

Contribution to the knowledge of *Cyclemys tcheponensis* (Bourret, 1939) and the distribution of *Cyclemys* in the Indochinese region (Reptilia: Testudines: Bataguridae)

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T. Ziegler

Fig. 1. - Juvenile *Cyclemys tcheponensis* (ZFMK 70331, lowland rainforest NW of Ky Thuong). Note the intensely reddish striped head and neck pattern.

Abstract

New data on life coloration, morphology and distribution of the poorly known batagurid turtle *Cyclemys tcheponensis* (Bourret, 1939) are presented, obtained during recent field studies in the southern part of North Vietnam. Further, the distribution of the different *Cyclemys* species in the Indochinese region is discussed, based on a review of several museum collections, and comments on their taxonomic status are given.

Key words: Reptilia, Testudines, Bataguridae, *Cyclemys*, *C. tcheponensis*, coloration, morphometry, distribution, Indochinese region.

Introduction

In their recent revision of the Southeast Asian leaf turtle genus *Cyclemys*, Fritz *et al.* (1997) regarded four species as valid: *Cyclemys dentata* (Gray, 1831), *Cyclemys oldhamii* Gray, 1863, *Cyclemys pulchrirostrata* Fritz, Gaulke et Lehr, 1997, and *Cyclemys tcheponensis* (Bourret, 1939). The latter two taxa are both distributed in Vietnam. They are together with the newly described *Cyclemys atripons* Iverson et McCord, 1997 from south-eastern Thailand and Cambodia the most poorly known representatives of this genus.

C. tcheponensis was originally described as a member of the genus *Geoemyda*, based on a juvenile from the Laotian side of the southern border area of Laos and Vietnam (Bourret 1939a, Fritz *et al.* 1999). McDowell (1964) was the first to point out the clear similarity of *tcheponensis* to *C. dentata* sensu lato. He even tentatively synonymized them. Subse-

quently, *tcheponensis* was usually regarded as a junior synonym of *Emys dentata* Gray, 1831 (= *Cyclemys dentata*) (e. g. Wermuth und Mertens 1977). However, Wirot (1979) did not adopt this opinion. He distinguished between leaf turtles with ("Geoemyda *tcheponensis*") or without head and neck stripes ("*Cyclemys dentata*") for Thailand. Based upon pet trade specimens of uncertain origin, McMorris (1976) and Pritchard (1979) reinforced McDowell's (1964) generic allocation of *tcheponensis*, but applied this name to *Cyclemys* specimens with a distinctly striped head and neck pattern and a dorsally mottled head. In contrast to *C. tcheponensis*, *C. dentata* was thought to be a species with an indistinctly striped or even uniformly coloured head and neck, the top of the head being solid copper brown (cf. McMorris 1976, Pritchard 1979, Iverson and McCord 1997). However, Fritz *et al.* (1997) demonstrated that both the lectotype and the paralectotype of *Emys dentata* Gray, 1831 belong to a *Cyclemys* species with distinct head and neck stripes as well as a speckled dorsal head pattern. (A third, lost type specimen was with certainty a representative of another genus, *Kachuga*). *C. dentata* (Gray, 1831) sensu stricto is distributed from Thailand over the Malay peninsula to Sumatra and Java. Its range also includes Borneo and some islands of the Philippines. Besides *C. dentata* sensu stricto, Fritz *et al.* (1997) recognized two additional species with a striped head and neck pattern with more restricted ranges. *C. tcheponensis* (Bourret,

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1939) is presently known from northern Thailand (Chiang Mai), northern Vietnam (Tonkin) and the border region between Laos and Vietnam. *C. pulchristriata* Fritz, Gaulke et Lehr, 1997 was described from Phuc Son, central Vietnam. The very similar species *C. atripons* Iverson et McCord, 1997 is known to occur in south-eastern Thailand and adjacent Cambodia. Thus, the former concept of *C. tcheponensis* included *C. dentata* proper, *C. tcheponensis* sensu stricto as well as *C. atripons* and *C. pulchristriata*, all with distinct head and neck stripes and a finely spotted dorsal head pattern. The oldest available name for the sole *Cyclemys* species with uniform head and neck coloration is *Cyclemys oldhamii* Gray, 1863. *C. oldhamii* occurs in a vast area in sympatry with *C. dentata*. *C. oldhamii* ranges from north-eastern India over Myanmar (Burma), Thailand, and the Malay peninsula to Borneo, Sumatra, and Java (Fritz et al. 1997). Adult *C. oldhamii* share with *C. tcheponensis* the very dark (brown to black) plastral coloration, a long interfemoral seam compared to interanal seam length, and a wide anal notch. The other three *Cyclemys* species possess mainly or entirely yellow plastra as adults, with or without a black radiating pattern, a distinctly shorter interfemoral seam compared to interanal seam length, and a narrow anal notch (Fritz et al. 1997, Fritz unpubl.).

