

Rec. zool. Surv. India : 104 (Part 3–4) : 91-97, 2005

**EXTENSION IN THE DISTRIBUTION OF BURMESE
WHISKERED BAT *MYOTIS MONTIVAGUS* (DOBSON, 1874)
IN THE NORTHERN WESTERN GHATS RANGE
MAHARASHTRA, INDIA**

V. S. KORAD, M. C. GAIKWAD AND K. D. YARDI

Department of Zoology, Fergusson College, Pune, Maharashtra-411 004

INTRODUCTION

Among the evening bats (Vespertilionidae, Chiroptera), the genus *Pipistrellus* is common in the urban area and in the spurs of Western Ghats region. While surveying the bats in the Western Ghats region, it was noticed that as compared to the *Pipistrellus*, *Myotis* bats require more specific roosting sites and high humidity in the surrounding.

In Indian subcontinent *Myotis montivagus peytoni* is endemic subspecies and reported at the high altitude, from 1300 feet (390 m) to 3490 feet (1047 m) (Bates & Harisson, 1997). Previously it was reported from Eastern Ghats region near Vishakhapatnam (Ghosh, 1989) and Western Ghats region of Karnataka (Wroughton, 1913i) and Kerala states (Bates & Harrison, 1997).

METHODS

The Central Western Ghats of Maharashtra state, India (approximately N 19°30'–E 74° 20' to N 17°56' E 73°42') was surveyed for the assessment of bat fauna. During this survey, the bat species were identified, the permanent roosting sites were recorded and other ecological details were noted down.

Each of the colonies of the Burmese Whiskered bat, *Myotis montivagus* (Dobson, 1874) was found out during day time observing the heaps of fecal matter on the floor of the roosting site. One mature male bat was collected from the crevices in which they were resting. The taxonomy was confirmed by external cranial and dental measurements.

For the study of the feeding habit of the species under study, the fecal matter analysis was performed as described by Whitaker Jr. J. O., (1998).

OBSERVATIONS

While surveying the bat fauna in the Western Ghats region, two male Burmese Whiskered bats, *Myotis montivagus* (Dobson, 1874) (Registration No. M/653, Zoological Survey of India, Western Region, Akurdi-Pune) were reported at two different places in Mahabaleshwar region. The taxonomical details of the specimens are as follows :

Class MAMMALIA
Order CHIROPTERA
Suborder MICROCHIROPTERA
Family VESPERTILIONIDAE
Genus *Myotis*
Species *Montivagus*

1874c. *Vespertilio montivagus* Dobson, 237 : Type locality : Hotha, Yunnan, China.

Diagnosis of genus : The ears are comparatively tall, with spear shaped and straight tragus. The tail is enclosed in the inter-femoral membrane. The rostrum is about equal in length to the braincase.

$$\text{Dental formula : } i \frac{-2 \ 3}{1 \ 2 \ 3} c, \frac{1}{1} pm, \frac{-2 \ 3 \ 4}{-2 \ 3 \ 4} m, \frac{1 \ 2 \ 3}{1 \ 2 \ 3} = 38$$

Diagnosis of species : The medium sized bat with forearm length ranging between 44.5 mm and 46.3 mm. The pelage is soft and black with brown and white tips on the dorsal side. On the ventral side the tips of hair are paler, almost brownish white with dark base. The second upper premolar (Pm^3) is small. The second lower premolar (Pm_3) is small and consists about half the crown area of the first (Pm_2). The anteorbital foramen is widely separated from the anterior rim of the orbit.

Taxonomic remarks : The specimens from southern India are larger in size than that of Myanmar specimens. The present bat specimens from the Northern Western Ghats resemble the specimens of Southern India, which are referred to *M. m. peytoni*. The subspecies is endemic to the Indian subcontinent.

External, Cranial and Dental measurements (in mm) of *Myotis montivagus peytoni*.

