

New records of the endangered Southeast Asian Box Turtle, *Cuora amboinensis* (Testudines, Geoemydidae), from Mizoram, northeast India

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The Southeast Asian Box Turtle, *Cuora amboinensis* (Daudin, 1801) (Family: Geoemydidae), is the most diversified and widespread taxon in the genus *Cuora* (Gray, 1856), distributed throughout the southeast Asian mainland (Myanmar, Thailand, Indo-China, Indo-Malaya and the Philippines), north-eastern India (Assam, Nagaland, and Arunachal Pradesh), the Nicobar Islands and the hills of eastern Bangladesh (Moll and Vijaya, 1986; Anderson, 1872; Bhupathy and Choudhury, 1992; Frazier and Das, 1994; Das, 2002). The species consists of four subspecies – *C. a. amboinensis* Daudin, 1802 (East Indian Box Turtle or Wallacean Box Turtle), *C. a. couro* Schweigger, 1812 (Indonesian Box Turtle), *C. a. kamaroma* Rummler and Fritz, 1991 (Malayan Box Turtle) and *C. a. lineata* McCord and Phillipen, 1998 (Burmese Box Turtle) (Schoppe and Das, 2011).

The species is mainly confined to stagnant water bodies favouring shallow muddy areas with thick vegetation, but opportunistically inhabits most types of water bodies except large rivers and reservoirs. It is also known to occur in intermittent streams across hilly forest areas, mangrove creeks, paddy fields and irrigation canals; from tidal areas up to about 400 m elevation (Das, 1991; van Dijk, 1998; Schoppe and Das, 2011). Due to severe threats such as, habitat fragmentation, shifting cultivation, illegal hunting for traditional medicinal purpose and pet trade the species is listed as Endangered by the International Union for

the Conservation of Nature (IUCN, 2020). Also, the species is listed on Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora since 2000 (CITES, 2017). However, to date, the species is not listed under the Indian Wildlife Protection Act, 1972, therefore, a revision is reasonable as it is likely to qualify for listing as Schedule IV (Cota et al., 2020). Here, we provide the first record of *C. amboinensis* from Mizoram, northeast India, which extends the known range of distribution of the species in the country.

The first individual, a juvenile female (Fig. 1A), was collected on 6 August 2020 at 13:20 h. The specimen was found burrowed in mud at the bank of Lawki pond (24.1186°N, 92.3458°E; elevation 90 m), Zawlpui village, Mamit District. The second individual, a juvenile female (Fig. 1B), was sighted basking on a wooden log on 20 November 2020 from Tuirial drainage (23.7752°N, 92.8119°E; elevation 137 m), near Tuirial village, Aizawl district located ca. 60.8 km southeast from the first collection site. The third individual, an adult female (Fig. 1C), was captured on 30 January 2021 at 12:30 h from Beraw drainage (24.3158°N, 92.6527°E; elevation 10 m), Buhchangphai village, Kolasib district which is 38.1 km to the north of the first location.

Taxonomic identification was based on examination of specimens and data provided by Schoppe and Das (2011). Morphometric and meristic characters of the specimens were recorded with a flexible measuring tape, of 1 mm precision. The following diagnostic characters were used for specimen identification: carapace length (CL), carapace width (CW), plastron length (PL) and plastron width (PW) (Table 1). The meristic traits consisted of the carapace and plastron scute patterns including: nuchal scute, vertebral scute, costal scute, marginal shields (from both the left and right), two supra-caudal shields, two gular shields, two humeral shields, two pectoral shields, two abdominal

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Figure 1. (A) A live specimen of juvenile *Cuora amboinensis* from Zawlpui Village. (B) A juvenile *Cuora amboinensis* from Tuirial drainage. (C) An adult *Cuora amboinensis* from Buhchangphai village. (D) A juvenile *Cuora amboinensis* from Lawki pond, Zawlpui Village. Yellow dot mark highlights the anomalous costal shield, positioned 5th on the left side of the costal shield. Photos by G. Z. Hmar (B–D), and Tlau Liana (A).

shields, two femoral shields, and two anal shields. Sex of the specimens was identified following Schoppe and Das (2011). An updated distribution map showing the distributional records of the species in northeast India was prepared using QGIS v. 3.10.8 (Fig. 2).

The head of all the examined species had a dark brownish or olive yellowish with 3 orangish-yellow bands running across the sides of the head. The carapace was highly dome shaped with dark olive colour with a

pale vertebral keel; plastron was yellowish with dark blotches on the marginal and the outer edges of the plastral scute. Limbs of the individuals were olive-yellowish and digits were entirely webbed.

