

A Criticism of Sareen and Wadhwa's (1981) paper entitled, 'Embryological studies in Papilionaceae, the genus *Alysicarpus* Neck'

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In *Alysicarpus vaginalis* the male archesporium is multi-cellular and hypodermal. The anther wall is four-layered and its development confirmed to the Dicotyledonous type. The tapetum is uni-nucleate, uni-seriate and secretory type. The endothecium forms fibrous thickenings at maturity. Simultaneous cytokinesis results in tetrahedral and isobilateral tetrads. Pollen grains are shed at bi-nucleate and bi-celled stage. Some pollen grains show the sign of germination before anthesis and had three-nuclei. However, Sareen and Wadhwa (1981) reported uni-cellular archesporium, Monocotyledonous type of anther wall development and decussate microspore tetrads. They also failed to report three-nucleate pollen and their germination *in situ*. The ovule is bitegmic, crassinucellate and campylotropous. The female archesporium which is uni- or bi-cellular is hypodermal in origin. A linear tetrad of megaspores is formed. The development of the megagametophyte is confirmed to the Polygonum type. Some abnormalities were observed during the development of the megagametophyte, indicating that the nuclear divisions in the megagametophyte are not always simultaneous resulting in three-, five- and six-nucleate megagametophytes. At one instance in the eight-nucleate an anomalous megagametophyte, polar nuclei were missing and two extra antipodals were found arranged in two series (3+2). However, Sareen and Wadhwa (1981) were not aware of any type of anomaly in the megagametophyte. Fertilization is porogamous. Though double fertilization is a rule occasionally single fertilization that is syngamy occurred without triple fusion. Very often the zygotic nucleus was found to divide prior to the primary endosperm nucleus. The endosperm development follows the nuclear type. Sareen and Wadhwa (1981) were unaware of such anomalies. In *Alysicarpus vaginalis* six different Megarchtypes ($A_1, A_2, B_1, B_2, C_1, C_2$) were noted. The embryo development follows the *Alysicarpus* variation of the Onagrad type of Johansen (1950) or First Period, Series A, Megarchtype IV of Soueges and Crete (1952). In fact Sareen and Wadhwa (1981) could not go beyond Onagrad type. The structure of the testa agrees in general with the Papilionaceous type of Corner (1951). Thus it is confirmed that the observations of Sareen and Wadhwa (1981) on the embryology of *Alysicarpus vaginalis* are superficial and misleading.

Key words : Embryology of angiosperms.

The embryogeny 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 systematist 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 exists 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* (Podalyriaceae). However, Salgare (1973e,74a,97c) has observed three different Megarchtypes in *Phaseolus aconitifolius* (Phaseoleae), out of these three, the first two could be placed in Soueges and Crete (1952) embryogenic classification, but the third could not be placed in their system and seems to be a

type by itself. In addition to the transverse division of the Oospore either vertical (Piperad type) or an obliquely transverse divisions were observed by Salgare (1975p) in *Sesbania aegyptiaca* (Galegeae). In *Alysicarpus vaginalis* (Hedysareae) six different Megarchtypes ($A_1, A_2, B_1, B_2, C_1, C_2$) were noted by Salgare (1986b). Two different Megarchtypes were noted by Salgare (unpublished) in *Phaseolus aureus* (Phaseoleae).

In *Alysicarpus vaginalis* the male archesporium is multi-cellular and hypodermal. The anther wall is four-layered and its development confirmed to the dicotyledonous type. The tapetum is uni-nucleate, uni-seriate and secretory type. The endothecium forms fibrous thickenings at maturity. Simultaneous cytokinesis results in tetrahedral and isobilateral tetrads. Pollen grains are shed at bi-nucleate and bi-celled stage (1975d,76d). Similar condition was also observed by Salgare in *Phaseolus aureus* (1970,73d,75f,86a), in *Phaseolus aconitifolius* (1974a,75q,76p,97d), in *Dumasia villosa* (1975aa), *Cyamopsis psoralioides* (1975as), in *Sesbania*