

Table 1 Features of esterification reaction in presence of hydrogen fluoride

Products	Time of reaction (h)	B.P.(°C)	Yield (%)
Ethyl acetate	26	76-77	82
Ethyl benzoate	26	213-214	95
Methyl benzoate	26	199-200	97
Propyl benzoate	38	110-112	98
Butyl benzoate	40	120-122 (10 mm Hg) (11 mm Hg)	92

The residue was neutralized with 30% sodium hydrogen carbonate solution. The reaction mixture was extracted thrice with diethyl ether and the combined extracts were dried over anhydrous magnesium sulphate for 4 h. On evaporation an oily product was obtained, which was fractionally distilled to give the ester in very high yield. The above method was used for the preparation of the esters listed table 1.

The products listed in table 1 were identified by comparing their b.p., IR spectra and refractive index with those of authentic specimens^{4,5}.

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LEPTOMERYX, AN OLIGOCENE ARTIODACTYL FROM THE LOWER MURREE OF SIAL SUI (KALAKOT TEHSIL), DISTRICT RAJAURI, JAMMU AND KASHMIR

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THE present note deals with the discovery and age implications of a traguloid artiodactyl *Leptomeryx*

recovered from the Lower Murree sediments occurring in the Kalakot tehsil of Rajauri district, Jammu and Kashmir, India. Geologically the Murree rocks occupy the peripheral part of the Kalakot, Metka and Mahogala inliers in the Rajauri district, forming a gradational contact with the underlying marine Subathu sediments. The Murree sequence comprises alternating maroon sandstone, clays, mottled clays, claystone, siltstone and grey sandstone, with a few intercalating pseudoconglomerates. The pseudoconglomerates are composed of maroon sandy matrix surrounding pedogenetic calcareous pebbles, mostly oval in shape and formed intraformationally.

The present specimen was collected from a 2-m-thick pseudoconglomerate bed in the Sial Sui I section, about 12 km north-west of Sair (figure 1a, b). Here, this richly fossiliferous horizon is sandwiched between maroon argillaceous sandstone units and occurs about 575 m above the Subathu-Murree contact at Jigni. Besides *Leptomeryx*, the horizon has also yielded a diverse faunal assemblage represented by rhinocerotoids, crocodiles and fishes. An adjacent small section (Sial Sui II), near Sial Sui post office, extending towards Paglot, also comprises a localized pseudoconglomerate bed (2 m thick), which has yielded the same Sial Sui I fauna and, in addition, rodents, (?)insectivore, pelecypods and charophytes. As the base of this section appears to be tectonically disturbed, the exact relationship of the section with the Sial Sui I section is difficult to state with certainty. However, on faunistic grounds, the two pseudoconglomerates from both these sections seem to be coeval.

While a great diversity of artiodactyls have been reported from the Fatehjang Zone and the Bugti Bone Beds (both in Pakistan)¹ the family Leptomerycidae is only represented by *Predremotherium* (?) *beatrice* and there is no known record of the genus *Leptomeryx* from the subcontinent. Recently² a few artiodactyls have been reported from the vicinity of the Kalakot tehsil. These are *Palaeochoerus* (Kalakot and Mahogala), *Microbunodon* (Kalakot) and *Gonotelmia* (Sial Sui). Although a number of leptomerycids are reported from the Upper Eocene to Upper Miocene sediments of Africa, Asia, Europe and North America³, the distribution of the genus *Leptomeryx* is confined only to the Oligocene of North America where it has attained the maximum grade of evolution, with some advanced forms becoming extinct in the Lower Miocene. A comparison of the Sial Sui *Leptomeryx* (probably a new species) with the North American species shows

