Appearance of a new intermediate biotype (R. 183) has been picked up from B.O. 47 in Central U.P. during 1973–74. R. 183 differs from light coloured R. 117 and the intermediate type R. 135 in that it has radiating, fluffy textured mycelia on oat meal producing irregularly scattered conidia on periphery of radiating margin.

TABLE I

Comparative cultural characters of new biotype R. 183

Sl. No.	Biotype	Colour: Colony	Colour: Spore mass	Spore size
1.	R. 117	Moon beam	Grenadine-R	26·1–31·5 μ × 4·2–5·8 μ
2.	R. 135	Piping rock grey stone	Tigerlily	19·0–26·6 μ × 4·2–5·8 μ
3.	R. 183	Piping rock grey stone	Cadmium orange	33·0–37·4 μ × 4·4–4·95 μ

The virulence of R. 183 was also compared with R. 117 and R. 135 on a set of ten host varieities by the usual plug technique. The comparative behaviour is given in Table II.

TABLE II

Comparative behaviour of R. 183 *by plug technique*

Sl. No.	Variety	Average lesion length in cm against biotypes: R. 117	R. 135	R. 183
1.	Co. 213	42·8	60·8	75·6
2.	Co. 312	110·2	109·8	122·7
3.	Co. 331	56·7	70·4	78·1
4.	Co. 453	73·7	97·5	82·3
5.	Co. 1148	34·9	34·5	39·1
6.	Co. 1158	43·4	54·1	41·7
7.	Co. S. 443	75·6	43·4	62·1
8.	Co. S. 510	118·7	81·8	122·1
9.	B.O. 17	61·4	49·7	40·1
10.	B.O. 47	37·4	43·6	97·7

R—Resistant (lesion length up to 37·5 cm).

MR—Moderately resistant (lesion length between 37·6 and 75·0 cm).

S—Susceptible (lesion length above 75·0 cm).

A perusal of Tables I and II indicates that R. 183 is morphologically different from the other biotypes, as the moderately resistant varieties, *i.e.*, Co. 213, 331 and B.O.47 became susceptible with R. 183 and this has been found responsible for the decline of B.O. 47 in the area. It is, therefore, essential that in the resistance tests only the virulent biotypes be picked up.