Here we present new data on the coloration, morphology and distribution of *C. tcheponensis*. In addition, Indochinese distributional records are discussed for *C. atripons*, *C. pulchristriata*, and *C. oldhamii*.

Materials and Methods

To accumulate new data on Indochinese *Cyclemys*, especially on *C. tcheponensis*, we reviewed several museum collections in Europe and the USA. We encountered specimens relevant for this study and not mentioned in Fritz et al. (1997) in the holdings of the American Museum of Natural History, New York (AMNH), the Museum of Comparative Zoology, Cambridge, Mass. (MCZ), the Muséum National d'Histoire Naturelle, Paris (MNHN), the Museum of Vertebrate Zoology, Berkeley (MVZ), the Natural History Museum, London (BMNH), and the United States National Museum, Washington, D.C. (USNM). Further specimens examined are in the collections of the following institutions: Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt a. M. (SMF), Nationaal Natuurhistorisch Museum, Leiden (RMNH), Naturhistorisches Museum Wien (NMW), Staatliches Museum für Naturkunde Stuttgart (SMNS), Staatliches Museum für Tierkunde Dresden (MTKD), Zoologisches Forschungs-institut und Museum Alexander Koenig, Bonn (ZFMK), Zoologisches Museum Berlin (ZMB), Zoologisches Museum Hamburg (ZMH). Also seven live specimens from Lake Inlé (Myanmar) from the private collection of Dr. Peter Valentin (Vienna) were taken into account.

In Vietnam, the second author examined the herpetological collections of the Centre for Natural Resources Management and Environmental Studies (CRES) allied to the University of Hanoi, and of the University of Vinh (UV). He also conducted field studies in southern North Vietnam from June to September 1997 and from August to October 1998, yielding several additional local animal trade specimens of *C. tcheponensis* collected in the lowland rainforest north-west of the village Ky Thuong, Ha Tinh province (Ky Thuong: 18°01'N, 106°08'E). Each of the three purchased specimens is deposited now in the herpetological collections of MTKD, UV, and ZFMK. A fourth specimen was studied but not purchased in September 1998 at an animal dealer in Ky Thuong.

Two further *C. tcheponensis*, lacking precise locality data, were bought at the Don Xuan market in Hanoi in September 1997. Both are now in the ZFMK collection.

Below a list of museum specimens considered in this study is given. Additional specimens examined are listed in Fritz et al. (1997). Unless indicated otherwise, all specimens are preserved in 70% ethanol.

Cyclemys atripons

THAILAND: "Bangkok": MTKD 17202, semiad., don. **H. Weissinger**, 1979; ZMB 39188, juv., leg. **Aagaard**, ca. 1930.

Chanthaburi: Kao Sabap (Khao Sabap): USNM 94745, juv., leg. **Hugh M. Smith**, 20 Nov. 1933.

Chonburi: Nong Khor: USNM 70367, pull., leg. **Hugh M. Smith**, 30 Sept. 1925.

Trat: Ko Chang (Koh Chang, Koh Kong): MCZ 29571-29572, juv. et subad., leg. **Malcolm A. Smith**, no date, don. **Thomas Barbour**, 1 Jan. 1930; USNM 53423, adult female (shell, soft parts in alcohol), leg. **C. Boden Kloss & William L. Abbott**, Dec. 1914; USNM 53424, juv., leg. **C. Boden Kloss**, Dec. 1914; Ko Kut (Koh Kut): USNM 79515, adult female (stuffed), leg. **Hugh M. Smith**, 21 May 1929; Kao Kuap (Khao Kuap): USNM 81865 (holotype of *Cyclemys atripons* Iverson et McCord, 1997), adult female (stuffed, skull separate), leg. **Hugh M. Smith**, 24 Dec. 1929.

