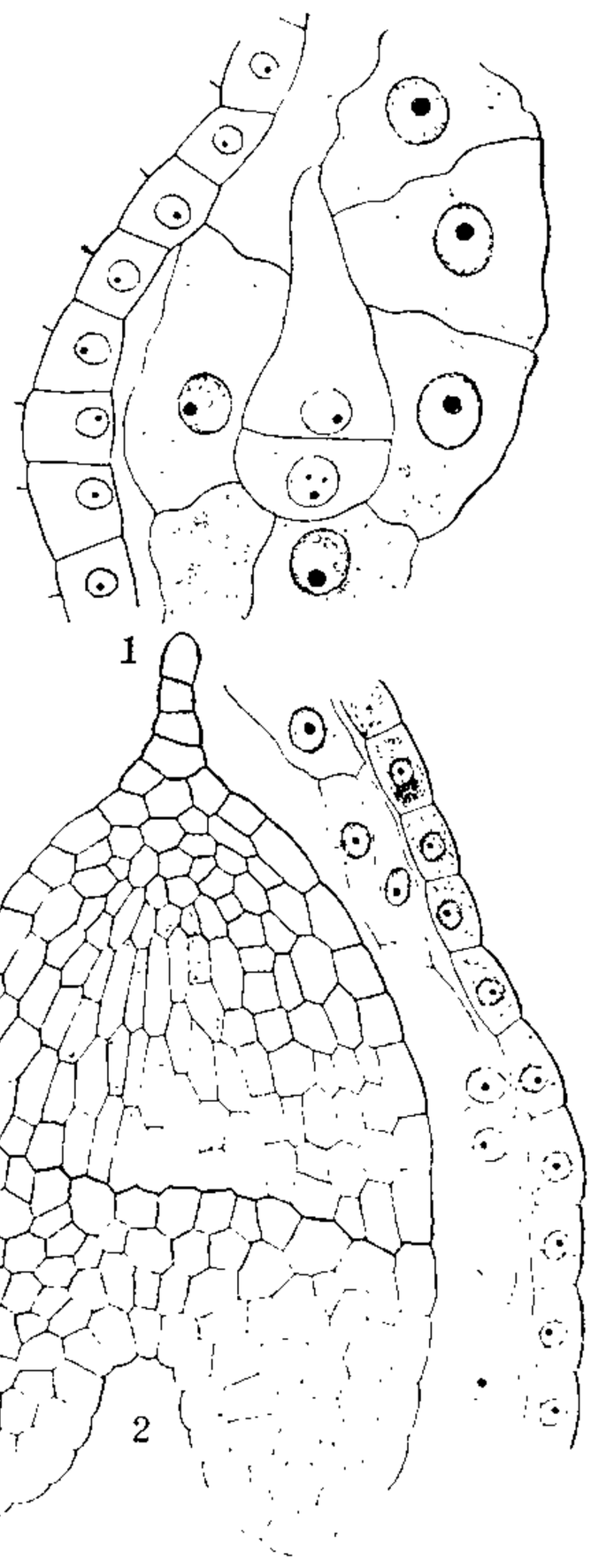
of the endosperm are poor in cytoplasm, highly vacuolated and distinct from those of the endothelium (Fig. 1). The endosperm cells continue to remain in this state during the later stages of development and in this very condition they are gradually digested away by the growing embryo. At about the stage shown by Fig. 2 the endosperm in the developing seed is represented by a layer of one or two cells with poor cytoplasmic contents, showing signs of disappearance. As the development proceeds the endosperm actually disappears before the seed matures.



FIGS. 1–2. *Cæsulia axillaris*. Fig. 1. A micropylar part of embryo-sac showing 2-celled embryo surrounded by highly vacuolated endosperm cells and a layer of endothelium. Fig. 2. L.S. of an young embryo showing an endosperm layer with poor cytoplasmic contents and a layer of endothelial cells. Fig. 1, ×733; Fig. 2, ×433.

While the endosperm is thus being consumed the cells of the endothelium continue to present a healthy appearance. To begin with, they are radially elongated but gradually during development they become elongated in the tangential direction. They also show in them the presence of starch grains later on, and they persist in the mature seed in the form of a layer surrounding the embryo. These cells with their starch contents look very much like the cells of endosperm (Fig. 2), and like the latter they also function as an organ of storage for the young embryo. Thus, this layer persisting in the mature seed of *Cæsulia axillaris* in the form of an endosperm is morphologically an inner layer of the integument which gradually develops into the endothelium and ultimately functions as an organ of storage simulating an endosperm. In the light of these findings the species in which endosperm is reported to persist needs reinvestigation. Details will appear elsewhere.

