

## List of Plates

(Note: Plates are attached at the end of each chapter)

Title	Page number
<b>Chapter 4</b>	
Plate 4.1: Lithologs of sections studied in the Mahi (first page) and Sabaramati (second page) basins.	54,55
Plate 4.2: Internally stratified silty sand block lining the base of the conglomerate sheet at Rayka (Mahi basin). Scale is 1 m long. Note the vertical orientation of the stratification.	56
Plate 4.3: Irregular clast morphology of calcretes at Rayka (Mahi basin). Camera lens cap is 5.5 cm in diameter.	56
Plate 4.4: Juxtaposition of $Gt_b$ facies over the underlying $Gt_d$ facies. $Gt_b$ foreset beds are only several grain thicks while $Gt_d$ foreset beds are much thicker. Diameter of the lens cap is 5.5 cm. Location = Rayka, Mahi basin.	57
Plate 4.5: Gravel troughs of 3D dune origin. Location = Rayka, Mahi basin.	57
Plate 4.6: Planar cross-stratified gravel facies at Poicha, Mahi basin. Scale is 1 m long.	58
Plate 4.7: Horizontally stratified silty sands associated with the conglomerate facies. Unit in the foreground is 2 m thick. (Location = Rayka, Mahi basin).	58
Plate 4.8: Sh facies of sheetflood origin. Note the continuous extent of horizontal parallel stratification in the sediments above the author. (Height of the author is 1.56 m). Location is Hirpura, Sabarmati basin.	59
Plate 4.9: Sim facies (massive silts) seen capping deposits of sheetflood origin (Sh facies) at the top of the section. Thickness of red horizon at the left end of the photograph is 3 m (Location = Dabka, Mahi basin).	59
Plate 4.10: Massive silts (Sim) forming characteristic vertical bluffs due to absence of internal stratification at Mahudi, Sabarmati basin. Bluff of the right is 7 m thick.	60
<b>Chapter 5</b>	
Plate 5.1: Lithologs of sections studied in the Mahi (first page) and Sabaramati (second page) basins showing calcrete types and its distribution.	113,116
Plate 5.2: Pseudo-anticlines developed in vertisol at Rayka (Mahi basin) due to the intersection of oppositely directed curvi-planes. Scale is 0.5 m.	117
Plate 5.3: Close-up view of pedogenic slickensides formed along the surface of a parallelepiped in a vertisol. Location = Mahudi, Sabarmati basin. Diameter of coin is 2.5 cm.	117

Plate 5.4: Vertisol at Rayka, Mahi basin, showing development of peds, carbonate impregnated fissures and large calcrete nodules disseminated throughout the profile. Length of marker is 8 cm.	118
Plate 5.5: Red-bed at Dabka (Mahi basin) seen nearly bisecting the section. Thickness of red-bed is 3.5 m.	118
Plate 5.6: Red-bed of pedogenic origin at Hirpura (Sabarmati basin). Note the loss in reddening towards the base which is associated with a concomitant loss in clay content also. Length of hammer is 32 cm.	119
Plate 5.7: Cross-stratification within the red-bed suggesting the derived nature of the rubified sediment. Length of hammer is 32 cm. Location = Waghpur, Sabarmati basin.	120
Plate 5.8: Section of vertisol nodules showing a 'ped' nucleus of varying dimensions with respect to the outer carbonate shell. Diameter of coin is 2.3 cm.	120
Plate 5.9: Decimetre size disorthic calcrete nodules in the vertisol at Rayka, Mahi basin. Diameter of the lens cap is 5.5 cm.	121
Plate 5.10: Disorthic calcrete nodules associated with a pedogenic red-bed forming a broad band about 0.5 m thick. Scale is 0.5 m. Location = Dabka, Mahi basin.	121
Plate 5.11: Polished section of vertic calcrete nodule from the basal vertisol at Mahudi, Sabarmati basin. Note the intense network of spar filled veins seen traversing the nodule. Diameter of coin is 2.3 cm.	122
Plate 5.12: Groundwater calcrete sheets seen following stratification planes of a channel-fill sand body at Rayka, Mahi basin. Height of figure is 1.55 cm.	122
Plate 5.13: Discontinuous groundwater calcretes seen developed along stratification planes within Sh facies. Diameter of lens cap is 5.5 cm. (Location = Rayka, Mahi basin).	123
Plate 5.14: Field photograph of cauliflower calcretes. Note the density of calcretes within the host sediment and the size. Length of the hammer is 32 cm.	123
Plate 5.15: Polished section of a cauliflower calcrete showing clay and spar filled shrinkage planes traversing the micritic nodule. Diameter of coin is cm. (Location = Mahudi, Sabarmati basin).	124
Plate 5.16: Rhizoliths from vertic soils from Rayka, Mahi basin. Scale is in centimetres.	124
Plate 5.17: Rhizogenic calcretes from pedogenic red-bed at Dabka, Mahi basin. Note that in comparison to the rhizoliths from vertic soils these are smaller in dimensions and are 'agglutinated'. Scale is in centimetres.	125
Plate 5.18: Photomicrograph of clotted micrite. Sample is of a vertic pedogenic calcrete (Mahudi, Sabarmati basin). Bar = 50 $\mu$ m.	125

- Plate 5.19: Photomicrograph of radial grain coat of needle calcite on quartz clasts floating in a micritic groundmass. Sample is of cauliflower calcrete from Mahudi, Sabarmati basin. Bar = 50  $\mu\text{m}$ . 126
- Plate 5.20: Sparitic growth from the pore-wall towards the quartz grain mimicking grain coat fabrics. Note the increase in calcite crystal size towards the grain. Sample is of cauliflower calcrete, Mahudi, Sabarmati basin. Bar = 50  $\mu\text{m}$ . 126
- Plate 5.21: Photomicrograph of calcite veins traversing the micritic groundmass. These veins might probably be relicts of root channels that were later infilled by microspar. Bar = 50  $\mu\text{m}$ . Sample is of vertic calcrete, Mahudi, Sabarmati basin. 127
- Plate 5.22: Corroded margin of quartz clast due to initial dissolution during the interaction of meteoric waters with the grain. Note the outwardly directed 'c' shaped pits. Bar = 50  $\mu\text{m}$ . Sample is of cauliflower calcrete, Mahudi, Sabarmati basin. 127
- Plate 5.23: Exploding microcline grain due to the displacive growth of calcite. Crossed nicols, bar = 50  $\mu\text{m}$ . Sample is of cauliflower calcrete, Mahudi, Sabarmati basin. 128
- Plate 5.24: Pedogenesis of groundwater calcretes showing relicts preserved within a soil profile, before complete redistribution of the carbonate. Length of hammer is 28 cm. Location = Rayka, Mahi basin. 128
- Plate 5.25: Close-up of disruption of groundwater calcrete sheets during pedogenesis leading to the development of smaller nodules. Upper part of the scale is in millimetres. Location = Rayka, Mahi basin. 129