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

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AN AMPHIDIPLOID *NICOTIANA GLUTINOSA* L. × *NICOTIANA TRIGONOPHYLLA* DUN. HYBRID

KOSTOFF[1] and later Goodspeed[2] 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 colchicine doubling of a branch in a sterile F_1 plant.

Like both the parents, the F_1 also possessed 24 somatic chromosomes. The *glutinosa* characters were predominant. Meiosis was irregular and pollen production was almost lacking. Colchicine 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 F_2 (C_2) 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

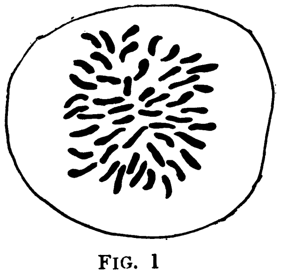

FIG. 1

more or less the F_1 morphological characters, with a slight increase in size of individual organs. Pollen production is very good. Meiotic number 24 was observed in several counts made in these plants (Fig. 2). Well-filled cap-

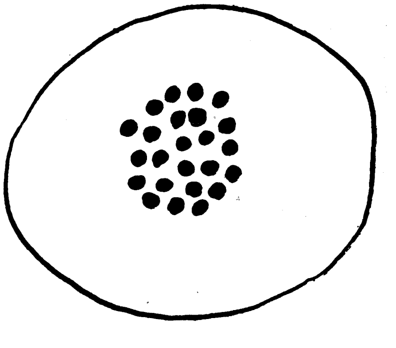

FIG. 2

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

sules are being formed and already from their seed a F_3 (C_3) population has been raised. Thus the amphidiploid has proved to be fertile and is under detailed study for various characters including disease resistance.

Due to its vigorous growth and good fertility, the amphidiploid might soon establish itself as a new stable species.

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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 hormones 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. *Schleichera trijuga,* Willd. is a deciduous plant where well-formed secondary 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 arranged in a triangular manner, with the base of the triangle towards the adaxial side of the petiole. Each vascular bundle is endarch and