



Further specimens and phylogenetic position of the recently described leaf turtle species *Cyclemys gemeli* (Testudines: Geoemydidae)

PETER PRASCHAG¹, ANNA K. HUNSDÖRFER² & UWE FRITZ^{2,3}

¹Am Katzelbach 98, A-8054 Graz, Austria. E-mail: peter@praschag.at

²Museum of Zoology (Museum für Tierkunde), Natural History State Collections Dresden, A. B. Meyer Building, D-01109 Dresden, Germany. E-mails: anna.hundsdoerfer@snsd.smwk.sachsen.de, uwe.fritz@snsd.smwk.sachsen.de

³Corresponding author

Abstract

We describe external morphology and habitat of ten specimens of *Cyclemys gemeli*, a recently discovered leaf turtle species from north-eastern India, previously known only from its incomplete holotype and photos of a live female. Further, we assess the phylogenetic position of *C. gemeli* using sequence data of the mitochondrial cytochrome *b* gene as well as of three nuclear DNA fragments (C-mos, Rag2 genes, intron 1 of R35 gene) and confirm its genetic distinctiveness. Mitochondrial data strongly suggest a sister group relationship of *C. gemeli* and *C. fusca*, another species occurring in Myanmar. According to our new records, the Naga Hills and the Arakan Mts could constitute the geographical divide between *C. gemeli* and *C. fusca*. Morphologically, *C. gemeli* resembles other dark-bellied *Cyclemys* species and determination by external morphology alone is quite difficult.

Key words: India, Myanmar, *Cyclemys fusca*, *Cyclemys gemeli*, molecular phylogenetics

Introduction

The Southeast Asian leaf turtle genus *Cyclemys* Bell, 1834 is a morphologically difficult group comprising cryptic species. A recent investigation using mitochondrial, nuclear genomic and morphological data revealed the existence of seven species, three of which were described as new for science (Fritz *et al.* 2008). The description of one of the new species, *C. gemeli*, was based only on an incomplete bony shell, sequence data of its mitochondrial cytochrome *b* gene (cyt *b*) and photos of another live turtle from Assam, India. No nuclear genomic data were available. In the present paper, we publish photos of the live specimen mentioned in Fritz *et al.* (2008) and data of nine additional live leaf turtles from north-eastern India. Further, we use saliva samples of four of these individuals for sequencing the mitochondrial cyt *b* gene and the three nuclear DNA fragments (C-mos, Rag2 genes, intron 1 of R35 gene) utilized for phylogenetic reconstructions in Fritz *et al.* (2008) in order to assess their taxonomic and phylogenetic position. We also provide some observations on collection sites and distribution range.

Material and methods

Sampling. During field work in the states of Assam, Meghalaya and Nagaland (north-eastern India), the senior author had the opportunity to study 10 juvenile and adult leaf turtles and to obtain salivary samples (oral swabs) of four specimens for later genetic investigation. Two turtles were kept by locals, while the others were field-collected. Of each turtle, photographs were taken and straight-line carapacial lengths were measured using a calliper (Table 1). Unfortunately the exact measurements of three turtles studied in 2007 were lost on journey.