

### A Preliminary Note on the Development of the Female Gametophyte in *Costus speciosus* L.

IN a recent article Maheshwari<sup>1</sup> has reviewed the work on the embryology of angiosperms that has been done in India and suggested a re-investigation of certain genera including *Costus*. Previous investigation on this line on *Costus speciosus* L. was carried out by Humphrey<sup>2</sup> who suggested a "Lilium type" of embryo-sac development.

The results of our investigation show that an archesporial cell is developed in the hypodermal layer of the nucellus, it cuts off a parietal cell and then functions as the megaspore mother-cell. The megaspore mother-cell increases in size before division. In the stages of the heterotypic prophase the nucleus, in some preparations, is observed to lie at the lower end of the protoplast (Fig. 1). The heterotypic spindle, however,

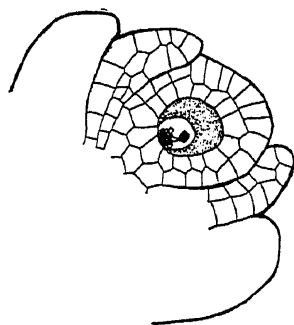


Fig. 1.  $\times 375$ .

is oriented centrally and is quite sharp. A cell plate is noted on the completion of the reduction division. The homotypic spindles are arranged somewhat obliquely and as a result four obliquely-oriented tetrad of macrospores is formed (Fig. 2). The chalazal

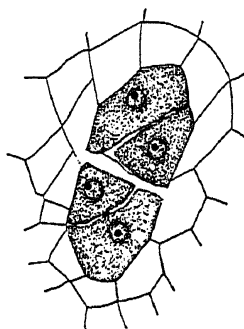


Fig. 2.  $\times 250$ .

macrospore alone functions while the rest degenerate. The mature embryo-sac is eight-nucleate and is of the normal angiospermic type. The antipodals later degenerate.

The development of the embryo and the endosperm is being worked out and some interesting stages in the development of the

endosperm have been obtained. A detailed account of the complete investigation will be published elsewhere in due course.

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<sup>1</sup> Maheshwari, P., *Curr. Sci.*, 1935, **3**, 599-605.

<sup>2</sup> Humphrey, J. E., *Ann. Bot.*, 1896, **32**, 1-40.

### On an Abnormal Flower of *Convolvulus pluricaulis* Chois.

ONE of the flowers of *Convolvulus pluricaulis* Chois. (= *Evolvulus pilosus* Roxb.)<sup>1</sup> examined during a practical class showed an apparently fertile anther attached to one of the two stigmatic branches of the style (Fig. 1).



Fig. 1.  $\times 4$ .

The anther is practically sessile and of the same shape and size as the other anthers of the flower. Though it had dehisced like the others, there were just two pollen grains inside and these were exactly like the normal pollen grains; the anther was obviously fertile. Serial sections of the specimen showed no suggestive differences in the internal structures of the two stigmatic branches.

Parts of the pistil being substituted by or transformed into anthers are on record and described under "Staminody of the Pistil".<sup>2</sup> Anthers surmounting the pistil have also been noted in a few plants.<sup>3</sup> Worsdell<sup>4</sup> records the case of an abnormal flower of *Linaria vulgaris* where, in addition to other

abnormalities, imperfect anthers were borne on the style. Baillon's<sup>5</sup> description of "stigmas of *Ricinus communis* as having been in one instance antheriferous" furnishes another close parallel. All the above cases are supposed to be examples of Metamorphosis. On the other hand, adhesion of carpelloid or even untransformed stamens to pistils is quite common and is described under the category of Adnation.<sup>6</sup>

I am inclined to consider the specimen under consideration as an example of the latter category. So far as I know this abnormality has not been recorded in the family Convolvulaceæ.

My best thanks are due to Mr. O. N. Tyagi of the First Year B.Sc. Class who drew my attention to this exceptional flower.

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<sup>1</sup> Hooker, *Flora of British India*, 1885, Vol. iv, 218; Duthie, *Flora of the Upper Gangetic Plain*, 1911, Vol. ii, 105.

<sup>2</sup> Masters, *Vegetable Teratology*, 1869, 299.

<sup>3</sup> Masters, *loc. cit.*, 300.

<sup>4</sup> Worsdell, *The Principles of Plant Teratology*, 1916, Vol. ii, 206.

<sup>5</sup> Masters, *loc. cit.*, 300; Penzig, *Pflanzen-Teratologie*, 1922, Vol. iii, 209.

<sup>6</sup> Masters, *loc. cit.*, 35; Worsdell, *loc. cit.*, 236, 37.

#### The Kaldurga Conglomerates and the Iron Ore Series of the Bababudans, Kadur District, Mysore.\*

REFERRING to the recent papers on the Bababudan rocks published by Mr. C. S. Pichamuthu,<sup>1</sup> I should like to offer a few remarks regarding the Kaldurga conglomerates and the Iron ore series of rocks.

The Kaldurga conglomerates were originally considered to be sediments by Bruce Foote,<sup>2</sup> Wetherell<sup>3</sup> and Smeeth,<sup>4</sup> but as a result of later examination Slater<sup>5</sup> and Smeeth<sup>6</sup> doubted the sedimentary origin. Subsequently, Sampat Iyengar<sup>7</sup> mapped the region in great detail and came to the conclusion that they were of autoclastic origin. Whether these rocks can finally be proved to be sediments or not, is difficult to say at present, but a critical examination of some of the arguments put forward by Pichamuthu shows that more than one opinion is still possible on the subject, and the evidences he has adduced are not sufficiently strong

and convincing to accept a sedimentary origin for all these formations.

Many of the features such as the shape and rounding of the pebbles, sharp boundary between pebble and matrix, varied assemblage of pebbles, the difference between pebble and matrix and alternation of pebbly and non-pebbly bands, etc., are not entirely wanting in conglomerates which could be shown to be of autoclastic origin. Pichamuthu's argument<sup>8</sup> that the granite pebbles do not contain orthoclase or microcline (implying thereby that the intrusive Tarikere granite is not represented as pebbles in the conglomerates) appears to be based on insufficient examination. Sampat Iyengar laid much emphasis<sup>9</sup> on the similarity between the granite of the conglomerate and the Tarikere gneissic granite. A re-examination of the material collected by him bears out his conclusions. In the granite pebbles collected by him from the temple boulder<sup>10</sup> ( $Z_4/869$ , 866, etc) both orthoclase and microcline are found, though only to a limited extent. When the granite is subjected to crushing and shearing, it is only natural to expect an alteration of the feldspars, the albite remaining over as the more stable under metamorphic conditions whereas orthoclase would get converted into sericite and muscovite. Sericite is no doubt found largely in the granitic pebbles and they might have been formed from the alteration of the potash feldspars.

B. Rama Rao, in the course of his detailed examination of the Shimoga Belt during the last field season, has obtained many distinct evidences of ripple marks, current bedding, rain prints and other undoubted indications of sedimentation in the quartzites and some of the conglomerates of that region. It may be probable that even the Kaldurga conglomerate has had a sedimentary origin, but the evidences adduced by Pichamuthu are not strong enough to warrant such an assumption. Moreover, the evidences for shear and crushing are clearly indicated and it remains yet to be proved if this has taken place in a pure sedimentary conglomerate, or in a complex of igneous rocks, or even in a mixed series of igneous rocks and sediments. The evidences now available, however, do not justify a hasty conclusion and the inference that the Tarikere granite has played no part in the formation of the "Granite Pebbles" of the Kaldurga conglomerates is unwarranted. The question of the precise mode of origin of these rocks

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