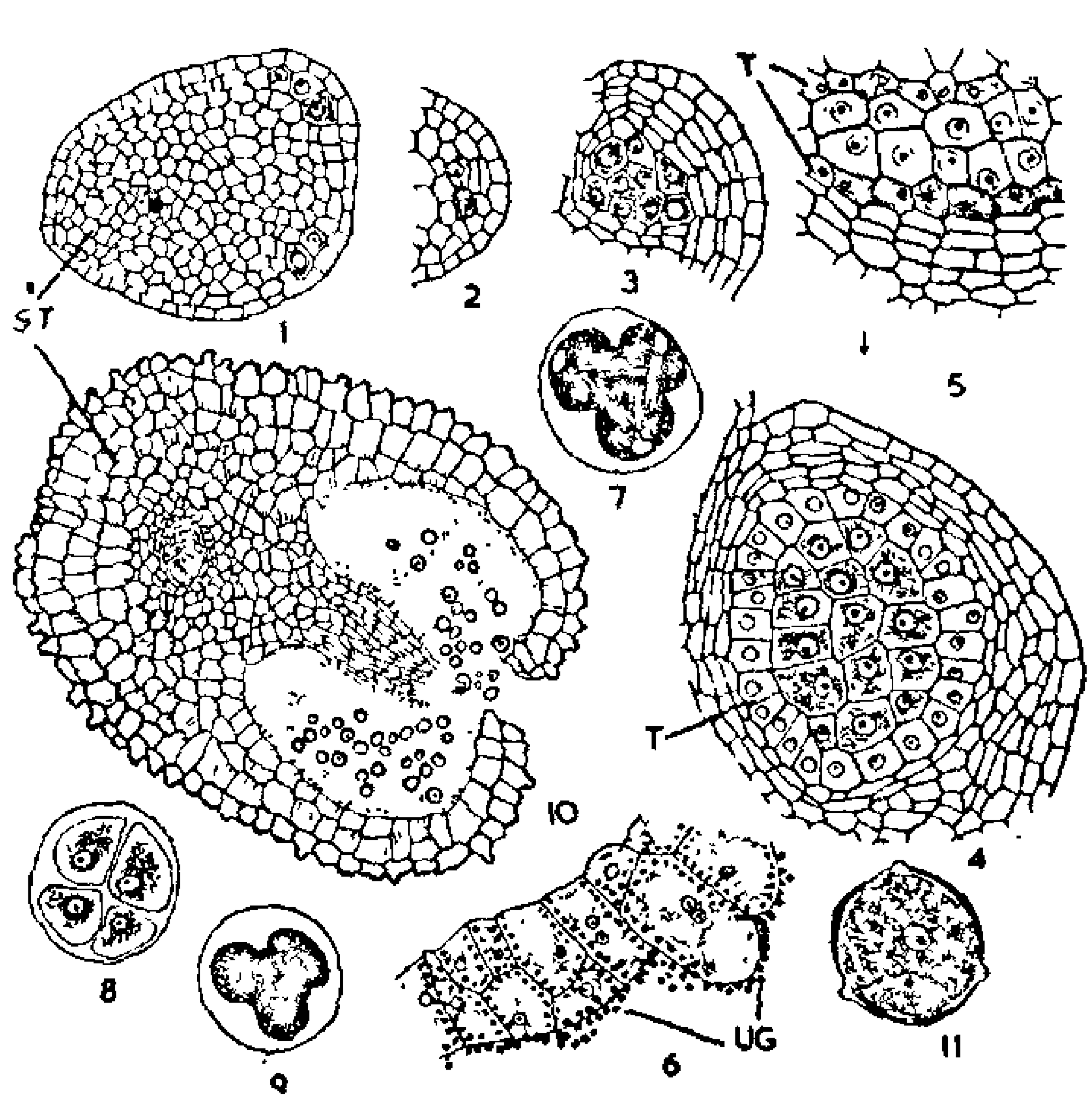
ANTHER IN *MORINGA CONCANENSIS* NIMMO

DAVIS[2] states that in *Moringa* the anther wall development has not been described and that the two adaxial sporangia of each anther fail to develop while Bhojwani and Bhatnagar[1] state that each anther lobe *has only one microsporangium and that the* an her *is* monothecous. According to Puri[3], the archesporium differentiates at only two inner lobes in *Moringa oleifera* but his Fig. 1 shows sporogenous tissue. Further, he made no mention of the endothecium. As such a detailed study of the anther of *Moringa concanensis* was undertaken and reported here.

A transection of the anther, which is oval, shows 2 or 3-celled hypodermal archesporium at two corners on the broader side (Fig. 1). The archesporium cuts off a primary parietal layer which divides periclinally resulting in two secondary parietal layers both of which divide similarly forming 5 or 6 layers of cells (Figs. 2–4) of which the outermost forms the fibrous endothecium and the innermost becomes the secretory tapetum. The anther wall development conforms to the Basic type[2]. Along the connective side, the parenchymatous cells immediately adjacent to the sporogenous tissue organise into the tapetum (Fig. 5). The primary sporogenous cells divide a few times resulting in microspore mother cells which undergo simultaneous meiotic divisions and cytokinesis is by furrowing (Fig. 7). The microspore tetrads are mostly isobilateral or tetrahedral (Figs. 8, 9). Puri[3] stated that in *M. oleifera* the tapetal cells on the inner side of the loculus are always 2–3 times more elongated than those of the outer side. However, in *M. concanensis*, the tapetal cells, to begin with, are of about equal size but later, the cells along the inner side of the loculus enlarge considerably so that the tapetum becomes dimorphic. The uninucleate tapetal cells become vacuolated and their nuclei divide resulting in binucleate cells and in some of the cells the nuclei fuse becoming secondarily uninucleate. As the secretory tapetum is gradually used up, Ubisch granules appear on the inner tangential walls and the radial walls. At places, the tapetum becomes two-layered and in such a case, these granules are not found along the outer tangential walls of the outer layer (Fig. 6). A point of especial interest is the development of fibrous thickenings in 4 or 5 layers of cells of the sterile theca (Fig. 10). A reexamination of the anther of *M. oleifera* also revealed such a feature but Puri[3] missed this.

The pollen grains are tricolporate and are shed at the two-celled stage and the three-celled condition reported in *M. oleifera* by Puri[3] could not be confirmed.



FIGS. 1–11. Fig. 1. T.S. anther showing the archesporial cells × 240. Fig. 2. T.S. part of the anther showing the primary parietal layer and secondary parietal layer × 240. Fig. 3. Same showing the formation of parietal layers × 240. Fig. 4. Same showing the spore mother cells, the tapetum and the wall layers × 240. Fig. 5. Same showing the differentiation of tapetum along the connective side (Arrow indicates connective side) × 240. Fig. 6. T.S. part of the two-layered tapetum with no Ubisch granules along the outer tangential walls × 240. Figs. 7–9. Formation of microspore tetrads × 300. Fig. 10. T.S. mature anther showing the fibrous thickenings extending to the cells of the sterile theca × 240. Figs. 11. Mature pollen grain × 300. (ST, Sterile theca; T: Tapetum; UG. Ubisch granules.)

From the above, it is clear that the two sporangia, one from the adaxial and the other from the abaxial side, of the same theca develop while the other theca remains sterile.

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