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Titelbild: *Cuora yunnanensis*

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The Yunnan box turtle, *Cuora yunnanensis* (BOULENGER 1906); historical background and an update on the morphology, distribution and vulnerabilities of the only known living specimens

Torsten Blanck, Ting Zhou & William P. McCord

abstract

A live pair of *Cuora yunnanensis* was purchased in the markets of Kunming, Yunnan, China in 2004 and 2005. This represents the first confirmed specimens found since the Institute of Zoology, Academia Sinica, Beijing specimens of the 1920's. Only 12 vouchered specimens of this species have previously been recorded. Based on these live animals and all available museum material, the species is herein re-described, along with the presentation of data and notes on the current state of knowledge concerning this intriguing turtle species. A re-designated type locality for *Cuora yunnanensis* is presented herein.

key words

Reptilia; Testudines; Geoemydidae; *Cuora yunnanensis*; turtle; china.

History

This enigmatic geoemydid species presently in the genus *Cuora* (GRAY, 1855) was described by GEORGE ALBERT BOULENGER in 1906, the then curator of the British Museum of Natural History in London (BMNH). This description was primarily based on the morphology of the lectotype BMNH 1946.1.22.97 (see BLANCK, 2005 for designation)

a sub-adult female from Tongchuan fu (believed by



Fig. 1: Lateral view of the female *Cuora yunnanensis* lectotype BMNH.1946.1.22.97

some to indicate Dongchuan, see IVERSON, 1992 and below), and the para-lectotypes BMNH 1946.1.22.98, 1946.1.22.99 and 1946.1.23.1-3 (most are sub-adult to adult males with BMNH 1946.1.23.2 being a juvenile, 1946.1.23.3 is now



Fig. 2: Dorsal and ventral views of the *Cuora yunnanensis* lectotype and paralectotypes. From left to right: BMNH 1946.1.22.97, 1946.1.22.98, 1946.1.22.99, 1946.1.23.1 and 1946.1.23.2

found in the SSTM). BOULENGER incorrectly placed this species in the genus *Cycllemys* (BELL, 1834), possibly due to misunderstanding the degree of hinge mobility in the different genera involved, or to the fact that BOULENGER received the specimens already preserved in formalin, which is known to decrease the mobility of the plastral hinge, as is also the situation with most of the specimens being young. SMITH, 1931 was the first to place this species in the genus *Cuora*. At the time of the description, 3 further specimens of *Cuora yunnanensis* (NMW 29936.1, NMW 29936.2 and MNHN 1907.10 (all males)) were known to science, but probably not to BOULENGER. Interestingly, the NMW, MNHN and most BMNH specimens were collected or purchased by the same Father GRAHAM in Yunnan fu, now known as Kunming, the capital of Yunnan Province, China. As stated in BLANCK, 2005, the specimens were probably purchased in the Jing Xing bird and flower market of Kunming or in either the central Yuantong Si or the Huating Si



Fig. 3: Lateral view of *Cuora yunnanensis* NMW 29936 (left) and 29936.2 (right)



Fig. 4: Frontal view of the specimens from Fig.3



Fig. 5: Ventral view of the specimens from Fig.3



Fig 6: Dorsal and ventral views of *Cuora yunnanensis* MNHN 1907.10.;
Photos: Roger Bour

Buddhist Temple ponds in the Xishan Area. BMNH 1946.1.22.97 was collected or purchased by Reverend DYMOND in Tongchuan fu, now called Dongchuan, a small city 100 km northeast of Kunming, northern Yunnan Province, close to Sichuan Province and the Yangtze Kiang River basin.



Fig. 7: The Jing Xing bird and flower market, Kunming, Yunnan, China



Fig. 8: Yuantong Si temple, central Kunming, where many *Ocadia*, *Pelodiscus* and *Trachemys*, can be found



Fig. 9: View of Lake DianChi from the Xishan Mountains, Yunnan Province, China



Fig. 10: The Xishan mountain park, where ZHANG & CHENG, 1946 claimed to have found a *Cuora yunnanensis* female

Another 3 specimens were collected or purchased by an anonymous Chinese collector in the 1920's, again from Kunming and deposited in the IOZB: an adult female (IOZB 00167), an adult male (IOZB 00168), and the plastron, skull and leg of another adults male (IOZB 00169). In May 1940 another possible specimen (female), was said to be collected in Xishan, the forest mountain park adjacent to Kunming by ZHANG (ZHANG & CHENG, 1946), but unfortunately, this specimens is presently missing and unable to be confirmed as a certain record of the species.

