SUMMARY

Cytological studies are made in 18 species of the genus *Euphorbia*, of which chromosome counts for five taxa are reported for the first time. The chromosome numbers in four other species of this genus are found to be at variance with the earlier reports. Of the 18 investigated species, 12 were found to be at different levels of poly­ploidy while 6 are at the diploid level. The chromosome number varies from \( n=8 \) (\( E. \) dracunculoides and \( E. \) maddenii) to \( n=60 \) (\( E. \) royleana). An aneuploid race is found in \( E. \) heterophylla.

Abnormal meiotic behaviour (multivalents and univalents at diakinesis, laggards at A-I, sterility of pollen grains and formation of micropollen) is recorded in two morphotypes of \( E. \) neriifolia collected from Chandigarh and Ahmedabad. Rarely, in the Chandigarh population, 90 bivalents were observed in an occasional spore mother cell at M-I. It is suggested that this taxon has probably arisen through hybridisation between \( E. \) royleana \( (n=60) \) and \( E. \) nivulia \( (n=30) \).
On the basis of available data $x=10$ is suggested as the primary base number for the genus. It has been observed that sections Anisophyllum and Tithymallus are greatly diversified in regard to the basic chromosome number while the section Euphorbium seems to be uniform in this respect.

The role of polyploidy and aneuploidy in the speciation and evolution of the genus has been stressed.

Of the seven species studied embryologically, four (*E. maddeni*, *E. neriifolia*, *E. nivulia* and *E. royleana*) are worked out for the first time while additional embryological information is provided for the other three species.

Anther wall formation is of the Dicotyledonous type in *E. dracunculoides* and *E. maddeni*, while in the rest of the presently investigated species it is of the Basic type which is considered to be the ancestral type in angiosperms.

Tapetal cells initially are uninucleate but later become binucleate. Tapetum is of the secretory type. Simultaneous cytokinesis results in tetrads with tetrahedral and decussate arrangement. Trinucleate pollen grains have been found in *E. dracunculoides* and *E. maddeni* while in the other four species, *E. geniculata*, *E. heterophylla*, *E. nivulia* and *E. royleana*, the pollen grains are shed at 2-nucleate stage. In *E. neriifolia*, the pollen grains remain uninucleate and exhibit a large percentage of sterility.
Ovules are uniformly anatropous, bitegmic and crassinucellate with a well developed placental obturator. Hypostase becomes more prominent after fertilization. Nucellus forms a beak at the micropylar end which in most cases projects into the micropyle almost at the level of inner integument, while in E. nivulia the nucellar beak is relatively more elongated. Micropyle forms a zigzag path in E. dracunculoides and E. maddeni whereas it is straight in the rest of the species. A prominent caruncle is observed in E. dracunculoides and E. maddeni.

Embryo sac is uniformly of the monosporic Polygonum type. Enucleate cytoplasmic vesicles are observed in E. dracunculoides. In E. maddeni the aggregation of endosperm nuclei is more conspicuous towards the chalazal end of the embryo sac. Endosperm is of the Nuclear type but the tissue later becomes cellular throughout. Phylogenetic significance of the Nuclear endosperm is highly debated. Embryogeny conforms to the Crucifer type. Seeds are albuminous.

It is suggested that the genus Euphorbia be not segregated into different genera, the characteristic type of inflorescence strongly binds the various taxa together. It, however, illustrates beautifully the tendencies to diversification which is the hallmark of evolution in an otherwise stable basic genomic constitution.