Thanks are due to Dr. L. B. Kajale for guidance and helpful criticism.

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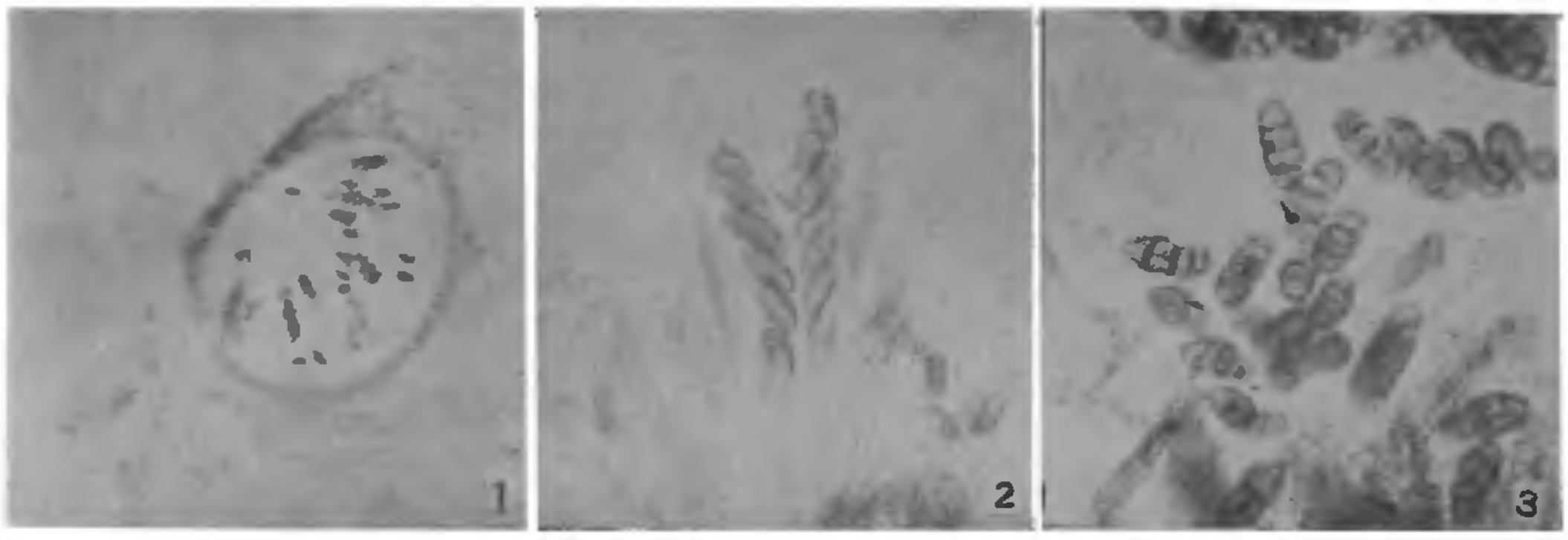
A NEW FUNGUS ON THE LEAFLETS OF *CYCAS REVOLUTA*

WHILE studying the leaf-spot diseases at Allahabad, the authors recorded the presence of an ascomycetous fungus on the dried portions of the leaflets of *Cycas revoluta*. So far only two imperfect fungi, *viz.*, *Phyllosticta cycadina* and *Ascochyta cycadina* had been reported from this host.

The perithecia of this fungus are always separate, never aggregated, they are usually globose and black in colour. Generally they are mixed with the pycnidia of *Phyllosticta* and *Ascochyta* but can easily be distinguished on account of their superficial nature and jet black colour. Microtome sections of the host showed that only the bases of perithecia were slightly immersed in the palisade of the host (*vide* Fig. 1). The range of perithecial size varies from 108·8–216·7 × 95·2–185·6 μ (Average 143·6 × 127–9 μ).

Asci are long, hyaline, cylindrical with eight ascospores arranged obliquely in each ascus (*vide* Fig. 2). The ascospores are dark-brown,



FIGS. 1–3. Fig. 1. Transverse section of leaflet of *Cycas revoluta* showing a perithecium with several asci and ascospores, ×350. Fig. 2. Asci of various age with hyaline wall and obliquely arranged ascospores, ×870. Fig. 3. Some mature ascospores showing three transverse septa and one longitudinal septum, ×870.

muriform with three transverse septa and only one longitudinal septum (4 septa in all, *vide* Fig. 3). The range and average size of mature asci and ascospores is recorded below.

