LESSER FALSE VAMPIRE BAT

Megaderma spasma in Odisha

IUCN Red List:

Global — LC
(Csorba et al. 2008)

National

India — LC

Roosting of *Megaderma spasma* in Gupteswar caves of Odisha

Mammalia
[Class of Mammals]

Chiroptera
[Order of Bats]

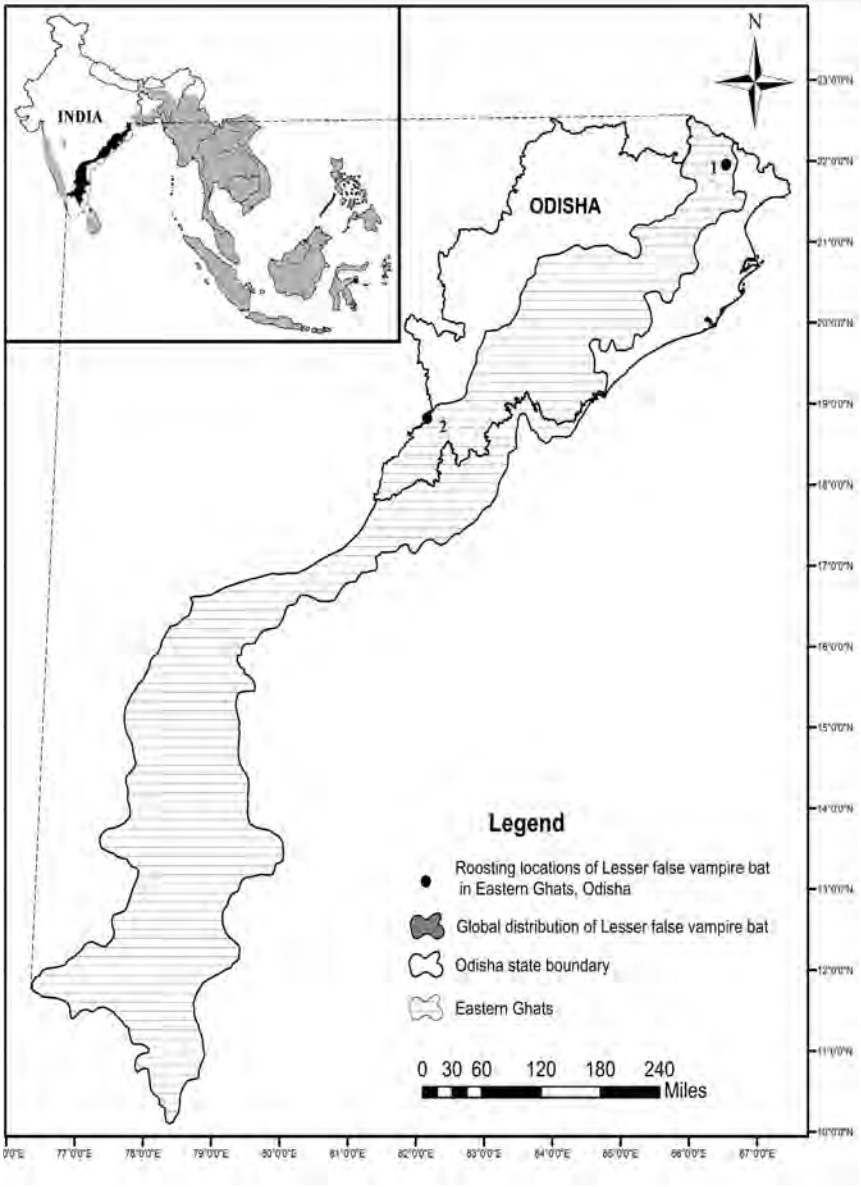
Megadermatidae
[Family of False Vampire Bats]

Megaderma spasma
[Lesser False Vampire Bat]
[Common Asian Ghost Bat]

Species described by Linnaeus in 1758

The Lesser False Vampire Bat *Megaderma spasma* Linnaeus, 1758 is one among the five species of megadermatids found in the Old World tropics (Wilson & Reeder 2005) and widely distributed over South and Southeast Asian countries (Csorba et al. 2008). The species is found in humid areas ranging from dense tropical moist forests in South Asia (Molur et al. 2002) to lowland primary and secondary forests in Southeast Asia (Heaney et al. 1991).