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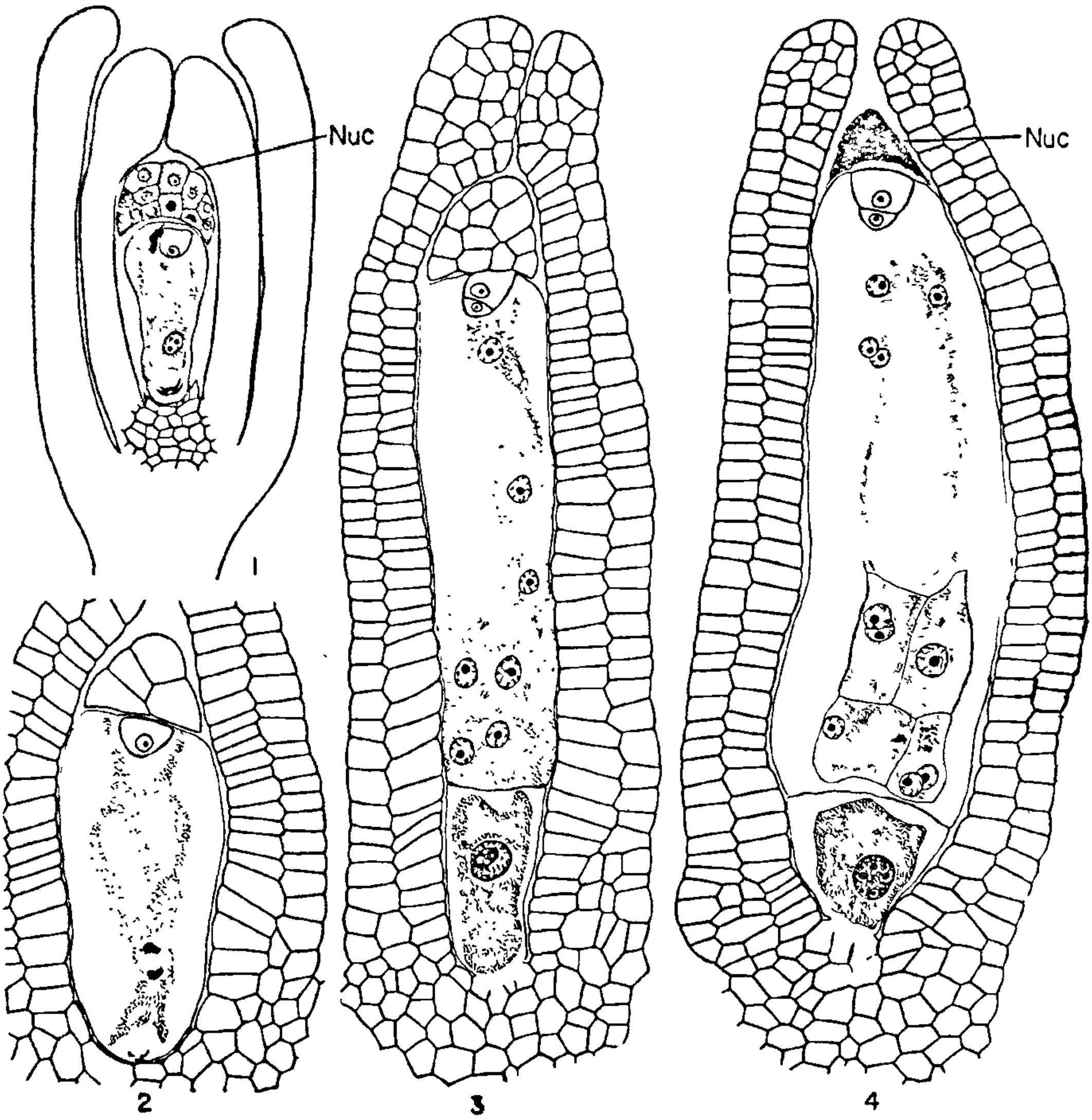
ENDOSPERM IN *ARIOPSIS PELTATA* NIMMO., ARACEAE

VERY few studies have been undertaken on the full gamut of endosperm development in the family Araceae. In their review on the topic, Swamy and Parameswaran[1] have raised doubts on the occurrence of the Helobial ontogeny in the family. This family is reported to exhibit all the three major types of endosperm ontogenesis—Nuclear, Cellular and Helobial. Swamy and Parameswaran[1] suggested not only a fresh study of the taxa already investigated but also an extended investigation on taxa unworked hitherto.

In the course of comprehensive studies on the embryology of the Araceae, the monotypic genus *Ariopsis peltata* was seen to exhibit a clear instance of helobial ontogeny, which is the first unmistakable record.

The ovules are orthotropous bitegmic and tenuinucellate (Fig. 1). The fertilized embryo sac is broader at the micropylar part and it is in contact with the inner integument except at the micropylar end where a nucellar cap persists. The primary endosperm nucleus prior to division is located at the chalazal end of the embryo sac. It divides *in situ* in a transverse plane (Fig. 2) causing the partitioning of the embryo sac into a conspicuously large micropylar chamber and a small chalazal chamber. The early post-fertilization development is characterized by rapid elongation of the ovule along the micropylar-chalazal axis and the position occupied by the smaller chalazal chamber is not affected. The cytoplasm of



FIGS. 1–4. Fig. 1. Longisection of the ovule with fertilized embryo sac, × 415. Fig. 2. Shows division of primary endosperm nucleus at chalazal end of the fertilized embryo sac, × 580. Fig. 3. Young endosperm, note free nuclei in the micropylar chamber and the hypertrophied nucleus in the chalazal chamber, × 580. Fig. 4. Shows cells formation in the micropylar chamber, × 580. NUC = Nucellar cap.