Asci 64–65 × 15–17 μ (average 64·65 × 16·3 μ).

Ascospores 14–16 ×5–6 μ (average 15·23 × 5·46 μ).

Detailed morphological studies were undertaken and it was concluded that the organism was some species of *Teichospora*. This genus was created by Fuckel[1] in 1870. Saccardo[2] in his first treatment divided *Teichospora* in three subdivisions: *Eu. Teichospora* with perithecia not collapsing and spores coloured; *Strickeria* with perithecia finally collapsed—concave and spores coloured and *Teichosporella* with subhyaline spores and perithecia not collapsing. The descriptions of all the known species of *Teichospora* were compared and it was found that the organism did not agree fully with any of them. It shows some resemblance with *T. œlicola* (Pass) but the asci of the present species are much shorter in length and slightly thicker in breadth. Further the spores of the present species are smaller in breadth though there is no difference in length. In *T. œlicola* the number of septa vary from 3-5 but in this fungus the mature ascospores develop four septa only. It thus appears that the present organism is some new species of *Teichospora* and it is proposed to name it as *Teichospora indica*. So far this genus has not been reported from India.

Teichospora indica sp. nov.—The Latin description is given below:—

Perithecia semper distincta, numquam aggregata, ut plurimum globosa et nigra, sæpe intermixta pycnidiis *Phyllostictæ* et *Ascochytæ*, a quibus tamen sat faciliter distingui potest colore penitus nigro et natura superficiei; bases tantum peritheciorum immersæ sunt in textus vallares plantæ hospitis. Asci longi, hyalini, cylindrici et octospori. Maturæ ascosporæ fusce brunneæ, muriformes, ter transverse, semel longitudinaliter septatæ. Ex morphologia patet organismum ad genus *Teichosporam* pertinere. Perithecia 108·8–216·7 × 95·2–185·6 μ; asci 65–64 × 15–17 μ; ascosporæ 14–16 × 5–6 μ.

Descriptione omnium specierum cognitarum Teichosporæ comparata, claruit nostram speciem nulli earum convenire omnibus in partibus, quare nova species esse videtur. Nulla huius generis species ex India descripta est hucusque. Nostra species *Teichospora indica* nov. spec. hic nominatur.

In order to find out its relationship with other two organisms (*viz.*, *Phyllosticta cycadina* and *Ascochyta cycadina*), numerous attempts were made to grow it at various pH ranges, different temperatures and on a number of synthetic and semi-synthetic media but the perithecia were never developed in culture. Only sterile mycelium was produced. Few perithecia were, however, produced when the organism was grown on sterilized leaves of *Cycas revoluta* but even under such conditions the conidial stages were not observed. Detailed cultural and pathological studies are in progress.

The authors are grateful to Prof. H. Santapau, of St. Xavier's College, Bombay, for translating the description in Latin and to Shri. D. D. Nautiyal for taking the photomicrographs.

Department of Botany, R. N. TANDON.
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October 4, 1959.

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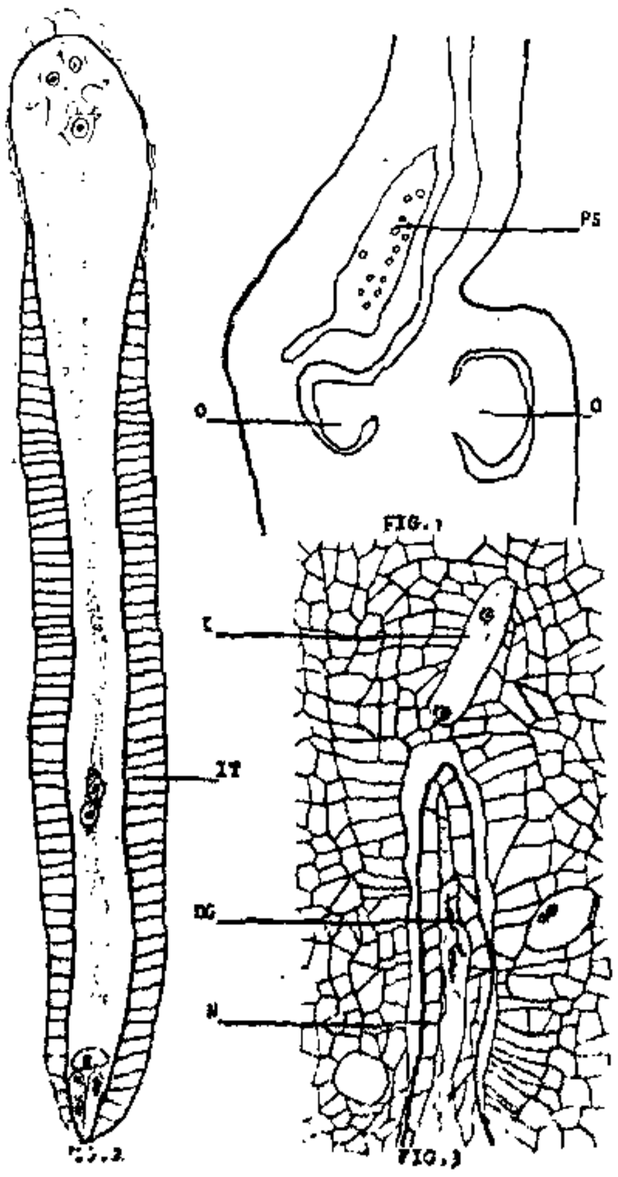
SOME PRELIMINARY OBSERVATIONS ON THE FLORAL STRUCTURES OF OLEACEAE