Cyclemys oldhamii

INDIA: Assam: Naga Hills: BMNH 1930.6.8.4, juv., Pres. Bombay Nat. Hist. Soc., 1930.

LAOS: "Lao Mts., Siam" (= Luang Prabang Mts, Laos, see Fritz et al. 1998: 40): BMNH 1947.3.4.26, adult female (stuffed), leg. **Henri Mouhot**, 1862; Ban Toup, Bokeo (20°28'N, 100°48'E): MNHN 1997.4296, ad. male, leg. **Roger Bour & Annemarie Ohler**, April 1997.

MYANMAR: ZMB 8872, ad. female, leg. **J. Anderson**, ca. 1880; ZMB 8893, ad. female, leg. **J. Anderson**, ca. 1880.

Kachin: MTKD 40842-40843, ad. females, vend. **Oscar Shiu**, don. **M. Reimann**, July 1998; Singkaling H'Kamti: AMNH R-58423, juv., leg. **H. C. Raven**, no date; Lake Indawgyi (Myitkyina district): BMNH 1929.12.1.15, juv., Pres. Indian Museum, Calcutta, 1929; Tasan: BMNH 1974.2494, ad. male (stuffed), leg. **M. A. Smith**, March 1919.

Burma: Pegu: BMNH 1867.6.18.6 and BMNH 1868.5.11.15, juv. (shells), leg. **W. T. Theobald**, 1867, 1868.

Taninthayi: Mergui: BMNH 1947.3.5.63, ex 1856.5.6.1 (lectotype of *Cyclemys oldhamii* Gray, 1863), ad. male (shell), leg. Prof. **Oldham**, 1856.

THAILAND: MTKD 12495-12496, ad. male and juv., don. **F. J. Obst**, 1972; MTKD 13769, juv., don. Zoo Leipzig, Aug. 1977; MTKD 24328-24329, ad. female and subad., don. **Ludwig Trutnau**, June 1982; MTKD 28067, ad. female, don. **M. Reimann**, March 1988; MTKD 37552, ad. female, don. **M. Reimann**, July 1995; MTKD 40543, ad. male, don. **M. Reimann**, April 1998; MTKD 40544-40545 (skeletons), ad., don. **M. Reimann**, April 1998; MTKD 40650-40651, ad. females, don. **M. Reimann**, June 1998; MTKD 40652, ad. female (shell and skull, soft parts in alcohol), don. **M. Reimann**, June 1998; MTKD 40830-40834, 2 ad. males and 3 ad. females (MTKD 40834 skull separate), don. **M. Reimann**, July 1998; "Bangkok": ZMH R01098, juv., don. **S. Wiese**, March 1977;

North Thailand: MTKD 40300 and MTKD 40389-40390, ad. males (MTKD 40390 skeleton), don. **M. Reimann**, Dec. 1997, Jan. 1998; MTKD 40521 and MTKD 40537, ad. females, don. **M. Reimann**, April 1998.

Sing Buri: near Sing Buri: ZMH R03842, subad. female, leg. **E. Klingemann**, March 1975.

Cyclemys pulchristriata:

VIETNAM: UV unnumbered, juv., leg. **Hoang Xuan Quang**, no further data.

“**Annam**”: RMNH 4751, pull., leg. **H. Fruhstorfer**, no date; SMF 7667, pull., vend. **H. Fruhstorfer**, 1904; SMNS 3802, pull., vend. **H. Fruhstorfer**, 1905; ZMH R00292, pull., vend. **H. Fruhstorfer**, 27 Oct. 1903.

Dà Nang: Phuc Son: NMW 29525:2-5 (NMW 29525:4 holotype of *Cyclemys pulchristriata* Fritz, Gaulke et Lchr, 1997), pull. et juv., leg. **Hans Fruhstorfer**, 1901.

Gia Lai: MVZ 222125, juv., Buon Loy, ca. 20 km NW Kan Nack, Anke District, leg. **Ilya Darevsky & Nikolai Orlov**, 9 Nov. 1993.

Lam Dong (Haut Donai): Báo Loc (= Blao): USNM 95100, pull., leg. **E. Poilane**, 11 March 1933.

Cyclemys tcheponensis

NO LOCALITY: MTKD 38376, pull., don **Gerald Fuchs**, Feb. 1996.

