

Table 1 Induction of cervical carcinoma by 20-methylcholanthrene in intact and oophorectomized mice following two different techniques

Status of Animals	Painting Method			Thread Impregnation Method		
	Latent period of dysplasia (mild)	Latent period of cervical carcinoma	Incidences of cervical carcinoma	Latent period of dysplasia (mild)	Latent period of cervical carcinoma	Incidences of cervical carcinoma
INTACT OVARY	** 6—8th day (110)*	** 8—10th week	68.77%	** 10—13th day (115)*	** 12—14th week	44.5%
OOPHORECTOMIZED	** 7—8th day (125)*	** 8—10th week	67.2%	** 10—15th day (110)*	** 12—14th week	43.6%

* Numerical data in the parenthesis denotes the number of animals for the experimentation.

** Indicates range.

1:3 (20-methylcholanthrene:beeswax) both in group I and group II mice. However, carcinogen was applied in oophorectomized mice on the 15th day following oophorectomy. Controls were simultaneously kept for comparison. The latent period for dysplasia (mild) and carcinoma of cervix were determined as reported by Kehar and Wahi⁶ by serial examination of cervico-vaginal exfoliated cells using PAP stain. This study was further confirmed by histological studies (table 1).

It is evident from the table that the latent period for dysplasia and carcinoma of cervix are the same both in intact and oophorectomized mice in each technique although there are differences in latent period between the techniques applied. Such differences might be attributed to differences in the amount of carcinogen released for interaction with target cells.

Disturbances in hormonal balance has been reported to influence malignant growth in endocrine or in their dependent target organs⁷. In the present study, the extirpation of the ovary did not influence the latent period for dysplasia and carcinoma of cervix as well as incidence of cervical carcinoma. Mueenuddin and Zaman⁸ have also shown that chemical carcinogenesis following oophorectomy does not influence the total incidences of carcinoma of cervix *in situ* and its invasive properties supporting the present observation.

Authors are thankful to the Director of CNCR, Calcutta for providing laboratory facilities.

8 November 1983; Revised 23 July 1984

1. Forsberg, J. G., *Am. J. Obstet. Gynecol.*, 1975, **121**, 101.

2. Forsberg, J. G., *Natl. Cancer Inst. Monogr.*, 1979, **51**, 41.
3. Forsberg, J. G., *Cancer Res.*, 1981, **41**, 721.
4. Gardner, W. U., *Ann. NY. Acad. Sci.*, 1959, **75**, 543.
5. Murphy, E. D., *Am. J. Pathol. (Abs)* 1953, **29**, 608.
6. Kehar, U. and Wahi, P. N., *Acta. Cytol.*, 1967, **11**, 1.
7. Jordon, S. W., Charles, R. K. and Wright, D. E., *Acta. Cytol.* 1982, **26**, 823.
8. Mueenuddin, G. and Zaman, H., *Acta. Cytol.* 1967, **11**, 205.

DISCOVERY OF DINOSAURIAN HORN-CORE FROM THE INFRA-TRAPPEAN ROCKS OF KHEDA DISTRICT, GUJARAT

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THE presence of Dinosaurian horn-core has been recorded from the infra-trappean rocks, near a locality about 1 km NNW of Guthli, Kheda district, Gujarat. This is in addition to the Dinosaurian fossil locality discovered¹ about a km west of Rahioli, and the discovery of dinosaurian eggs in Kheda district⁷ which have yielded well-preserved Dinosaurian fossil-bones as well as autochthonous dinosaurian eggs.