BLANCK visited Kunming and the Xishan in 2005 and found that no natural ponds or streams exist, making it unlikely that the species naturally occurred there. Several Buddhist temples

can be found, the largest of them being the aforementioned Huating Si Temple where many turtles can be seen, notably *Trachemys scripta elegans* (WIED-NEUWIED, 1839), with reddish iron-stained shells similar to that observed with several museum specimens of *C. yunnanensis* (see Fig. 2). *Pelodiscus sinensis* (WIEGMANN, 1835), *Ocadia sinensis* (GRAY, 1834) and non-native *Cyclemys dentata* (GRAY, 1831) were also found at the temples, contributing to the impression that *C. yunnanensis* from Kunming are probably derived from these temple ponds and originated from localities other than Kunming. See distribution below for reasons why Kunming is thought not to be part of the natural distribution of this species.

Fig. 11:
Dorsal view of
Cuora yunnanensis
IOZB 00167 (left)
and 00168 (right)



Fig. 12:
Ventral view of the
specimens from Fig. 11



Fig. 13:
Remains of
Cuora yunnanensis
IOZB 000169





Fig. 14: The Huating Si Temple in the Xishan



Fig. 15: Iron-stained *Trachemys scripta elegans* at the Huating Si Temple pond

Another assumed specimen of *C. yunnanensis*, in the collection of the Kunming Zoological Institute of the Academy of Sciences was identified as a *Cuora pani aurocapitata* by the sr. author in 2005.

Until the last few years, not much attention was given to this species since its original description 100 years ago. In March 2004, the first living female specimen since that of ZHANG in 1940, was discovered and purchased by a Kunming citizen named YAN JIE at the Jing Xing bird and flower market of Kunming, Yunnan Province, China, for just a few Euros.



Fig. 16: Lateral view of the live female *Cuora yunnanensis*

This finding was first recorded by ZHOU & ZHAO, 2004, followed by BLANCK, 2005 (see description and comparison with all known museum specimens), BOUR, 2005 and the IUCN, 2006. The IUCN Red List, 2006 still lists *C. yunnanensis* as extinct, with the speculation that this female specimen might be a “designer” hybrid and that genetic analysis of the specimen is needed.



Fig. 17: Antero-lateral view of the live male *Cuora yunnanensis*



Fig. 18: The only stall at the Jing Xing bird and flower market, Kunming selling turtle species other than *Trachemys scripta*, e.g. *Cuora amboinensis*, *Geoemyda spengleri*, *Manouria impressa*, *Ocadia sinensis*; thus possibly where the live 2004 and 2005 specimens were purchased

In June 2005 yet another specimen appeared, this time a male. As with the live female, the first knowledge of the specimen to outsiders came via a Chinese turtle internet forum (PXTX), where photos were posted. ZHOU subsequently found the owner and visited him (ZHOU, 2005). It was another Kunming citizen, a Mr. Wu Hui, who purchased this specimen, again in the Jing Xing bird and flower market in Kunming, possibly from the same turtle dealer as the

2004 specimen. The seller says he obtained the turtle from an old farmer that had kept it for about 15 years (ZHOU, 2005). Captivity is substantiated by two drill holes in the marginal scutes, as seen in BMNH 1946.1.22.97 and NMW 29936.2, already discussed in BLANCK, 2005. These are tether-holes, to secure a turtle found in the field during work to a cord or to prevent a pet specimen from escaping. The morphological characteristics of the live specimens are discussed below.

Unsubstantiated reports of another live female and juvenile have been circulating in 2006. These authors will investigate all possibilities, such as a supposed *C. yunnanensis* shell owned by a Hong Kong dealer, that turned out (TANG pers. comm.) to be a *Chinemys nigricans* (GRAY, 1834) carapace glued to a *Cuora pani* plastron.



Fig. 19: Comparative view of the live male (left) and live female (right) *Cuora yunnanensis*

Morphology (description)

The comparatively flatter male and moderately more domed female carapace is an overall elongated oval shape. The background color of the carapace is chestnut to dark brown, with adult males darker than females, as seen in both the living and museum specimens, i.e. BMNH 1947.1.22.97 (female) & 1947.1.22.98 (male). Juveniles and sub-adults are intermediate to adults in color intensity. The carapace of adult males is more flared posteriorly than in females, giving the males a pear-like shape. In juveniles, sub-adults and young adults the carapace displays a distinct central keel flanked by less prominent lateral keels. These

keels, particularly the laterals, diminish greatly with age. The keels are a distinct light-brown/orange color in living specimens, more so in males, yet these colors are hardly visible in museum specimens. This is a diagnostic feature of this species not published before. As mentioned in BLANCK, 2005, most known



Fig. 20: Antero-dorsal view of the female *Cuora yunnanensis* lectotype BMNH 1946.1.22.97 (left) and male paralectotype BMNH 1946.1.22.98 (right)

specimens have a uniform ivory-colored plastron, with darker seams. There are 3 known exceptions to this: one being NMW 29936.1, having a brown barred pattern resembling that of *Cuora pani*, while the others are the 2004 and 2005 living specimens. The female exhibits a central dark brown blotch extending from the mid-pectoral to the femoral scutes, covering approx. 20% of the scute widths. The living male also has a unique pattern for this species, with the gular scutes completely dark brown and a large dark blotch in the center of the other plastral scutes covering approx. 80% of most scute widths, with the exception of the humeral scutes having only a thin dark area along the midline inter-pectoral seam. This pattern resembles the black plastral pattern of *Cuora mccordi* (ERNST, 1988a) and *Cuora cyclornata* (BLANCK et al. 2006). Thus the plastral pattern of *Cuora yunnanensis* is at this time unexplainably variable.

