

A New Subspecies of *Chelodina mccordi* (Testudines: Chelidae) from Eastern Rote Island, Indonesia

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Abstract. A recent field trip to Rote (Pulau Rote; Roti) Island involving these authors has confirmed that two morphologically distinct forms of *Chelodina* exist there; leading here to a formal description and diagnosis of *Chelodina mccordi roteensis* **ssp. nov.** from eastern Rote Island, Indonesia. Our morphological and phenotypic analysis differentiates this new subspecies from the conspecific nominotypical form.

Key words: Turtle, Pleurodira, chelid, *Chelodina mccordi*, Rote Island, Indonesia.



Extant species of side-necked turtles (Pleurodira Cope, 1864) are assigned to three families: Chelidae Gray, 1825, Podocnemidae Cope, 1868, and Pelomedusidae Cope, 1868.

Within the family Chelidae, the genus *Chelodina* Fitzinger, 1826, includes species of snake- or long-necked turtles. Historically (GOODE, 1967; BURBIDGE et al., 1974) and recently (GEORGES et al., 2002), *Chelodina* has been designated as comprising first two, then three subgeneric groups: A (= *Chelodina*), B (= *Macrochelodina* Wells and Wellington, 1985), and C (unnamed, containing only *Chelodina oblonga* Gray, 1841, = *Chelodina colliei* Gray, 1856).

Chelodina mccordi Rhodin, 1994, is a member of subgeneric group A, also called the “*Chelodina longicollis* group.” Species in this subgeneric group have generally narrower, more rounded heads, longer intergular scutes, vestigial barbels, shorter and thinner necks with tubercles, and broader plastrons. More specifically, *C. mccordi* is a member of the *Chelodina novaeguineae* complex — within subgeneric group A (see MCCORD and THOMSON, 2002). Shared characters in species of the *Chelodina novaeguineae* complex include enlarged anterior bridge struts, wide triturating surfaces,

narrow parietal crests, relatively more robust heads (for subgeneric group A) and shells, and an overall brown coloration.

Chelodina mccordi was once well distributed throughout the lakes and swamps of Rote Island (SALIM and YUWONO, pers. obs.). In the seasonal lakes of the Central Plateau region, which may have been a zone of intergradation between eastern and western populations, *C. mccordi* has experienced near complete extirpation. In the past 20 years population numbers have been diminished to near extinction by both the pet trade and mismanaged agricultural practices (GUNALEN, SALIM, and HAGEN, pers. obs.). At present the pet trade is less of a threat because there is little financial reward — the animals are now rare and more difficult to find, and the species has been listed in CITES Appendix II, which restricts trade. On the other hand, rice farmers continue to drain *C. mccordi* habitat for crop irrigation, and pollute the natural waters with chemical runoff; thus agriculture may complete the decimation of the species. We have not observed local consumption of *C. mccordi*, although locals speak of occasionally killing turtles out of a general fear of reptiles (HAGEN, pers. obs.)



Lake Enduy *Chelodina m. roteensis* male. Note robust head. Photo: W. P. McCord



Dorsal view of a female Lake Enduy *Chelodina m. roteensis*. AMNH # R-160132 (holotype). Photo: C. Hagen



Chelodina m. roteensis habitat, Rote Island. Photo: C. Hagen



Plastral view of *Chelodina m. roteensis* holotype. Photo: W. P. McCord



Lake Enduy *Chelodina m. roteensis*. Note the melanism and the distinct carapacial flare. Photo: W. P. McCord



Dorsal view of *Chelodina m. mccordi* from western Rote Island. Note less robust head and skull, less melanism and less distinct carapacial flare. Photo: W. P. McCord

After many years working with *Chelodina mccordi* specimens, we present here an original formal description of its eastern subspecies. This is published to provide a public and permanent scientific record. Date of publication: *Reptilia* (GB) no. 52 (no. 65/ES and no. 14/IT), Castelldefels, Spain, mailed 1 June 2007.

Taxonomy

EAST ROTE LONGNECK TURTLE

Chelodina mccordi roteensis **ssp. nov.**

Order Testudines Linnaeus, 1758

Suborder Pleurodira Cope, 1864

Family Chelidae Gray, 1825.

Holotype (designated herein). American Museum of Natural History (AMNH) #R-160132: an adult female, preserved in alcohol, purchased from native villagers by Frank Yuwono, originally collected in Lake Enduy, eastern Rote Island, Indonesia.

Paratype (designated herein). AMNH #R-160134: an adult male, preserved in alcohol, purchased from native villagers by Frank Yuwono, originally collected in Lake Enduy, eastern Rote Island, Indonesia.

Type locality. Lake Enduy, eastern Rote Island, East Nusa Tenggara Province, Indonesia.

Distribution. Presently known only from Lake Enduy and nearby small seasonal pools.

Etymology. Named for Rote Island, Indonesia, where the turtle naturally occurs.