The present area was considered unfossiliferous

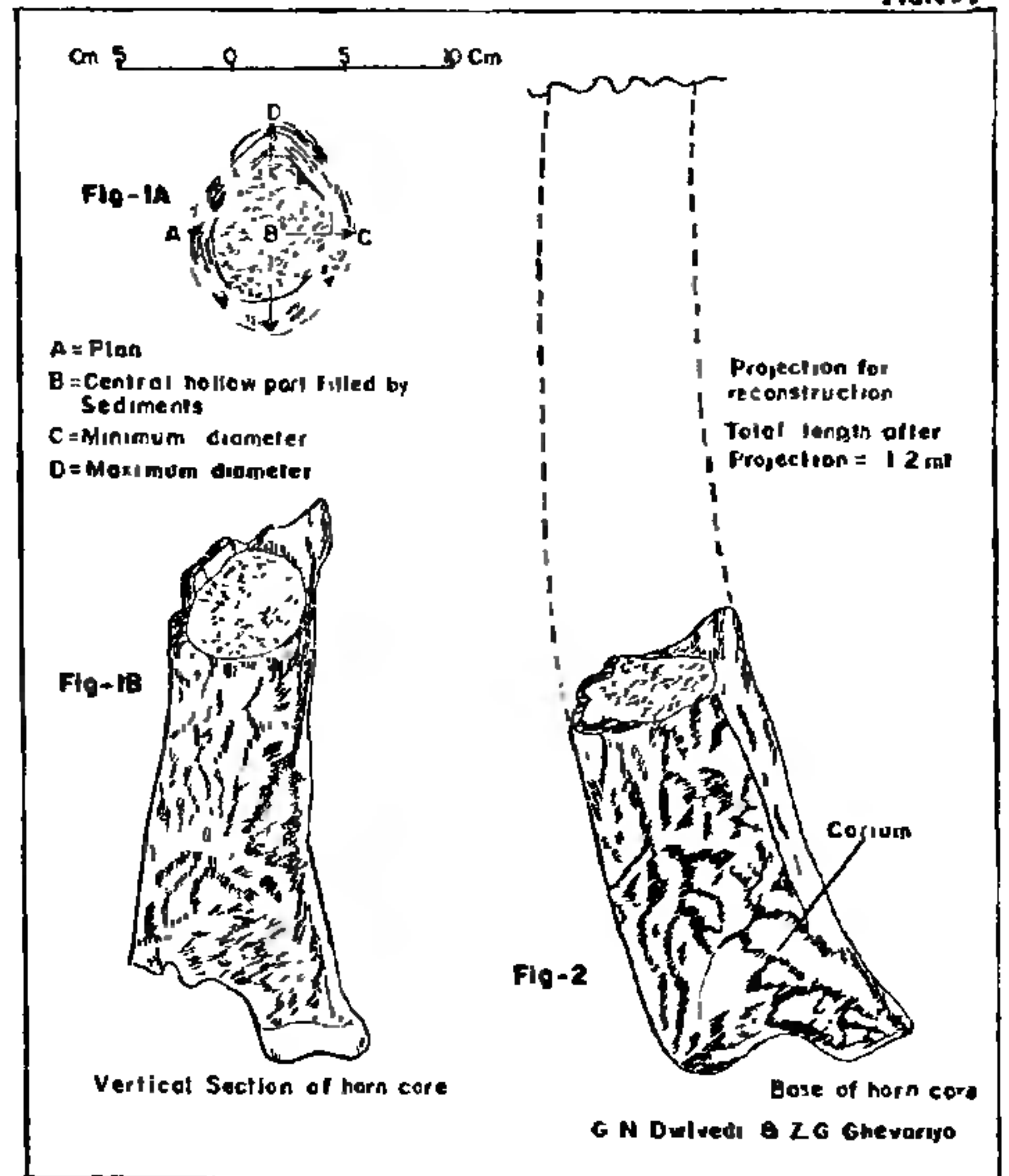
except for "indistinct fragments of fossil Lamelli-branch shells" recorded by Gupta and Mukherjee² who regarded the infra-trappean rocks of the area as Lameta beds.

The fossil horn-core is found in the calcareous bouldery conglomerate forming the lower part of the infra-trappean sequence resting directly over the Precambrian granitic basement.

