Effects of a Bengal Slow Loris *Nycticebus bengalensis* (Primates: Lorisidae) bite: a case study from Murlen National Park, Mizoram, India

Amit Kumar Bal¹, Anthony J. Giordano² & Sushanto Gouda³

¹² The Society for the Preservation of Endangered Carnivores and their International Ecological Study (SPECIES), PO Box 7403, Ventura, CA 93006, USA.
³ Amity Institute of Forestry and Wildlife, Amity University, Noida, Uttar Pradesh 201313, India.
¹ amitamu096@gmail.com, ² species1@hotmail.com, ³ sushantogouda@gmail.com (corresponding author)

Abstract: Lorises are the only known venomous primates. Threatened by habitat loss and pet trade, lorises and the effects of their bite, have received little attention to date. Given the growing number of accounts of bites by lorises on humans and paucity of information on their venom, here we present a case study on the context and results of a Bengal Slow Loris bite that occurred in the vicinity of Murlen National Park, Mizoram, India.

Keywords: Awareness, conservation, Lorisids, Murlen village, northeastern India, threatened species, victim.

The Bengal or Northern Slow Loris *Nycticebus bengalensis* is an arboreal strepsirrhine primate (Lorisidae) and one of the eight species in the same genus. Found in the tropical evergreen, semi-evergreen, tropical mixed-deciduous, and sub-tropical broadleaf forests of southeastern Asia (Choudhury 2001; Radhakrishna et al. 2006), it is part of a family that includes the only known venomous primate species (Choudhury 2001; Nijman et al. 2014). Slow lorises are distributed across northeastern India, eastern Bangladesh, southern China, Myanmar, northern and central Vietnam, Laos, Cambodia, Thailand, and possibly in northern Peninsular Malaysia (Nekaris et al. 2013; Nijman et al. 2014; Roos et al. 2014). In India, *N. bengalensis* can be found in the northeastern states of Assam, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, and Tripura (Choudhury 1992, 2001; Kumar 2009; Das et al. 2016). It is categorized as a Schedule I species under India’s Wildlife Protection Act, 1972, Appendix I species by CITES (Nekaris & Nijman 2007) and is also listed as ‘Endangered’ as per the IUCN Red List of Threatened Species (Nekaris et al. 2020). Anthropogenic activities such as clearing of forests, forest fires, shifting cultivation, hunting, poaching, pet trade, and importance given to ethno-medicinal uses, all present direct and indirect threats to lorises, and increase the risk of human encounters by several fold (Rowe 1996; Radhakrishna et al. 2006; Nekaris et al. 2013; Kumar et al. 2014; Perkin 2019; Lyngdoh et al. 2021). Cases of slow lorises getting electrocuted and frequent encounters in human dominant areas have also increased in Mizoram due to recent incidences of forest fire in the state (Sushanto Gouda pers. obs. since 2016). When threatened or disturbed, slow lorises tend to bite using teeth resembling a ‘needle-like toothcomb’ and, in the process, they release a venomous secretion obtained from licking a specialised brachial sebaceous
gland (Rode-Margono & Nekaris 2015). Upon mixing with its saliva, this secretion can cause anaphylactic shock in humans and other mammals when bitten (Wilde 1972; Nekaris et al. 2013; Gardiner et al. 2018). Over the past several decades, many cases of bites by slow lorises have been reported, particularly in the past 10 years (Wilde 1972; Kumar et al. 2014; Madani & Nekaris 2014; Inoue et al. 2021). Here we describe an actual incident, which involved a Bengal Loris biting a person from Murlen village, a largely rural community located on the periphery of Murlen National Park (MNP) in Mizoram, India.

**STUDY AREA**

This report originates from Murlen village (23.671°N, 93.273°E), a fringe village located just outside MNP about 30 km from the Myanmar border. MNP is a protected area of 100 km² which falls within the Indo-Burma Biodiversity hotspot. Situated in the Champhai district of Mizoram, the area is very close to the Chin Hills. MNP has six fringe villages, including Murlen village, which has a human population of 240 individuals. Locals here are dependent mainly on agriculture, and practice the slash and burn cultivation method. The individual loris discussed herein was eventually released back into the wild unharmed after being rescued from the site where the incident occurred.