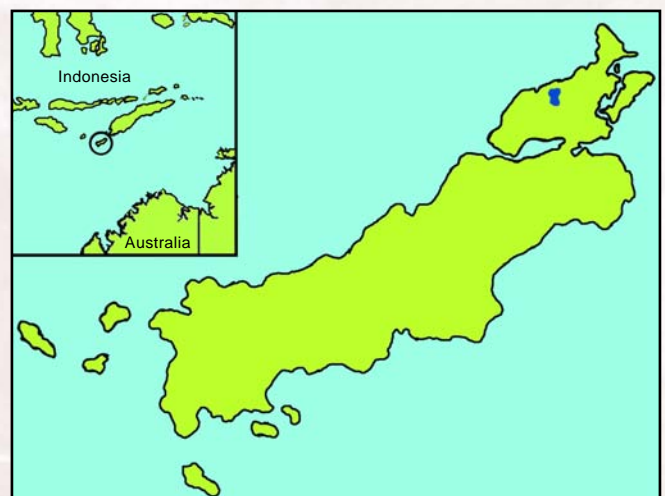
Description

Head. The head in both sexes is highly robust for *Chelodina* subgeneric group A (ranked second only to female *C. reimanni*). It has small elevated irregular scales on the masseters; a narrow (relative to head width) parietal roof; a row of tubercles that become gradually larger leading to a central small pair of barbels; a blunt and mildly sloped snout; and a triturating surface of intermediate width for subgeneric group A. The iris is yellow in the center with a gray periphery. The dorsal head color is brown with irregular black muting (degree of melanism). The tympanum, mandible, and underside of the head are a creamy yellow.

Neck. The neck is 60–70% as long as the carapace length. It bears moderately based, bluntly pointed tubercles. Dorsal coloration of the neck is gray/black. Ventral coloration of the neck is whitish-yellow.

Carapace. The carapace length is known to reach at least 220 millimeters. It is generally ovate, widest at the seventh marginal scute, and mildly rugose, with shallow median groove often present in adults, a low median keel often seen in mature adults (with or without a median groove), and no natural growth rings. The nuchal scute is 8% of the carapace length; the first marginal scute is always smaller in dorsal surface area than the second marginal; the fourth to the seventh (lateral) marginals are mildly upturned; the sixth to the eighth marginals flare; the medial half of the supracaudals (M12) are mildly elevated over the tail; the fifth vertebral is longer than it is wide. Carapace coloration is a chocolate brown background color with varying degrees of black muting.

Plastron. Relative to plastral length, the plastral width is the lowest for subgeneric group A; relative to carapace length, plastral width is low for subgeneric group A. The width at the inguinal notch is 98% of the width at the axillary notch; the width at the femoral/anal seam is 76% of the width at the humeral/pectoral seam. The plastral lobes narrow going both anteriorly and posteriorly; the anterior plastral lobe is wider than the posterior plastral



Note Lake Enduy, eastern Rote Island; possibly all that is presently left of the *Chelodina m. roteensis* distribution.



Photographic identification key for *Chelodina m. roteensis*: step 1 – note M1 is smaller than M2; step 2 – note V5 is longer than wide; step 3 – note the humeral/intergular scute seams are shorter than the gular/intergular scute seams; step 4 – note the pectoral/abdominal seam meets the marginals at M5; step 5 – note the ventral M6 scute reaches and forms part of the boundary of the inguinal notch. Photos: G. Cosentino

lobe; the anterior edge of the plastron does not reach the caudal border of the ventral marginals when viewed from below. The distance between the humeral seams of the intergular scute increases going posteriorly; the gular/intergular seams are always longer than the humeral/intergular seams. The plastral seam formula is Intergular scute length > IAb > IAn > IF > IP > IG. There is a shallow to intermediate anal notch. Bridge length relative to carapace length is intermediate for subgeneric group A. Axillary and inguinal scutes are absent. The ventral surface of the sixth marginal scute is 15% wider than that of the seventh marginal. The sixth marginal aligns with (helps form the border of) the anterior inguinal notch; the pectoral/abdominal seam meets the marginals near the middle of the fifth marginal scute. The plastron is equally flat in both sexes. Plastral coloration is a pale yellow with varying degrees of black muting along the central seams of the anterior half of the plastron.

Adult males are 15% smaller than females, and have thicker, longer tails. There are five horizontal scales on the dorsal surface of each foreleg. Soft parts are gray-black dorsally and white ventrally.

Diagnosis

We herein differentiate *Chelodina mccordi roteensis* **ssp. nov.** from the nominotypical (conspecific) form *Chelodina mccordi mccordi*. Molecular analyses (in prep.) will further clarify the subspecific status of each form. Of the characters given in the foregoing description, only those differentiating *C. m. roteensis* from *C. m. mccordi* are given here:

Head. The head of *C. m. roteensis* is much more robust (HW x HD/HL) than that of *C. m. mccordi* and those of all other *Chelodina* of subgeneric group A except *C. reimanni* and eastern Queensland populations of *C. canni*; the head width relative to carapace length (HW/CL) of *C. m. roteensis* is third after *C. reimanni* and *C. canni* from eastern Queensland, whereas the same ratio in *C. m. mccordi* is the lowest for *Chelodina* of subgeneric group A. There is more black muting on the head of *C. m. roteensis* than on the head of *C. m. mccordi*.

