

## First Report of Turtles from the Himalayan Kingdom of Bhutan

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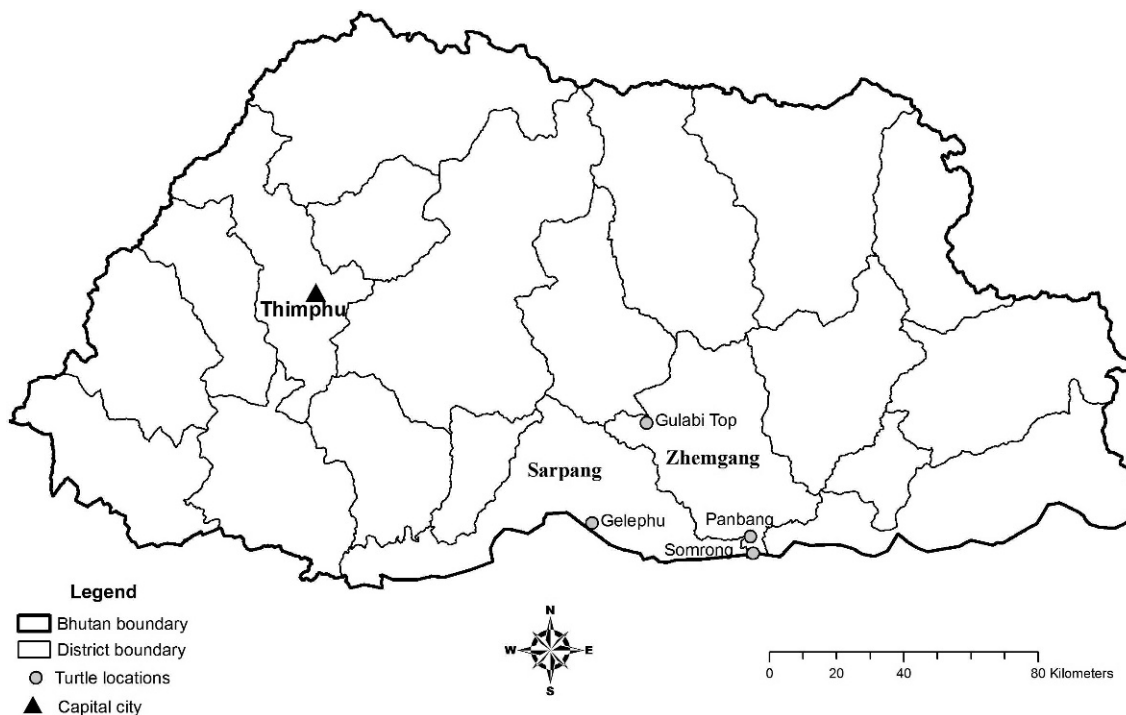
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**ABSTRACT.** – Five turtle species, *Cuora amboinensis*, *C. mouhotii*, *Cyclemys gemeli*, *Melanochelys tricarinata*, and *Indotestudo elongata*, are reported for the first time from the Himalayan Kingdom of Bhutan. The record of *C. mouhotii* represents a significant range extension to the west; that of *C. amboinensis* represents a range extension across a political border from the same landscape in adjacent Northeast India; and those of *C. gemeli*, *M. tricarinata*, and *I. elongata* fill geographic gaps in their known distributions. An analysis of distributions of other turtle species in adjacent eastern Nepal and Northeast India suggests that additional country records of turtles may be found in Bhutan, especially in the southern lowlands of the country.

Bhutan is a mountainous, landlocked Himalayan country, lying between the two large Asian nations of China and India, on the southern slopes of the Himalayas (Fig. 1). Consequently, it was generally assumed that the country is of low priority in terms of turtle conservation, and indeed, no turtle species has been reported during previous herpetological surveys (e.g., Biswas 1976; Bauer and Günther 1992; Das and Palden 2000; Wangyal 2011). Here we report the occurrence of five turtle species in the Himalayan Kingdom of Bhutan. One of these represents a significant range extension to the west, one represents a range extension across a political border from the same landscape in adjacent Northeast India, and three fill geographic gaps in their known global distributions.

