Bull. zool. Surv. India, 4 (3) : 331-336, 1981

A NEW GENUS AND A NEW SPECIES OF FLYING SQUIRREL (MAMMALIA : RODENTIA : SCIURIDAE) FROM NORTHEASTERN INDIA

By

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ABSTRACT

A new genus and a new species of flying squirrel (Rodentia : Sciuridae) from Namdapha, Tirap District, Arunachal Pradesh, India, a proposed Biosphere Reserve in northeastern India, have been described.

This new genus is distinguished by having a combination of characters found in several seperate genera and, so far known, is monotypic. The type species, also a new taxon, is characterized by its gorgeous red, white and gray colours on the dorsum and the ventrum being largely white.

INTRODUCTION

Recently, in course of a faunistic survey in Namdapha, Tirap District, Arunachal Pradesh, a proposed Biosphere Reserve area, during March-May 1981, a team headed by Dr. Shyamrup Biswas, Zoologist of the Zoological Survey of India, collected a unique flying squirrel. After critical examination, it was found to be an undescribed form belonging to a hitherto undescribed genus.

Since it will take some time to work out and report upon the entire collection, opportunity is taken to describe the new genus and the new species of this flying squirrel in the present communication.

All measurements are expressed in millimetres unless otherwise stated. Cranial measurements are taken after Ellerman (1963). Names of colours with initial capital letters are after Ridgway (1912).

