

CYTOLOGY OF *CULLENIA EXCELSA* WIGHT AND ITS TAXONOMIC SIGNIFICANCE

G. PUSHPARAJAN, P. I. KURIACHAN
and C. A. NINAN

Department of Botany, University of Kerala,
Kariavattom, Trivandrum 695 581, India.

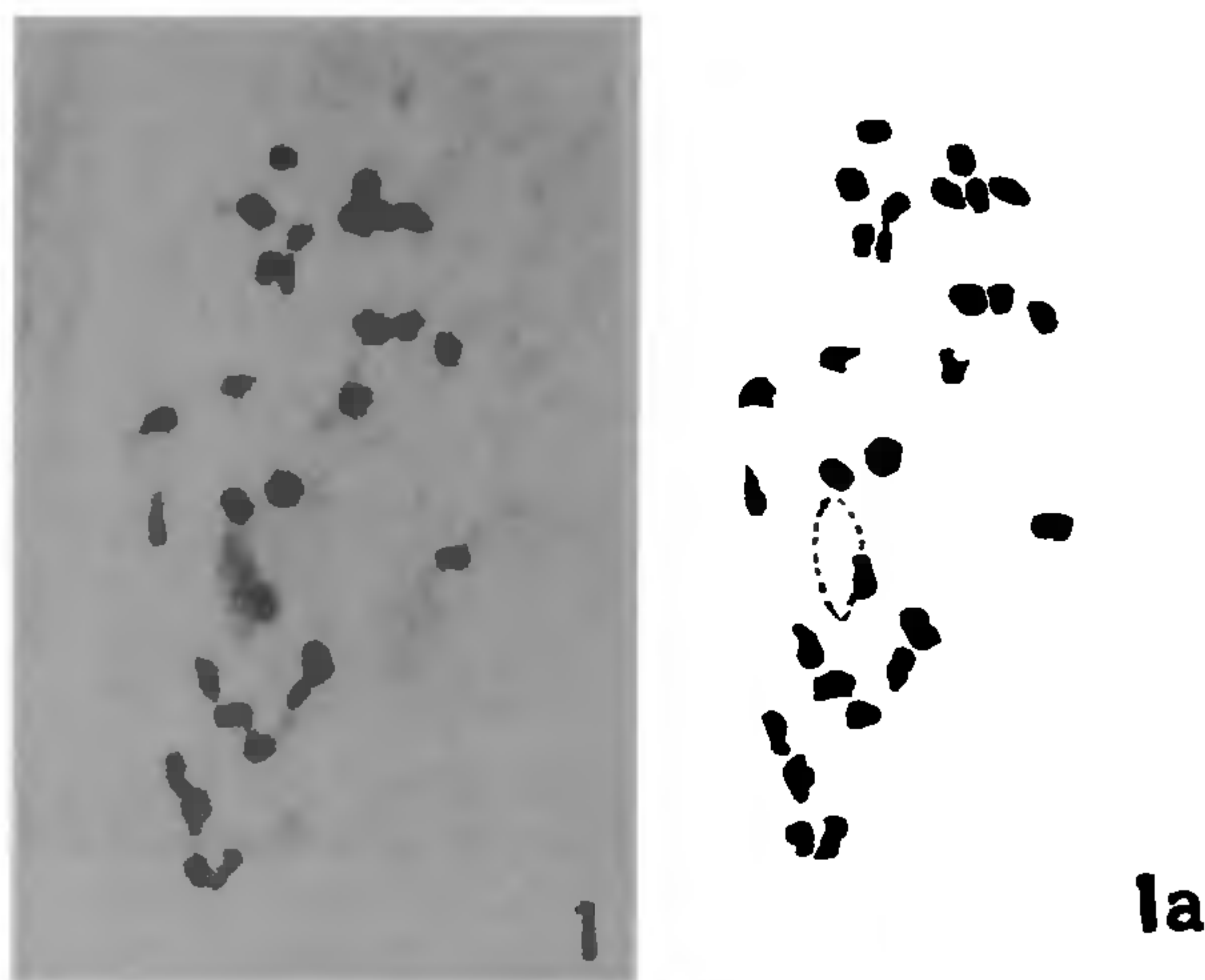
CULLENIA Wight is a monotypic genus (Bombacaceae) endemic to South India and Ceylon¹. It is a large tree producing pale brown soft wood. Its large spinous fruits form the main food of the lion-tailed monkey (*Macaca silenus*), an endangered species. Cytology of this genus is being reported here for the first time.

Materials for meiotic studies were collected from Muthukuzhivayal and Silent Valley in the Western Ghats. Flower buds were fixed in Semmen's fluid (3 absolute alcohol: 1 glacial acetic acid: 1 chloroform) to which a little of ferric acetate was added. Anther smears were made in 1% acetocarmine. PMCs showed 28 bivalents at first metaphase (Figures 1, 1a). Meiosis was found to be normal.