For each of these records, we provide a digital voucher, georeferenced locality data within each relevant Dzongkhag (= district), a habitat description, and information on previously known species range. We are convinced that these records refer to naturally occurring, wild individuals (and not human-transported individuals), as they were observed in protected areas within undisturbed broadleaved forests with low human densities. As further evidence, there are no reports of turtle trade or consumption within Bhutan that we are

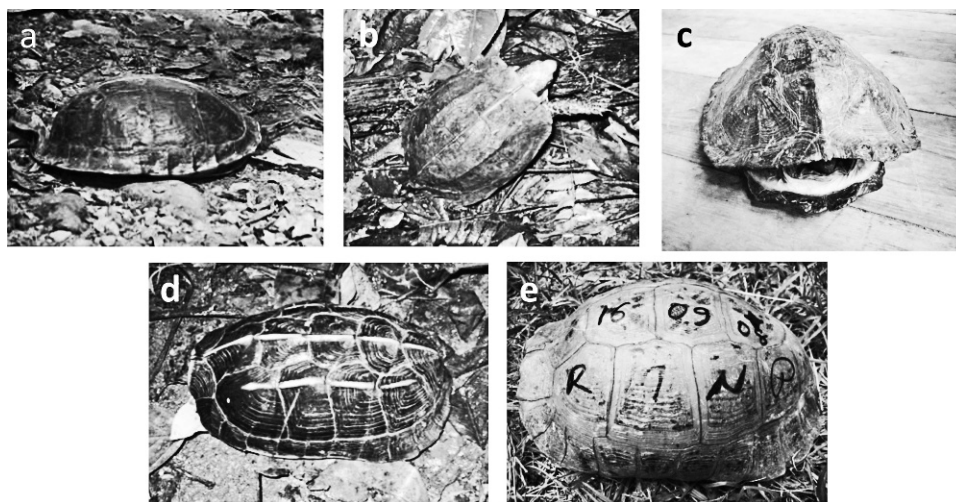


**Figure 1.** Political map of Bhutan, showing localities mentioned in text. Image prepared by Jigme Dorji.

aware of, and these species are known from similar habitats in adjacent parts of eastern Nepal and Northeast India.

Measurement data are available for a single turtle record that was retrieved as a dried shell. Straight carapace length (SCL) was measured along the vertebral line from the nuchal to posterior edge of last marginal. Images were

recorded opportunistically during other field studies, and digital voucher images have been archived at the Raffles Museum for Biodiversity Research, National University of Singapore (ZRC [IMG]). Geographical coordinates and elevation were recorded with a Garmin E-trek Vista or 12XL GPS (datum WGS 84).



**Figure 2.** Voucher photographs for turtles found during field efforts in Bhutan. a. *Cuora amboinensis*, Somrong, Zhemgang District, South-central Bhutan, 255 m asl (ZRC [IMG] 2.150). Photograph by Kinley/World Wide Fund for Nature- Bhutan Programme. b. *Cuora mouhotii*, Gulabi Top, Zhemgang District, South-central Bhutan, 370 m asl (ZRC [IMG] 2.151). Photograph by Dorji Wangchuk. c. *Cyclemys gemeli*, Sershong, Sarpang District, South-east Bhutan, 325 m asl (ZRC [IMG] 2.160b). Photograph by Jigme Tshelthrim Wangyal. d. *Melanochelys tricarinata*, Pangbang, Zhemgang District, South-central Bhutan, 1,350 m asl (ZRC [IMG] 2.152). Photograph by Dorji Wangchuk. e. *Indotestudo elongata*, Gelephu, Sarpang District, Southeast Bhutan, 255 m asl (ZRC [IMG] 2.153). Photograph by Dorji Wangchuk.

## GEOEMYDIDAE

*Cuora amboinensis* (Daudin 1801)

One specimen was found at Norbuling Lake (lat 28°08'30"N, long 100°00'28"E), within the Royal Manas National Park, Sarpang District, Southeast Bhutan, within a tree buttress near a lake, at an altitude of 390 m asl on 14 April 2006. A second individual (Fig. 2a) was found at Somrong (lat 26°47'28.9"N, long 90°58'11.37.9"E), Zhemgang District, South-central Bhutan, within a tropical broadleaf forest, at the edge of a stream, at an altitude of 253 m asl on 6 October 2010. The Bhutanese records are not unexpected, as the species has been recorded from the Manas Tiger Reserve of Assam State, India (Das 1990), which abuts Bhutan's southeastern border. The known distribution of the species encompasses Northeast India, Bangladesh, the Nicobar Archipelago, Myanmar, Thailand, China, Vietnam, the Malay Peninsula, Sumatra, Borneo, Java, Sulawesi, Ceram, Ambon, and the Philippines (Das 1987, 1995; Rummler and Fritz 1991; Nguyen and Ho 1996; Cox et al. 1998; Zhang et al. 1998).

