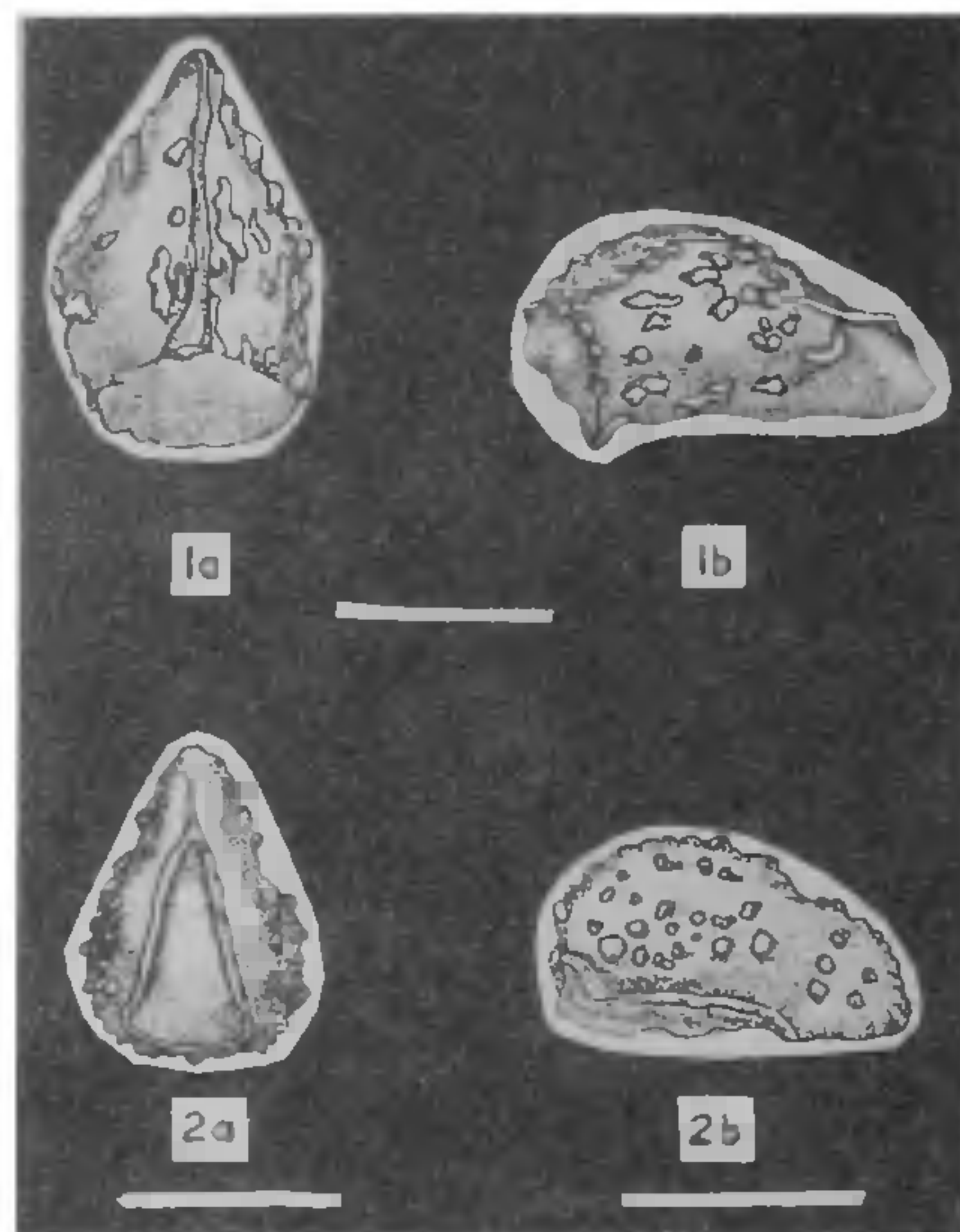


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**Figures 1, 2.** 1. Boraginaceae (Angiosperm) seed, Lameta Beds (Upper Cretaceous- ? Palaeocene), Balasinor, Kheda district, Gujarat; 1a. ventral view, 1b. lateral view of another seed. 2. *Boraginocarpus lakhanpalii* Mathur, Neogene, Chandigarh; 2a. ventral view, 2b. lateral view (scale represent 1 mm)