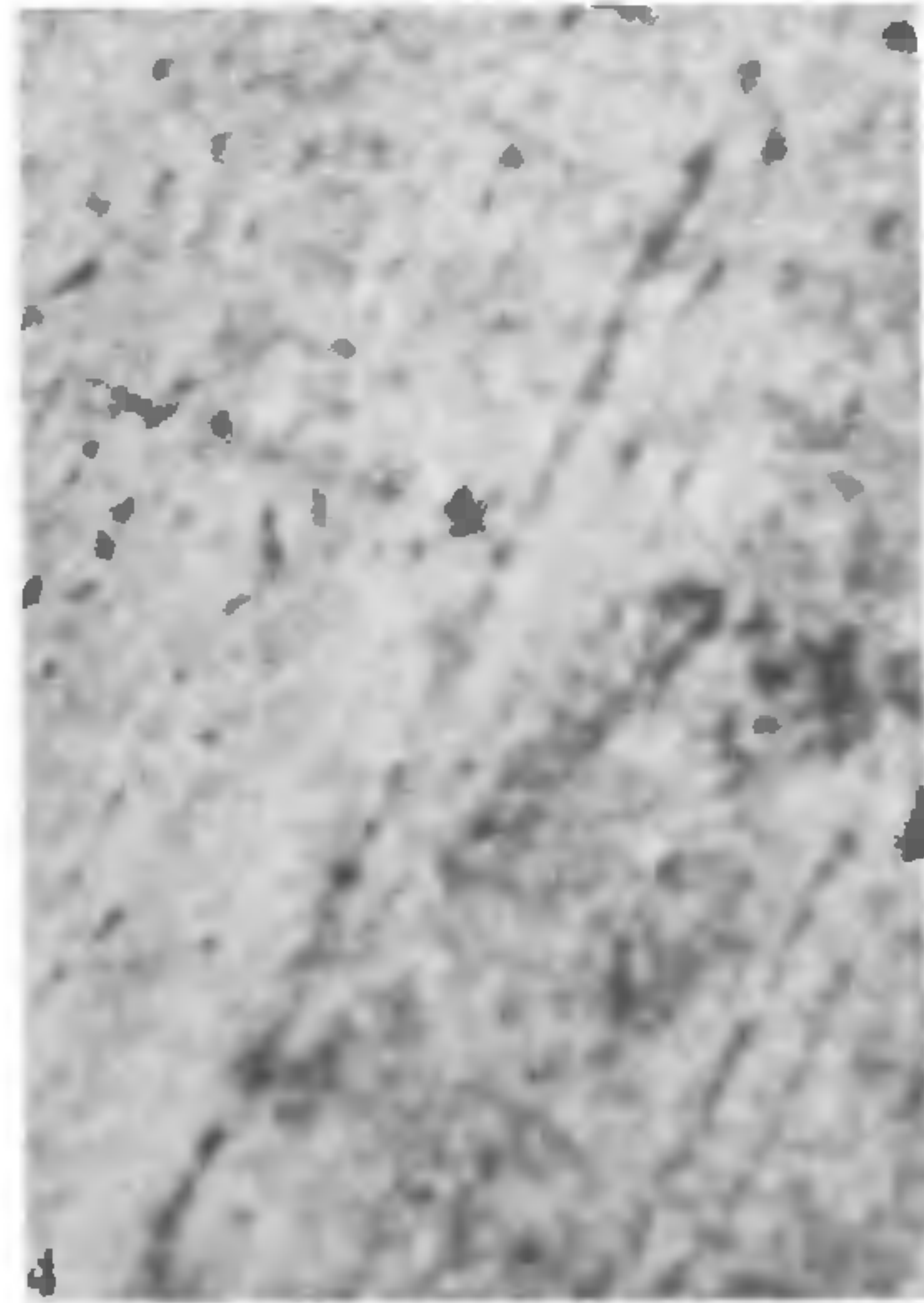
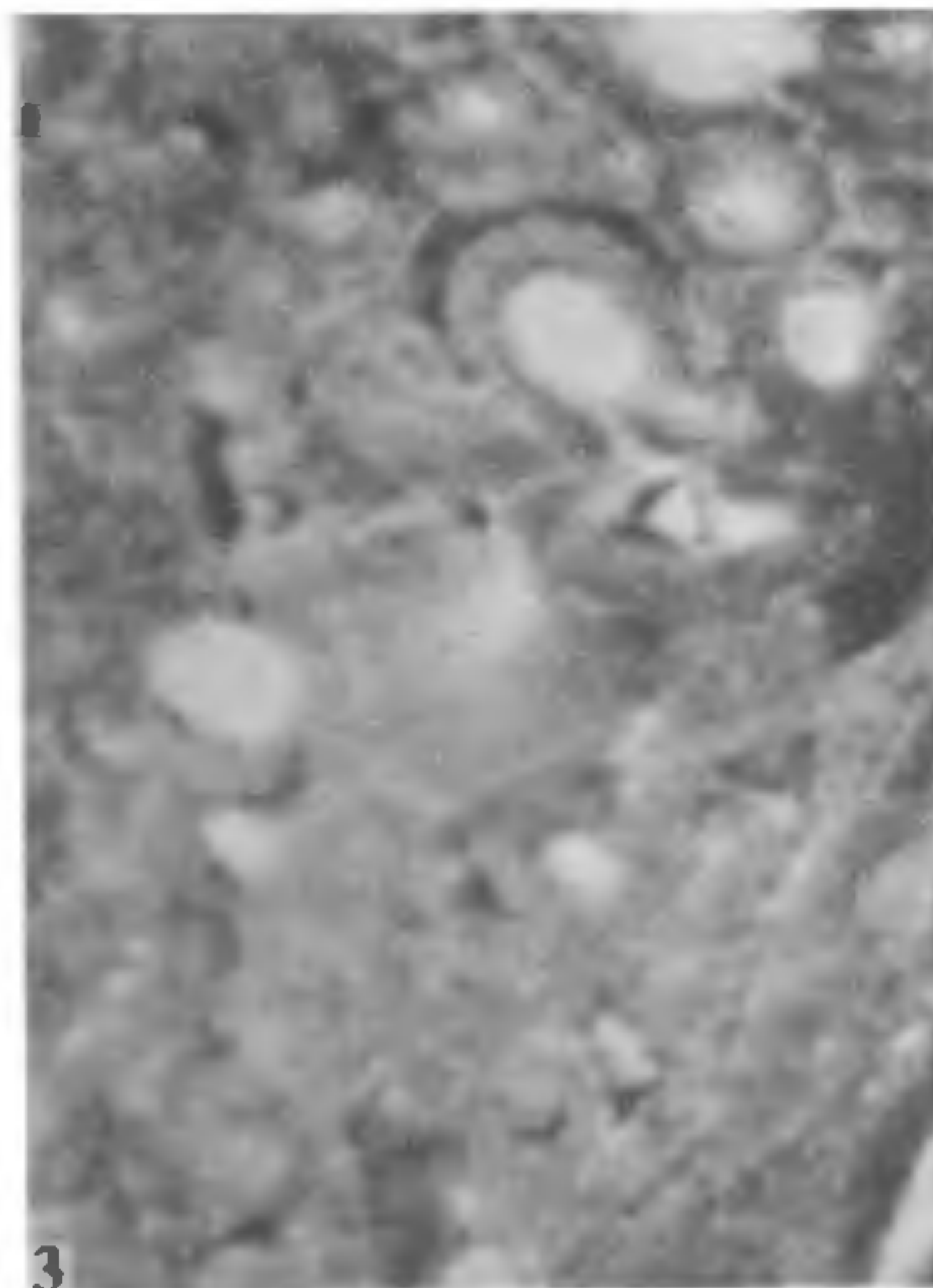
The fossil collected is the basal part of a horn measuring 25 cm in length (figure 1B). The specimen tapers upward, with basal minimum diameter 10.6 cm and top minimum diameter of 9 cm (figure 1A). The basal maximum diameter is 12.6 cm and the top maximum diameter is 11 cm. The horn-core is oblong in transverse section and curves inward in the lower part. The thickness of the wall is 2 cm at the maximum diameter and 0.5 cm at the minimum diameter. The central hollow part of the horn-core is filled by gritty calcareous matrix. The length of the Corium (figure 2) is 5 cm and the width is 4.5 cm and shows fibrous bony structure in the lower part upto a height of 14 cm, which is followed upward by middle hollow portion.

