VII

Illustrations
Fig. 1. Umbel showing flowers and fruits of different developmental stages. x 2

2 Flower bud, view from the top showing the exposed stylopodium. x 30

3. Flower. Note the prominent stylopodium. x 30

4, 5. Ovary from flower bud and flower, respectively. Arrow indicates the position of attachment of other floral parts. x 30

6, 7. Fruits at different developmental stages. 6 x 15; 7 x 12

(O - Ovary; P - Petal; S - Stylopodium).
Fig. 8. Nearly mature fruit. x 10

9. Mature fruit. x 10

10. Adnation of fruits. Note the separate styles of the united fruit. x 12


11. Apical part of the mature fruit. Note the distinct ridges and furrows. x 23

12. Stylopodial region showing the persisting style and stigma. x 60

13. Stylopodial base enlarged to show the cuticularization. x 150

(F - Furrow; R - Ridge; S - Stylopodium; ST - Stigma)
Fig. 14. Schematic representation of a fruit transection.

(C - Carpophore; DZ - 'Dehiscence Zone';
EN - Endocarp; EP - Epicarp; HY - Hylum;
ME - Mesocarp; P - Pericarp; SE - Seed;
V - Vitta; VB - Vascular Bundle).
Fig. 15-20. SE Micrographs.

15. C.S. fruit. x 21

16. C.S. single mericarp. x 396

17. Outer surface of fruit showing the reticulate pattern of the cells. x 420

18. C.S. of a mericarp to show the embryos. x 83

19, 20. C.S. carpophoral region of the fruit. Note the free carpophore in figure 20. 19 x 104; 20 x 83

21. C.S. bilocular ovary showing the placenta. x 128.

(C - Carpophore; E - Emryo; SE - Seed; V - Vitta; VB - Vascular bundle).
Fig. 22-28. Transections.

22. Ovary. Note the zone of thin walled cells at arrows. x 128

23. A trilocular ovary. x 116

24. Ovary wall. Note the developing seed inside the seed chamber. x 174

25-27. Part of the ovary wall. Abundance of total carbohydrates is evident in the epidermis (Fig. 25, circles). The vascular bundles are in their developmental stages. Note the size difference in the vitta in figure 27. Arrow indicates anticlinal division of the epithelial cell. 25 x 464; 26 x 267; 27 x 377

28. Part of the ovary wall to show the anticlinal and periclinal divisions of the sub epidermal layers. x 650

29. L.S. ovary wall. Note the presence of starch grains. Arrows points to the divisions of the mesodermal cells surrounding the vitta. x 600

Fig. 30. C.S. part of ovary wall to show the developing vascular bundle and the vitta. Starch grains are dispersed in the mesodermal cells. x 877

31-33. Longisections.

31. Part of the ovary wall from the basal portion showing the supply of vascular strands. x 261

32. Showing the development of a vitta. Note the absence of starch grains and PAS positive bodies in the epithelial initials. Arrows indicates the schizogenous development of the cavity of the vitta. x 395

33. Entire ovary. Note the vitta. x 116

34-37. Transections.

34. Developing seed. x 290

35. 'Dehiscence zone'. Note the smaller size of the cells. x 650

36. Basal part of the ovary from bud. Note the unequal development of the locules. x 130

37. Apical part of the ovary from flower. Note the closing of the seed chamber and the stomata at arrows. x 133

(DZ - 'Dehiscence zone'; EI - Epithelial initials; SC - Seed chamber; V - Vitta; VB - Vascular bundle; VS - Vascular strand).
Fig. 33-43. Transections.

38, 39. Apical portions of ovary from flower. Note the stoma at arrow in figure 38. 38 x 511; 39 x 128

40. Pericarp from developing fruit. Anticlinal divisions at arrows. Note that the vitta is circular in section. x 290

41. Portion of mericarp of developing fruit showing a vascular bundle. Note the nuclei in the epicarpic cells. x 464

42. Structural details of pericarp. Arrows indicates anticlinal divisions of epicarpic cells. x 167

43. Structural design of the entire fruit. Note the presence of starch grains and the bigger size of the mesocarpic cells towards the commissural region. Arrows indicates the peripheral distribution of the daughter nuclei of the primary endosperm nucleus. x 93

(C - Carpophore; DZ - 'Dehiscing zone'; EP - Epicarp; H - Hypodermis; ME - Mesocarp; SC - Seed chamber; SE - Seed; V - Vitta; VB - Vascular bundle).
Fig. 44-48. Transections.

44. Pericarp from the lateral side of the mericarp. Note the thick cuticularization on the outer tangential walls of the epicarp and the presence of stoma (arrow). x 353

45. Mature mericarp with vacuolated thick cuticularized epicarp and periclinally divided hypodermis. Note the highly lignified endocarpic cells. x 290

46. Portion of the pericarp to show the periclinal divisions of the epicarpic and hypodermal cell (circles). x 371

47. Portion to show the highly vacuolated cells of the pericarp. x 371

48. Pericarp from the lateral side to show prominent cuticularization of the exocarp. Note the presence of collenchymatous tissue and the lignified parenchyma adjacent to the vascular bundle. x 696

49. Peeling of the outer epidermis to show the angular shape of the cells. x 217

50. C.S. pericarp from the furrow region. Note that the mesocarpic cells surrounding the vitta are of smaller size. x 427

51. C.S. pericarp from the ridge region. The endocarp is single layered. x 334

(CC - Collenchymatous cells; EN - Endocarp; EP - Epicarp; H - Hypodermis; LP - Lignified parenchyma; ME - Mesocarp; TE - Testa; V - Vitta; VB - Vascular bundle).
Fig. 52-57. Transections.

52. Pericarp towards the dorsal ridge. Note the thin tubular endocarp. x 534

53. Pericarp towards the lateral ridge. Note the sharp cornered, big endocarpic cells. Arrow indicates anticlinal divisions. x 534

54. Portion of mature pericarp to show the vascular bundle and the adjacent tissue. Note the lignified parenchyma and the collenchyma. x 438

55. Pericarp stained with PAS to show the distribution of starch grains. Note the size difference in the starch grains in the mesocarpic layers. x 240

56, 57. Developing vascular bundles. Note the differentiation of protoxylem at arrow in figure 57. 56 x 745; 57 x 1040

58. L.S. vascular supply and the adjacent tissue. x 395

59. Basal part of the cleared fruit showing the bifurcation of the vascular bundles. x 45

60. C.S. basal part of fruit. x 100

(CC - Collenchymatous cells; EN - Endocarp; LP - Lignified parenchyma; ME - Mesocarp; P - Phloem; SE - Seed; TE- Testa; V - Vitta; VB - Vascular bundle; X - Xylem).
Fig. 61. Schematic diagram of a fruit showing the vasculature.

(CB – Carpophoral bundle; DB – Dorsal bundle; VB – Ventral bundle).
Fig. 62. Apical part of a cleared fruit showing the union of the vascular bundles towards the stylopodium. x 70

63. C.S. of style to show a single united bundle at the centre. x 122

64. C.S. of a vitta from a developing fruit. Note the nucleus in the epithelial cells. x 391

65. C.S. of an additional vitta in the mesocarp. x 390

66. Cleared peeling of the pericarp showing the union of two vittae. x 49

67. C.S. of two closely associated vittae. Note the presence of starch grains in the mesocarpic cells surrounding the epithelium. x 390

(EC - Epithelial cell; ME - Mesocarp; V - Vitta; VB - Vascular bundle; VS - Vascular supply).