LAOS: Haute Sé-Bang-Hien: CRES-T. 43 (ex T. 43, Laboratoire des Sciences Naturelles de l'Université Indochinoise, Hanoi, holotype of *Geoemyda tcheponensis* Bourret, 1939), juv. (preserved in formalin), leg. **René Bourret**, 1929; Dongtam-Ve: MNHN 1948-38 (ex T. 70, Laboratoire des Sciences Naturelles de l'Université Indochinoise, Hanoi), juv. (stuffed, skull separate), leg. **Poilane**, 1939; Saravane (Huai Nam Puat): USNM 103016, juv., leg. **Herbert G. Deignan**, 26 April 1936.

THAILAND: MTKD 17106, juv., don. **W. Sachsse**, Oct. 1979; SMNS 5355:1-2, juv., don. **M. Sigalas**, 1975.

Chiang Mai: Chiang Mai: SMNS 5505:1-8, pull. et juv., don. **M. Reimann**, 1976; Doi Chiang Dao (Chiang Dao): USNM 94602, juv., leg. **Hugh M. Smith**, 28 Jan. 1932.

VIETNAM: MTKD 33863, juv., vend. **M. Reimann**, Dec. 1992; MTKD 34647-34648, juv., don. **M. Reimann**, Sept. 1993; MTKD 35796-35798, juv., vend. **M. Reimann**, Sept. 1994; ZFMK 70332-70333, juv., bought at Don Xuan market in Hanoi, leg. **Thomas Ziegler**, Sept. 1997.

Ha Tinh: NW Ky Thuong: UV (field number TZ 1040), ad. female, leg. **Thomas Ziegler**, 9 July 1997; MTKD 41357, ad. female, leg. **Thomas Ziegler**, 6 July 1997; ZFMK 70331, juv., leg. **Thomas Ziegler**, 11 July 1997.

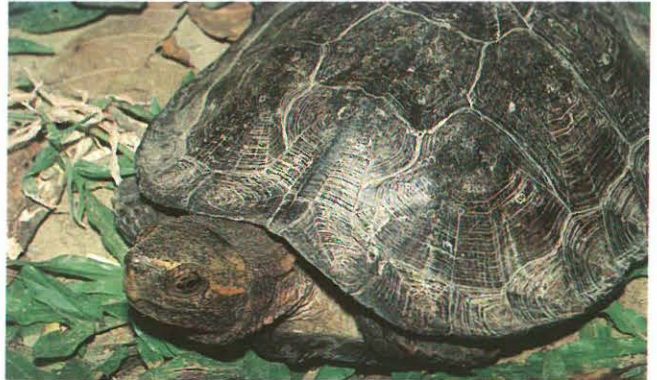
Nghe An: surroundings of Tan Ky: UV unnumbered, ad. male (preserved in formalin), leg. **Hoang Xuan Quang**.

Coloration in Life

Most *C. tcheponensis* known up to now are juveniles. **Bourret** (1941) depicted an adult of *C. tcheponensis* from northern Vietnam (“Tonkin”) under the name *Cyclemys dentata* as black-and-white drawing. **Fritz et al.** (1997) published a colour photograph of an adult purchased at a market in Lao Bao (central Vietnam). The latter authors stressed that

head and neck stripes of six captive specimens (originating from Lao Bao market) did not show the slightest tinge of red, i. e. the stripes were yellow. A live *Cyclemys* from western Thailand figured in **Thirakhupt and van Dijk** (1994) exhibits a faintly yellowish striped head and neck pattern (see chapter “Distribution and Variation of *Cyclemys* in the Indo-chinese Region”), without any reddish component.

In contrast, the Vietnamese *C. tcheponensis* studied alive by **T. Ziegler** displayed an intensely red striped head and neck pattern (Figs 1-3). A slightly reddish tinge is sometimes also present on the other light soft parts (underside of fore- and hindlegs, shoulder and inguinal region, thighs, Figs 4-6). In our juvenile *C. tcheponensis* the head and neck pattern is more contrasting than in adults. The top of the head is light brown and speckled with black (Fig. 7). **Bourret** (1939a, 1939b, 1941) wrote that in both juvenile specimens available to him the head stripes and the other light vermiculations of the head and neck were pink. However, the coloration of specimen T. 70 on the colour plate in **Bourret** (1939b) and later re-published as Planche D in **Bourret** (1941) is much paler than in our live specimens and shows at best a very slight tinge of pink (Fig. 8). Altogether, it seems possible that the yellow coloration of the specimens mentioned in **Fritz et al.** (1997) was a result of captivity.



