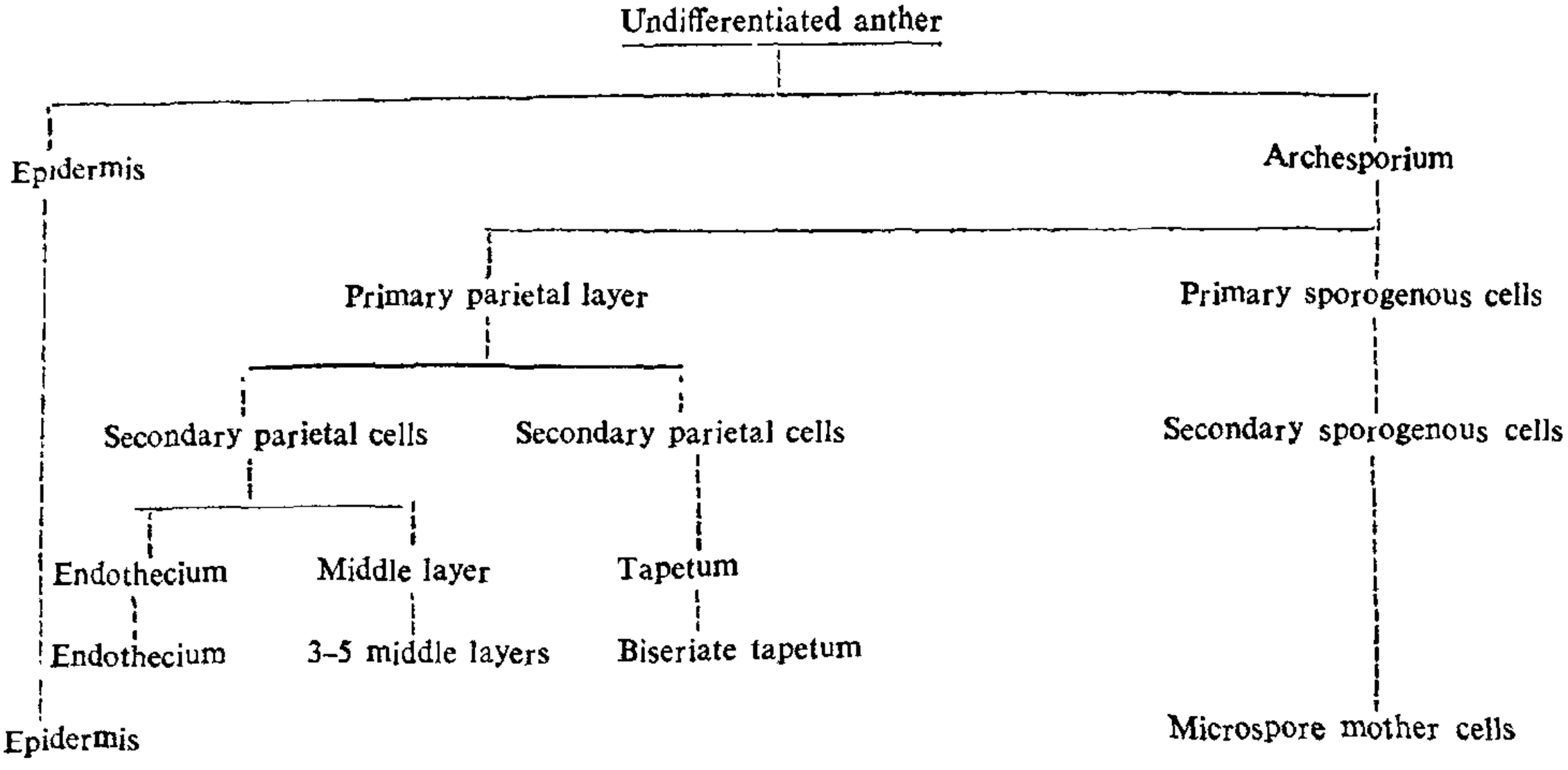
EMBRYOLOGY OF *MELIANTHUS MAJOR* L.
I. Microsporangium and Pollen

Melianthus major L. was placed by Bentham and Hooker[1] in the family Sapindaceae, but was separated on morphological grounds, by Gurke[4] and placed in a separate family Melianthaceae. It was later supported by most of the taxonomists. Recently Steyn[6] on the basis of embryogeny and Corner[2] on seed structure have also supported it, showing its affinities with Rosale.

Flowers of *Melianthus* are tetramerous, bisexual, irregular and polypetalous, produced in dence racemes. Stamens, with long filaments, are four in two groups of unequal lengths. Ovary is tetralocular with 5 or 6 anatropous ovules on axile placentum in each locule.