SYSTEMATIC ACCOUNTS

Order RODENTIA

Family SCIURIDAE

Subfamily PETAURISTINAE

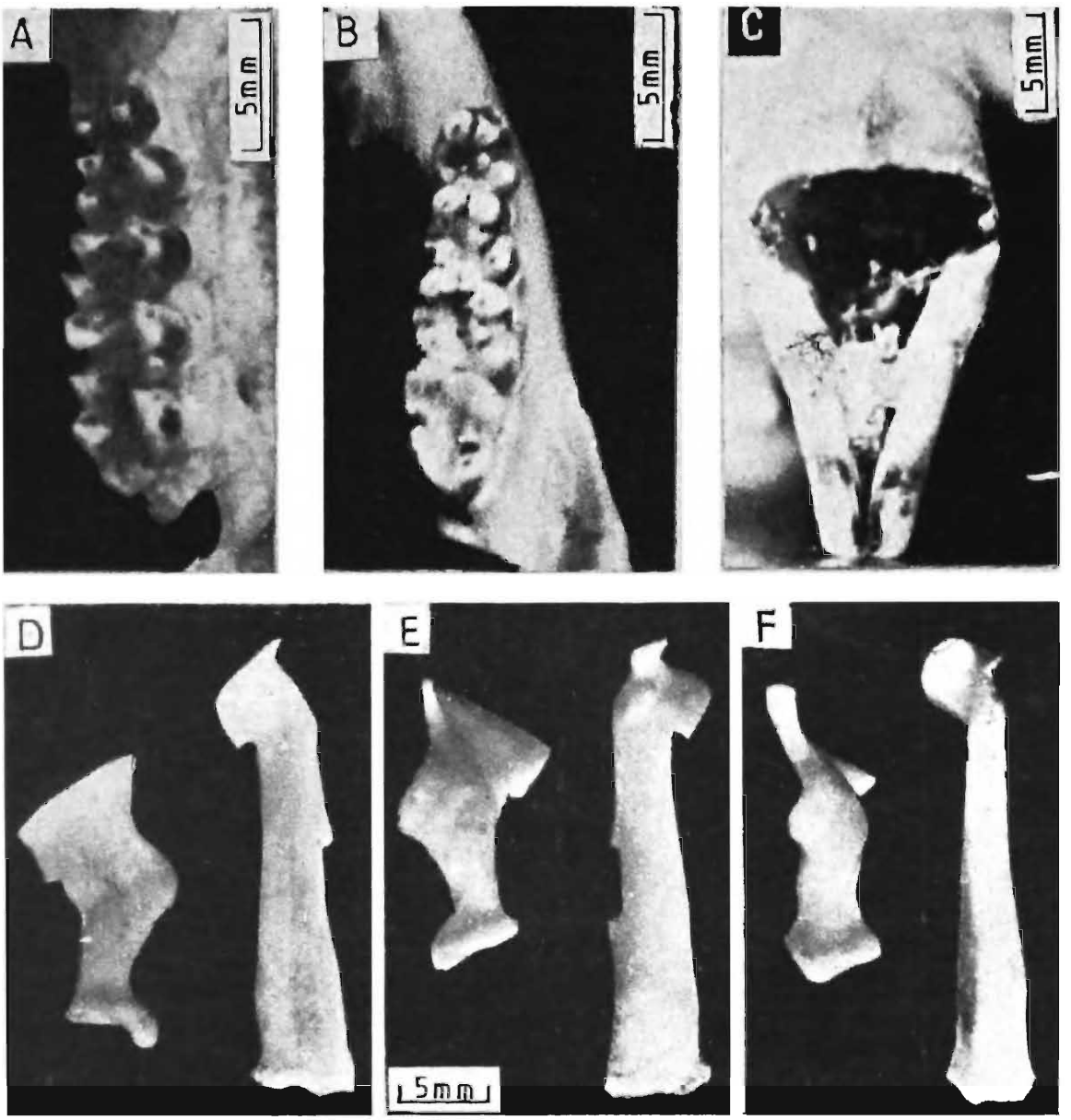
Genus **Biswamoyopterus***, new genus

DESCRIPTION

Size large, total length 1010 mm, head and body being 405 mm. Has a distinct interfemoral membrane connecting the basal one third of the tail. The tail is cylindrical, not distichous. Pelage thick, soft and gorgeously coloured on the dorsum, the vetrum being largely white. Each ear conch; apparently denuded, has tufts of long hairs at the base, one at the anterior margin, one at the posterior margin and another on the dorsal part.

Cranially, it is characterized by large orbit, very large bulla, relatively shorter palate

* The generic name has been derived in honour of Dr. Biswamoy Biswas, Joint Director (Retired), Zoological Survey of India, who has been my mentor since last twenty years.



A. Upper tooth row (right side) of the Holotype of *Biswamoyopterus biswasi* Saha.

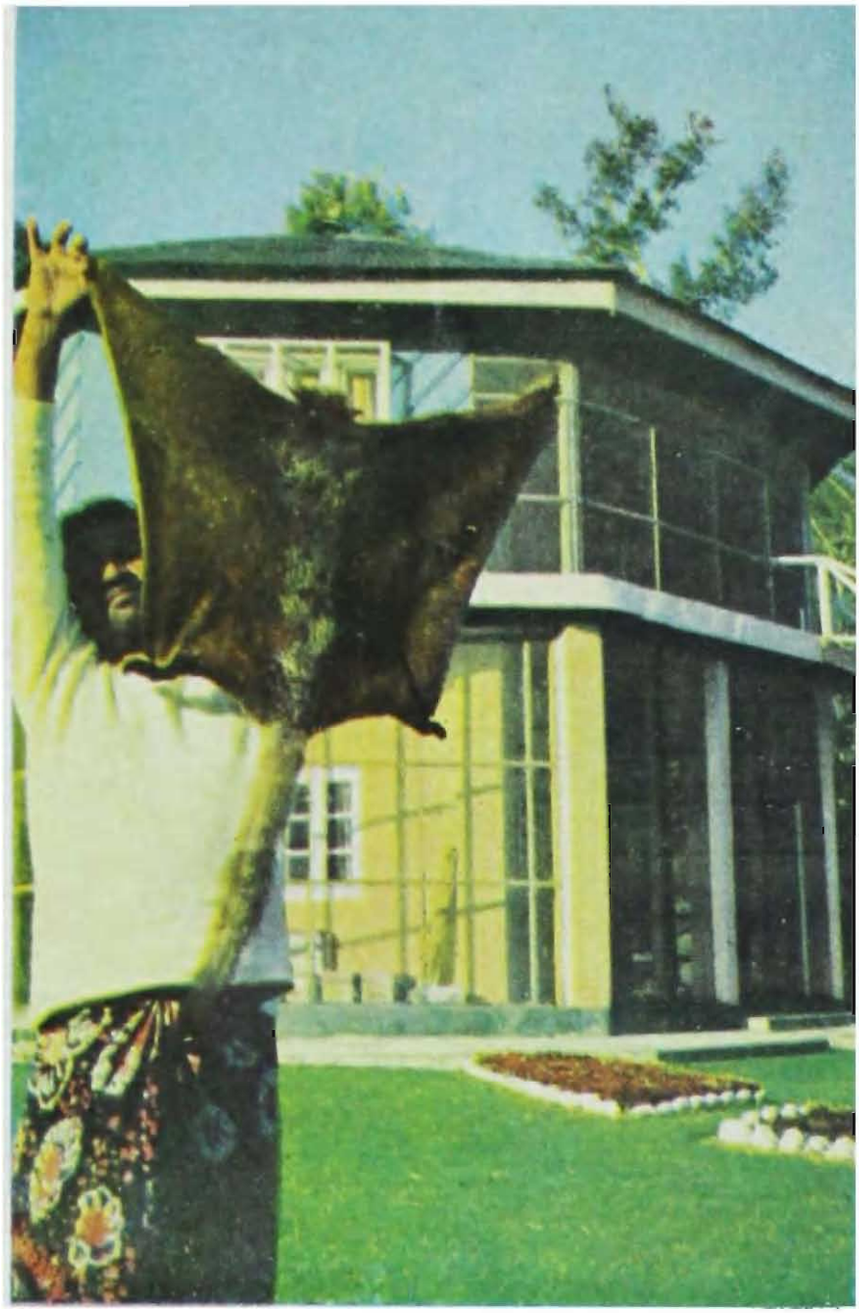
B. Lower tooth row (right side) of the same.