Neck. In *C. m. roteensis* the length of the neck is 60–70% the length of the carapace; in *C. m. mccordi* the length of the neck is 58–65% the length of the carapace. The tubercles on the neck are more pointed in *C. m. roteensis* and more rounded in *C. m. mccordi*. The dorsal

Data Table for *Chelodina mccordi roteensis* **ssp. nov.**

	CL	CW6	CW7	CW8	CD	V1L	V2L	V3L	V4L	V5L	V1W	V2W	V3W	V4W	V5W	M1L
AMNH #160132	199.07	-	155.58	141.76	84.20	50.36	36.99	32.61	25.92	41.77	51.63	38.36	33.54	27.44	55.47	19.06
AMNH #160134	187.01	-	139.99	128.70	65.17	46.60	31.31	35.62	22.93	34.34	50.08	38.15	35.06	29.23	55.27	20.27

Morphometric Key

CL = straight midline carapace length; CW6,7,8 = straight carapace width at 6th, 7th, and 8th marginals; CD = maximum carapace depth; V1–5L = vertebral number length; V1–5W = vertebral number width; M1–2 L & R = marginal 1–2 length left and right side; PL = midline plastral length; PWA = plastral width at axillary notch; PWI = plastral

neck color is more muted with black in *C. m. roteensis* than in *C. m. mccordi*.

Carapace. Carapace length in *C. m. roteensis* is known to reach 220 millimeters; in *C. m. mccordi*, 244 millimeters. Within subgeneric group A, *C. m. roteensis* and *C. m. mccordi* rank second and third respectively in shell robusticity (CW x CD/CL) after eastern Queensland populations of *C. canni*. The shell of *C. m. roteensis* is more oval (lower CW/CL) than the more rounded (higher CW/CL) shell of *C. m. mccordi*. The sixth marginal scute is narrower (relative to its length) creating a more distinct flare in *C. m. roteensis* than in *C. m. mccordi*. There is rarely a median keel in *C. m. mccordi*, whereas a low median keel is present in most adult *C. m. roteensis*. The black muting of the vertebral and costal scutes is darker in *C. m. roteensis* than in *C. m. mccordi*.

Plastron. The plastron of *C. m. roteensis* is the narrowest (relative to plastral length) of all species in subgeneric group A. In *C. m. mccordi* the ventral surface of the sixth marginal scute is 20% narrower than that of the seventh marginal, and the seventh marginal aligns with (helps form the border of) the anterior inguinal notch, usually bringing the pectoral/abdominal seam to meet the marginals at the fifth/sixth marginal seam; whereas in *C. m. roteensis* the ventral surface of the sixth marginal is wider than that of the seventh marginal, and the sixth marginal aligns with (helps form the border of) the anterior inguinal notch, having a pectoral/abdominal seam that meets the marginals anterior to the fifth/sixth marginal seam, near the middle of the fifth marginal scute.

Males are 15% smaller than females in *C. m. roteensis*; 11% smaller than females in *C. m. mccordi*. ■

Acknowledgments

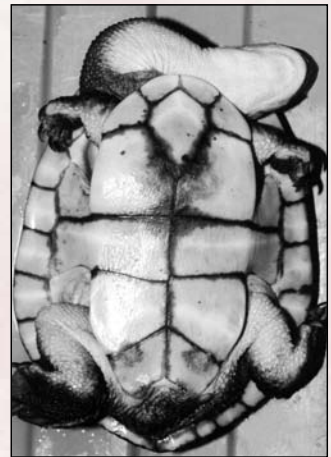
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C. m. roteensis paratype. AMNH #R-160134 — carapace. Photo: W. P. McCord



C. m. roteensis paratype. AMNH #R-160134 — plastron. Photo: W. P. McCord

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M1R	M2L	M2R	PL	PWA	PWI	PWHP	PWFA	BL	IG	IGSL	IP	IAb	IF	IAn	HL	HW	HD	IOW	PRW
20.52	30.10	22.65	160.21	84.30	81.02	74.98	54.88	44.12	5.77	48.18	17.78	34.54	27.15	26.80	47.09	39.09	25.27	6.24	4.15
18.63	26.31	24.26	135.88	73.25	68.23	66.19	48.87	34.37	5.82	42.50	15.68	25.35	20.80	21.65	43.44	38.72	21.80	5.39	3.74

width at inguinal notch; PWHP = plastral width at humeral/pectoral seam; PWFA = plastral width at femoral/anal seam; BL = bridge length; IGSL = intergular scute length; IG, IP, IAb, IF, IAn = midline plastral inter-scute seam lengths; HL = head length; HW = head width at tympana; HD = maximum head depth; IOW = inter-orbital width; PRW = parietal roof width.