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TWO NEW TURTLES FROM SOUTHEAST ASIA

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Abstract.—*Cuora chriskarannarum* (Emydidae: Batagurinae), new species, from Yunnan Province, China, and *Platysternon megacephalum shiui* (Platysternidae), new subspecies, from northern Vietnam are described and compared with other members of their genera.

The recent relaxation of regulations regarding scientific exploration and the collection and export of reptiles from China and Vietnam have introduced many uncommon and unusual animals into the pet trade. Dr. William P. McCord, a turtle fancier, obtained a number of turtles and recognized that some of these animals represented new taxa. Two of these are described below.

Methods and Materials

Straight-line measurements of each specimen were taken with dial calipers accurate to 0.1 mm, of the greatest carapace length, carapace width and depth at the level of the seam between vertebrals 2 and 3, marginal width (the difference between the carapacial width and the width across the pleurals taken between the points of juncture of the marginals and pleurals at the level of the seam between vertebrals 2 and 3), greatest plastron length, greatest width and length of both plastral lobes, greatest bridge length, greatest width and length of vertebrals 1 and 2 and pleural 2, and the medial seam length and greatest width of all plastral scutes. Notes and drawings were made of head, neck, limb, carapacial, plastral, and bridge patterns. Colors were recorded from living turtles and color transparencies. Shell proportions are expressed as ratios of one measurement to another. Sixteen ratios proved useful (abbreviations used in the text are given in parentheses): width/length of cervical scute (W/L CS), width/length of first

vertebral (W/L 1st V), width/length of second vertebral (W/L 2nd V), width/length of second pleural (W/L 2nd Pl), marginal width/carapacial width (MW/CW), marginal width/carapacial length (MW/CL), carapacial width/carapacial length (CW/CL), carapacial depth/carapacial length (D/CL), carapacial depth/carapacial width (D/CW), plastral length/carapacial length (PL/CL), bridge length/plastral length (B/PL), bridge length/carapacial length (B/CL), length of anterior plastral lobe/plastral length (APL/PL), width of anterior plastral lobe/plastral length (APW/PL), length of posterior plastral lobe/plastral length (PPL/PL), and width of posterior plastral lobe/plastral length (PPW/PL). The number of rows of large scales at the lateral edge of the antibrachium between the claw of digit V and the first horizontal skin fold proximal to the elbow (presented in text as foreleg scale rows) was recorded.

Specimens from the following collections were examined (abbreviations used in the text are given in parentheses): William P. McCord personal collection of living turtles (WPM), National Museum of Natural History, Smithsonian Institution (USNM).

Cuora chriskarannarum, new species

Fig. 1

Holotype.—USNM 266162, adult male; Ta Lau Shan, Yunnan Province, China (23°30'N, 102°25'E); Oscar Shiu, Sep 1986.

Paratype.—USNM 266163, adult female; Chinsha (=Chin' Ping), Yunnan

Province, China (22°46'N, 103°15'E); Oscar Shiu, Sep 1986.

Diagnosis.—Flattened, green species of *Cuora* with yellowish-green, black-bordered postorbital stripe, oblique yellowish-green stripe extending from upper jaw to below tympanum to neck, medial carapacial keel most pronounced on vertebrals 1–3, vertebral 1 usually extending laterally to seam separating marginals 1–2 or beyond, broad black seam-following plastral pattern, plastron with wide anal notch, and interanal seam complete.