The present finding is of some cytotaxonomic interest. *Cullenia* belongs to the tribe Durioneae of Bombacaceae. Cytology of only one member, *Durio zibethinus*^{2,3} of the tribe was reported earlier. *D. zibethinus* has $2n = 56$ chromosomes in root tip cells. The chromosome numbers of *D. zibethinus* ($2n = 56$) and *C. excelsa* ($n = 28$) indicate that these are based on $x = 14$.

Available chromosome number reports^{4,5} show that the two other tribes of the family Bombacaceae are based on $x = 11$ and 12 (Matisieae) and $x = 10, 11$ and 12 (Bombaceae). In this context the occurrence of chromosome numbers based on $x = 14$ in both the genera of the tribe Durioneae so far investigated is a strong indication of the unique status of the tribe within the family from a cytotaxonomic point of view. Durioneae is the most primitive tribe of Bombacaceae^{6,7}. It has also been suggested⁶ that Durioneae have evolved from the Hibisceae of Malvaceae through *Papuodendron*, which is the most primitive genus of Durioneae. Cytology of *Papuodendron* is not known. However, the occurrence of $x = 14$ as the basic number of *Cullenia* (Present study) and *Durio*^{2,3} adduce cytological support to the above suggestion, as chromosome numbers based on $x = 14$ are seen in different genera of Hibisceae also⁵.

GP is thankful to the CSIR for the award of research fellowship.



Figures 1. A PMC of *C. excelsa* showing 28 bivalents at diakinesis. 1a. India ink drawing of the above PMC $\times 1000$.

4 February 1986

1. Hooker, J. D., *Flora of British India*, Vol. I, L. Reeve & Co. Ltd., England, 1875, p 350.
2. Mangenot, S. and Mangenot, G., *Jard. Bot. l'Etat. Bruxelles Bull.*, 1958, 28, 315.
3. Mangenot, S. and Mangenot, G., *Rev. Cyt. et Biol. Veg.*, 1962, 25, 411.
4. Baker, F. G. and Baker, I., *Bot. Gaz.*, 1968, 129, 294.
5. Fedorov, A., *Chromosome numbers of flowering plants*, V. L. Komarov Botanical Institute, Leningrad, 1969, 156 and 423.
6. Borssum, W. J., *Blumea*, 1966, 14, 8.
7. Hutchinson, J., *The genera of flowering plants*, Vol. II, Oxford University Press, London, 1967, 524.

FIRST REPORT ON A FOSSIL *RATTUS* (MURINAE, RODENTIA) FROM THE PINJOR FORMATION OF UPPER SIWALIK OF INDIA

RAJAN GAUR

Anthropology Department, Panjab University,
Chandigarh 160 014, India.

UPPER Siwalik Subgroup constitutes a thick sequence of highly fossiliferous molassic sediments which have

yielded numerous remains of a variety of mammals in the last 150 years. However, the fossil rodents from Upper Siwalik are scarcely known¹⁻⁶. Among the rodents, the record of fossil murids is very poor in the Upper Siwalik. Only four taxa namely, *Nesokia*, *Mus*, *Golunda*, and cf. *Rattus* are known from the Upper Siwalik of the Indian subcontinent. However, cf. *Rattus* of Jacobs⁶ is more related to *Nesokia*, with which it shares many morphological characters and differs only in the absence of posterostyle, than to any *Rattus* species (J. J. Jaeger, personal communication). Of the above murid taxa, the last three taxa have been described from Pakistan Siwaliks by Jacobs⁶. The record of fossil murids from the Upper Siwalik of India is limited to a single specimen referred to as *Nesokia* cf. *N. hardwicki*. The locality and the exact horizon of *Nesokia* cf. *N. hardwicki* are unknown. However, Black⁴ (p. 263, figure 11) has reported *Nesokia* in the Tatrot Formation of Upper Siwalik. In an earlier paper⁷, the author had reported the occurrence of a murid indet in the Pinjor Formation of Upper Siwalik.

In the present communication a detailed report is presented for the first time on a fossil murid rodent from the Pinjor Formation of Upper Siwalik of India. While screening samples for microfossils the M_1 of a murid was recovered from the greyish clay of Pinjor Formation exposed about 7 km north of Chandigarh. In view of the extreme paucity of fossil murids from the Upper Siwalik, particularly in the Pinjor Formation, the same is described here.

Description:

The present specimen PUA-80/11 (figure 1) is a well-preserved right M_1 of a medium-sized murid. It is 2 mm in length, 1.25 mm in width, and its crown height is 1.18 mm. The molar is broken at the cervical margin, and hence the number of roots is difficult to estimate. The tooth is wider posteriorly than anteriorly and comprises of six main cusps (buccal and lingual anteroconids, protoconid, metaconid, hypoconid, and entoconid) which are arranged in two longitudinal rows. The buccal cusps are placed slightly posterior to the lingual cusps. The tooth is characterized by high cusps.