One of the observed localities, Tuirial, represents the southernmost range extension of the species on the Indian mainland, approximately 78.6 km southeast from the previously recorded locality in Baliapunjee (24.2780°N, 92.2694°E; elevation 70 m), Balipipla, Karimganj

Table 1. Morphometric and meristic measurements of the observed specimens of *Cuora amboinensis*. F- Female; CL- Carapace length; CW- Carapace width; PL- Plastron length; PW- Plastron width; MS- Marginal scute; VS- Vertebral scute; CS- Costal scute.

Sex	Collection site	Morphometric Measurement (mm)				Weight (kg)	Scalation				
		CL	CW	PL	PW		MS	VS	CS	Nuchal scute	Caudal Scute
F	Lawki pond	85	85	68	42	0.08	11+11	5	4+5	1	1+1
F	Tuirial drainage	165	160	135	75	0.34	11+11	5	4+4	1	1+1
F	Beraw drainage	250	250	210	108	1.37	11+11	5	4+4	1	1+1

District, Assam (Das and Gupta, 2017). Moreover, we observed a rare and anomalous development of costal shield/scute in the specimen from Lawki pond, Zawlpui village, with five costal shields on the left side (Fig. 1D); the same ratio is maintained in normal development, which is mostly four costal shields on each side of the carapace (Schoppe and Das, 2011).

Cuora amboinensis is a rare species, recorded from a few protected areas in the region and has severely declined outside the protected areas (Ahmed and Das, 2010). As it is categorised as Endangered (Cota et al., 2020), we recommend a precise assessment of its legal status in the country under the Indian Wildlife Protection Act, 1972. Mizoram state, lies within the Indo-Myanmar biodiversity hotspot region (Myers et al., 2000). Although 15 species of testudines have been recorded from Mizoram over the last two decades (Pawar and Choudhury, 2000; Matthew, 2007; Hmar et

al., 2020, 2021), knowledge on the chelonian diversity of the region is still limited. The current observed localities are from secondary forest that falls under tropical wet evergreen forest and tropical semi-evergreen forest (Champion and Seth, 1968) dominated mostly by species such as, *Tectona grandis*, *Ficus semicordata*, *Michelia champaca*, *Bischofia javanica*, *Artocarpus heterophyllus*, *Duabanga grandiflora*, *Melococanna baccifera*, *Dendrocalamus hamiltonii* and *Bambusa tulda*. At present, the habitat of the observed specimens is disturbed by anthropogenic activities such as fishing and agricultural practices; such activities may lead to habitat loss or degradation of the species. Therefore, targeted surveys are required to delimit the geographic range and natural history of the species and to help plan conservation measures.

Acknowledgements. We thank the Chief Wildlife Warden, Department of Environment, Forest and Climate Change, Government of Mizoram for the permission of herpetofaunal collections in Mizoram (Memo No: A. 33011/2/99-CWLW/225). We acknowledged the National Mission for Himalayan Studies (NMHS), Uttarakhand, Department of Science and Technology (DST-SERB-EMEQ) and Department of Biotechnology (DBT), New Delhi for financial assistance. We are grateful to Lalmuansanga, Ht. Decemson, Mathipi Vabeiryureilai, Lalmuanawma and Nancy Vansangkimi for their assistance during the field work. We thank Dr. Jayaditya Purkayastha, Help Earth, Guwahati, Assam for his valuable and helpful comments in pre-reviewing this work.

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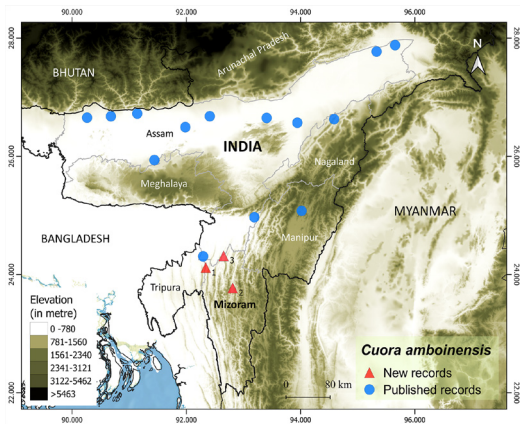


Figure 2. Distribution map of *Cuora amboinensis* in the northeast region of India highlighting the new and existing distribution records.

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