

Review

Megasporogenesis in *Dolichos lablab* L.: Further evidence of a criticism of Roy (1933)

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SUMMARY

Dolichos lablab L. is a member of the tribe Phaseoleae of the Papilionaceae. In one micropreparation, chalazal cell of the dyad contained a single nucleus and the micropylar one two nuclei. In one more micropreparation only three cells (a linear arrangement of three cells) were found. However, Roy (1933) was not aware of such an important anomalies in *Dolichos lablab*. This proves his superficial and misleading observations.

Key wards : Embryology of the Angiosperms.

Megasporogenesis culminates with the production of megaspores. Maheshwari (1945a, b) and Cave (1953) both relate the importance of gametophyte studies in Angiosperms. Since megaspore produce megagametophytes directly, production and position of megaspore must be significant not accidental. Megasporogenesis is initiated in most Papilionaceous species by the development of an archesporium hypodermally oriented in the nucellus. In Papilionaceae archesporium, whether multi-cellular or uni-cellular, is characteristically hypodermal. Roy (1933) *Dolichos lablab*, Samal (1936) *Crotalaria juncea*, and Rembert (1969) *Sophora japonica* and *Desmodium paniculatum* consider a few cases of sub-hypodermal archesporial development in Papilionaceae, but all other cases appear to be doubtful, including report of Cooper (1938) *Pisum sativum* and Paul and Datta (1950) *Crotalaria intermedia*. Salgare (1973) observed in *Cyamopsis psoralioides* that the multiple megasporocytes first appeared in the sub-hypodermal layer and were in contact with one or more parietal layers. In those species that exhibit sub-hypodermal archesporial development, an archesporial cell is reported to enlarge directly and function as a megasporocyte (Martin, 1914) in *Medicago sativa* and Roy (1933) in *Dolichos lablab*.

The ovule of *Dolichos lablab* L., a member of the tribe Phaseoleae of the Papilionaceae is bitegmic, crassinucellate and campylotropous. The issue of this paper will now focus on the culmination of megasporogenesis – megaspore organization. The megasporocyte undergoes meiosis I to form a dyad. Generally the members of the dyad are separated by a transverse wall, however, at one instance it was observed

that the members of the dyad were separated by an oblique wall. However, it was the failure of Roy (1933) to report such an important dyad in *Dolichos lablab*. Such observations were also made by the author (1973) in *Cyamopsis psoralioides*. As far as the author is aware these are the only reports for the Papilionaceae. In some species the micropylar dyad member may undergo dissolution (*Vicia villosa* and *Pueraria lobata* – Rembert, 1969), while in others meiosis II proceeds in both members, which results in the formation of a megaspore tetrad, which is a general feature of the Papilionaceae. A generalized or hypothetical (ancestral) pattern may be postulated as consisting of four megaspores in linear arrangement. Any one of these megaspores has equal potential for maturing into a megagametophyte. From this ancestral pattern following conditions are considered to be derived: (a) loss of spore function, (b) change in division plan, (c) loss of cell wall, and (d) loss of nuclear division. As a result of the failure of the lower or chalazal member of the first meiotic dyad to undergo the second meiotic division while the upper or micropylar member undergoes the usual second meiotic division resulting in a linear arrangement of three cells. The chalazal dyad member functions. At another instance there is the failure of the chalazal member of the meiotic dyad to undergo the second meiotic division, while the micropylar member undergoes the usual second meiotic division where there is failure of cytokinesis. However, it was the failure of Roy (1933) to report such an important development in *Dolichos lablab*. Some embryologists speak of a row of three megaspores. This is incorrect, because only two cells of this row can be megaspores and the third must be dyad cell. This pattern of development has been noted