The labial and lingual anteroconids are nearly straight, with slight posterior slant, and are joined anteriorly. The connection of the anteroconids with the metaconid and the protoconid row has produced a normal 'X' pattern. Except the anteroconids, all cones slope towards the anterior side. The wear on the cones is also inclined anteriorly, at an angle of 40° to 45°.

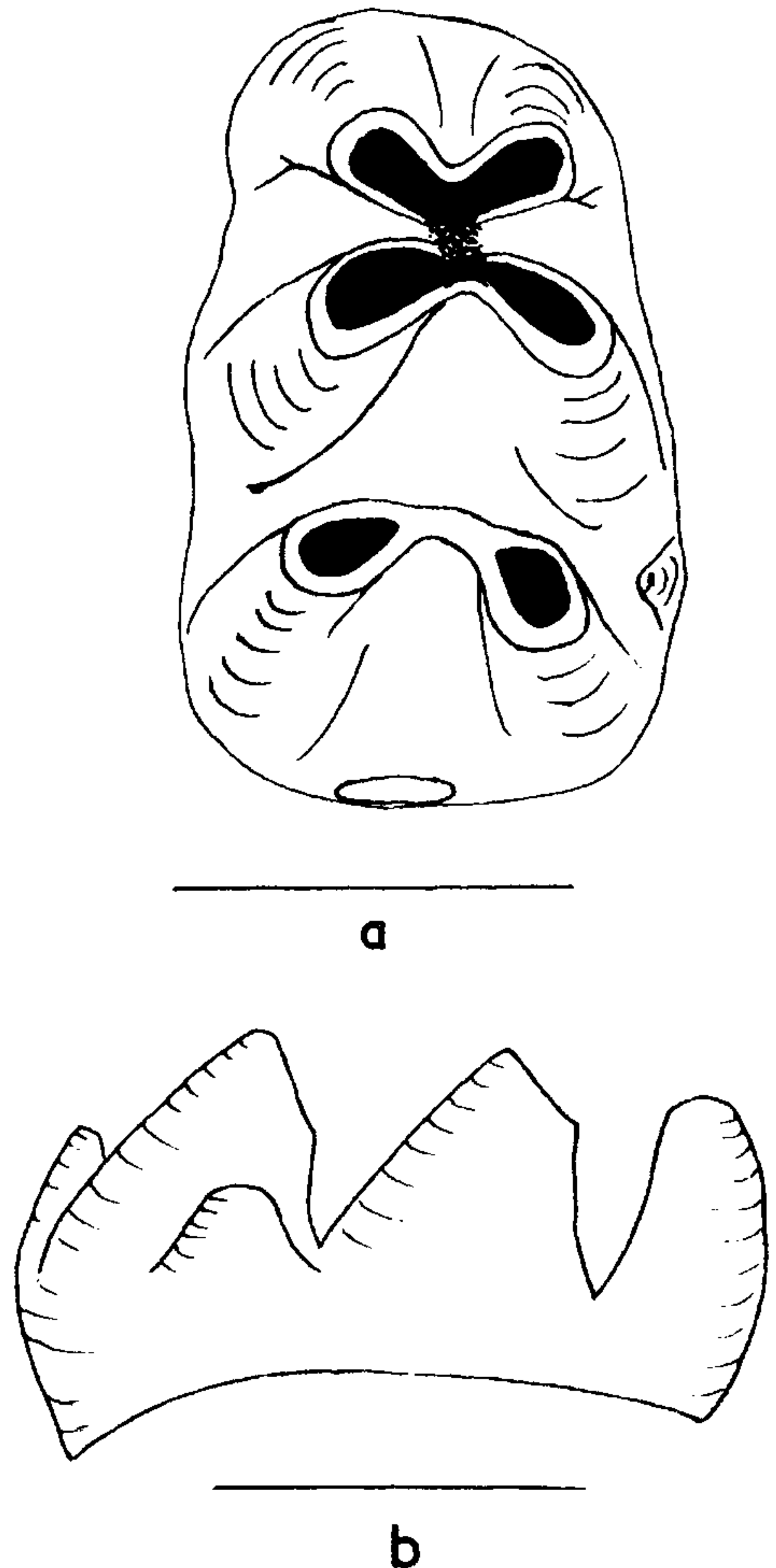


Figure 1. Right M_1 of *Rattus* sp. from Pinjor Formation of Upper Siwalik north of Chandigarh. **a.** Occlusal view, **b.** Labial view (Bar represents 1.0 mm)

The protoconid-metaconid, and hypoconid-entoconid connection is not very strong and is placed anteriorly, slightly to the labial side of the midline of the occlusal surface. There is no medial anteroconid. The posterior cingulum is a flattened oval and is much elevated, reaching upto half the height of the crown. Except a

pronounced tubercle C_1 , no other tubercle can be differentiated on the labial cingulum. Lingual cingulum is not developed. Posterior as well as anterior mures are not discernible.