HB	52.5	GTL	17.5
HF	9.4	CCL	15.2
T	35.3	PC	3.9
FA	45.4	ZB	12.0
E	14.5	BB	8.0

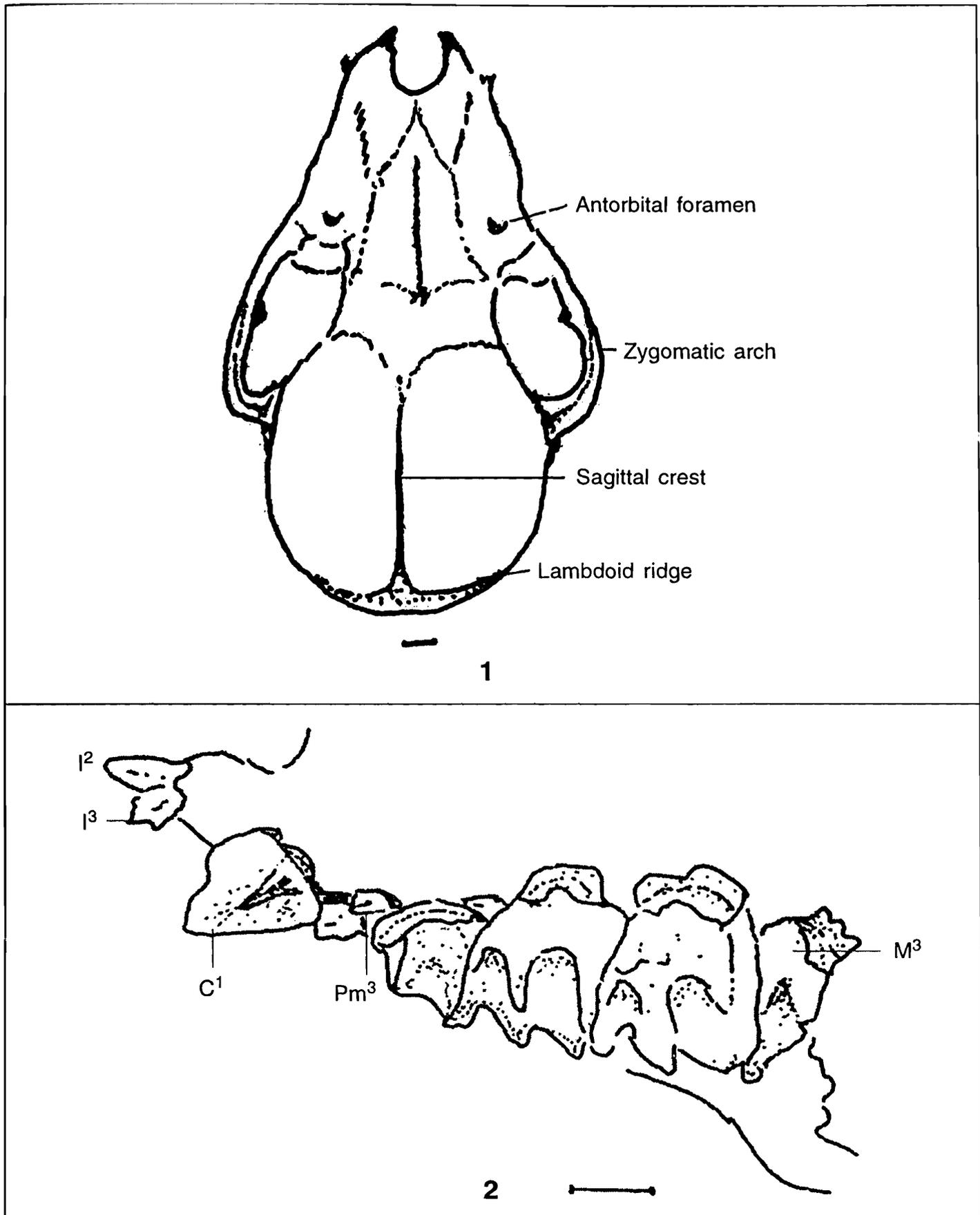


Fig. 1. : The camera lucida sketch of the skull (dorsal view) of *Myotis montivagus* showing flaring of the zygomatic arches and wide space between the antorbital foramen and the orbital fossa. Bar = 1 mm.

Fig. 2. : The camera lucida drawing of the maxillary teeth of *Myotis montivagus*. Bar = 1 mm.

