Figs. 1–19. Figs. 1–5 and 8 to 17. Leaf epidermal peelings. Fig. 1. Lateral contiguous stomata with radiating cuticular striations from the convex side of the guard cells. Fig. 2. Stomata with radiating cuticular striations on all sides. Note one of the guard cells is degenerating. Fig. 3. Anomocytic stoma surrounded by 4 epidermal cells. Fig. 4. Stoma surrounded by 3 epidermal cells. Fig. 5. Stoma surrounded by 7 epidermal cells. Figs. 6 and 7. Leaf stoma in T.S. and L.S. respectively. Observe cuticular striae as papillae. Figs. 8 and 9. Cytoplasmic connections between adjacent stomata. (In Fig. 9, one stoma has unequal guard cells.) Figs. 10–13. Degenerating stomata. Fig. 10. One guard cell has completely degenerated leaving the aperture. Fig. 11. Stoma where both the guard cells have degenerated and the pore is occluded. Fig. 12. Stoma, where both the guard cells degenerated leaving the pore. Fig. 13. Completely degenerated stoma with reduced pore. Fig. 14. Stoma with a single guard cell without pore. Fig. 15. Stoma with a single guard cell and pore. Fig. 16. Polar contiguous stomata. Fig. 17. Stoma with a single crescent-shaped guard cell bordering the pore. Fig. 18 Stem epidermal peeling showing disintegrating stoma with single crescent-shaped guard cell, giving a stellate appearance. Note the cuticular projections as dots. Fig. 19. T.S. of stem epidermis through the stoma. Figs. 3, 5 and 8 depict stomatal polymorphism.

(4) Cytoplasmic strands connecting the guard cells of adjacent stomata (Figs. 8 and 9); (5) Stomata with unequal guard cells (Fig. 9); (6) Degenerating stomata with complete or partial degeneration of guard cells (Figs. 10 and 2 respectively) and with complete degeneration of both guard cells leaving behind either an occluded pore (Fig. 11) or mere pore (Figs. 12 and 13); and (7) Stomata with a single crescent-shaped guard cell with pore (Fig. 17) or without pore (Fig. 14) or with a single disintegrating crescent-shaped guard cell (Fig. 18) giving a stellate appearance.

Though the occurrence of several abnormal stomata has been reviewed recently in several families of angiosperms, such occurrence is reported for the first time in the family Vitaceae. Pear glands known to occur in several members of Vitaceae, including Cissus, have also been observed on vigorously growing young stems, leaves and tendrils.

One of the authors (V.G.) thanks U.G.C. of India for financial assistance under the Faculty Improvement Programme and the Government of Tamil Nadu for deputation.

May 14, 1981.


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**THE DEVELOPMENT OF ENDOSPERM IN *PRIVA CORDIFOLIA* (LINN. F.) DUCRE**

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LITERATURE reveals that the information on the endosperm of Verbenaceae is inadequate to permit a generalized picture. Interpretations of ontogeny and structure of the endosperm and the organization of the haustoria in various members of the family vary with the authors. The present study deals with the development, structure and behaviour of the endosperm haustoria in *Priva cordifolia* (Linn. f.) DUCRE.

Following fertilization, the embryo sac elongates and the starch grains begin accumulating at the micropylar region of the ovule. The primary endosperm nucleus, situated in the centre of the embryo sac, divides prior to the zygote (Fig. 1), followed by cytokinesis,
separating the sac into one or less two equal chambers. The micropylar endosperm chamber, after elongation, again divides transversely resulting in a linear row of three endosperm cells with a central one, longer than the other two (Fig. 2).

The chalazal endosperm chamber becomes densely cytoplasmic even at an early stage. The nucleus undergoes free nuclear divisions resulting in 4-6 free nuclei (Fig. 3). A multinucleate chalazal haustorium at such an early stage in the ontogeny of the endosperm has not been reported earlier in Verbenaceae. The cell enlarges in size, develops several small vacuoles and attains pear-shape (Fig. 4). Gradually, the shape of the haustorium changes with the chalazal and protruding into a tubular structure, the tip of which becomes narrow and branched (Fig. 5) and pierces into the chalazal nucellar tissue (Fig. 6). The protoplast gets accumulated at the broad end and the vacuoles increase in size, while the chalazal tubular part of the haustorium remains distinct. It can be assumed that the large number of granules in the protoplast play an important role in physiology. Although the endosperm proper that becomes cellular presents a uniform appearance, its behaviour close to the chalazal endosperm haustorium is different. The cells close to the haustorium are smaller in size, densely cytoplasmic and abuts on the chalazal haustorium like a cap (Figs. 4, 6). At maturity of seed the chalazal endosperm haustorium becomes inactive and gradually degenerates.

The micropylar haustorium is organized from the micropylar cell of the 3-celled endosperm. The cell elongates, divides vertically twice to form a group of four cells presenting a general spherical appearance with the tips of which pierce through the micropyle (Figs. 7, 8). The cells of the endosperm proper near the micropylar haustorium are arranged compactly in tiers.

The endosperm proper is formed from the central cell of the 3-celled endosperm. The cell elongates considerably, divides transversely 3 or 4 times followed by longitudinal divisions. The 2-celled proembryo is pushed deep into the sac and occupies a position in the middle of the cellular endosperm. After the degeneration of the micropylar endosperm haustorium, tiers of cells of the endosperm proper, close to the haustorium, become deeply stained and function as successive tiers of secondary haustoria.

At maturity of seed, when the dicotyledonous embryo is fully developed, the embryo sac is completely depleted of the endosperm.

One of the authors (K. T.) is grateful to the University Grants Commission, New Delhi, for the financial assistance under the Faculty Improvement Programme.

May 14, 1981

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