The diurnal roosts include caves, abandoned buildings, temples, lofts of thatched huts, tiled roofs, tree hollows and disused mines (Csorba et al. 2008) and recently reported below water tank (Devkar & Upadhyay 2015). It lives in small colonies of single individual (Debata et al. 2013) to 30 individuals (Ellis 2015) which varies seasonally.



Roosting locations of *Megaderma spasma* in Eastern Ghats, Odisha

Global Distribution (Csorba et al. 2008):

South Asia — Bangladesh, India, Sri Lanka.

Southeast Asia — Sumatra, Java, Sulawesi, Halmahera, Indonesia, Borneo (Brunei, Indonesia and Malaysia), Philippines.

In India, it is predominantly known from the Western Ghats and northeastern India (Bates & Harrison 1997; Csorba et al. 2008) with sporadic records from West Bengal (Molur et al. 2002), Odisha (Debata et al. 2013), Gujarat (Alam 2010; Devkar & Upadhyay 2015) and Andaman Islands (Aul et al. 2014). Occurrence of Lesser False Vampire bat in the dry and arid regions of Gujarat is vital ecological information to the earlier biased understanding of its preference towards humid areas.

While surveying bats in different parts of Odisha, roosting sites of *M. spasma* were recorded from two different localities of the state. On 11 January 2014, the first roosting site was encountered from an abandoned wooded house in Odisha Tourism Development Corporation guest house premises near Lulung of Similipal Biosphere Reserve (SBR) in northern Odisha (21°56′01.62”N, 86°32′55.73”E; elevation 151m). The roost was occupied by three individuals at a height of seven meters from the ground and

Detailed morphological measurements of *M. spasma* from Eastern Ghats, Odisha

External Characters	Measurements (in mm)	
	Range (n=5)	Mean ± S.D.
Forearm Length	54.9- 61.8	58.48 ± 3.0
Head-body Length	68.9- 75.4	71.28 ± 2.69
Ear length	33.9- 37.6	35.86 ± 1.75
Nose-leaf	5.6- 6.3	5.94 ± 0.27

Megaderma spasma. Notice the short, vertical and convex sided nose-leaf.

Additional record of the Lesser False Vampire from Odisha, India

about 80m away from the nearby Palpala River along a riparian zone of SBR. The place is about 158km of aerial distance from the previously recorded roosting site (Sundergarh District; Debata et al. 2013) in western Odisha. Subsequently, on 26 December 2014, the second roosting site, at about 573km of aerial distance towards south from SBR was observed from an underground lime stone cave of Gupteswar hills in southern Odisha (18°49′12.97”N, 82°10′9.64”E; elevation 495m). The site is also situated along a riparian zone of Gupteswar Reserve Forest at a distance of 240m away from the adjoining Saberi River. The cave is spacious inside with a narrow opening. All the roosting individuals were closely packed with each other at about three meters above ground. Upon further approaching, the group segregated into different parts of the cave, making it possible to count 47 individual bats in the roost. The place is about 515km of aerial distance from the previously recorded roosting site in western Odisha (Debata et al. 2013). Vegetation of all the recorded localities is tropical mixed moist deciduous type (Champion & Seth 1968) and

biogeographically fall under Eastern Ghats, which represents a discontinuous series of hill ranges spreading between 11°30′ to 22°N latitude and 76°50′ to 86°30′E longitude from the northern limits of Odisha to the Vaigai River in Tamil Nadu through Andhra Pradesh and some parts of Karnataka (Sinha 1971; Environmental Information System) and forms a part of Deccan Peninsula (Rodger & Panwar 1988).

The species is distinguished from other Indian insectivore bats by absence of tail and from its close relative, *M. lyra* E. Geoffroy, 1810 by having a short, vertical and convex sided nose-leaf with distinctly heart-shaped base followed by tall and oval shaped ears jointed only at the base. Based on these morphological characters and external measurements, the species is confirmed to be *M. spasma* by following the identification keys (Bates & Harrison 1997; Srinivasulu et al. 2010). As these morphological features are clearly identifiable, none of the species were collected.