TIB	18.3	CM ³	6.3
5MT	39.7	CM ₃	7.0
4MT	40.6	M ³ –M ³	7.0
3MT	41.6	M	13.1
RW	6.8	C ¹ –C ¹	4.8

n = 2, Sex – male

HB : Head and Body length, HF : Foot length, T : Length of Tail, FA : Length of Forearm, E : Length of Ear, TIB : Length of Tibia, 5MT : Length of 5th Metacarpal, 4MT : Length of 4th Metacarpal, 3MT : Length of 3rd Metacarpal, RW : Width of Rostrum, GTL : Greatest length of skull, CCL : Condylar length, PC : Post-orbital constriction, ZB : Zygomatic breadth, BB : Breadth of braincase, CM³ : Maxillary tooth row, CM₃ : Mandibular tooth row, M³–M³ : Posterior palatal width, M : Mandibular length, C¹–C¹ : Anterior palatal width.

GENERAL COMMENTS

The wing membranes are naked and uniformly dark brown. The ear is comparatively short and its tip is bluntly round. The anterior surface of the pinna is smoothly concave and the posterior margin has a shallow concavity below the tip.

Cranial characters : The cranium is relatively robust and broad with an average condylar length of 15.3 mm and the breadth of the brain case is 8.0 mm. The sagittal ridge lacks post-orbital ridges in front, but the lambdoid ridges are well marked. The nasals show gradual gradient from posterior to the anterior end, the bones are almost flat anteriorly. The zygomatic arches are strong and much flared. The palatal region is longer, but relatively less concave.

Dentition : Both the upper and lower canines are strong, short, with broad base and blunt tip. When compared with the corresponding canine, the third premolar (Pm⁴ and Pm₄) is strong and slightly less in height and crown area.

Both first (Pm²) and second upper premolars (pm³) are minute, the second upper premolar (pm³) is intruded, but the first (Pm²) and third upper premolars (pm⁴) are not in contact. M³ is less than half the size of M². M¹ is relatively short and broad as compared to M².

On the lower jaw all the three premolars are in tooth row. The first two incisors are tricuspid, but the third one has four cusps. The coronoid process of mandible is much elevated.

Ecological remarks : The Burmese Whiskered bat, *Myotis montivagus* were collected from Mahabaleshwar area (N 17°56' – E 73°42') at two different places, about 15 km – 20 km away from each other. One male bat was collected in late October 2002 and the other of same sex in late February 2004. Both were mature and roosting in isolation in the shallow holes in the basalt rock. The rock was dripping continuously even in the dry winter in the first case and early summer in the latter. The heaps of fecal matter under the roosting site indicated the use of site for considerably long period. The temperature of the microhabitat was 20°C and humidity recorded was 110%.