## BORAGINACEAE (ANGIOSPERM) SEEDS AND THEIR BEARING ON THE AGE OF LAMETA BEDS OF GUJARAT

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THE Lameta beds of Balasinor area, Kheda district, Gujarat have recently acquired great importance because of the finds of dinosaur eggs in them<sup>1, 2</sup>. During the course of search for microfossils in the limestone and marl of the dinosaur eggs-bearing locality, the authors recovered angiospermic seeds belonging to the family Boraginaceae (figures 1a, b). So far there is no record of such seeds from either the Lameta beds or from any of the other Cretaceous-Lower Tertiary sediments of India. However, from the Neogene sediments of Siwalik hills near Chandigarh, the Boraginaceae seeds have been described<sup>3</sup> (figures 2a,

b). They have also been well documented from tropical American Neogene<sup>4-9</sup>. The oldest fossil Boraginaceae seeds are known from Palaeocene of England<sup>10</sup>.

The angiospermic seeds from Kheda (figures 1a, b) are small, 1.5 to 2.5 mm long, ovoid trigonal in shape, having basal, semi-circular scar of attachment. A well developed keel is present all along the ventral margin. The nutlets are inflated posteriorly and narrow apically. The surface is rough with irregular ridges and prickles.

The above seeds are primitive in characters as compared with the Neogene seeds from Chandigarh (*Boraginocarpus lakhanpalii* Mathur) with which they show resemblance in overall shape and rough prickled surface (figures 1, 2). However, the basal, semi-circular scar of attachment and a well-developed keel all along the ventral margin (figure 1a) are very distinctive in the Kheda specimens. Among the present-day Boraginaceae, the nutlets of *Anchusa officinalis* Linnaeus bear a similar semi-circular scar of attach-

ment but the Kheda specimens differ in other characters.

The Lameta sediments are generally assigned Turonian-Maestrichtian age on the basis of dinosaur remains<sup>11-13</sup>. Since the family Boraginaceae, to which the seeds described here belong, ranges from Palaeocene to Recent, the age of Lameta sediments of Kheda is inferred to be as young as Palaeocene. In view of the fact that the dinosaur eggs are now known elsewhere from Palaeocene sediments<sup>14</sup> as well, the Palaeocene age of dinosaur egg-bearing Lameta sediments of Kheda inferred here, is not an incongruity. However, the possibility of bringing down the lower age limit of the family Boraginaceae to Upper Cretaceous cannot also be ruled out completely because angiosperms had become a dominant part of the flora well before the dawn of Tertiary in the late Cretaceous. In either case, whether the age of Lameta sediments is extended to Palaeocene or the range of the family Boraginaceae is brought down to Upper Cretaceous, the new find assumes considerable significance.

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## MIOCENE CROCODILIAN (TOMISTOMIDAE) FOSSIL FROM SOUTHWESTERN KUTCH, GUJARAT

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A WELL-PRESERVED upper jaw of a crocodile with tomistomidian affinities was collected from the lower part of Vinjhan Shale<sup>1,2</sup>—Lower Miocene sequence of Kutch. This communication briefly describes this fossil.

The fossil locality (figure 1) is about one km southwest of village Sukhpar (23° 22' 25" : 68° 44' 55") in Abdasa Taluka of Kutch district, Gujarat. The jaw bones were collected from a road section, on Naliya-Narayansarover road, about 20 km northwest of Naliya.

The fossil jaw was found entombed in 30 cm thick fossiliferous greyish clays associated with gypsiferous olive green shales. The other fossils found in these beds are mainly *Turritella*, *Certhium* and a variety of lamellibranchs.