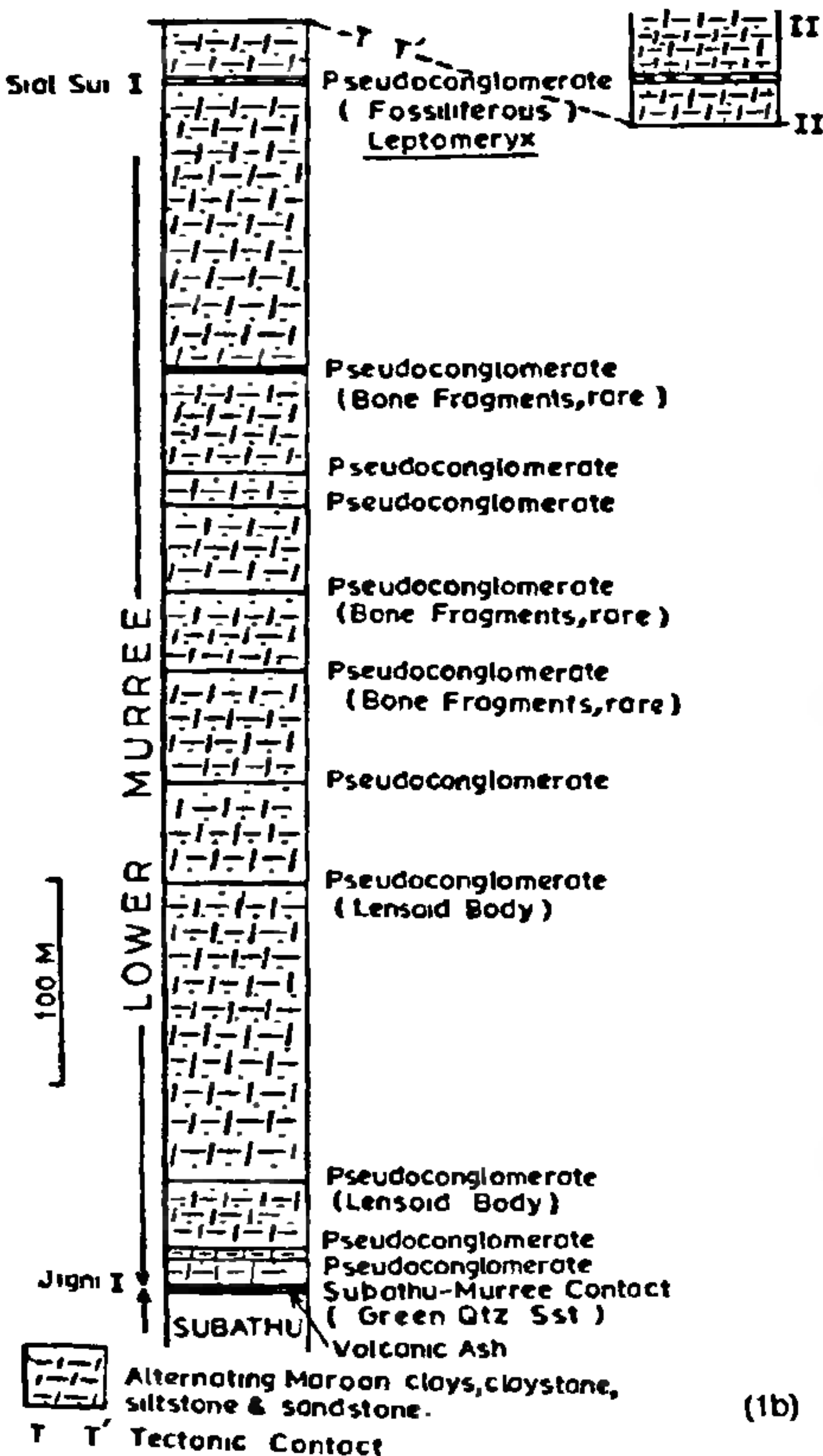