Comparison:

The M_1 under description differs from *Progonomys* by its large size, greater crown height, and the reduction of labial cingulum. It can be differentiated from *Karnimata* by the absence of an anterior mure, the presence of less rounded cusps and the absence of a medial anteroconid. Besides its relatively large size, it also differs from *Karnimata* by the absence of labial tubercles other than C_1 . In *Karnimata* C_3 and C_4 usually occur. The present M_1 can be distinguished from *Parapodemus* by the absence of a medial mure and labial tubercles other than C_1 , such as C_3 and C_4 . Moreover in the present case the lingual tubercle, which is sometimes found in *Parapodemus*, is also absent.

The large size, and the absence of a highly asymmetrical 'X' pattern and a medial anteroconid differentiate the present M_1 from that of *Mus*. Metrically the molar under discussion is in the range of *Apodemus primaevus* of Michaux⁸. However, it differs from *A. primaevus* in the absence of a medial anteroconid and the presence of less number of labial tubercles, such as C_3 and C_4 . It can easily be distinguished from *Golunda* by its relatively small size, the absence of arcuate cusps and the presence of C_1 . It can further be distinguished from *Golunda* by the absence of a medial anteroconid. In *Golunda* the cusps are arcuate and independent, and a small anteroconid is present. The present M_1 differs from *Parapelomys* by the presence of the 'X' pattern and the absence of anteromedial cingulum. In *Parapelomys* the 'X' pattern is absent and the labial and lingual cusps join very late in wear. One out of every six first lower molars of *Parapelomys* shows C_4 ⁶. This feature is absent in the present specimen.

The present molar is comparable with *Rattus*, with which it shares a common "Rattus" pattern, in some morphological features, such as the absence of a medial anteroconid, the presence of anteriorly slanting cones and a relatively high crown. However, the crown in the present molar is higher than the general case in *Rattus*. Since the present M_1 is morphologically much closer to *Rattus* than to other murid genera, it is assigned here to the genus *Rattus*. However, detailed comparisons with the extant species of *Rattus* are necessary to identify it to the species level. Moreover, more material, particularly the maxillary teeth, is

required to make definitive comments about the specific affinities of the present find. Pending further investigations, the present M_1 (PUA-80/11) is referred to as *Rattus* sp.

The author is thankful to Prof. Dr. S. R. K. Chopra, Pro-Vice-Chancellor, Panjabi University, Patiala for many useful suggestions. Thanks are also due to Prof. Ashok Sahni, Centre of Advanced Studies in Geology, Panjab University, Chandigarh for the stimulating discussions. Prof. J. J. Jaeger, Laboratoire de Paléontologie de Vertébrés et de Paléontologie Humaine, Paris, France confirmed the identification and provided comments on the manuscript, for which the author is grateful.

26 August 1985; Revised 26 November 1985

1. Matthew, W. D., *Bull. Am. Mus. Nat. Hist.*, 1929, **56**, 437.
2. Hinton, M. A. C., *Ann. Mag. Nat. Hist.*, 1933, **12**, 620.
3. Colbert, E. H., *Trans. Am. Philos. Soc.*, 1935, **27**, 1.
4. Black, C. C., *Palaeontology*, 1972, **15**, 238.
5. Gupta, S. S., Verma, B. C. and Tewari, A. P., *J. Paleontol. Soc. India*, 1978, **21 & 22**, 112.
6. Jacobs, L. L., *Museum Northern Arizona Bull.*, 1978, **58**, 1.
7. Gaur, R. and Chopra, S. R. K., 1984, *Nature (London)*, 1984, **308**, 353.
8. Michaux, J., *Palaeobiol. Continent.*, 1971, **2**, 1.

A NEW SPECIES OF THE INTERESTING GENUS *RHYNCHOCHALCIS* CAMERON [HYMENOPTERA: CHALCIDIDAE] FROM INDIA

T. C. NARENDRAN

Department of Zoology, University of Calicut,
Kerala 673635, India.

THE interesting genus *Rhynchochalcis* consists of species of Chalcid wasps possessing characteristic long genal regions. Cameron¹ erected the genus based on the type-species *Rhynchochalcis niger* obtained from Cape Colony (South Africa). Later the same author² described *Rhynchochalcis pruinosa* Cameron (Comb. nov.) erroneously under the genus *Megacolus* from Quetta (Pakistan). During the present author's study