*Cuora mouhotii* (Gray 1842)

One specimen (Fig. 2b) was found at Gulabi Top (lat 26°50'14"N, long 90°58'11.79"E), Zhemgang District, south-central Bhutan, at an altitude of 370 m asl on 6 June 2007 in hilly subtropical broadleaf forest with thick, moist undergrowth.

The current record is the first for Bhutan, and an extension of range ca. 157 km to the west of Sessa (lat 27°12'N, long 92°30'E). The known distribution of this species extends from Northeast India, through Myanmar, Thailand, Cambodia, and Laos to southern China (Das 1987, 1995; Nguyen and Ho 1996; Zhang et al. 1998; Choudhury 2001b). The nearest records to Bhutan are those from the north bank of the River Brahmaputra in Northeast India, reported by Choudhury (2001a), from Drupong Reserve Forest (Papum Pare District, Arunachal Pradesh), Balipara Reserve Forest (Sonitpur District, Assam State), and Sessa (West Kameng District, Arunachal Pradesh).

*Cyclemys gemeli* (Fritz et al. 2008)

One specimen (Fig. 2c) was found at Sershong (lat 26°56'18.83"N, long 90°31'06.65"E), Sarpang District, Southeast Bhutan, at an altitude of 315 m asl on 7 June 2011. Found at the edge of a tropical broadleaf forest.

This recently described species is known from near Bahraich, Uttar Pradesh (near the Nepal border), across to northeastern India (Fritz et al. 2008), including Nepal (Rai 2004) and Bangladesh (Kabir et al. 2009), although with apparently isolated populations. This species is a member of a taxonomically cryptic lineage of Asian turtles, species determination by external morphology alone being difficult (see Praschag et al. 2009). However, as the morphological details match this species and no other

**Table 1.** List of turtles known from Bhutan, compared with those from adjacent areas in eastern Nepal, and Northeast India. Extralimital distribution data were obtained from Choudhury (2001a), Das (1990, 1995, 1997, 2009), Frazier (1992), Frazier and Das (1994), Schleich and Kästle (2002), Shah (1995), Shah and Tiwari (2004), Shaw (1931), and Shrestha (2000).

Species	Bhutan	Eastern Nepal	Northeast India	Remarks
<b>GEOEMYDIDAE</b>				
<i>Cuora amboinensis</i>	+	–	+	New record for Bhutan
<i>Cuora mouhotii</i>	+	–	+	New record for Bhutan
<i>Cyclemys gemeli</i>	+	+	+	New record for Bhutan
<i>Geoclemys hamiltonii</i>	–	+	+	Occurrence in Bhutan likely
<i>Hardella thurjii</i>	–	+	+	Occurrence in Bhutan likely
<i>Kachuga dhongoka</i>	–	+	+	Occurrence in Bhutan likely
<i>Kachuga kachuga</i>	–	+	+	Occurrence in Bhutan likely
<i>Melanocheilus tricarinata</i>	+	+	+	New record for Bhutan
<i>Melanocheilus trijuga</i>	–	+	+	Occurrence of subspecies <i>indopeninsularis</i> in Bhutan likely
<i>Morenia petersi</i>	–	+	+	Occurrence in Bhutan likely
<i>Pangshura smithii</i>	–	+	+	Occurrence of subspecies <i>pallidipes</i> in Bhutan likely
<i>Pangshura sylhetensis</i>	–	–	+	Occurrence in Bhutan likely
<i>Pangshura tectum</i>	–	+	+	Occurrence in Bhutan likely
<i>Pangshura tentoria</i>	–	+	+	Occurrence of subspecies <i>flaviventer</i> in Bhutan likely
<b>TESTUDINIDAE</b>				
<i>Indotestudo elongata</i>	+	+	+	New record for Bhutan
<b>TRIONYCHIDAE</b>				
<i>Chitra indica</i>	–	+	+	Occurrence in Bhutan likely
<i>Lissemys punctata</i>	–	+	+	Occurrence of subspecies <i>andersoni</i> in Bhutan likely
<i>Nilssonina gangeticus</i>	–	+	+	Occurrence in Bhutan likely
<i>Nilssonina hurum</i>	–	+	+	Occurrence in Bhutan likely
<i>Nilssonina nigricans</i>	–	–	+	Occurrence in Bhutan likely

species of *Cyclemys* have been reported further west of northeastern India, we allocated the Bhutanese material to this nominal species.