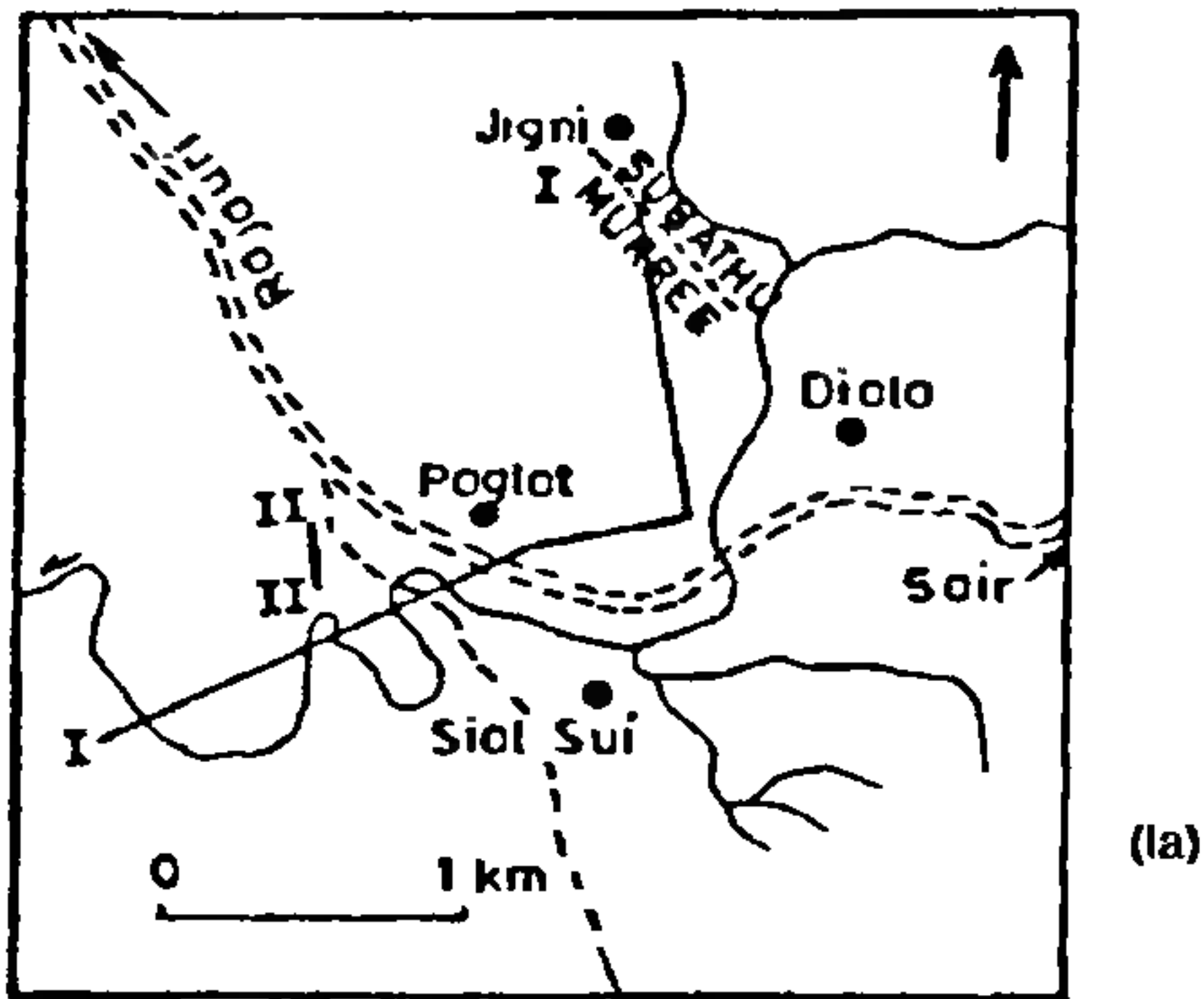