C. Upper incisors (in front view) of the same to show the unpigmented enamel although patchily stained and very feebly grooved inner margin of each tooth.

D. Baculum of the Holotype of *Biswamoyopterus biswasi* Saha (left) compared with that of *Petaurista candidulus* Wroughton (right) in dorsal view.

E. The same in ventral view.

F. The same in lateral view (right side).



Dorsum of the Holotype of *Biswamoyopterus biswasi* Saha
(the dead animal before skinning).

Dorsum of the Holotype of *Biswamoyopterus biswasi* Saha
(the dead animal before skinning).

Close up of the head region to show the ear tufts of Holotype of *Biswamoyopterus biswasi* Saha (the dead animal before skinning).

ending in line with the tooth row, deeply notched frontal depression, wider zygomatic width, and the zygomatic spring and muzzel giving an overall acute triangular outline to the skull in dorsal profile.

In dentition, it is characterized by the following features. The incisors are not pigmented with red although the white enamel is patchily stained with dark brown, and the upper incisors are feebly grooved on the inner margin (Plate V, Fig. C). Cheek teeth are brachydont but simplified and strongly cuspidate, lacking wrinkles and sculptures on enamel. Each molariform tooth is subtriangular in outline with the blunt apex on the lingual side. Both the upper premolars are functional. Pm^3 occupies the middle of the internal half of the tooth row. On the upper series Pm^4 is the largest tooth with three strong cusps, well seperated from each other, are placed on the labial side and one strong cusp on the lingual side ; another small cusp is present in the middle of the posterior transverse ridge. M^1 and M^2 are with two prominent cusps on the labial side and two on the lingual side, of which the postero-internal cusp is lowest ; another feeble cusp is present on the posterior transverse ridge. M^3 strongly built and has a deep central valley with one major cusp on either side of it placed anteriorly ; the margin of the tooth is sharply laminated, more prominently so on the posterior part. The transverse ridges on the molariform teeth are obliquely placed connecting the posterior cusp of the labial side with the anterior cusp of the lingual side. The lower M_3 is, however, the largest tooth in the combined upper and lower series. The lower molariform teeth are rhomboid in outline (Plate V, Fig. A, B).

The baculum is strongly built ; apex hollowed and spatulated but is very short in length. The proximal part has a short but robust shaft and the distal apical part large, flattened and curved into a very wide spout, without any accessory structures (Plate V, Fig. D, E, F).

Discussion

The new genus exhibits a combination of characters that are present in several distinct genera and are of much taxonomic values. In external features, it resembles the giant flying squirrels of the genus *Petaurista* Link, 1795, in its large size, cylindrical and non-distichous tail, and by the presence of a well developed interfemoral membrane. These characters are also found in *Aeretes* Allen, 1940 and *Aeromys* Robinson & Kloss, 1915. But, the present genus differs from those three genera by detailed taxonomic characters, externally by the presence of ear tufts and in dentition. Ear tufts are also found in *Belomys* Thomas, 1908 and *Trogopterus* Heude, 1898 but these two genera do not have any interfemoral membrane and their tail is not cylindrical but distichous.