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Fig. 2. - Adult *Cyclemys tcheponensis* (UV, field number TZ 1040, female, lowland rainforest NW of Ky Thuong).



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Fig. 3. - Ventral aspect of the head and neck of a subadult *Cyclemys tcheponensis* (carapace length 165 mm, lowland rainforest NW of Ky Thuong) studied at an animal dealer in Ky Thuong (September 1998).

The hatchling of *C. tcheponensis* was already figured and described in **Fritz et al.** (1996, 1997). An additional hatchling, MTKD 38376, and the very small juvenile USNM 103016 (carapace length 65.5 mm) closely agree with the description and figures there. Most characteristic is the striped head and neck and the extensive, dark-brown plastral figure. The latter is never present in hatchlings of any other *Cyclemys* species. During growth, this figure fuses more and more

with a dark radiating pattern (see Fig. 4 and Fig. 8), developing on the growth annuli of the scutes. This pattern becomes denser with the individuals getting bigger and older and results in a more or less entirely dark plastron in medium



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Fig. 4. - Ventral view of a juvenile *Cycllemys tcheponensis* (ZFMK 70333) bought at Don Xuan market in Hanoi, Vietnam (September 1997).

sized and adult specimens (Figs 4-6). In medium sized individuals the radiating pattern mainly remains discernible along the seams. Adult *C. oldhamii* display a very similar plastral pattern and coloration. However, the plastral pattern of hatching *C. oldhamii* consists of irregular, small dark spots on a lighter ground (Fritz *et al.* 1996, 1997).



T. Ziegler
Fig. 5. - Ventral view of the subadult specimen depicted in Fig. 3.

Morphometry

The carapace lengths of four *C. tcheponensis* hatchlings (SMNS 5355:1-2, SMNS 5505:3 and 5) range between 61.2 and 64.8 mm (mean = 63.2 mm). Another hatchling, MTKD 38376, is distinctly smaller (51.8 mm), however, this specimen has an abnormal carapace scutellation which could be related with an unusual small size. It lacks all costal scutes on the left side, while on the right side only the third and fourth costals are present (and malformed). USNM 103016, a very small juvenile with a shell length of 65.5 mm, has growth

lines of 3 or 4 mm, and thus was similar in size to the four above mentioned specimens at hatching.



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Fig. 6. - Ventral view of specimen TZ 1040. Note the mutilated hind feet.



T. Ziegler
Fig. 7. - Portrait of an adult *Cycllemys tcheponensis* (MTKD 41357, female, body mass 1189 g, lowland rainforest NW of Ky Thuong). Note dorsally speckled head.

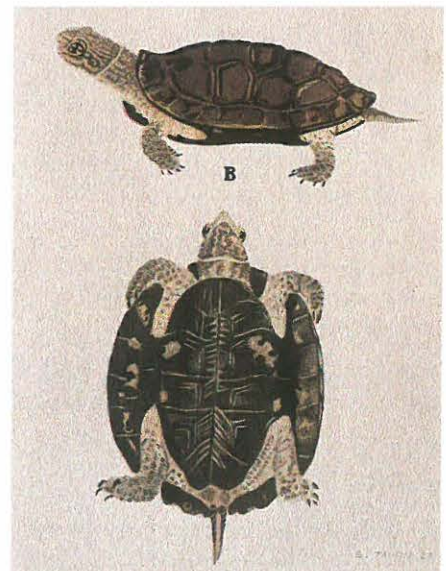


Fig. 8. - Reproduction of the right half of Bourret's (1941) Planche D (*Cycllemys tcheponensis*, T. 70, Dong-tam-Ve; on the left, a *Cuora trifasciata* is depicted.) The same plate was already published in Bourret (1939b) with an additional inserted caption.

Table 1

Measurements of Vietnamese *Cyclemys tcheponensis* and **Bouret's** specimens (in mm, shell measurements according to **Fritz** 1995). It was not possible to take all measurements for the holotype (T. 43). *: Measurements not possible due to injuries or state of preparation.