Figure 1. a. Location of fossiliferous pseudoconglomerate levels at Sial Sui I and Sial Sui II, and of the Subathu-Murree contact at Jigni. b. Composite Lower Murree section exposed from Jigni to Sial Sui.

greatest correspondence to *L. mammifer* (Chadronian = latest Eocene to late middle Oligocene)⁴ in size and to *L. evansi* (Orellan and Whytneyan = late middle Oligocene to late Oligocene)⁵ in morphology. The affinities with *Predremotherium (?) beatrix* from the Bugti Beds are yet to be fully established.

Description:

Family: Leptomerycidae

Genus: *Leptomeryx* Leidy 1853

Molar (figure 2): Left upper molar, probably first molar, preservation excellent, quadritubular in outline with four prominent cusps in the form of ridges, moderate crown height. Paracone and metacone similar in shape and size. Paracone centrally shifted. Labial side possesses a broken parastyle, small mesostyle and less-developed meta-style with two columnal infoldings on paracone and metacone. Hypocone slightly more compressed than protocone and labially shifted. Cingulum well-defined along anterior and lingual margins and feeble on other sides. Median valley deep.

This find of *Leptomeryx* from a pseudoconglomerate unit in Sial Sui I section is of great significance as it sheds additional light on the age of the Murree

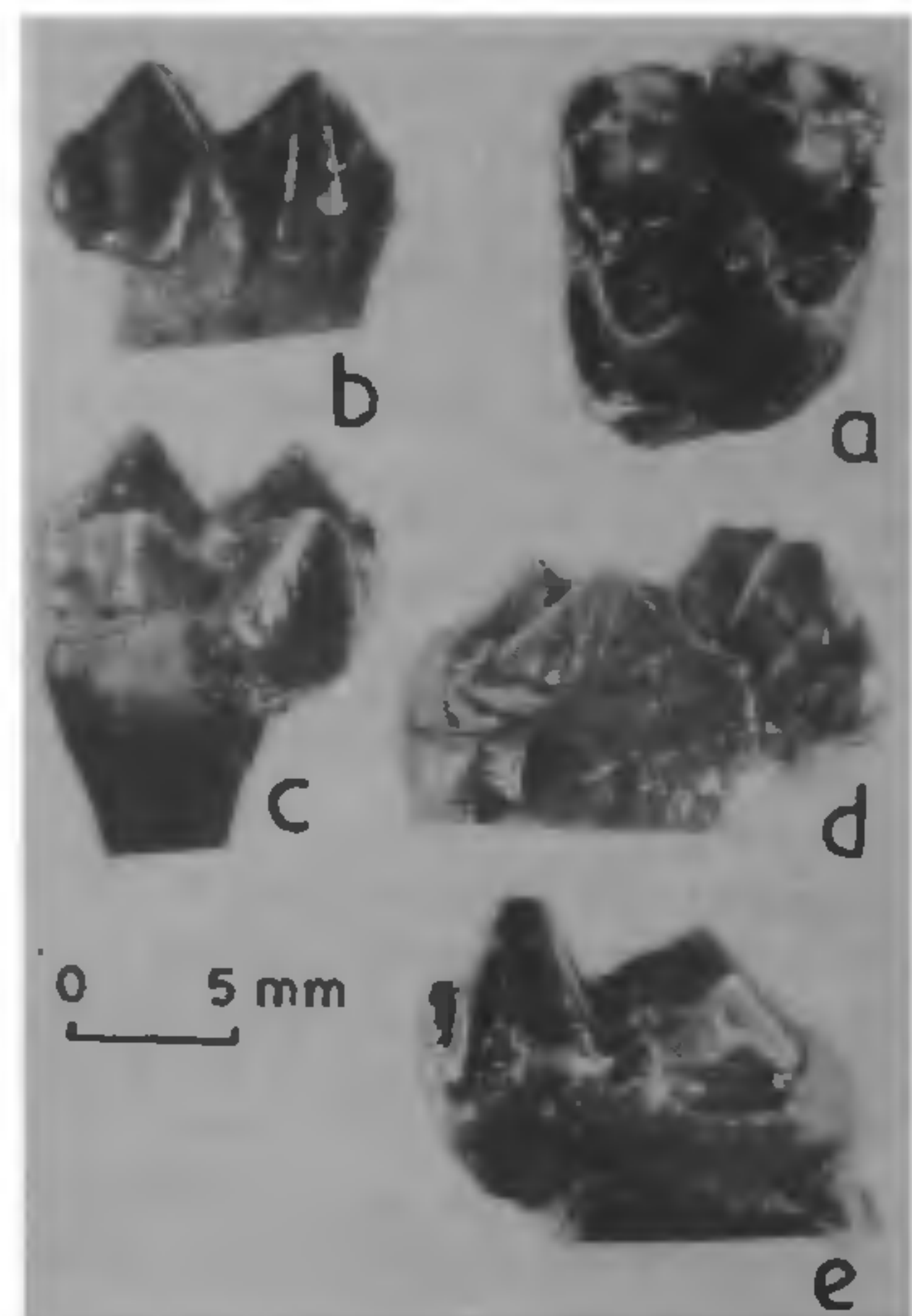


Figure 2. *Leptomeryx* sp. (left upper molar). a. Occlusal view; b. Labial view; c. Lingual view; d. Posterior view; e. Anterior view.

Group. The close correspondence (in terms of evolutionary grade) of the present specimen with typical Oligocene North American leptomerycids is strongly suggestive of an equivalent age (Oligocene) for the Lower Murrees. An examination of the pseudoconglomerates reveals that they are composed of calcareous pebbles, most of which are oval while some are flattened and squeezed into various forms tapering to one end. These pebbles are pedogenetic and were formed at the site of deposition rather than being transported as detritus. Such pseudoconglomerates are found at various levels in the Lower Murree section and represent incipiently developed soil profiles. This rules out the possibility