The ventral marginals are generally ivory in color with some fine blackish spots in all known specimens but NMW 29936.1 and the living male, where infrequent larger dark spots and blotches of varying size appear in both. The plastral hinge is well developed in adults and the front plastral lobe can be completely closed as with other *Cuora*; hinge mobility starts at approx. 85 mm carapace length. We disagree with BOULENGER (1906) and POPE (1935) claiming the hinges of this species are weakly developed. The plastral seam formula is variable, but in most, including both living specimens it is IAb \geq IP \geq IAn>IG>IF>IH.

A distinct anal notch is present in juveniles and sub-adults but almost disappears with age. The background color of the soft parts and head is predominantly brown. Following BOULENGER (1906), SMITH (1931), POPE (1935) ERNST (1988b) and BLANCK (2005), the head exhibits two yellow lateral stripes with dark borders.



Fig. 21: Dorsal view of the live female (left) and the live male(right) *Cuora yunnanensis*. Note the tether holes in the male



Fig. 22: Ventral view of the specimens from Fig. 21

These stripes are variable and in some specimens there are three i.e. both living specimens and to some extent specimen BMNH 1947.1.22.98. In general, the upper stripe begins at the nostril, thins-out on the upper eyelid at the orbit, and continues from behind the eye over the tympanum and down the neck dorso-laterally. The lower stripe is often thinner, sometimes discontinuous, goes along the upper jaw under the eye, passes under the tympanum and down the neck ventro-laterally. There is a variable diminished third lateral stripe, also starting at the nostrils, interrupted by the orbit, ending over the posterior tympanum.

The jaws are bone-colored; the iris is predominantly green, with a black bar running from the 2 to 8 o'clock position.



Fig. 23: Lateral head composite of known specimens of *Cuora yunnanensis*.

Left to right top row: BMNH.1946.1.22.97, 1946.1.23.1, MNHN 1907.10, IOZB 00169 and the living female

Left to right middle row: IOZB 00167, BMNH 1946.1.22.98, BMNH 1946.1.22.99, NMW 29936.2 and the living male

Left to right bottom row: NMW 29936.1, BMNH 1946.1.23.2, IOZB 00168, BMNH 1946.1.23.3 (SSTM). Photos by Torsten Blanck, Ting Zhou and Roger Bour