this chamber soon assumes and exhibits progressive basic chromaticity to histological stains. Its nucleus undergoes hypertrophy accompanied by nucleolar splitting into smaller units of diverse size. Thus it functions as a typical haustorium or the basal apparatus (Figs. 3–4). Meanwhile, the nucleus of the micropylar chamber undergoes divisions in the neighbourhood of the basal apparatus but no wall is laid down between the daughter nuclei either during this or during the next two divisions. The first three successive divisions in the micropylar chamber are not synchronous. The free nuclear stage lasts until eight nuclei are formed. It should also be noted that larger number of these are scattered in the chalazal half of the embryo sac there by indicating a parallel way of subsequent cell formation. Further increase in the quantum of endosperm is caused by nuclear divisions accompanied by prompt wall formation. Thus the sequence of events in endosperm development typically conforms to the norm of helobial ontogeny.

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LAEVIGATOSPORITES OVALIS WILSON AND WEBSTER WITH ITS SPORANGIUM FROM LIGNITIC BEDS OF RATNAGIRI DISTRICT

OCCURRENCE of Lignite in Ratnagiri District was reported in 1871 by Wilkinson.[4] Since then several other geologists have also added to the list of exposural sites in this district, mainly from well sections. Palaeobotanical information on these beds is entirely lacking. The present communication records some commonly encountered sporangia containing spores from the lignite encountered in two well sections on Ratnagiri–Pawas Road at third Dharmashala stop.

Sporangium (Fig. 1) stalked, ovoid, 300·00 μm long, 225·00 μm broad in the middle; wall single-celled in thickness; annulus vertical, cells rectangular, transversely extended, 72·0 × 34·0 μm, radial walls highly thickened, thickness of common wall 6·8 μm; stomium prominent, 51·0 μm in vertical extent, cells 44·2 × 17·0 μm, transversely elongated; other cells of sporangial wall thin, rectangular, vertically oriented, 85·0 × 29·0 μm, thickness of common wall 1·7 μm; sporangial stalk multilayered, cells vertically elongated, ± rectangular, about 51·0 × 17·0 μm, thin-walled.

FIGS. 1–3. Fig. 1. Sporangium, × 1,900. Fig. 2. Sporangial bit with spores, × 1,900. Fig. 3. Isolated spore, × 4,000.

Spores psilate, monolete, bilateral, concavoconvex, 32 × 40 × 32 μm; laesura simple, 26·0 μm long, margin slightly thickened, ends pointed (Figs. 2, 3).

The above description of the spores agrees with that of *Laevigatosporites ovalis* described by Wilson and Webster[5] from the Tertiary coal of Montana, U.S.A. and hence these spores have been attributed to *L. ovalis* Wilson and Webster.

In India, the sporae disperse of *L. ovalis* have been hitherto recorded from the Tertiary deposits of Warkalli, Neyveli (Ramanujam[1]) and the Cauvery basin of South India (Venkatachala and Rawat[3]).

Wilson and Webster[5] attributed the affinity of *L. ovalis* with such genera of polypodiaceae as *Asplenium*, *Athyrium*, *Aspidium*, *Blechnum* and *Thylepteris* which produce plano-convex to concavo-convex, smooth-walled, monolete spores. As there is uncertainty about the preservation of perine during fossilization, it was not possible to determine whether the dispersed spores of *Laevigatosporites ovalis* were perinous or non-perinous.

The structure of the sporangium described here alongwith these spores confirms the affinity of the latter with the family Polypodiaceae. It may be noted that no trace of perine could be seen even in those spores found inside the sporangium (Fig. 2), suggesting that *L. ovalis* is a non-perinous morphotype.

All the genera mentioned above except *Athyrium* have perinous spores. The spores of some species of *Athyrium* are perinous but those of the nonperinous species are granulose to rugulose. A comparison of these spores with the living members of Polypodiaceae (Santha Devi[2]) suggests their affinity with the members of the subfamily Platyserioideae with smooth-walled spores.

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CHIMERAL EMBRYOIDS OF POLLEN ORIGIN IN TOBACCO

PRODUCTION of haploids from anther cultures of tobacco has been demonstrated by various authors[1]. There are reports of haploid production using tetrad, uninucleate and binucleate pollen grains[2]. However, certain facets concerning the ontogeny of embryoids