Abbreviations are as follows: CL: maximum carapace length; CW: maximum carapace width (with location at the marginals); SH: maximum shell height (with location at the vertebrals); PL1: maximum plastron length; PL2: mid-seam plastron length as sum of GuL, HumL, PecL, AbdL, FemL, and AnL (due to the irregular shape of the plastron and the somewhat asymmetrical arrangement of the plastral scutes, the sum of the individual scute lengths measured along the mid-seam of the plastron slightly surpasses the length between the anteriormost and the posteriormost point of the plastral mid-seam); GuL: intergular seam length; HumL: interhumeral seam length; PecL: interpectoral seam length; AbdL: interabdominal seam length; FemL: interfemoral seam length; AnL: interanal seam length; PWI: width of plastral forelobe; PWII: width of plastral hind lobe; HL: head length, from tip of the snout to occipital (supraoccipital); HH: maximum head height (behind border of eye, including closed lower jaw); HW: tympanal head width; NuL: maximum nuchal length; NuW: maximum nuchal width; Ndiv: lateral seams of nuchal diverging caudally (+).

	MTKD 41357	ZFMK 70331	UV TZ 1040	UV unnum.	ZFMK 70332	ZFMK 70333	T. 43	MNHN 1948-38
CL	224.0	79.7	201.8	202.0	133.8	103.7	69.2	67.9
CW	170.0 (7)	* (7)	151.1 (8)	146.2 (6)	111.0 (6)	90.4 (7)	62.5 (7)	63.2 (7)
SH	73.0 (2)	29.6 (2)	60.0 (2)	78.0 (2)	52.9 (2)	36.7 (2)	25.1 (3)	-
PL1	207.0	76.5	186.5	~ 180	124.2	92.7	58.9	60.4
PL2	198.9	73.0	180.6	177.2	118.7	90.4	58.7	60.3
GuL	29.5	9.8	27.7	26.2	17.9	15.4	11.5	10.4
HumL	15.0	7.0	15.5	14.6	13.0	10.0	5.2	7.0
PecL	47.3	14.5	46.0	39.6	27.2	19.8	12.4	12.2
AbdL	44.0	17.2	31.1	32.3	21.7	14.5	10.5	11.8
FemL	31.8	11.4	28.3	29.6	16.9	13.7	7.8	8.7
AnL	31.3	13.1	32.0	34.9	22.0	17.0	11.3	10.2
PWI	91.1	*	83.9	84.0	59.1	41.3	29.6	30.8
PWII	110.2	38.9	100.5	98.0	66.7	51.3	33.3	33.3
HL	55.3	22.9	48.9	47.7	35.4	27.3	?	*
HH	20.3	10.4	19.7	21.2	14.9	11.5	?	*
HW	31.5	14.3	28.2	29.2	20.5	15.9	?	*
NuL	15.3	5.8	13	12.1	9.5	8.0	?	*
NuW	10.0	5.3	7.4	7.0	8.5	6.4	?	*
Ndiv	+	+	+	+	+	+	+	+

In Table 1 we present measurements of some Vietnamese *C. tcheponensis*, the holotype of that taxon, and of **Bouret's** (1939b, 1941) second specimen T. 70, now MNHN 1948-38. Our biggest *C. tcheponensis* (MTKD 41357) has a carapace length of 224 mm, clearly exceeding the measurements of 178 mm and 185 mm for the two adult specimens given in **Fritz et al.** (1997). Presumably, *C. tcheponensis* reaches an even larger maximum size. The “*C. dentata* plastron” with a length of 255 mm from Hongay, North Vietnam, mentioned by **Bouret** (1939b) is probably of a *C. tcheponensis* as no other *Cyclemys* species is known from that region.

Distribution and Variation of *Cyclemys* in the Indochinese Region

Currently the distribution of *Cyclemys* in the Indochinese region is barely understood (**Fritz et al.** 1997). It is unknown how large the ranges of *C. atripons*, *C. pulchrisriata* and *C. tcheponensis* are and whether there are areas of sympatry between any of these taxa or with *C. dentata* and *C. oldhamii*.

Our distribution map (Fig. 9) is based on the above mentioned voucher specimens. With the exception of photographic documentation by **Thirakhupt** and **van Dijk** (1994, see below), we did not take any records based on specimens not examined by ourselves in account (e. g. as given in **Iverson** and **McCord** 1997) to avoid mistakes by incorrect determinations.