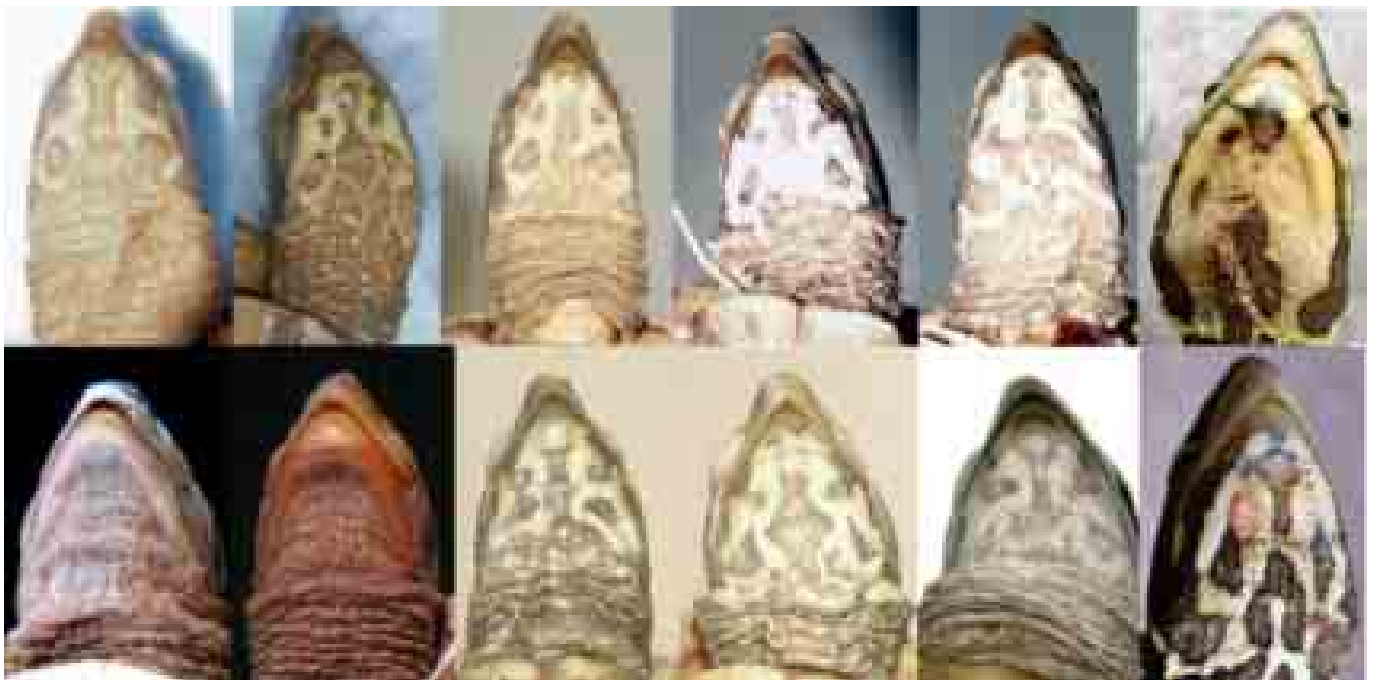


Fig. 24: Throat composite of most known specimens of *Cuora yunnanensis*.

Left to right top row: BMNH.1946.1.22.97, 1946.1.22.98, 1946.1.22.99, 1946.1.23.1, 1946.1.23.2 and the living female

Left to right bottom row: IOZB 00167, 00168, NMW 29936.1, 29936.2, MNHN 1907.10 and the live male

The yellow throat displays a conical mottled pattern, present in all museum specimens and the living male. It consists of a variable but generally bi-laterally symmetrical pattern, boldest anteriorly, diminishing often to a few small yellow dots halfway down the ventral neck. The living female *C. yunnanensis* represents the only specimen not having the mottled throat pattern, instead having three



Fig. 25: Lateral view of the live male *Cuora yunnanensis*

brown blotches, raising the question as to whether it is an expression of individual or geographical variation. The latter appears unlikely since the other specimens are consistent with this character although collected from different locations. According to BOULENGER (1906), the stripes on the head and legs and the throat markings are orange in color. According to SMITH (1931) they are yellow and orange in live specimens. POPE (1935) stated that the throat pattern of live specimens consisted of orange and yellow spots. The live female and all museum specimens available have a yellow throat and head stripe coloration. The living male however has a yellow throat and lateral head stripes, all turning orange on the neck.

The front limbs have five curved claws, whereas there are four on the hind limbs. The legs are dark brown in color. The feet are webbed, suggesting an aquatic lifestyle. The lateral edge of the front and hind legs bear a yellow (all museum specimens and living female) or orange (living male) stripe. Furthermore, the front limbs have a bold dorsal yellow (museum specimens & living female) or orange (living male) stripe extending from the upper leg to the second claw. Such a stripe is also present in *Mauremys rivulata* (VALENCIENNES, 1833), where it extends distally to the first claw and in *Mauremys annamensis* also usually extending to the first claw, and with which *C. yunnanensis* also shares having a tricarinate carapace,



Fig. 26: Lateral and ventral head composite of the live female (top and middle left) and male (top and middle right) *Cuora yunnanensis* specimens and *Mauremys annamensis* (bottom left and right). Note the similar patterns

the same general carapace and soft tissue coloration and a similar head and throat pattern (see below).

Leg stripes may vary, i.e. BMNH 1946.1.22.98 exhibits a second dorsal stripe on each front leg, branching off the previously mentioned stripe and ending at the first claw. The live specimens also have a small yellow (female)/orange (male) spot at the dorsal base of each claw on all four feet.

The medial limbs display yellow (museum specimens & living female) to orange (living male) reticulations, as do the axillary and inguinal fossae. The brown tail



Fig. 27: Front leg composite of *Cuora yunnanensis* and *Mauremys annamensis*. Top row: live female *Cuora yunnanensis* (left) and a live *M. annamensis* (right); Bottom row: *Cuora yunnanensis* BMNH 1946.1.22.98 (left) and a live *M. annamensis* (right). Note the similar but variable patterns

has two light yellow dorso-lateral stripes, as is found in *C. pani*, *C. trifasciata* and *C. cyclornata*.

Between the morphology shown here and in BLANCK (2005), it is clear, that there is much phenotypic variability in this species. With the lack of presence in the markets ruling out likely geographic variation from a wide distribution, we are left at this time to conclude there is a high incidence of individual variation in *C. yunnanensis*.