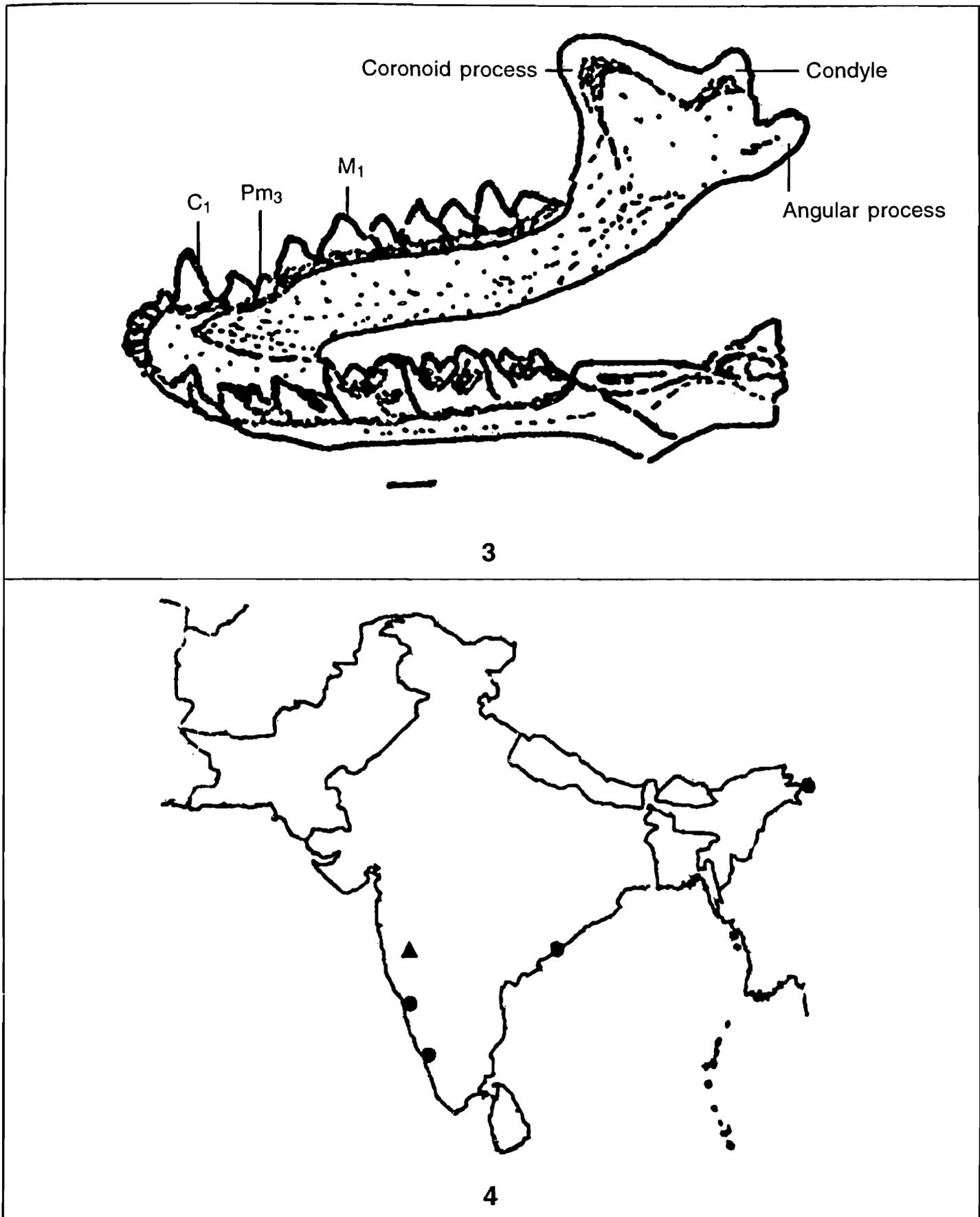


Fig. 3. :The camera lucida drawing of the lower jaw of *Myotis montivagus*. Bar = 1 mm.

Fig. 4. :Distribution of *Myotis montivagus* in India. ● Previous records (as mentioned by Bates & Harrison, 1997) and ▲ the recently found out location in the northern part of the Western Ghats.

Nothing could be known about the reproductive cycle, since female bats were not found. But the maternity colony is assumed in the nearby place, as most of the evening bats reproduce in post winter season in India and parturition occurs just before monsoon.

Feeding habits : The fecal analysis showed remnants of exoskeleton of hard shelled beetles, scales of moths, parts of antennae, wings, mouth-parts, legs and cornea of beetles and moths.

Beetles dominated the fecal matter visually and comprised about 98% of fecal matter, remaining was of soft bodied moths. The results indicate preference of bats towards hard shelled insects.

DISCUSSION

Myotis montivagus is reported from China, Myanmar, Western Malaysia, Indonesia and India. In the Indian subcontinent it is reported at Gersoppa falls (Type locality of *M. montivagus peytoni* in Karnataka state, India) and Anakkampoye (Kerala state, India) in the Western Ghats region and two additional localities in the Vishakhapatnam district of the Eastern Ghats of India. Their distribution ranges from the altitude 400 meters (Wroughton, 1913i, at Gersoppa) to 1052 meters (Ghosh, 1989, at Eastern Ghats). The present study reports the extension in the distribution of this species towards northern part of the Western Ghats region and again at the altitude 1340 meters at two places in the Mahabaleshwar region (Maharashtra state, India). Preference for roosting site at high altitude in the vicinity of the running streams or big falls for the present species, therefore is clearly evident. Not much is known about the reproduction of this species till now.