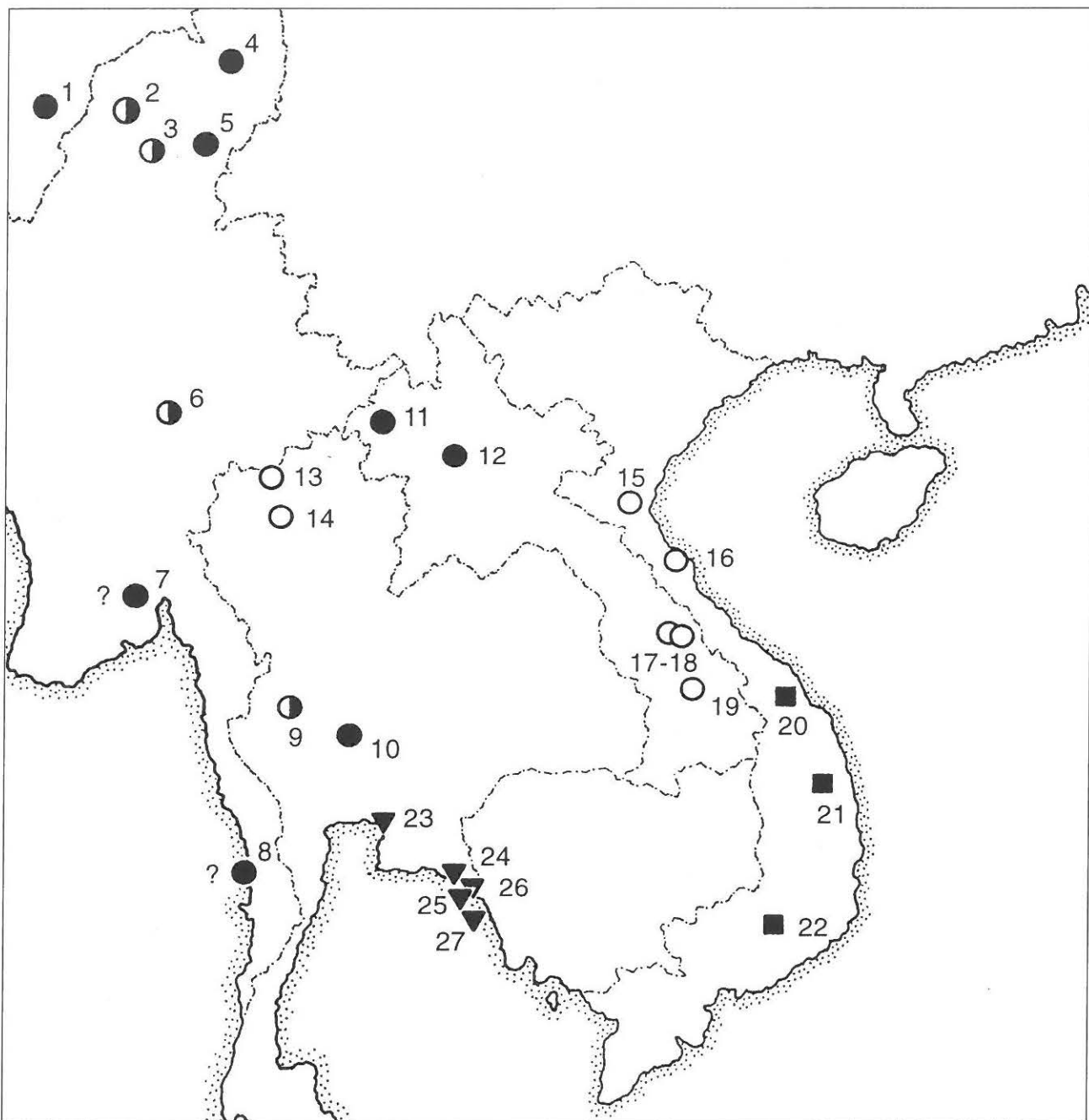


Fig. 9. - Distribution of *Cyclemys* in the Indochinese region. Closed circles: *C. oldhamii* (question marks designate localities vouchered by shells only, i. e. soft part coloration could not be investigated); semi-closed circles: *C. oldhamii* with *tcheponensis* characters (dorsally speckled head, weak head and neck stripes, and/or hatchling plastral pattern characteristic for *C. tcheponensis*); open circles: *C. tcheponensis*; triangles: *C. atripons*; squares: *C. pulchristriata*.