Obvious sexual dimorphism is present in this species: the

carapace of males is much flatter than in females; males are pear shaped and flared at the 8th to 9th marginal scutes, while the female carapace is nearly rectangular; the coloring of the carapace is lighter brown in females than in males; the coloring of the soft tissues is orange in males and yellowish in females; the head of the male is longer in proportion to the carapace length than in females; the tail is thicker at its base, longer in relation to the length of the plastron, and has the cloaca situated beyond the rear margin of the carapace in males; and the plastron is slightly concave only in adult male *C. yunnanensis*, as is the evident in BMNH 1946.1.22.98 and the living specimen.

The recently discovered, 152.2 mm SCL live male is larger than the 125.5 mm SCL BMNH 1947.1.22.98 previous record size male. The live 186.2 mm SCL female is larger than the 138.4 mm SCL type specimen, BMNH 1947.1.22.47 and the 164.7 mm SCL IOZB 00167 previous record size female. Thus the species grows larger than thought by ERNST (1988b), POPE (1935), SMITH (1931) or BOULENGER (1906), consistent with the other *Cuora* species. The living female now weighs 1200 g; the male 400 g (see Table 1 for growth data).

Captive Observations

The live female is omnivorous in captivity, feeding on earthworms, shrimp, fish, pork, strawberries, tomatoes and carrots. The live male in captivity appears to be carnivorous, eating only the “meats” from a variety of foods offered. Both specimens eat only in water. They have been kept in a constant water

temperature of 19~31°C, with no attempt to simulate hibernation. The male is more withdrawn than the female.

Genetics

Many people (including the IUCN, 2006) believe *Cuora yunnanensis* is a hybrid, possibly between *Cuora pani* (SONG, 1984) and *Chinemys reevesi* (GRAY, 1831), due to its rarity and potentially shared morphological characters, as was discussed in detail in BLANCK, 2005. Another potential source of parental DNA would be *Mauremys annamensis* (SIEBENROCK, 1903), with which *C. yunnanensis* shares a number of morphological features as mentioned above.

PARHAM et al. (2004) genetically analyzed the MNHN 1907.10 specimen and concluded, that it is probably not a hybrid, but rather a distinct *Cuora* species, and is sister to *Cuora flavomarginata* (GRAY, 1863), a rather terrestrial, morphologically different box turtle, as opposed to being more closely related to the morphologically similar *Cuora trifasciata* (BELL, 1825), *Cuora pani pani* (SONG, 1984) *Cuora pani aurocapitata* (LUO & ZONG, 1988) and *Cuora cyclornata* (BLANCK et al. 2006). The flaws in this analysis are also discussed in detail in BLANCK, 2005. Larger specimen sampling, including the live specimens is needed for a more valid genetic analysis. This will be difficult, as the owners of the known live specimens do not allow any tissue taken from their valuable specimens. The final phylogenetic placement of *C. yunnanensis* will have to wait until more specimens are found and viable DNA is available for analysis.

Distribution

Despite the fact that 14 out of the 15 specimens known were obtained in Kunming, it is unlikely that the species has ever naturally occurred in or around this city. Kunming (25°02'N, 102°43'E), is situated at an elevation of 1893 m above sea level. With summer temperatures rarely above 23°C, this area is not suited to *Cuora* egg incubation. The type specimen of *Cuora yunnanensis* was derived from Tongchuan fu, according to IVERSON, 1992, which is believed by some to be an older synonym of Dongchuan Shi (26°11'N, 103°03'E), where nearby climatic conditions would be far better for the reproduction of *C. yunnanensis*. Although Dongchuan itself is situated at an elevation of 1878m, it lies immediately adjacent to the 185 km long, 695m elevation XiaoJiang River basin which is a tributary of the Jinsha section of the Yangtze River system. Summer temperatures there are often above 25 °C making it more suitable for *C. yunnanensis* to occur, however, recent visitors to this locality were unable to find any signs of *C. yunnanensis* through locals or in markets.



Map: Broken Green Circles: Suspected areas of distribution of *Cuora yunnanensis* (see text)
Red lines: Southwest Silk Road, used for commerce until early 20th century
Green spots: Important localities mentioned in the text

TANG (pers. comm.) and BLANCK, (see FALLING RAIN, 2004) found that Tongchuan fu (= Tungchwan-fu), is actually not the old name for Dongchuan, as designated by IVERSON, 1992 and followed by all subsequent authors, but rather the old name for Zhongping (= Huize) City (26°42'N, 103°30'E). This locality is at 2217 m elevation and is the capital of Huize County (the former Tungchwan county), northern Yunnan, China. It is located 35 km northeast of Dongchuan, very close to the Yangtze River lowland drainage and the Xili He River, close also to the Sichuan Province border and only a few hundred kilometres southwest of the distribution of the morphologically closely related *Cuora pani* in Sichuan Province. Zhongping City records maximum summer temperatures of 30°C, with an average temperature of 23 °C from April to September, thus the same climate as in Kunming, making it unlikely that *C. yunnanensis* occurs naturally in the city proper, but the Jinsha River basin is approx. 30 km away, offering a more favourable climate for turtles at 600-1000m elevation. For the reasons above and for more clarity, using the origin of the lectotype, we hereby re-designate the type

locality of *C. yunnanensis* as the vicinity of Zhongping (Huize) City (26°42'N, 103°30'E) in Huize County, northeastern Yunnan Province, China (= Tongchuan Fu).