The specimen forms a part of the upper jaw, which is elongated and tapers gradually towards the anterior end. The length of the jaw is about 190 mm and the

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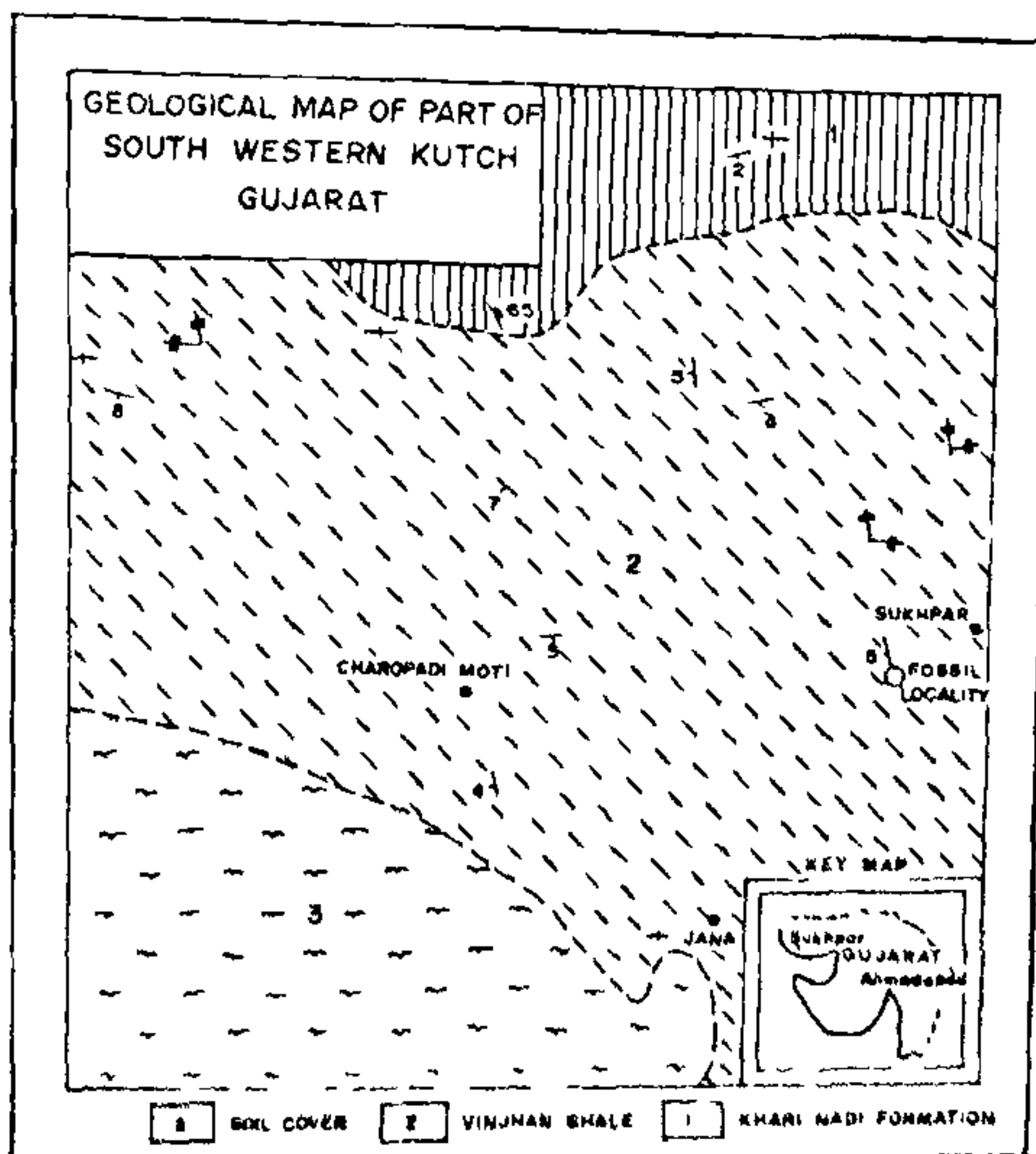


Figure 1. Geological map of part of southwestern Kutch, Gujarat.