#### *Melanochelys tricarinata* (Blyth, 1856)

One specimen (Fig. 2d) was found at Pangbang (lat 27°08'37.8"N, long 90°39'34.0"E), Zhemgang District, south-central Bhutan, at an altitude of 350 m asl on 6 June 2007 in subtropical broadleaf forest. The known distribution of the species includes areas east, west, and south of Bhutan, including the Manas Tiger Reserve of Assam State (Das 1990) which abuts Bhutan's southeastern borders. Therefore, a Bhutanese record is not unexpected. The range of the species is northern and eastern India, along the foothills of the Himalayas to Northeast India and in northern Bangladesh, and there appears to be a disjunct population in extreme Southeast Bangladesh (Das 1995, 2009; Kabir et al. 2009).

#### TESTUDINIDAE

##### *Indotestudo elongata* (Blyth, 1853)

One specimen, represented by a complete shell with scutes (Fig. 2e) of SCL 260 mm, was found at Gelephu (lat 26°52'28.08"N, long 90°29'43.09"E), Sarpang District, Southeast Bhutan, at an altitude of 255 m asl on 16 September 2008 on a river bed at the edge of tropical broadleaf forest near a human settlement. This species is known from isolated localities (perhaps an effect of habitat fragmentation) in Nepal, northern West Bengal, northern Orissa, eastern Bihar, Jharkhand, Assam (Goalpara and the Cachar Hills), Mizoram and Meghalaya (Khasi Hills), and Bangladesh, besides Myanmar, southern China, Laos, Thailand, Cambodia, Vietnam, and the Malay Peninsula (Swan and Leviton 1962; Zhao and Adler 1993; Das 1995; Nguyen and Ho 1996; Cox et al. 1998; Zhang et al. 1998; Choudhury 2001b; Jha 2009). Given its known distribution east, west, and south of Bhutan (see Frazier 1992), the current record is unsurprising.

#### SUMMARY

These five species of turtles are being reported from Bhutan for the first time. All were from subtropical forests, at the edge of the lowlands called "duars" that are subject to land use practices such as shifting cultivation, overgrazing, and burning, as well as extraction of timber for manufacturing traditional medicine (Sargent 1985; Karan 1990; Das and Palden 2001). Additional turtle species are likely to be found in Bhutan. These include species that are known from Manas Tiger Reserve (*Pangshura smithii*, *P. sylhetensis*, and *P. tentoria*; Das 1990), a protected area in Northeast Indian state of Assam that is adjacent to the Royal Manas National Park in south-eastern Bhutan. Other turtle species have distributions that approach the southern borders of Bhutan, in eastern India's West Bengal state, including the Baradighi area (*Nilssonina hurum*; Shaw

1931; Das 1995), and Gorumara Wildlife Sanctuary (*Pangshura tectum*, *Melanochelys trijuga*, *Nilssonina* sp., and *Lissemys punctata*; Das 1997). Turtles that reach eastern Nepal (including *Morenia petersi*) are also expected to occur in appropriate habitats in Bhutan. Table 1 summarizes the occurrences of turtles in Bhutan and adjacent areas.

#### ACKNOWLEDGMENTS

We thank our respective institutions, the College of Natural Resources, Royal University of Bhutan, the Bumdeling Wildlife Sanctuary, the Royal Manas National Park, and the Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak, for supporting our research. Special thanks are due to Jigme Dorji, College of Natural Resources, for preparing the map for the paper, and to Kinley, World Wide Fund for Nature-Bhutan Programme, for the image of *Cuora amboinensis*. Finally, we thank Kelvin K.P. Lim, Raffles Museum for Biodiversity Research, National University of Singapore, for ZRC digital voucher numbers, and Aaron Bauer and Bryan Stuart for reviewing the manuscript.

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Received: 15 August 2011

Revised and Accepted: 20 March 2012

Handling Editor: Anders Rhodin