**Case report**

On 22 of January 2022, our team visited a shifting cultivation area, approximately 4 km from Murlen village. This is an area where local people were clearing the secondary forest for subsistence agriculture. During our visit, we came upon a Bengal Slow Loris on a branch at the top of a *Castanopsis tribuloides* tree (local name- *Thing-sia*). The slow loris was in the process of descending the tree as it was about to be cut down (Image 1). Unfortunately, members of the local community decided they were going to kill it, due in part to the fact that no vegetation remained in the surrounding areas to which it could escape. However, we intervened, offering to rescue and release it into MNP. After dropping down to the ground, the loris tried to hide among branches that had been felled from the tree. Before we could reach the spot where it was ‘hiding’, a local farmer (age 54) tried to capture it with his bare hands and in the process he was bitten on the middle finger of his left hand. The animal held fast for at least two minutes (Image 2) and after some struggle, we forcibly extricated the finger also freeing the loris. The bite victim insisted on pulling off some body hair from the loris and applied it to his wound, a decision influenced by the local belief that slow loris hairs have great medicinal value and can reduce further bleeding or ill effects. Eventually, AKB placed a jacket over the loris after which it was temporarily placed into a carry bag, made locally from old cotton clothing, for its own protection and safety of everyone else. The bite victim also applied extract to the wound ground from leaves of the plant *Thunbergia grandiflora* (local name-*Va-ko*) (Image 3). We were told this was also to stop the bleeding, and prevent further infection.

Approximately 15 minutes after being bitten, the farmer began to experience severe stomach pain. This was followed by chest pain, difficulty in breathing, nausea, headache, and temporary loss of vision. His face started to swell especially his lips and he began to feel cold. He also mentioned feeling a ‘flow of current’
around the wound and even across his whole hand and then pain around his mouth. Because the location was very remote (i.e., ~50 km from the nearest hospital in the town of Champhai), we could provide no additional medication to him. Upon consulting other farmers who were working in a nearby forest, the bite victim was provided with 500 mg of Paracetamol (Acetaminophen: a pain reliever), 250 mg of Avil (Pheniramine maleate: an antihistamine), and some warm water. He then attempted to rest by laying down, during which he was frequently spitting up, experiencing pain in his neck, and was not able to talk.

After three hours of rest, the farmer felt better and was able to walk back to the village. However, on his way back, he complained of a headache and stomach pain. Upon reaching the village, we went to the nearest forest adjacent to MNP, and safely released the slow loris (Image 1). When we inquired about the health condition of the farmer the next day, he had completely recovered with no symptoms of the slow loris’s venom, nor did he need or ask for any additional medications.

**Discussion**

Although the slow loris is generally regarded as a shy and cryptic species, it is also frequently exploited for the pet trade throughout southeastern Asia (Nijman & Nekaris 2014; Lyngdoh et al. 2021). In the northeastern states of India, locals are known to hunt and also consume the meat of slow loris, whereas their fur is believed to have ethno-medical uses in treating excessive bleeding and other injuries (Jugli et al. 2020). Most cases involving a venomous loris bite on humans across southeastern Asia are reported for Pygmy Slow Loris (N. pygmaeus), although others have included the Bengal Slow Loris (N. bengalensis), Philippine Slow Loris (N. menagensis) and Javan Slow Loris (N. javanicus) (Gardiner et al. 2018). In prior cases, the impact of Slow Loris bites has ranged from passing or fleeting to more long-lasting effects or complications, with healing time ranging from one day to >8 months (Rode-Margono & Nekaris 2015; Inoue et al. 2021). The farmer in this case had previously also been bitten by a highly venomous red-tailed Bamboo Pit Viper (Trimeresurus erythrurus) which could have led to greater immunological resistance, and thus aided his speedy recovery. Avil (Pheniramine maleate) and paracetamol (Acetaminophen) are not necessarily known to be prescribed drugs for loris bites, yet this combination of antihistamine and pain reliever may have proven effective in this case.