Dr. RAO DING QI, a *C. yunnanensis* researcher with the Academia Sinica working in cooperation with Kadoorie Farms, Hong Kong, mentioned (pers. comm.) that northern Yunnan is currently under investigation and that the local people of this area are familiar with a turtle with a “white” plastron, however, so far all turtles presented to him were *Pelodiscus sinensis*, which has a white plastron.

Outside China, HOIJNY (pers. comm.) reports unsubstantiated stories of a turtle with a yellow plastron and a brown carapace from northern Laos and the nearby northwestern Vietnam border area, and the eastern Xishuangbanna region of southern Yunnan, in China, all offering tropical rainforests with average summer temperatures of 28°C, and an elevation of 500 - 1200 m, lower than most of Yunnan Province. The overall herpetofauna of this potential *C. yunnanensis* locality is poorly researched to this day.

More anecdotal information tells of a brown Cuora-like turtle originating from the vicinity of Ping Bian (22°58'N, 103°40'E) and Hekou Yao (22°42'N, 104°00'E), southeastern Yunnan Province close to the delta of the Red River and from the nearby northern Vietnam border area. The presence of subtropical rainforests at elevations of 800 – 1400 m might offer suitable habitat for *C. yunnanensis* in this area.

Specimens from this distance, in days past, could have been transported via the “Southwest Silk Road”, which interestingly passed through all these locations, towards Kunming and farther to Zhongping (see Map). Between inaccessibility and rarity of the turtles, current research on *C. yunnanensis* in the above mentioned areas is difficult. The likelihood of the species being restricted to a very small distribution adds to the challenge.

It is possible the present scarcity of the species is due to previously searching in the wrong places (i.e. Kunming and Dongchuan area) for it, similar to the scenario of *Siebenrockiella leytensis* (TAYLOR, 1920), which was thought to be extirpated or extremely rare, until it was rediscovered in 2003 (DIESMOS et al. 2004) in good numbers on the Island of Palawan, 600 km away from its misleading type locality, the island of Leyte, where it probably never existed.

Habitat

The habitat is presently uncertain, but according to morphology and behaviour in captivity, the species likely occupies habitats similar to that of *Cuora pani* and *Cuora trifasciata*, i.e. slow moving streams in the hill and mountain rainforests at elevations of approx. 300 - 800 m.



Fig. 28: Frontal view of the only known live female (left) and the only known live male (right) *Cuora yunnanensis*

Vulnerability

As with all Southeast Asian turtle species, *Cuora yunnanensis* is threatened by habitat destruction, by collection for the food markets and by the pet trade. If this species is endemic to a small area of distribution, these threats would be higher than for most species. The owners of the two known live specimens have been offered more than 50,000 US\$ for these specimens by European, American, Japanese and Chinese collectors, making *C. yunnanensis* the highest priced turtle species in the world, increasing the probability of total extirpation. Presently, along with the commercial dealers and the private collectors searching for them is Dr. RAO DING QI of the Kunming Institute of Zoology, sponsored partly by Kadoorie Farms of Hong Kong. He intends to make it a protected area if the habitat is found, hopefully before others decimate whatever population still exists in the wild. These authors encourage the owners of the two presently known live specimens to reproduce them for the sake of the survival of the species.

We also encourage the IUCN to tentatively change the official status of *C. yunnanensis* from extinct to critically endangered using the morphological data presently known, until a more valid molecular analysis is performed

Live female	July 2004	July 2005	July 2006
Weight	850 g	950 g	1200 g
SCL	175.2 mm	178.4 mm	186.2 mm
SMCW	118.6 mm	119.3 mm	120.1 mm
MCH	74.0 mm	74.5 mm	74.8 mm
SPL	183.5 mm	185.6 mm	188.3 mm
SPW	101.2 mm	101.7 mm	103.5 mm
Live male	July 2004	July 2005	July 2006
Weight	n.a.	370 g	400 g
SCL	n.a.	148.9 mm	152.2 mm
SMCW	n.a.	101.7 mm	106.1 mm
MCH	n.a.	55.6 mm	56.3 mm
SPL	n.a.	133.2 mm	136.5 mm
SPW	n.a.	79.1 mm	79.3 mm

Table 1: Measurements of the 2004 and 2005 live *Cuora yunnanensis* specimens.