THE family Oleaceae includes about 24 genera comprising four to six tribes in various systems of classification. Interrelationships within the family and with other families of Gentianales present problems worth investigating from morphological and embryological points of view. Stant (1952)[1] on anatomical basis supported the transfer of *Nyctanthes* to the family Verbenaceae as suggested by Airy Shaw (1952).[2] It is necessary to verify its validity on the embryological grounds. The present work deals with the genera *Nyctanthes, Jasminum, Schrebera* and *Olea*.

Distinct heterostylous forms occur in *Nyctanthes* and *Jasminum*. Another noteworthy feature in their morphology is the occasional occurrence of tricarpellate gynæcea and three stamens in place of the usual two. Also a part of the carpellary tissue in *Jasminum* may give rise to a pollen sac (Fig. 1).

In *Nyctanthes arbor-tristis* L. the floral organs appear in a regular sequence. The style is gynobasic. The anther wall consists of four or five layers including the epidermis. The tapetum is secretory and at places it is two layers thick. It is three layers thick on the connective side and differentiates very early. The meiotic divisions are of the simultaneous type. The pollen grain usually has three germ furrows and shows exine sculpture in the form of knob-like excrescences. The generative cell is lenticular. The pollen is shed at the bicelled stage.



FIGS. 1-3. Fig. 1. L.s. ovary showing two ovules (O) and a pollen sac (PS), ×13·33. **Fig. 2.** Mature 8-nucleate embryo-sac with integumentary tapetum (IT), ×110. **Fig. 3.** L.s. ovule with nucellus (N) and degenerating sporogenous mass (DG). Note an enlarging integumentary cell (I), ×110.

The archesporium in the ovule appears as a single cell. Rarely multiple archesporium was observed. The ovule is unitegmic, tenuinucellar and anatropous. Integumentary tapetum is also organised. The nucellus is single-layered at the micropylar end but on the sides of the embryo-sac it is two-layered. The megaspore tetrads are linear or T-shaped. The development of the embryo-sac corresponds to the normal type (Fig. 2). The synergids are hooked. The antipodals are three in number. The endosperm is cellular. The embryo has a long suspensor. The germination is epigeal. The cotyledons are long-petioled and they help in raising the plumule above the soil.

In *Jasminum* sp. the archesporium in the ovule is multicellular. Several embryo-sacs develop from the megaspores. The behaviour of the integumentary tissue is interesting. Some of its cells become multinucleate and simulate an embryo-sac (Fig. 3). Microdissections of the embryos mounted in Zirkle's medium often showed pleiocotyly. The germination is hypogeal.

Messeri (1950)[3] and King (1938)[4] have reported Scilla type of embryo-sac in *Olea europæa*. I find the same in *Olea dioica* Roxb.

Schrebera swetenioides Roxb. was collected from Bileshwar and Junagadh (Saurashtra). It reveals the typical one-integumented, tenuinucellate, anatropous ovule which develops an integumentary wing on the seed. Work on *Ligustrum neilgherrense* Clarke and *Linociera malbarica* Wall is under progress.

It gives me great pleasure to express my sincere thanks to Professor P. Maheshwari for encouragement and advice and to Dr. R. D. Desai for facilities.

M.G. Science Institute, N. K. PATEL.
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