Finally, after interviewing some local people from the village around MNP, we learned that in past years, there were at least three cases of slow loris bites. We found that two of the victims reported similar experiences to the one of the farmer we describe here, whereas the other suffered no symptoms at all. Though the effect seemed in our case to last only a few hours, considering the remoteness of the area and the lack of medical facilities, enhanced awareness about the outcomes of potential human interactions with lorises is important to the future safety of both primates and humans. This includes the role that habitat loss, particularly due to extensive shifting cultivation practices and logging, may play in the future and inevitability of such interactions.
The participation of both local communities and forest departments is urgently needed to foster coexistence with, and possibly even stewardship of, slow lorises.

Consent: Written informed consent was obtained for the publication of this report and all accompanying images.

REFERENCES

Choudhury, A.U. (1992). The Slow Loris (Nycticebus coucang) in Northeast India. Primate Report 34: 77–83.

Choudhury, A.U. (2001). Primates in northeast India: An overview of their distribution and conservation. ENVIS Bulletin: Wildlife and Protected Areas 1(1): 92–101.

Das, N., J. Biswas, K. Bhattacharya & K.A.I. Nekaris (2016). Observations on the Bengal Slow Loris Nycticebus bengalensis in Pakke Tiger Reserve, Arunachal Pradesh, India. Asian Primates Journal 6(1): 27–32.

Gardiner, M., A. Weldon, N. Gibson & K.A.I. Nekaris (2018). Survey of practitioners handling slow lorises (Primates: Nycticebus): An assessment of the harmful effects of Slow Loris bites. Journal of Venom Research 9: 1–7.

Inoue, F., I. Akihiko, T. Takafumi, T. Ichikawa, M. Suga, S. Ishihara & S. Nakayama (2021). Severe anaphylactic shock following a Slow Loris bite in a patient with cat allergy. Internal Medicine 60: 3037–3039.

Jugli, S., J. Chakravorty & V.B. Meyer-Rochow (2020). Tangsa and Wancho of North-east India use animals not only as food and medicine but also as additional cultural attributes. Foods 9: 1–29. https://doi.org/10.3390/foods9040528

Kumar, A. (2009). Endangered slow loris’s journey from NERIST to Itanagar Biological Park. The Arunachal Times 1–2.

Kumar, A., K. Sharma, J. Panvor, K. Mazumdar, A. Devi, M. Krishna & P.C. Ray (2014). Threats to the Bengal Slow Loris Nycticebus bengalensis in and around Itanagar Wildlife Sanctuary, Arunachal Pradesh, India: Impediments to conservation. Endangered Species Research 23: 99–106. https://doi.org/10.3354/esr00540

Lyngdoh, A.W., P. Khatonier, J. Das & S. Lyngdoh (2021). A Survival blueprint for the conservation and management of the Bengal Slow Loris, Nycticebus bengalensis, in Meghalya, India. An output from the EDGE of Existence fellowship, Zoological Society of London and National Geographic PhotoArk Program, 2019–2021.

Madani, G. & K.A.I. Nekaris (2014). Anaphylactic shock following the bite of a wild Kayan Slow Loris (Nycticebus kayan): Implications for Slow Loris conservation. Journal of Venomous Animals and Toxins including Tropical Diseases 20: 43. http://www.jvat.org/content/20/1/43

Nekaris, K.A.I. & V. Nijman (2007). CITES proposal highlights rarity of Asian nocturnal primates (Lorisidae: Nycticebus). Folia Primatologica 78: 211–214.