In dentition, the new genus has the unique feature of its incisors being not pigmented with red as they are in all other known flying squirrels. The cheek teeth are brachydont but much simplified and strongly cuspidate. Enamel of the cheek teeth is not wrinkled or sculptured as found in the giant flying squirrels, specially, *Petaurista*. Simplified molariform teeth retained much of the basic *Sciurus*-type pattern, similar to *Hylopetes* Thomas, 1908 and *Aeromys*, but differ from them by upper Pm^4 being larger than M^1 as found in *Belomys* and *Trogopterus*. It differs from the last two genera who have compli-

cated cheek teeth with much wrinkles and folds on enamel and also by other details.

The baculum of the new genus, at the first glance, appears similar to that of *Belomys* but the nature of curvature of the apical spatulate hook and absence of accessory structure it differs from that in *Belomys*.

This new genus like *Aeromys*, abridges the giant flying squirrels and the smaller flying squirrels. To the former by presence of inter-femoral membrane and non-distichous, cylindrical tail and with the latter by much simplified brachydont molariform teeth retaining much of the basic *Sciurus*-type pattern and also by presence of ear tufts as found in some smaller flying squirrels.

The new genus *Biswamoyopterus* Saha, so far known, is monotypic and represented by the type species which is also a new species described below.

Biswamoyopterus biswasi*, new species

DESCRIPTION

Colouration : body above, in general, Morocco Red grizzled with white, a conspicuous blob of Pale Violet Gray present on the top of crown ; patagium glossy Mehgony Red ; particoloured tail beyond interfemoral membrane proximally Pale Smoky Gray, changing distally to Vinaceous Rufous, then to Hay's Russet and finally to Clove Brown near tip, the proximal gray part is also washed with red ; muzzle mostly Vinaceous Rufous changing to a broad ring of Mehgony Red around eyes ; a narrow black line forms the nasal bridge ; hands and feet darker than body ; ear tuft on posterior margin silvery white but that of anterior margin basally white and changing to Morocco Red distally, some all silvery white hairs are also mixed up with those bicoloured hairs, tufts on dorsal base of the ear Morocco Red and extending to middle of the neck from each side ; neck region otherwise coloured Mehgony Red ; some silvery white hairs are scattered over forehead and cheeks ; forehead is washed with red because of the hairs of that region being faintly tipped with red ; lower cheeks mixed gray and white. Body below is white with hairs having Pearly Gray bases ; patagium below washed with faint Orange-Rufous ; interfemoral membrane with a band of Pale Morocco Red near margin, the margin is also grizzled with gray and white, more so near tail root ; underarm Mehgony Red, intensified distally ; underfeet Morocco Red near ankles ; a black line running from each side of propatagium extends to wrist and margin of the palm, this also extending over dorsal side of manus, particularly to fingers ; margins of soles of feet black ; lateral margin of patagium and scrotal sac Vinaceous Slate grizzled with silvery white ; distal end of scrotal sac adorned with long hairs which are tipped Vinaceous Rufous ; chin dusky with a spot of Clove Brown below lower lip. (Plate VI, Figs. A, B).

Each hair on dorsum is banded with gray basally and red distally, but pattern is different in different region. Each body hair is coloured Vinaceous Slate and Smoky Gray on basal onethird and red on remaining part. White hairs that produce grizzled effect are basally gray, middle part white and finely tipped with black. Haris on loin and outer part of patagium Orange Cinnamon on base and red on distal part. Underwool coloured intense

* The species name has been derived after the collector of the Holotype, Dr. Shyamrup Biswas, Zoologist, Zoological Survey of India, the Leader of the Namdapha Expedition, 1981.

cinnamon. Each hair on proximal twothird of tail banded by various shades of colours from base to tip and arranged in the following manner : Vinaceous Slate (20%), Pale Smoky Gray (next 40%), Orange Cinnamon (15%), Vinaceous Rufous (10%) and the remaining free end (5%) being Hay's Russet to Clove Brown ; in similar fashion, each hair on distal onethird of tail Orange Cinnamon (10%), Pale Smoky Gray (next 30%), Orange Cinnamon again (5%) and the rest (55%) grading from Hay's Russet to Clove Brown. Intensity of gray on tail decreases with the increase of russet and brown from proximal to distal region.