Description (from all specimens examined).—Carapace length to 160 mm (males 113, females 160), elliptical, flattened (D/CL 0.29–0.42, \bar{x} = 0.346; D/CW 0.40–0.60, \bar{x} = 0.498; CW/CL 0.67–0.73, \bar{x} = 0.694); widest at marginals 8, highest at posterior of vertebral 2. Carapace sides straight, posterior rim slightly serrated and with a very small medial notch. All marginals flared, those over bridge slightly downturned (MW 11.8–17.3 mm, \bar{x} = 14.1; MW/CW 0.13–0.18, \bar{x} = 0.157; MW/CL 0.09–0.14, \bar{x} = 0.109). Marginal 1 widest, marginals 3–6 smallest. Scute texture rough with growth annuli. Cervical rectangular, longer than wide (W/L CS 0.70–0.72, \bar{x} = 0.713). Vertebrals wider than long; vertebral 1 largest and very flared anteriorly, reaching seam separating marginals 1–2 or marginal 2 in 15 (88%) specimens; vertebral 5 posteriorly flared. Low medial keel most pronounced on vertebrals 3–5. Olive-brown, rim yellow, seams outlined with dark brown or black, keel black. Undersides of marginals yellow with black, posteriorly-directed wedge at each seam, some with narrow, radiating black lines.

Plastron length to 159 mm (males 111, females 159), longer than carapace in 7 (41%) specimens (PL/CL 0.96–1.02, \bar{x} = 0.995), slightly upturned anteriorly, movable hinge between pectoral and abdominal scutes. Posterior lobe longer and wider than anterior lobe (APL/PL 0.39–0.44, \bar{x} = 0.414; PPL/PL 0.55–0.60, \bar{x} = 0.578; APW/PL

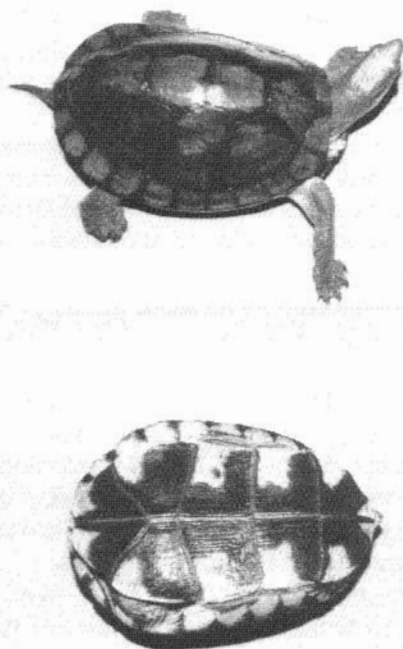


Fig. 1. *Cuora chriskarannarum*, new species.

0.45–0.50, \bar{x} = 0.474; PPW/PL 0.51–0.57, \bar{x} = 0.536; APW/CW 0.62–0.70; \bar{x} = 0.682; PPW/CW 0.74–0.81, \bar{x} = 0.769). Anterior lobe truncated, posterior lobe with shallow anal notch. Anal scutes laterally tapering toward midline. Bridge moderate (B/CL 0.22–0.32, \bar{x} = 0.273; B/PL 0.23–0.31, \bar{x} = 0.274); 0–1 axillaries; 1 inguinal. Average plastral formula An. > Abd. > Pect. > Gul. > Fem. > Hum.; 10 (59%) had this formula, but 5 other formulae occurred; An., Abd., Pect. always longer than Gul., Fem., Hum. Interanal seam present and complete. Yellow with wide black seam-following pattern becoming more extensive with age (size); bridge with black bar.

Head narrow; snout slightly projecting; upper jaw slightly hooked. Olive (lighter dorsally, darker laterally) with yellowish-green postorbital stripe and second yellowish-green stripe extending obliquely downward from upper jaw to below tympanum;

both stripes with narrow black borders. Faint thin black line may circle tympanum. Iris green; unmarked yellow jaws and chin. Neck olive dorsally and laterally, yellowish-green ventrally, several faint, narrow yellow lateral stripes present.

Digits webbed. Forelimbs with large scales (10–15 rows, \bar{x} = 14.0); outer surface olive, inner surface and sockets cream to whitish-green. Hindlimbs with smaller scales, colored as forelimbs. Holotype with amputated right hindlimb. Tail olive dorsally with two dark-bordered longitudinal stripes, venter yellow with olive tip.

Smaller, flatter males having concave plastra, longer thicker tails with anal vent beyond carapacial rim, and pointed snouts; larger, more vaulted females having flat plastra, shorter tails with anal vent beneath carapacial rim, and rounded snouts.

