

A Review :

A fresh light on the embryology of *Phaseolus aconitifolius* Jacquin, obs.: further evidence of a criticism of P. Maheshwari (1950), Soueges and Crete's (1952), S.C. Maheshwari (1955), Johri (1963), Rembert (1967a - Ph.d. Thesis, 67b, 69, 71), Bhasin (1971) and Deshpande and Bhasin (1974)

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The embryology of the Papilionaceae is full of interest. In this family, so well characterized by the structure of its flower and fruit, the degree of homogeneity is apparently so great that the systematists hesitates in setting the limits of the various genera within the family. However, from the embryogenic point of view these genera can be as clearly distinguished as those of the Papaveraceae. The Papilionaceae has long been an object for embryological studies on account of considerable variation that exist in the mode of embryonal development so much so that even two different Megarchtypes may occur in the same species as is reported by Rau (1954) in *Desmodium laevigatum* (Hedysareae), Goursat (1969) in *Astragalus glycyphyllos* (Astragaleae) and *Baptisia australis* (Podalyrieae). However, Salgare (1973, 74a, 76d, e, 97c, 2006e) has observed three different Megarchtypes in *Phaseolus aconitifolius* (Phaseoleae), out of these three, the first two could be placed in Soueges' and Crete's (1952) embryogenic classification (category A₂ and C₂ of Soueges and Crete's, 1952; Salgare, 1973, 74a, 76d, e, 97c, 2006e), but the third could not be accommodated in their system and seems to be a type by itself (Salgare, 1973, 74a, 76d, e, 97c, 2006e). This proves that Soueges' and Crete's (1952) embryogenic system of classification is not perfect and needs its revision. It should be pointed out that Bhasin (1971) and Deshpande and Bhasin (1974) did not trace out such embryonic developments in *P. aconitifolius*. This proves their superficial and misleading observations.

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), Samal (1936), and Rembert (1969) consider a few cases of sub-hypodermal archesporial development in Papilionaceae, but all other cases appear to be doubtful, including report of Cooper (1938) and Paul and Datta (1950). In addition to the uni-cellular male archesporium, bi-cellular archesporium was also noted by Salgare (1974a, 75c, 76e) in *P. aconitifolius*. However, Bhasin (1971) and Deshpande and Bhasin (1974) were not aware of bi-cellular male archesporium again proves their superficial and misleading observations.

The megasporocyte undergoes meiosis I to form a dyad. Meiosis II proceeds in both members, which results in the formation of a megaspore tetrad which is a general feature of Papilionaceae. A generalized or hypothetical (ancestral) pattern may be postulated as consisting of four megaspores in linear arrangement. In *P. aconitifolius* a linear megaspore tetrad, in addition to T-shaped tetrads were also present (Salgare, 1974a, 75c). However, Bhasin (1971) and Deshpande and Bhasin (1974) were unaware of a linear tetrad of megaspore again proves their superficial and misleading observations.

Any one of these megaspores has equal potential for maturing into a megagametophyte. Depending on the number of megaspore nuclei taking part in the development, the megagametophytes of angiosperms has been classified into three main types: monosporic, bisporic