Cranial features are characterized by the following : very large orbit (33.9% of occipitonasal length), bulla enlarged and inflated (21.4%), large palatal foramina (8.84%), foramen magnum much enlarged, frontal depression very deeply notched, zygomatic arch much wide (65.6%), interparietal well demarcated, fronto-parietal ridge strong anteriorly and confluent with posterior rim of postorbital process, the latter is more flat and broad, transverse flank of squamosal that contributes to zygomatic arch is flat, broad and convex anteriorly, occipital plane much convex, peroccipital process very short and closely inclined to tympanic bulla, the latter being very large and approaching each other anteriorly resulting narrowed anterior part of basioccipital and posterior part of basisphenoid, intermaxillary foramen conspicuously large.

Short and robust baculum has a dumbbell-shaped twisted proximal shaft and widely expanded and upturned distal apical part, the latter is very broad and curved, and projecting from the left hand side like a spout of jug ; apical part is subequal to shaft in length.

Type Material : *Holotype* one male ; skin, skull and baculum, deposited in the National Zoological Collection, Zoological Survey of India, Calcutta, Z.S.I. Reg. No. 20705, collected by Shyamrup Biswas on 27 Apr. 1981.

Type Locality : Deban, (alt. *c.* 350 metre), 26 km east of Miao, Namdapha, Tirap District, Arunachal Pradesh, India.

Measurements of the Holotype : External : head and body 405, tail 605, hindfoot 78 (with claws 83), ear 46, greatest patagial expanse 760, interfemoral membrane connects 186 of tail length from root.

Cranial : occipitonasal 72.4, condylobasal 70.1, palate 34.7, diastema 15.7, palatal foramina 6.4, bulla 15.5, upper tooth row 15.5, nasal 20.9, orbit 24.6, frontal length 28.6, least interorbital width 19, greatest zygomatic width 47.5 ; upper teeth : Pm^3 2.4, Pm^4 4.4, M^1 3.6, M^2 3.6, M^3 3.4 ; lower teeth : Pm_4 2.9, M_1 3.4, M_2 3.4, M_3 4.4.

Baculum : total length 16.7, shaft length 11.5, width of apical hook 6.8.

Discussion

This new species, which may be called the Namdapha Flying Squirrel, is a beautifully coloured animal with gorgeous fur. In brilliance of coat colour, it approximates to some species of the genus *Petaurista*, specially to *Petaurista taylori* Thomas.

The Holotype was collected at early hours of evening (at 20.15 hrs) from a lofty Nahar tree (*Mesua ferrea*). Another species of flying squirrel, namely, *Petaurista candidulus* Wroughton, fairly common in that terrain, was also found foraging near by. The range of this new species, so far known, is only in the catchment area of the Noa Dihing River, particularly on the western slope of the Patkai Range in Namdapha area. Its extraordinary

characters as well as its range of distribution are of important academic interest, particularly in regard to its bearing on the phylogeny of flying squirrels and zoogeography of the region.

ACKNOWLEDGEMENTS

I am thankful to the Director, Zoological Survey of India for providing me the opportunity to accompany Dr. Shyamrup Biswas, in the Namdapha Expedition and for the facilities to study the mammalian collection.

I express my sincere gratitudes to Dr. B. K. Tikader, Director, Dr. K. K. Tiwari, Director (Retired), Dr. B. Biswas, Joint Director (Retired), Dr. K. C. Jayaram, Deputy Director, Dr. A. K. Ghosh, Superintending Zoologist, who have kindly gone through the manuscript critically and made immensely valuable suggestions to improve it and to Dr. P. D. Jentkins, Mammal Room, British Museum, who kindly compared it with the material at her disposal and confirmed the identification.

I am thankful to Dr. V. C. Agrawal and Sarvashri P. K. Das, D. K. Ghosal, S. Ghosh and B. B. Datta for their constant encouragements, and acknowledge the help and assistance received from Sarvashri R. K. Ghose, T. Chakraborty, M. K. Ghosh, S. R. Dey Sarkar, D. K. Biswas and Dr. S. Chakraborty.

Finally, my sincere thanks are due to Dr. Shyamrup Biswas and Shri Nemai Charan Gayen with whom I had the opportunities to share the pains and pleasures during the field work, and also to Shri B. K. Barua, Divisional Forest Officer, Namdapha Wildlife Sanctuary, who kindly extended all facilities for our field survey in Namdapha.

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