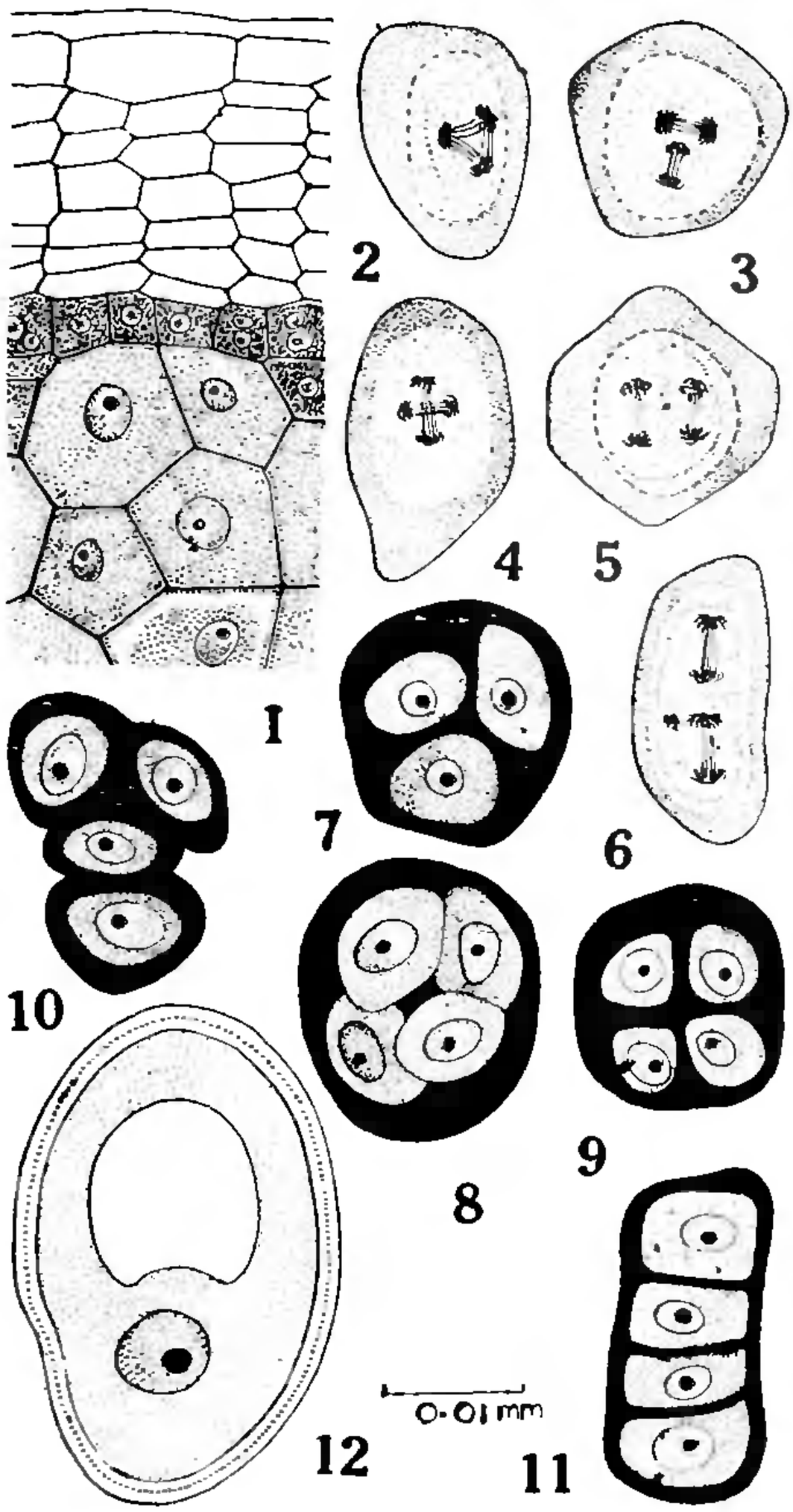
A young tetrasporangiate anther differentiates into epidermis and central homogeneous mass, which cuts off parietal layer and inner multiseriate archesporium. The periclinal divisions in the parietal layer result in the differentiation of anther wall which consists of 6–8 layers of cells (Fig. 1). The epidermal cells are tangentially stretched with thin cuticle. As the development proceeds they become more stretched and narrow. The endothecium remains unchanged till the formation of pollen grains. Later the cells of endothecium elongate radially and produce the characteristic fibrous thickenings; rarely the thickening develop prior to the dehiscence. The number of middle layers varies from three to five which are usually ephemeral. Occasionally one or two of the middle layers persist till the anther derisces. The innermost wall layer is the glandular tapetum. It is uni-biseriate laterally and multiseriate towards anterior and posterior ends of the anther. Its cells are uninucleate to begin with but become bi-tetranucleate by mitotic or amitotic divisions during meiosis I. At the formation of microspore tetrads, minute globules appear on the inner tangential wall of the tapetum. The globules however are not observed at later stages of development. The cells later on become vacuolated, stretched and persist even after the formation of pollen grains.

The Following chart summarises the development of anther wall. It is of Dicotyledonous type (Davis[3]).