Occurrence of Lesser false vampire bat from two widely separated regions of Eastern Ghats in Odisha, one from extreme north and the other from the southern region is the first report from the Eastern Ghats and it is probably been overlooked by the earlier workers. Even, lack of systematic survey has underestimated the biological significance of the region. Recent faunal discoveries from the Eastern Ghats, however, give a new insight to the earlier biased understanding of distribution of many species across Indian subcontinent by having affinity with that of eastern Himalaya and Western Ghats elements (Mohapatra et al. 2010, 2014; Agarwal et al. 2013; Nayak et al. 2014; Debata et al. 2015). The area is believed to be a dispersal route of biodiversity to and from Southeast Asia (Das et al. 2015). This finding also supports the hypothesis being Eastern Ghats as a refuge of relict population of many wet zone species once widely distributed (Hora 1949; Mohapatra et al. 2010; Agarwal et al. 2013). Vegetation of the Eastern Ghats is a mosaic of moist to dry deciduous with few pockets of semi evergreen forests (Champion & Seth 1968) encompassing 11 wildlife sanctuaries, two tiger reserves and one biosphere reserve, thus a great diversity of forest dwelling bat is expected. Unfortunately, bat fauna of this region in particular to Odisha has not been properly understood. The increasing anthropogenic activities in terms of mining, construction of dams, monoculture plantations are the biggest threats to the ecosystem and biodiversity of this hill ranges (Das et al. 2015). So a systematic survey of bats in Odisha in particular to the Eastern Ghats is necessary which can give a better insight to understand the diversity and geographic range of different species and aid in fostering their conservation in long run.

Acknowledgements
We thank the Principal Chief Conservator of Forests, Odisha for permission to carry out the study in Similipal Biosphere Reserve. The first author would like to thank the Rufford Foundation for providing a small grant for the study in Similipal Biosphere Reserve and the field staffs of SBR for their support during field survey. The first authors also likes to thank University Grants Commission for providing Non-NET PhD fellowship. Authors thankfully acknowledge the help and support of Himanhu S. Palei, Tuhinansu Kar, Sudheer K. Jena, Shakti S. Nanda, Swetashree Purohit and Manish Kumar Bakshi during field survey. Local villagers are also thanked for helping in identifying the bat roosts.

References

Agarwal, I., M. Wilkinson, P.P. Mohapatra, S.K. Dutta, V.B. Giri & D.J. Gower (2013). The first teresomatan caecilian (Amphibia: Gymnophiona) from the Eastern Ghats of India-a new species of *Gegeneophis* Peters, 1880. *Zootaxa* 3693(4): 534 – 546; http://doi.org/10.11646/zootaxa.3693.4.7

Alam, S. (2010). First record of Lesser False Vampire Bat (*Megaderma spasma* Linnaeus, 1758) in Gir National Park and Sanctuary. *Journal of Bombay Natural History Society* 107(2): 155-156.

Aul, B., P.J.J. Bates, D.L. Harrison & G. Marimuthu (2014). Diversity, distribution and status of bats on the Andaman and Nicobar Islands, India. *Oryx* 48(2): 204–212.

Bates, P.J.J. & D.L. Harrison (1997). Bats of the Indian Subcontinent. Harrison Zoological Museum, Sevenoaks, England, UK, 258pp.

Champion, H.G. & S.K. Seth (1968). *A Revised Survey the Forest Types of India*, New Delhi: Manager of Publications, Govt. of India, 404pp.

Csorba, G., S. Bumrungsri, K. Helgen, C. Francis, P. Bates, M. Gumal, T. Kingston, L. Heaney, D. Balete, J. Esselstyn, S. Molur & C. Srinivasulu (2008). *Megaderma spasma*. The IUCN Red List of Threatened Species 2008: e.T12939A3399869. http://doi.org/10.2305/IUCN.UK.2008.RLTS.T12939A3399869.en. Downloaded on 18 January 2017.

Das, P.K., P.P. Mohapatra & A.K. Biswal (2015). *Glimpse of biodiversity of Odisha*, Odisha Biodiversity Board, Bhubaneswar, Odisha, India, 82pp.