The transverse section of Dinosaurian bones and horn-core, and the present-day mammalian horn core were studied under microscope. The transverse section of Dinosaurian bone shows well-preserved circular as well as oblong harvesian canals and bone marrow

Plate - 6



Figures 1, 2. (1A) Cross-section of the Horn Core showing diameters. (1B) Sketch of horn-core. 2. Reconstruction of horn-core after projection.



Figures 3-4. 3. Transverse section of Dinosaurian bone showing harvesian canals. 4. Transverse section of Dinosaurian horn-core showing alternate dark and light layers.

(figure 3) while the fossil horn-core shows well-defined alternate layers of black (pigment ?) and light colours (figure 4) which may signify the layers of epithelium cells known as epithelial squames³ as observed in the transverse section of the present day mammalian horn-core. There is overall similarity in the microstructures of Dinosaurian horn-core and mammalian horn-core.

On reconstruction the horn-core appears to be about 1.2 m in length (figure 2). The horn-core is probably a part of brow-horn (supra orbital horn-core). The recorded size of brow horn-core varies from 1.3 to 2 m in different species⁴.

The present discovery of Dinosaurian horn-core from the locality is of great importance as it signifies the presence of family Ceratopsidae of sub-order Ornithischian Dinosaurs⁵, which appeared during the late Cretaceous period and where the last phase of Dinosaurian evolution⁶ occurred.

8 May 1984; Revised 21 July 1984

1. Dwivedi, G. N., Mohabey, D. M. and Bandyopadhyaya, S., *Discovery of vertebrate fossils in infra-trappean Lameta beds of Kheda district, Gujarat, IV Indian Geological Congress, Abstract Volume-I, Sections-I to VIII, B.H.U., Varanasi, 1982, p. 3.*
2. Gupta, B. C. and Mukherjee, P. N., *Rec. Geol. Surv. India, Vol. 73, Part-1, 1938.*
3. Carleton, H. M., *Essentials of histology*, Longman, Green & Co, London, 1943, p. 281.
4. Ostrom, J. H., *A new look at the Dinosaurs*. National Geographic Vol. 154, No. 2, pp. 152-185, 1978.
5. Zittel, Karl A Von, *Textbook of palaeontology*. Macmillan & Co. Limited, London, 1932.
6. Kurten, B., *The age of Dinosaurs*. World University Library, Weiden Field, Neolson, 1968.
7. Mohabey, D. M., *J. Geol. Soc. India*, 1984, 25, 329.

MARINE NATURAL PRODUCTS—II: CHARACTERISATION OF LIPID FRACTION FROM THE STONY CORAL *PORITES* *LUTEA*

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MARINE flora and fauna contain complex and interesting steroid mixture¹. Until the introduction of refined techniques such as gas liquid chromatography (GLC) and more recently the combined use of GLC and mass spectrometry, many of the sterols were inseparable and thus not detectable in pure form; this led to confusion in the characterisation of certain sterols. Using the new techniques it is easier to identify steroids from few milligrams of the mixture.

We have earlier² discussed the isolation of batyl alcohol and a sterol, brassicasterol. The sterols from *Porites lutea* could not be identified due to the lack of sample. The present communication deals with the characterisation of different sterols and fatty acid constituents by GC-MS, IR, NMR and MS techniques.

The lipid fraction on repeated column chromatography yielded the sterol mixture³, fatty acids and their methyl esters. The sterol mixture when subjected to GLC on 3% OV-17 (270°) and mass-spectra run on MAT-44, showed it to be a mixture of seven sterols corresponding to molecular ions M⁺ 384, 386, 398, 400 and 412; 414 and 412 representing respectively GLC peaks I to VII. Wyllie *et al*⁴ examined mass spectrometric fragmentation of a number of sterols observing diagnostically important and mechanistically interesting cleavage associated with the presence of a side chain double bond. These findings help natural product chemists in the structural elucidation of steroids.

Mass spectral fragmentation of compounds corresponding to GLC peak Nos. I (M⁺ 384), III (M⁺ 398), V (M⁺ 412) and VII (M⁺ 412) showed major fragment ion at m/e 271 corresponding to the loss of side chain plus two hydrogens, indicating that these compounds have side chain double bond and probably have Δ^5 , 3-OH moiety. Sterols corresponding to peak Nos. I, III & V show fragment ion at m/e 273 by an allylic cleavage and strong peak at m/e 300 indicating Δ^{22} double bond. Besides, these fragment ions, peak Nos. V has base peak m/e 69, which is characteristic of 4-demethyl, 5-dehydrodinosterol, peak No. VII show intense fragment ion m/e 314 formed by McLafferty type rearrangement corresponding to fucosterol with