Other material.—WPM 1–15 (live; 2 males, 13 females); from localities of type specimens.

Etymology.—The name *chriskarannarum* is in honor of Dr. McCord's daughters Christine and Karen, and his wife Anne.

Remarks.—The new species is most closely related to *Cuora pani* Song, 1984, *C. trifasciatus* (Bell, 1825), and *C. yunnanensis* (Boulenger, 1906), and at least one additional undescribed species. These taxa form a distinct subgroup within *Cuora* characterized by relatively flattened carapaces, plastrons with wide anal notches, and complete interanal seams. *Cuora pani* is from Shaanxi Province, China. It has a lemon-yellow head with a broad yellow longitudinal stripe, a brown carapace with reddish vertebrals and a keel extending over vertebrals 1–5, a yellow plastron with a pattern of black wedges that are often separated along the seams, and a broad vertebral 1 that may extend to marginals 2. *Cuora trifasciatus* ranges from Kwangsi and Kwangtung provinces and Hainan in China through northern Vietnam and possibly to Burma. Its head is olive dorsally, brown to black laterally, and with a lateral longitudinal

stripe; an olive to brown tricarinate carapace bears three longitudinal black stripes; the black plastron has a yellow border; vertebral 1 usually does not extend to the seam separating marginals 1–2. *Cuora yunnanensis* is known only from the highlands of Yunnan Province, China. It has a brown head with a narrow yellow stripe extending from the nostril through the eye to the neck, a unique mottled chin pattern, a brown carapace with dark seams and a keel extending over all five vertebrals, a yellow to light brown plastron with narrow dark seams, and a vertebral 1 that does not extend to the seam separating marginals 1–2.

Platysternon megacephalum shiui,
new subspecies
Fig. 2

Holotype.—USNM 266160, adult male; vicinity of Langson, Langson Province, Vietnam (26°50'N, 106°45'E); Oscar Shiu, Aug 1986.

Paratype.—USNM 266161, adult male; same collection data as holotype.

Diagnosis.—Head, shell, limbs, sockets, ventral surface of tail heavily speckled with yellow, orange or pink spots; cephalic shield moderately developed, not entering orbit; upper jaw strongly hooked; carapacial surface smooth, posterior rim unserrated; no postorbital stripe, dark plastral figure, or small additional scales at medial juncture of gular and humeral scutes.

Description.—(From all specimens examined.) Carapace length to 151 mm (males 151, females 107), flat (D/CL 0.26–0.31, \bar{x} = 0.280; D/CW 0.38–0.47, \bar{x} = 0.438; CW/CL 0.60–0.68, \bar{x} = 0.640), widest at marginals 9, highest at vertebral 1. Carapace sides straight, or slightly indented at bridge; anterior rim medially indented; posterior rim smooth, but with small medial notch. Anterior and posterior marginals flared, especially over hindlimbs, those at bridge downturned (MW 3.6–7.9 mm, \bar{x} = 5.53; MW/CW 0.42–0.81, \bar{x} = 0.65; MW/CL

0.025–0.045, \bar{x} = 0.041); marginals 1 widest, those over bridge smallest. Scute surfaces smooth. Cervical very small, wider than long (absent in two specimens). Vertebrae wider than long, 5th largest. Medial keel low, blunt; most prominent on vertebrae 3–5. Brown with mottled pattern of small yellow, orange, or orangish-red spots throughout, but most prominent on pleurals and dorsal surface of marginals. Ventral surface of marginals yellowish-brown or olive with yellow, orange or pink speckles.