Nekaris, K.A.I., R.S. Moore, E.J. Rode & B.G. Fry (2013). Mad, bad and dangerous to know: The biochemistry, ecology and evolution of Slow Loris venom. Journal of Venomous Animals and Toxins Including Tropical Diseases 19: 21. http://doi.org/10.1186/1678-9199-19-21

Nekaris, K.A.I., H. Al-Razi, M. Blair, N. Das, Q. Ni, E. Samun, U. Streicher, J. Xue-long & L. Yongcheng (2020). Nycticebus bengalensis (errata version published in 2020). The IUCN Red List of Threatened Species 2020: e.T39758A179045340. https://doi.org/10.2305/IUCN.UK.2020-2.RLTS.T39758A179045340.en

Nijman, V. & K.A.I. Nekaris (2014). Traditions, taboos and trade in slow lorises in Sundanese communities in Southern Java, Indonesia. Endangered Species Research 25(1): 79–88. https://doi.org/10.3354/esr00610

Perkin, A. (2019). Rondo Dwarf Galago Paragalago rondoensis (Honess in Kingdon, 1997), pp. 24–27. In: Schnitzer, C., R.A. Mittermeier, A.B. Rylands, F. Chiozza, E.A. Williamson, D. Byler, S. Wich, T. Humle, C. Johnson, H. Mynott & G. McCabe [eds.]. Primates in Peril: The World’s 25 Most Endangered Primates 2018–2020. IUCN SSC Primate Specialist Group, International Primatological Society, Global Wildlife Conservation, and Bristol Zoological Society, Washington, DC.

Radhakrishna, S., A.B. Goswami & A. Sinha (2006). Distribution and conservation of Nycticebus bengalensis in North-eastern India. International Journal of Primatology 27: 971–982.

Rode-Margono, J.E. & K.A.I. Nekaris (2015). Cabinet of Curiosities: Venom systems and their ecological function in mammals, with a focus on primates. Toxins 7: 2639–2658.

Roos, C., R. Boonratana, J. Supriatna, J.R. Fellowes, C.P. Groves, S.D. Nash, A.B. Rylands & R.A. Mittermeier (2014). An updated taxonomy and conservation status review of Asian primates. Asian Primates Journal 4(1): 2–38.

Rowe, N. (1996). A Pictorial Guide to the Living Primates. Pogonias Press, New York, NY.

Wilde, H. (1972). Anaphylactic shock following bite by a slow loris, Nycticebus coucang. American Journal of Tropical Medicine and Hygiene 21: 592–594.
The Journal of Threatened Taxa (JoTT) is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at www.threatenedtaxa.org. All articles published in JoTT are registered under Creative Commons Attribution 4.0 International License unless otherwise mentioned. JoTT allows unrestricted use, reproduction, and distribution of articles in any medium by providing adequate credit to the author(s) and the source of publication.

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

July 2022 | Vol. 14 | No. 7 | Pages: 21331–21486

Date of Publication: 26 July 2022 (Online & Print)

DOI: 10.11609/jott.2022.14.7.21331-21486

Articles

The Javan Leopard Panthera pardus melas (Cuvier, 1809) (Mammalia: Carnivora: Felidae) in West Java, Indonesia: estimating population density and occupancy
– Anton Ario, Senjaya Mercusiana, Ayi Rustadi, Robi Gumilang, I Gede Gelmeg Darma Putra Wirawan & Toni Ahmad Slamet, Pp. 21331–21346

Breeding phenology and population dynamics of the endangered Forest Spiny Reed Frog Afrixalus sylvaticus Schlotz, 1974 in Shimba Hills, Kenya
– Alfayo Koskei, George Eshiamwata, Bernard Kirui & Phylus K. Cheruiyot, Pp. 21347–21355

Icthyofaunal diversity of Senkhi stream, Itanagar, Arunachal Pradesh: a comparative status between 2004–05 and 2018–19
– Koj Taro, Lakpa Tamang & D.N. Das, Pp. 21356–21367

First record of Proceratium Roger, 1863, Zaphinctus Wheeler, 1918, and Vollenhovia Mayr, 1865 (Hymenoptera: Formicidae) from the Western Ghats of peninsular India, description of three new species, and implications for Indian biogeography
– Kalesh Sadasivan & Manoj Kripakaran, Pp. 21368–21387

Communications

New queen? Evidence of a long-living Jaguar Panthera onca (Mammalia: Carnivora: Felidae) in Tikal National Park, Guatemala
– Carlos A. Gaitán, Manolo J. García, M. André Sandoval-Lemus, Vivian R. González-Castillo, Gerber D. Guzmán-Flores & Cristel M. Pineda, Pp. 21388–21395

