possessed an extra egg which is believed to be a transformed synergid[5]. In *Pennisetum dubium*, autonomous development of a mass of cells much resembling the embryo was noticed even when egg and polar nuclei are present. This embryo-like structure again indicated the possibility of synergid being the source[6].

In several instances of the suspected origin of embryo from synergid, the possibility of nucellar origin or cleavage of the zygotic embryo as causes are not ruled out. Thus, no conclusive evidence of synergid origin has been presented by the early workers. In most of the reports dealing with the origin of the embryo, the sac essentially possessed unfertilized polars and nearly total absence of endosperm.

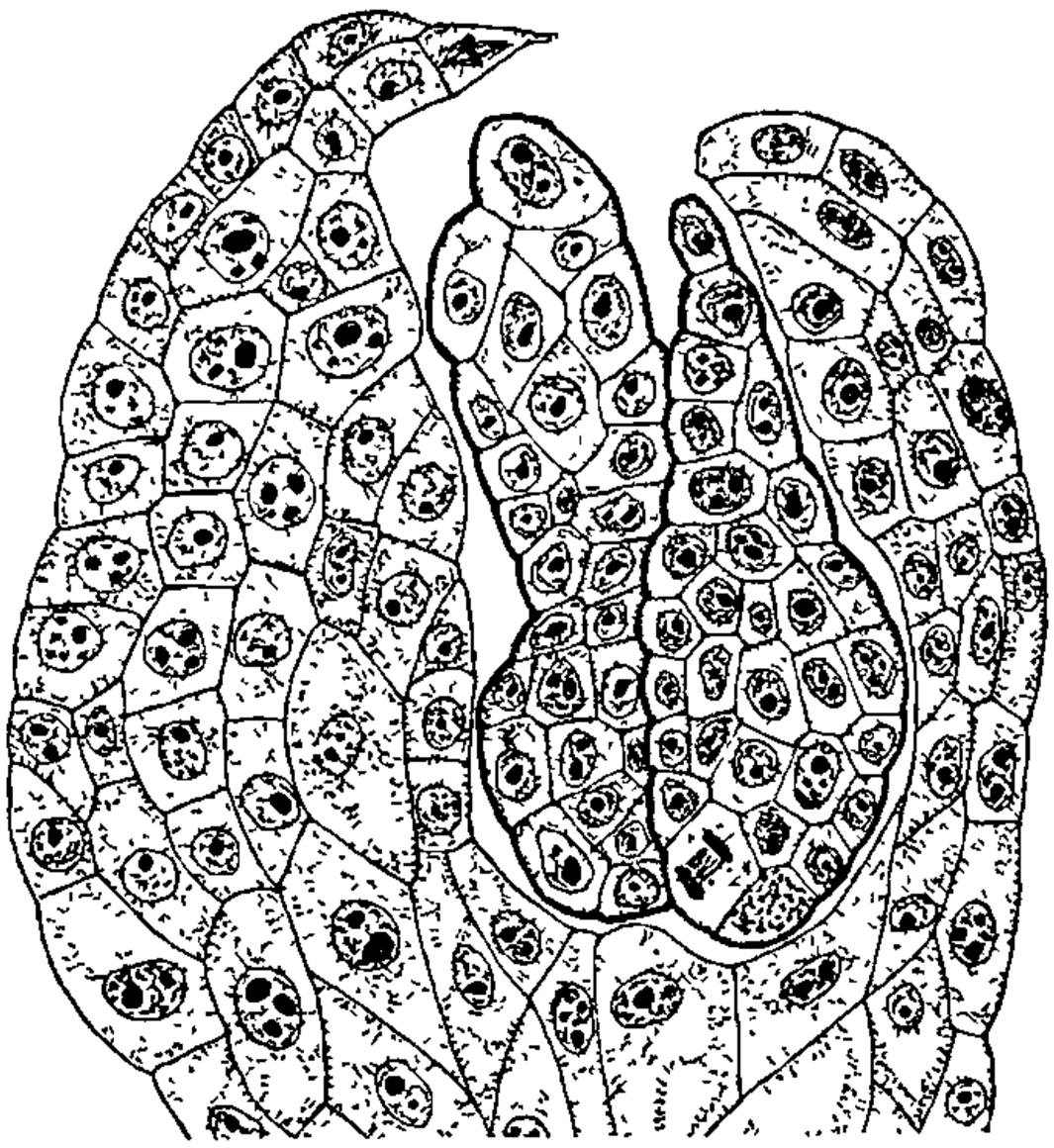

FIG. 1. Twin embryos embedded in cellular endosperm ; embryo towards left is of zygotic origin and the one towards right is of synergid origin, × 2,000.