Plastral length to 112 mm (males 112, females 94); PL/CL 0.75–0.80, \bar{x} = 0.776. Anterior lobe slightly longer than posterior lobe, which wider (APL/PL 0.36–0.47, \bar{x} = 0.433; PPL/PL 0.40–0.44, \bar{x} = 0.423; APW/PL 0.36–0.48, \bar{x} = 0.443; PPW/PL 0.46–0.52, \bar{x} = 0.493; APW/CW 0.46–0.61, \bar{x} = 0.537; PPW/CW 0.55–0.67, \bar{x} = 0.598). Anterior lobe truncated; posterior lobe with anal notch. Femorals and anals laterally tapering toward midline. Bridge narrow; B/CL 0.15–0.20; \bar{x} = 0.173; B/PL 0.19–0.24, \bar{x} = 0.223; 1–2 axillaries, 1–2 inguinals. Plastron connected to carapace by ligaments at bridge. Average plastral formula An. > Hum. > Fem. > Pect. > Abd. > Gul.; 8 formulae present in 11 specimens examined (3 with average formula); variation occurring in Hum., Pect., Fem., and An.; Abd. and Gul. consistently shortest. Yellowish-brown or olive with many small yellow to orangish-red spots throughout, and yellow seams.

Head large, cannot be withdrawn into shell. Snout pointed, projecting; upper jaw strongly hooked. Dorsal cephalic shield only moderately developed, not covering posterior portion of orbit. Upper jaw sheath not as well developed as in other subspecies. Brown with numerous orange to red spots on dorsal and lateral surfaces. Eyes bulging; iris brown. Jaws, chin, throat brown with yellow, orange or red mottling.

Digits webbed. Forelimb with large scales (7–10 rows, \bar{x} = 8). Thighs with tubercle-like scales; skin of outer surface of limbs

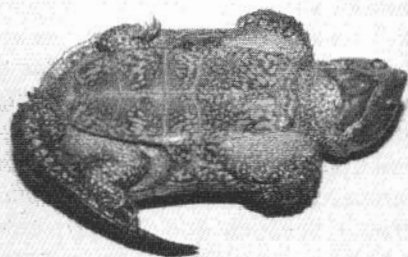
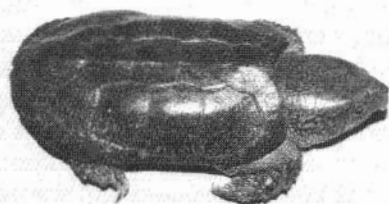


Fig. 2. *Platysternon megacephalum shiui*, new subspecies.

and dorsal surfaces of neck and tail brown; limb sockets and ventral surface of neck yellowish-brown. Limbs, sockets, underside of tail with yellow, orange or red spots. Tail long, covered dorsally with large annular scales.

Males having concave plastra and anal vent beyond carapacial marginals; females flat plastra and vent beneath carapace.

Other material. — WPM 1–9 (live, 7 males, 2 females) from type locality.

Etymology. — The name *shiui* is in honor of the collector Oscar Shiu.

Remarks. — Four other subspecies of *Platysternon megacephalum* have been described. *Platysternon megacephalum megacephalum* Gray, 1831, which occurs in southern China, has an unpatterned yellow plastron, a slightly keeled carapace with poorly developed growth annuli, and a slightly serrated posterior rim, the marginals above the bridge flared, a well developed

cephalic shield that often covers the rear of the orbit, a strongly hooked upper jaw, yellow mottling on the jaws, and a pattern of radiating narrow lines on the dorsal surface of the head. *Platysternon megacephalum peguense* Gray, 1870 is found from western Vietnam west to southern Burma. It has a dark seam-following plastral pattern, the carapacial keel pronounced and sometimes indications of lateral keels, well developed growth annuli, the posterior carapacial rim serrated, unpatterned yellow jaws, a strongly hooked upper jaw, and a black-bordered postorbital stripe. *Platysternon megacephalum vogeli* Wermuth, 1969 occurs in northwestern Thailand. It is similar to *P. m. peguense* in having a dark plastral figure, but differs in having a short, narrow, less hooked upper jaw, and a smooth, unserrated carapace. *Platysternon megacephalum tristernalis* Schleich and Gruber, 1984 is from Yunnan Province, China, and similar to *P. m. megacephalum* except it has three additional small scales at the medial junction of the gular and humeral scutes. It is likely that further study will prove *P. m. vogeli* and *P. m. tristernalis* invalid. Ernst is currently studying the variation within *Platysternon*.

Acknowledgments

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