of any tectonism and major hiatus, lending support to the idea of conformable sequence between the Subathu and Murree Groups. Recent palaeomagnetic studies⁶ further support absence of disturbance and an Oligocene age for these sediments. Based on field relationship, sedimentological history and facies considerations, many workers⁷⁻¹¹ have also opined that the Subathu-Murree contact is a continuous and uninterrupted sedimentological phase. Thus the field relationship of the pseudoconglomerate unit (in Sial Sui I section) existing about 575 m above the Subathu-Murree contact at Jigni and the palaeontological evidence furnished by *Leptomeryx* clearly indicate that the lower limit of the Murree Group may extend to Oligocene or even lower without any interruption at the Subathu-Murree junction. This section corresponds to a similar section at Lachi Khan¹², about 65 km north of the Murree type section, where both gradational contact (evidenced by similar pseudoconglomerate units) with the underlying Eocene sequence and Oligocene age for the Murree sediments have been indicated.

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A NEW RECORD OF EDIBLE *AMANITA* FROM INDIA

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AN edible species of *Amanita*, *A. rubescens* (Fr.) S. F. Gray was collected during our studies on fleshy fungi of North-Western Himalayas and is described here as new to India¹. The specimens have been deposited in the Herbarium, Department of Biosciences, Himachal Pradesh University, Shimla (HPUB).

Amanita rubescens (Fr.) S. F. Gray, *Nat. Arr. Brit.* Plate 1, 600, 1821, figure 1A-E.

Pileus 6-10 cm diam., ovoid at first, soon obtusely campanulate to broadly convex or nearly plane, sometimes with a low broad umbo, slightly viscid, reddish brown (8E₇)² covered with numerous, floccose, greyish brown to dark brown (9D₃-9F₃) patches of universal veil which are readily washed off; margin smooth or occasionally the extreme margin indistinctly striate. Lamellae thin, crowded, free, moderately broad, white, staining reddish, lamellulae present between the lamellae; edges entire.

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