Debata, S., H.S. Palei, P.P. Mohapatra & A.K. Mishra (2013). First record of Lesser False Vampire bat (*Megaderma spasma* Linnaeus, 1758) from Sundergarh, Odisha, India. *Small Mammal Mail* 5(1): 26-27.

Debata, S., H.S. Palei, P.P. Mohapatra and S.K. Palita (2015). Additional records of Cantor's Leaf-Nosed Bat *Hipposideros galeritus* Cantor, 1846 (Mammalia: Chiroptera: Hipposideridae) in eastern India: Odisha. *Journal of Threatened Taxa* 7(8): 7477-7479; http://doi.org/10.11609/JoTT.o4247.7477-9.

Devkar, R. & K. Upadhyay (2015). Sighting of Lesser False Vampire Bat (*Megaderma spasma*) from Central Gujarat, India. *Small Mammal Mail* 7(1): 2-3.

Ellis, E. (1999). "*Megaderma spasma*" (On-line), Animal Diversity Web. Accessed on 07 October 2015 at http://animaldiversity.org/accounts/Megaderma_spasma.

Environmental Information System. Topography. In Ecology of Eastern Ghats. Aaccessed on 07 October 2015. http://www.eptrienvis.nic.in/All%20PDF%20Files/Topography.pdf

Heaney, L.R., D.S. Balete, M.L. Dollar, A.C. Alcala, A.T.L. Dans, P.C. Gonzales, N.R. Ingle, M.V. Lepiten, W.L.R. Oliver, P.S. Ong, E.A. Rickart, B.R. Tabaranza Jr. & R.C.B. Utzurrum (1998). A synopsis of the mammalian fauna of the Philippine Islands. Fieldiana: *Zoology* (New Series) 88: 1–61.

Hora, S.L. (1949). Satpura Hypothesis of the Distribution of the Malayan Fauna and Flora to Peninsular India. *Proceedings of the National Institute of Sciences of India* 15(8): 309-314.

Mohapatra, P.P., A. Das & S.K. Dutta (2010). *Psammodynastes pulverulentus*, range extension from Eastern Ghats, Andhra Pradesh. *Herpetological Review* 41(1): 111.

Mohapatra, P.P., H.S. Palei & S.A. Hussain (2014). Occurrence of Asian Small-clawed Otter *Aonyx cinereus* (Illiger, 1815) in Eastern India. *Current Science* 107(3): 367-370.

Molur, S., G. Marimuthu, C. Srinivasulu, S. Mistry, A.M. Hutson, P.J.J. Bates, S. Walker, K.P. Priya & A.R.B. Priya (2002). *Report of Status of South Asian Chiroptera: Conservation Assessment and Management Plan*. Zoo Outreach Organisation, CBSG South Asia & WILD Society, Coimbatore, India. i-viii+154pp.

Nayak, A.K., M.V. Nair & P.P. Mohapatra (2014). Stripe-necked Mongoose *Herpestes vitticollis* in Odisha, eastern India: a biogeographically significant record. *Small Carnivore Conservation* 51: 71-73.

Rodger, W.A. & H.S. Panwar (1988). *Planning a Protected Area network in India*. Vol I & II. The Report. Wildlife Institute of India, Dehradun, India.

Sinha, B.N. (1971). *Geography of Orissa*, National Book Trust, New Delhi, 351pp.

Srinivasulu, C., P.A. Racey & S. Mistry (2010). A key to the bats (Mammalia: Chiroptera) of South Asia. *Journal of Threatened Taxa* 2(7): 1001-1076; http://doi.org/10.11609/JoTT.o2352.1001-76

Wilson, D.E. & D.M. Reeder (Eds). (2005). Mammal Species of The World. 3rd Edition. Johns Hopkins University Press, Baltimore, MD. 2 Volumes, 2141pp.

Subrat Debata[1], Sharat Kumar Palita[2] & Anup Kumar Nayak[3]

[1,2] Department of Biodiversity and Conservation of Natural Resources, Central University of Orissa, Koraput, Odisha, India
[3] Office of the Field Director, Satkosia Tiger Reserve and Regional Chief Conservator of Forests, Anugul Circle, Anugul, Odisha, India
Email: [1] subrat.debata007@gmail.com, [2] skpalita@gmail.com (Corresponding author), [3] anupnayak@gmail.com