First camera trap record of Striped Hyena Hyaena hyaena (Linnaeus, 1758) (Mammalia: Carnivora: Hyaenidae) in Parsa National Park, Nepal
– Pramod Raj Regmi, Madhu Chetri, Haribhadra Acharya, Prakash Sigdel, Pp. 21396–21401

Range extension and new ecoregion records of the Crocodile Monitor Varanus salvator (Peters & Doria, 1878) (Reptilia: Varanidae) in Papua New Guinea
– Borja Reh & Jim Thomas, Pp. 21402–21408

A checklist of fish and shellfishes of the Poonthura estuary, southwestern coast of India
– Kiranya Bella, Pramila Sahadevan, Giri Bhavan Sreekantan & Rajeev Raghavan, Pp. 21409–21420

A new species of Protosticta Selys, 1885 (Odonata: Zygoptera: Platystictidae) from Western Ghats, India
– Kalesh Sadasivan, Vinayan P. Naik & K. Abraham Samuel, Pp. 21421–21431

A case study on utilization and conservation of threatened plants in Sechu Tuan Nalla Wildlife Sanctuary, western Himalaya, India
– Puneet Kumar, Harminder Singh & Sushil Kumar Singh, Pp. 21432–21441

A survey of ethno-medicinally important tree species in Nauradehi Wildlife Sanctuary, central India
– Tinku Kumar, Akash Kumar, Amit Jugnu Bishwas & Pramod Kumar Khare, Pp. 21442–21448

Short Communications

Effects of a Bengal Slow Loris Nycticebus bengalensis (Primates: Lorisidae) bite: a case study from Murlen National Park, Mizoram, India
– Amit Kumar Bal, Anthony J. Giordano & Sushanto Gouda, Pp. 21449–21452

First record of Garra birostris Nebeshwar & Vishwanath, 2013 (Cypriniformes: Cyprinidae) from Doyang and Dikhu rivers of Brahmaputra drainage, Nagaland, India
– Sophiya Ezung, Metevinu Kechu & Pranay Punj Pankaj, Pp. 21453–21457

Two new records of Lilac Silverline Apharitis lilacinus (Lepidoptera: Lycanidae) from northeastern India
– Monsoon Jyoti Gogoi, Ngulkholal Khongsai, Biswajit Chakdar & Girish Jathar, Pp. 21458–21461

Illustrated description of the mantis Mesopteryx platycyphala (Mantodea: Mantidae) collected from West Bengal, India
– Gauri Sathaye, Sachin Ranade & Hemant Ghate, Pp. 21462–21466

Cetrelia isidiata (Asahina) W.L. Culb. & C.F. Culb. (Parmeliaceae) – an addition to the Indian lichen biota
– Gaurav K. Mishra, Pooja Maurya & Dalip K. Upreti, Pp. 21467–21469

Notes

A new southern distribution record for Pacific Marten Martes caurina
– Maximilian L. Allen, Brianne Kenny, Benjamin Crawford & Morgan J. Farmer, Pp. 21470–21471

First Asian record of Light-mantled Albatross Phoebetria palpebrata (Foster, 1785) from Rameswaran Island, Tamil Nadu, India
– H. Byju & N. Raveendran, Pp. 21473–21475

Salvia misella Kunth (Lamiaceae) - a new record for Eastern Ghats of India
– Prabhat Kumar Das, Pradeep Kumar Kamila & Pratap Chandra Panda, Pp. 21576–21579

Salsola oppositifolia Desf. in Great Rann of Kachchh, Gujarat – a new record for India
– Rakesh Gujar, Vinesh Gamit, Ketan Tatu & R.K. Sugoor, Pp. 21580–21583

Extended distribution of Impatiens scapiflora (Balsaminaceae) to the flora of Eastern Ghats, India
– T.S. Saravanan, S. Kaliamoorthy, M.Y. Kamble & M.U. Sharief, Pp. 21484–21486

Publisher & Host