CONSERVATION STATUS

Myotis montivagus is included as "Lower Risk, Near Threatened" in the 1996 IUCN Red List of Threatened Animals (Baillie & Groombridge, 1996). In India the species is considered Vulnerable (C.A.M.P. 2002, workshop for Chiroptera of south Asia, Madurai), due to restricted area and continuing decline in quality of habitat (B2ab-iii; D2). The occurrence of the species in the Northern Western Ghats seemed to be rare.

SUMMARY

The evening bats belonging to genus *Myotis* are found restricted to rich water sources in the Western Ghats region of Maharashtra state, India. While surveying the bat species in this region, two colonies of the Burmese Whiskered bat, *Myotis montivagus* were reported from Mahabaleshwar region (N 17°56' – E 73°42').

The sites were located at high altitude (1340 meters) in the crevices and holes on the slope of the hilly region. The basalt rocks were falling in the path of the running streams and were wet in the early hot summer days. Isolated mature male bats were trapped from each of the sites and measured for taxonomical studies.

The fecal analysis revealed that these bats thrive on hard shelled insects and moths. Nothing could be known about the reproductive cycle.

Myotis montivagus is assessed as vulnerable taxon in South Asia. The present record is the first report from the northern Western Ghats, previously it was recorded in 1913 and the last decade of twentieth century in the southern part of Western Ghats. *Myotis montivagus peytoni* is the endemic subspecies of the Indian subcontinent, and seemed to be rare in occurrence.

ACKNOWLEDGEMENT

The recent survey is funded by the Ministry of Environment and Forests, Government of India. Authors are thankful to Mr. Wagh V. K. (Principal, Fergusson College, Pune) and Mr. Momin M. M. (Head of the Zoology Department, Fergusson College, Pune -Maharashtra, India) for providing the laboratory facilities and hearty cooperation. Thanks are due to Dr. Mahabal A. S. (Officer In Charge, Zoological Survey of India, Western Region, Akurdi-Pune) for moral support and encouragement and Dr. Pradhan M. S. (Scientist D, Zoological Survey of India- Western Region, Akurdi-Pune) for confirming the taxonomical status of the specimens and valuable suggestions for preparing the manuscript.

REFERENCES

- Baillie, J. and Groombridge, B. 1996. 1996 IUCN Red List of Threatened Animals. The IUCN Species Survival Commission, Gland & Washington, 368 pp.
- Bates, P.J.J. and Harrison, D.I. 1997. *Bats of Indian Subcontinent*. Harisson Zoological Museum Publication. Bowerwood House, St. Botolph's Road. Sevenoaks, Kent TN 13 3AQ, England. Pp. 258.
- Corbet, G.B. and Hill, J.E. 1986. *A world list of Mammalian species*. British Mus. (Nat. Hist.), London. 226 pp.
- Ellerman, J.R. and Morrison-Scott, T.C. 1951. *Checklist of Palaearctic and Indian Mammals 1758 to 1946*. British Mus. (Nat. Hist.), London. 810 pp.
- Ghosh, M.K. 1989. New locality records for *Myotis montivagus peytoni* Wroughton & Reley, 1913, and *Murina cyclotis cyclotis* Dobson, 1872 (Chiroptera : Vespertilionidae) in the Eastern Ghats of Andhra Pradesh, India. *J. Bombay nat. Hist. Soc.*, **86** : 93-94.
- Whitaker Jr., J.O. (1998). Food Habits Analysis of Insectivorous Bats. In : *Ecological and Behavioral Methods for the Study of Bats*. Pp. 171-189.
- Wroughton, R.C. 1913i. Report No. 6 : Kanara. Bombay Natural History Society's Mammal Survey of India. *J. Bombay nat. Hist. Soc.*, **22** : 29-44.
- Wroughton, R.C. and Ryley, K.V 1913. Scientific results from the Mammals Survey, III. *J. Bombay nat. Hist. Soc.*, **22** : 13-21.