Measurements in Table 1 were obtained by the following methods:

SCL (straight carapace length) – taken along the midline, in a straight line from the anterior to the posterior border of the carapace; SMCW (straight maximum carapace width) - taken in a straight line at the level of maximum carapace width; MCH (maximum carapace height) - taken at the level of maximum carapace height; SPL (straight plastron length) - taken along the midline in a straight line from the anterior plastral border to the anal notch; SPW (straight plastral width) – taken in a straight line at the base of the anterior plastral lobe.

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Museum acronyms

BMNH (British Museum of Natural History); IOZB (Institute of Zoology, Academia Sinica, Beijing); NMW (Naturhistorisches Museum Wien); MNHN (Muséum National d'Histoire Naturelle, Paris); SSTM (Shanghai Science and Technology Museum).

Literature

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Die Yunnan-Dosenschildkröte, *Cuora yunnanensis* (BOULENGER, 1906); Geschichte, neue Erkenntnisse zur Morphologie, Verbreitung und Gefährdung der einzigen bekannten lebenden Exemplare

Deutsche Kurz-Zusammenfassung von Andreas Budischek

abstract

Bis 2004 und 2005 ein lebendes Pärchen auf den Lebendtiermärkten von Kunming, Yunnan gekauft wurde, galt *Cuora yunnanensis* seit den 20er Jahren als ausgestorben. Diese Tiere sind die ersten, die seit den letzten Exemplaren des zoologischen Instituts der chinesischen Akademie in Peking lebend gefunden wurden. Bisher gibt es von *C. yunnanensis* lediglich zwölf belegte Exemplare. Basierend auf den nunmehr gefundenen lebenden Exemplaren und dem verfügbaren Material aus Museen, beschreibt der vorliegende Artikel diese Art wieder. Gleichzeitig werden neueste Daten und Erkenntnisse dieser faszinierenden Art vorgelegt. Weiters wird die ursprüngliche Typuslokalität untermauert.

key words

Reptilia; Testudines; Geoemydidae; *Cuora yunnanensis*; Schildkröten; China.

Geschichte

Von Boulenger 2006 ursprünglich als *Cyclemys yunnanensis* beschrieben, wurde die rätselhafte Art später richtigerweise von SMITH (1931) unter die Gattung *Cuora* gestellt. Die bis heute gefundenen Belegexemplare stammen aus Kunming und Xishan, China. BLANCK bereiste 2005 beide Gebiete und musste feststellen, dass es dort keine natürlichen Habitate (Teiche, Tümpel, Flüsse o.ä.) gibt. Ein natürliches Vorkommen der Art ist daher in diesen Gebieten sehr unwahrscheinlich.

Nachdem *C. yunnanensis* in den letzten hundert Jahren wenig Aufmerksamkeit geschenkt wurde, konnte 2004 erstmals ein lebendes weibliches Exemplar von YAN JIE auf dem Vogel- und Blumenmarkt in Kunming, Yunnan, China erworben werden; und das für eine Hand voll Euro. Trotz mehrerer Berichte über diesen „Fund“ wird die Art auch 2006 auf der IUCN Red List als ausgestorben geführt. Dies auf Grund von Spekulationen über „Designer Hybriden“. Im Juni 2005 tauchte zusätzlich noch ein männliches Exemplar auf demselben Markt auf. Ungesicherten Aussagen zufolge sollen ein weiteres weibliches Exemplar und ein Jungtier existieren. Des weiteren stellte sich ein angeblich von *Cuora yunnanensis* stammender Panzer jedoch als ein zusammengeklebter Carapax von *Chinemys nigricans* mit einem Plastron von *Cuora pani* heraus (TANG, pers. Mittlg.).

Morphologie

Der vergleichsweise flachere Carapax des Männchens und der eher gewölbte des Weibchens hat eine längliche Form und ist kastanien- bis dunkelbraun (♀ heller, ♂ dunkler). Der Carapax ausgewachsener Männchen ist leicht birnenförmig. Jungtiere besitzen einen stärkeren mittleren Kiel flankiert von zwei weniger dominanten seitlichen Kielen. Diese Kiele, besonders die seitlichen, verschwinden mit zunehmendem Alter. Dies ist ein in bisher nicht beschriebenes Merkmal von *C. yunnanensis*. Die meisten Exemplare haben ein elfenbeinfärbiges Plastron mit dunkleren Nähten. Die ventralen Marginalia sind ebenfalls meist elfenbeinfärbig mit feinen schwarzen Punkten. Das Gelenk am Plastron ist gut entwickelt und kann ab zirka 85 mm Carapaxlänge bewegt werden. Die Grundfarbe der Weichteile und des Kopfes ist überwiegend braun. Der Kopf hat zwei seitliche dunkel eingefasste gelbe Streifen. Diese variieren von Exemplar zu Exemplar und einige Tiere besitzen derer drei. Die gelbe Kehle besitzt einen kegelförmigen gesprenkelten Fleck, mit Ausnahme des lebenden Weibchens, welches stattdessen drei braune Flecken besitzt. Das wirft die Frage auf, ob es sich hierbei um eine spezielle Färbung eines Exemplars, oder um die Merkmale einer verbreitungsabhängigen Variabilität handelt. Die Streifen an Kopf und Beinen variieren von gelb bis orange und von Exemplar zu Exemplar stark. Die Füße besitzen Schwimmhäute, was auf einen aquatilen Lebensstil hinweist.

