

MEGASPOROGENESIS IN SOME DALBERGIEAE

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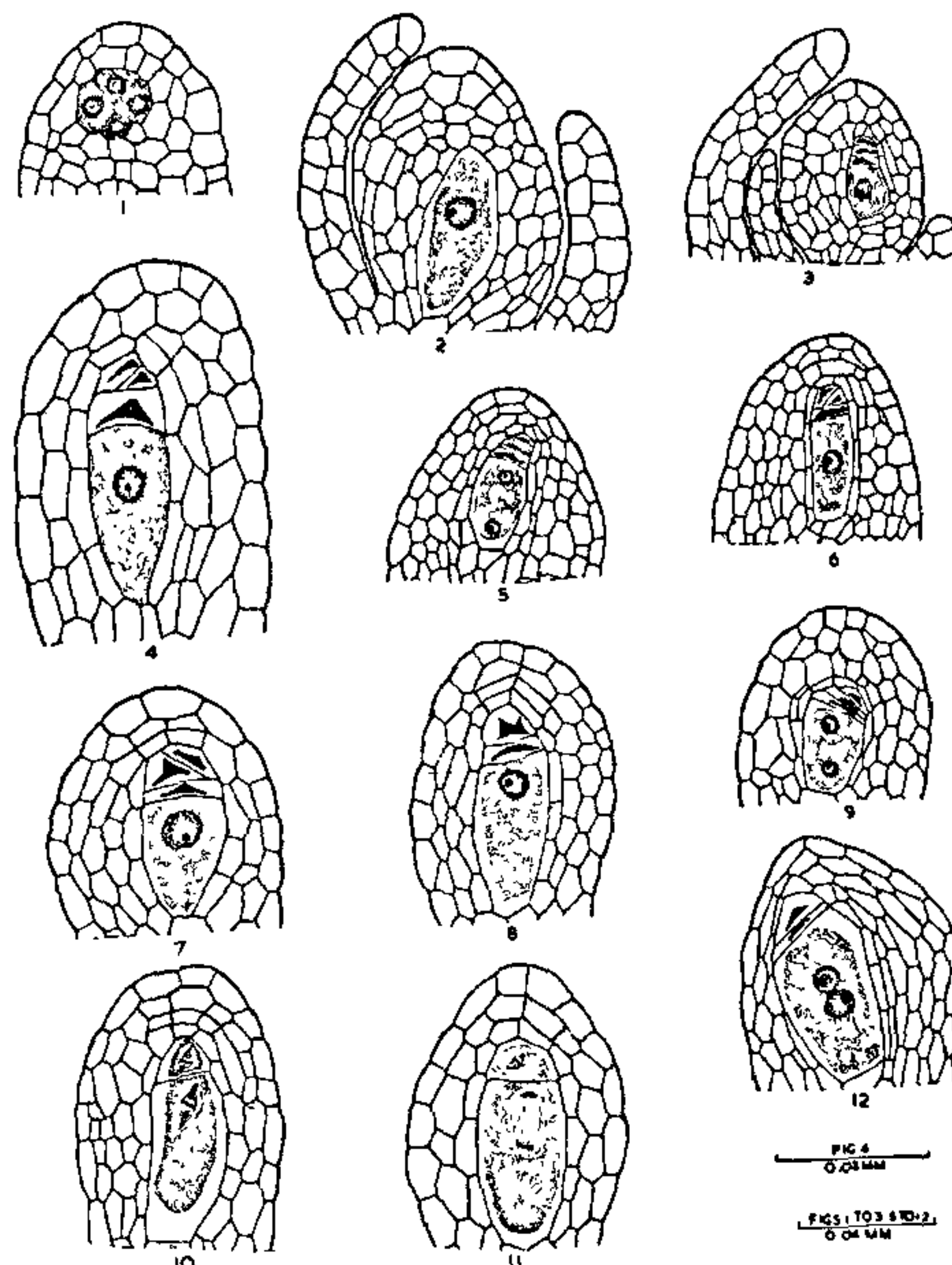
REMBERT¹⁻⁴ traced the megasporogenesis in some Papilionaceae and attributed phylogenetic significance to the megaspore tetrad patterns. Based on his observations and information available earlier, Rembert recognized 12 different patterns in the family and derived one type from the other.

Information on megasporogenesis in the tribe Dalbergieae is scarce and hence the present study on *Dalbergia sissoo* Roxb., *D. paniculata* Roxb., *D. latifolia* Roxb., *Pongamia pinnata* (Linn.) Pierre, *Derris scandens* Benth., and *Pterocarpus marsupium* Benth. was taken up.

The archesporium in the ovule is hypodermal and cuts off a parietal cell in all the cases. Two or more megaspore mother cells were observed occasionally in *D. paniculata* and *P. pinnata* (figure 1). The megaspore mother cell undergoes the usual meiotic divisions and gives rise to a linear tetrad of megaspores in *Dalbergia latifolia*, *D. sissoo* and *D. scandens* (figures 2, 3, 5, 9) whereas in *D. paniculata*, *P. marsupium* and in *P. pinnata* the upper dyad undergoes a vertical division during the second meiotic division, resulting in a T-shaped tetrad (figures 4, 6, 7). Occasionally in some ovules of *P. pinnata*, only a triad is formed as a result of megasporogenesis where the upper dyad degenerates after the first meiotic division, while the lower one undergoes the second meiotic division giving rise to a lower functional and an upper degenerating cell (figure 8). In all the above cases the embryo sac development is of the polygonum type.

Variation in the embryo sac development has been observed in *P. pinnata* with the occurrence of both the Polygonum and bisporic types. In 5 out of 20 cases examined where the embryo sac development was of the bisporic type, the first division of the megaspore mother cell was normal resulting in a 'dyad' (figure 10). The second meiotic division in the lower dyad was unaccompanied by wall formation resulting in the formation of a two-nucleate embryo sac, while in the upper dyad nuclear division was accompanied by wall formation and the two resulting megaspores degenerated as such (figures 11, 12). Thus only a triad was formed as a result of megasporogenesis.

Following the terminology of Rembert⁴ these tetrad patterns correspond to type III in *D. latifolia*, *D. sissoo* and *D. scandens*, type IIIa in *D. paniculata*, *P. marsupium* and *P. pinnata*, type VI in some ovules of *P. pinnata* and type VII in a few ovules of *P. pinnata*. Rembert derives type VII (bisporic) from type III and



Figures 1-12. 1. L. S. portion of ovule showing group of megaspore mother cells in *P. pinnata*. 2. An enlarged megaspore mother cell in *P. pinnata*. 3, 5, 9. Linear tetrad of megaspores in *D. latifolia*, *D. sissoo* and *D. scandens*. 4, 6, 7. T-shaped tetrads in *Pterocarpus marsupium*, *Dalbergia paniculata* and *Pongamia pinnata*. 8. A triad in *P. pinnata*. 10-12. Dyad and triad stages in the bisporic development of *P. pinnata*.

contends that in the Papilionaceae it occurs in the four morphologically advanced tribes viz. Genisteae, Galegeae, Viciae and Phaseoleae. The earlier record of bisporic type in *Ougenia oojeinesis*⁵ belonging to the tribe Hedysareae and the present observation do not lend any support to such a view.

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