The protoplasm of microspore mother cells rounds off before they undergo meiosis. Meiotic divisions are normal; however the cytokinesis is simultaneous by furrowing, resulting in tetrahedral decussate and isobilateral types of tetrads and successive by cell plate formation producing linear, T–shaped and isobilateral types of tetrads (Figs. 2–11). A callose is differentiated at the reduction division and becomes more prominent at tetrad stage. Young microspores get separated by irregular disintegration of callose. They are rounded, with prominent nuclei and dense cytoplasm. The microspores enlarge and attain their characteristic elliptical shape which is triangular in polar view. The spore wall gets differentiated into exine and intine. Prior to the division the microspore nucleus migrates to one side and a big vacuole appears on the other side (Fig. 12). The nucleus divides resulting in a vegetative, pole ward and generative nuclei. Pollen grains are usually shed at this stage but three-nucleate pollen grains at the time of shedding are not uncommon. Pollen grain is monad, isopolar, radiosymmetric, perprolate (49 × 26 μ) Amb peritreme-pleurotreme, apocolpium, diameter 6–7 μ,

Tricolporate, colpi ± 42 μ long. narrow slit-like, ends pointed, Ora lalongate (± 4 × 14 μ), polar margins of the ora thickened.

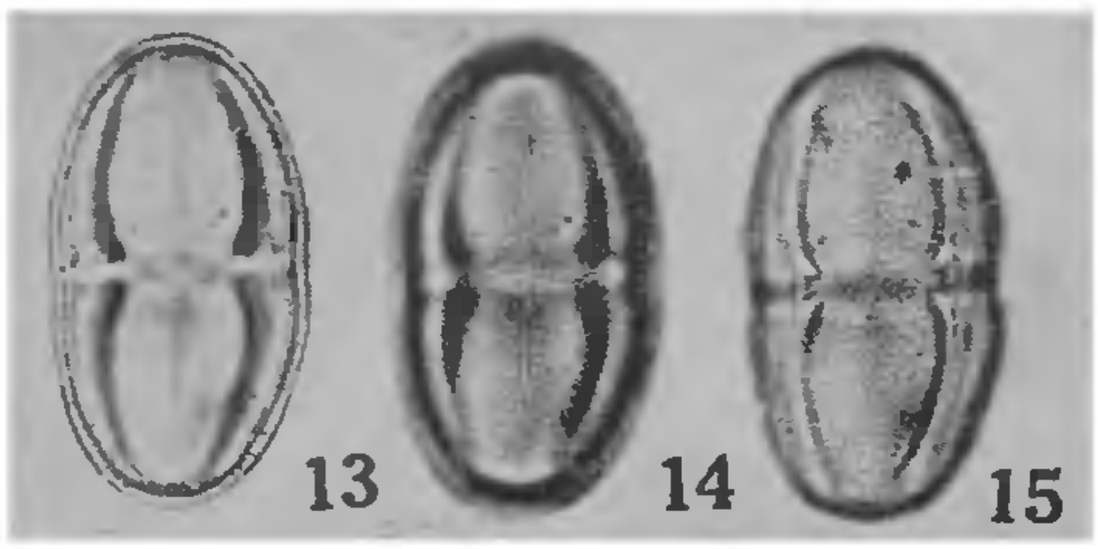


FIGS. 1–12. Microsporogenesis in *Melianthus major*. Fig. 1. Portion of anther wall at microspore mother cell stage, Figs. 2–6. Dividing mother cells. Figs. 7–11. Different types of tetrades. Fig. 12. Male gametophyte.

Exine 3 μ thick, sexine ± 1·5 μ thick, pertectate. Tectum supported by densely placed bacules. Nexine as thick as sexine (Figs. 13–15).

The microsporangia of each anther lobe are unequal in size, thus there is no coalescence of the adjacent locules and each microsporangium dehisces independently. At the region of dehiscence the cells of endothecium are small, they fail to develop fibrous thickenings and become cuticularised.

Morphologically quite distinct from Sapindaceous taxon, the genus *Melianthus* also differs in the development of microsporangia, microsporogenesis and male gametophyte from the worked out members of Sapindaceae in the presence of features such as persisting epidermis, 3–5 middle layers, biseriate tapetum, linear and 'T'-shaped tetrads, cytokinesis by furrowing as well as cell plate formation, 3-nucleate pollen grains at shedding, no coalescence of adjacent sporangia, and independent dehiscence of each lobe.



FIGS. 13–15. Pollen grains of *Melianthus major*

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VIBRIO PARAHAEMOLYTICUS IN THE MARINE ENVIRONMENT AT PORTO NOVO

INFORMATION on the occurrence of *Vibrio parahaemolyticus* from India is scanty. Chatterjee *et al.*[1] were the first to isolate *V. parahaemolyticus* and other associated non-cholera vibrios from the faeces of patients with diarrhoea in Calcutta. Recently, Bose and Chandrasekar[2] reported the occurrence of *V. parahaemolyticus* in the slime of marine prawns from the