Die Geschlechter unterscheiden sich zusätzlich zur Panzerform noch durch den beim Männchen an der Wurzel dickeren, im Vergleich zur Carapaxlänge längeren und mit der Kloakenöffnung weiter außen liegenden Schwanz.

Das vor kurzem entdeckte lebende Männchen ist mit einer Carapaxlänge von derzeit 152,2 mm weit größer als das bisher beschriebene größte Exemplar mit 125,5 mm. Auch das lebende Weibchen ist mit 186,2 mm größer als alle bisher beschriebenen. Beide stellen somit gleich einen neuen Größenrekord für *C. yunnanensis* dar.

Erfahrungen bei der Haltung

Das lebende Weibchen ernährt sich in Gefangenschaft omnivor hauptsächlich von Regenwürmern, Shrimps, Fisch, Schweinefleisch, Erdbeeren, Tomaten und Karotten. Das Männchen scheint eher carnivor zu sein und ernährt sich ausschließlich von Fleisch, obwohl verschiedenstes Futter angeboten wird. Beide Exemplare fressen ausschließlich im Wasser. Sie werden bei jeweils konstanten Temperaturen von 19 °C bis ungefähr 31 °C gehalten und machen keine Anstalten eine Winterruhe einzugehen. Die Lebensweise des Männchens ist mehr zurückgezogen, als die des Weibchens.

Genetik

Oft wird vermutet, dass es sich bei *C. yunnanensis* um einen Hybriden, möglicherweise zwischen *Cuora pani* und *Chinemys reevesii* oder *Mauremys annamensis* handelt. Genetische Untersuchungen von PARHAM et al. (2004) zeigten jedoch, dass sich eher um eine *Cuora* als einen Hybriden handelt. Da die derzeitigen Besitzer der Tiere keine Gewebeproben zulassen, muss eine endgültige Klärung jedoch auf weitere lebende Exemplare warten.

Verbreitung

Trotz dem Umstand, dass 14 der 15 bekannten Exemplare in Kunming erworben wurden, ist es sehr unwahrscheinlich, dass sie dort jemals vorkamen. Kunming liegt 1893 m über dem Meeresspiegel mit Sommertemperaturen selten über 23 °C, nicht geeignet *Cuora* Eier zu inkubieren. TANG (pers. Mittlg.) und BLANCK fanden jedoch erstmals heraus das der Fundort des Typusexemplars Tongchuan fu, der alte Name von Zhongping (= Huize) ist. Die Stadt selbst hat zwar ähnliche Temperaturverhältnisse wie Kunming, jedoch liegt in nur 30km Entfernung der Talkessel des Flusses Jinsha, der in 600 – 1000 m Meereshöhe ein besseres Klima für Schildkröten bietet. Somit wird hiermit die Typuslokalität von *C. yunnanensis* wie beim Typusexemplar angegeben, auf Zhongping (Huize) Stadt (26°42'N, 103°30'E) im Bezirk Huize, nordöstliche Yunnan Provinz, China (= Tongchuan Fu) festgelegt. Es gibt noch weitere Berichte über verschiedene Vorkommen, die jedoch noch unbestätigt blieben. Die entsprechenden Orte sind derart abgelegen und unzugänglich, dass eine Bestätigung sehr schwer werden wird. *C. yunnanensis* ist derart selten, dass man annehmen könnte, vielleicht auch in den falschen Gebieten danach gesucht zu haben.

Habitat

Das Habitat ist derzeit sehr unklar, jedoch aufgrund der Morphologie und dem Verhalten in Gefangenschaft, bewohnt diese Art wahrscheinlich ähnliche Gebiete wie *Cuora pani* und *Cuora trifasciata*. Diese sind langsam fließende Gewässer in den Hügel- und Bergwäldern mit Meereshöhen von 300 – 800 m.

Gefährdung

Mit Angeboten von über 50.000 Dollar aus Europa, USA, China und Japan gilt diese Art als die teuerste Schildkröte der Welt. Diese fragwürdige Ehre verdankt sie unter anderem der Zerstörung der Habitate, dem Absammeln für die Lebendtiermärkte und dem Tierhandel.

Alle Bilder, Tabellen, Literaturhinweise und Danksagungen
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Testudo hermanni hercegovinensis
Foto: M. Petronijevic



Cuora yunnanensis
Foto: T. Zhou

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