The present investigation in *Pennisetum squamulatum* Fresen of Panicoideae offers a clear instance of synergid origin of an extra embryo within a single embryo sac. This is evident from the occurrence of twin embryos which are surrounded by copiously formed endosperm (Fig. 1). In this species, several ovules showed entry of more than one pollen tube into one and the same embryo sac. The gametes which are discharged by the pollen tubes near the vicinity of the egg apparatus in all probability fertilize both the egg and synergid as well as secondary nucleus. The synergid origin of the second embryo following fertilization is further confirmed by the nearly diploid number of chromosomes that were counted in the component cells. In addition, one of the embryos exhibits the typical multicellular squat suspensor, a characteristic feature of the sexual embryo in the Gramineae. The other embryo, however, is pear-shaped, reflecting the contour of the synergid itself ; in position too, it lies in the same locus of the synergid. These features suggest the origin of the second embryo from a 'fertilized' synergid.

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## A NEW BASIC NUMBER IN *CLITORIA* LINN.

THE genus *Clitoria* L. of family Leguminosae is widespread in tropics and subtropics and constitutes forty species, of which three are reported from India[1]. The members of the genus range in habit from large shruby climbers like *C. ternatea* L. to tiny annual herbs like *C. biflora* Dalz. Some species such as *C. ternatea*, *C. rubiginosa* Pers., *C. mariana* L. show great morphological variation and in *C. ternatea* such polymorphism is perhaps due to simple Mendelian inheritance[12].

So far, most of the workers have investigated clitorias for chromosome numbers only[2-6,8,11]. Detailed karyotypic and meiotic studies are completely lacking. Earlier chromosome number reports indicate eight as the basic number in the genus[2-8,11]. In the present communication we report a new basic number in the genus and also, detailed male meiosis in *C. biflora*. The methods followed have been detailed earlier[9].

The various associations at metaphase I, observed in 25 PMCs, were $7_{II}$ (Figs. 1, 3–5), $6_{II} + 2_{I}$ (Fig. 2), $5_{II} + 4_{I}$ in 9, 9 and 7 cells respectively. The range, of bivalents and univalents per cell was 5–7 and 0–4, the mean being 6·08 and 1·84 respectively. On average 3·48 were ring and 2·60 were rod bivalents, their range being 0–7 and 0–6 respectively. Number of chiasmata per cell ranged from 6–14. Mean number was 9·6, out of which on average 8·8 are terminalized giving terminalization coefficient of 0·91. Five bivalents were comparatively of larger size and two smaller (Figs. 1, 3–5). In comparison, *C. ternatea* ($2n = 16$) has four large and four small bivalents[9]. At metaphase I, small bivalents were seen to disjunct earlier than others (Figs. 3–5). Significantly, in one

FIGS. 1–8. Figs. 1–6. Metaphase I. Figs. 1, 3–5, $7_{II}$. 2, $6_{II} + 2_I$. Fig. 6, $6_{II} + 3_I$. Figs. 7–8, Anaphase I. Note early disjunction in small bivalents in 3–5 and a lagging bivalent in 8, × 820.

PMC we observed $6_{II} + 3_I$ (Fig. 6). In 10 out of 15 cells, analysed at anaphase I, the chromosome distribution was normal (7 : 7) while in 2 cells it was 8 : 6. In two cells either a bivalent (Fig. 8) or 2 univalents were found to be lagging behind and one cell was observed at early anaphase I, where only number could be counted (Fig. 7). Subsequent course of meiosis was normal resulting in reasonably good seed set.

From the above studies it is clear that the present material has $n = 7$. The $n = 8$ has been regarded as true basic number of the genus (unpublished), partly because this number is found in taxa that are not only morphologically distinct but are widely distributed in tropics and subtropics and further, two natural triploids ($n = 12$, $2n = 24$), reported so far, are built on this number[3,4].

During the perusal of earlier data numerous examples in plant kingdom, with experimental verifications, have been observed which clearly indicate that changes in basic diploid chromosome number is towards decreasing side rather than on increasing side and the decrease in basic number is generally associated with certain morphological specializations such as annual habit, zygomorphic flowers, etc.[10]. The asymmetrical karyotype derived from primitive symmetrical karyotype has been regarded as yet another parameter for diagnosing the taxa and asymmetry in karyotype is also generally accompanied by specialization in external morphology[10]. *C. biflora* is an annual herb and the flowers are zygomorphic. In comparison, other species like *C. ternatea*, where the basic number has been reported as eight, the flowers may be zygomorphic or actinomorphic[7] and they are perennial shrubs[1]. Thus it is clearly evident that the basic number of 7 is of recent origin and might have been derived from $x = 8$. The reduction in basic number is associated with specialization in external morphology such as annual habit and zygomorphic flowers. Sanjappa and Dasgupta[6] have reported $n = 8$, $2n = 16$ for the same species and if that is so, the comparison between the two could be interesting.

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