

Superposed multiple megagametophytes – Trisporic development in *Cyamopsis psoraloides* DC. – A record for the Angiosperms: Further evidence of a criticism of Maheshwari (1950), Johri (1963) and Rembert (1967a - Ph.D. Thesis, 67b, 69, 71)

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Battaglia (1955) considers the concept of the spore and emphasizes that the term should be limited to a cell produced by regular or irregular meiosis, originating in the sporophyte and giving rise to a gametophyte. Battaglia (1951) discusses the importance of the position of the megaspore nuclei in determining the final form of the megagametophyte. He states that “natural modification” in megasporogenesis determine the morphology of the gametophyte. This is an important point, and its implications should be realized. Megasporogenesis culminates with the production of megaspores.

Coulter (1908) was the first to make a clear distinction between divisions which formed megaspores, and divisions that produced nuclei of megagametophytes. This, as it turned out, was a very important distinction, and separates the meiotic divisions leading to megasporogenesis from the mitotic divisions leading to megagametogenesis.

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. 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 and tetrasporic (Maheshwari, 1950 and Johri, 1963). In the first only one of the four megaspores, in the second two megaspore nuclei, and in the third all the four megaspore nuclei take part in the development of the megagametophyte.

Rembert (1969) stated that “In no case is more than one megaspore known to function in this family-Papilionaceae”. However, findings of Jonsson (1879-1880) and Guignard (1881) make it very clear that Rembert’s (1967a, b, 69, 71) knowledge in the field is inadequate. Bisporic development in *Laburnum anagyroides*

(Rembert, 1966), in *Wisteria sinensis* (Rembert, 1967b) as well as in *Pueraria lobata* (Rembert, 1969) was also noted by Rembert (1967a, b, 69, 71) under such condition his this statement is contradicting. Present work as well as the past extensive work of the author (1973b, 74a, b, 75a, e, f, n, 97, 2000, 06) made very clear that the statement of Rembert (1969) is misleading.

Trisporic development of the megagametophyte is recorded for the first time by Salgare (1973b, 74a, b, 75a, e, f) which has no place in the present classification of the megagametophytes of Angiosperms (Johri, 1963; Maheshwari, 1950) which had escaped from the eyes of the embryologists. These are the first and the only reports (Salgare, 1973b, 74a, b, 75a, e, f, n, 97, 2000, 06). This is a weakness in the classification of the megagametophytes of Angiosperms and needs its revision. Trisporic development has no place in the megaspore tetrad patterns formulated by Rembert (1966, 67a, b, 69, 71). This proves that Rembert’s (1966, 67a, b, 69, 71) system is imperfect and needs its revision.

Cyamopsis psoraloides DC., is a member of the Papilionaceae. At one instance a linear tetrad of megaspores showed further development, where the chalazal three megaspores were found to be potential and developed further, however, the micropylar one lost its potentiality and degenerated, leaving behind its remnant, resulting into the superposed multiple megagametophytes. The upper megagametophyte is developed up to the five-nucleate stage. These five nuclei are situated in two tiers (2+3) of the sickle shaped structure. The middle megagametophyte developed seven nuclei, one of the nuclei is migrating to the chalazal end. The lowest or the chalazal megagametophyte developed three antipodal cells. These three antipodal cells are arranged in the form of an inverted pyramid. Since the well developed three antipodals are formed by the chalazal megagametophyte, it is every possibility that the middle megagametophyte may contribute to the secondary nucleus and the next to it, the uppermost megagametophyte may contribute to the formation of the egg apparatus. It should be pointed out

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