Localities: 1: Naga Hills, 2: Singkaling H' Kamti, 3: Lake Indawgyi, 4: Kachin, 5: Tasan, 6: Lake Inlé, 7: Pegu, 8: Mergui, 9: Huai Kha Khaeng Wildlife Sanctuary, 10: Sing Buri, 11: Ban Toup, 12: Luang Prabang Mts, 13: Doi Chiang Dao, 14: Chiang Mai, 15: Tan Ky, 16: Ky Thuong, 17: upper Sé-Bang-Hien river, 18: Dong-tam-Ve, 19: Saravane, 20: Phuc Son, 21: Buon Loy, 22: Báo Loc, 23: Nong Khor, 24: Kao Sabap, 25: Ko Chang, 26: Kao Kuap, 27: Ko Kut. A record of *C. tcheponensis* for "Tonkin" (Bourret 1941, see Fritz et. al. 1997) is too imprecise to be plotted.

In eastern Thailand, Laos, and Vietnam a most complicated pattern turns out, which is not to be interpreted easily. *C. atripons* seems to be a more western vicariant of *C. pulchristriata*. An investigation on the exact taxonomic status of both forms will soon be published elsewhere (Fritz in prep.). Without any doubt, both are closely related, but there are certain colour pattern differences justifying their distinction.

It is obvious that the locality "Bangkok" of some of the museum specimens (*C. atripons*: MTKD 17202, ZMB 39188; *C. oldhamii*: ZMH R01098) has to be treated carefully because such large cities are centres of animal trade for a long time. Therefore, we did not plot these records in our map. Nevertheless, even without these doubtful records, the ranges of *C. atripons* and *C. oldhamii* seem to approach one

another closely in south-central Thailand, so that their sympatric occurrence is a possibility.

In Vietnam, *C. pulchristriata* inhabits the central and southern parts of the country whereas *C. tcheponensis* is recorded from more northerly localities and southern Laos. However, Lehr (in Fritz et al. 1997) encountered *C. tcheponensis* at an animal market in Saigon. This could indicate its occurrence further south. Already Fritz et al. (1997) speculated that *C. tcheponensis* could inhabit the entire Mekong basin. Even more complicated is the situation in the west. It is clear that *C. tcheponensis* occurs in Chiang Mai (northern Thailand) as proven by the specimens SMNS 5505:1-8 (Chiang Mai) and USNM 94602 (Doi Chiang Dao), which do not obviously differ from specimens from southern Laos and

North Vietnam. Remarkably, east of Chiang Mai there are two records of *C. oldhamii* in northern Laos (Luang Prabang Mts: BMNH 1947.3.4.26, Ban Toup, Bokeo: MNHN 1997.4296), arguing for a parapatric or sympatric occurrence of both taxa. In this context, the more western records of dark coloured *Cyclemys* are worth to be re-examined here.

Fritz et al. (1997) relegated the taxon *Cyclemys dhorshansensis* Annandale, 1918 into the synonymy of *C. oldhamii*. The description of *Cyclemys dhorshansensis* was based upon the shells of two adults from Lake Inlé, Burma. The only confident characters separating *C. tcheponensis* from the similar *C. oldhamii* are all related to soft part coloration. Therefore it cannot be excluded that *C. dhorshansensis* represents the taxon later described by **Bourret** (1939a) as *Geoemyda tcheponensis*. Also our voucher specimens of *C. oldhamii* from Pegu (BMNH 1867.6.18.6, BMNH 1868.5.11.15) consist of shells only, and hence could be in fact *C. tcheponensis*. On the other side of the picture, a series of seven live specimens of different age stages from Lake Inlé in the private collection of Dr. **P. Valentin** (Vienna), recently studied by **U. Fritz**, does not support this hypothesis. These specimens lack a striped head and neck pattern and are thus treated here as *C. oldhamii*. However, unlike *C. oldhamii* the top of their head is speckled, which could indicate that they are intermediate between *C. tcheponensis* and *C. oldhamii*. Their shell coloration is very dark brown to black, without a reddish brown tinge often found in other *C. oldhamii*. Similarly coloured adult *Cyclemys* from "Thailand" (MTKD 37552, 40650-40651, 40830-40834) and "North Thailand" (MTKD 40300, 40389-40390, 40521, 40537) are also in the collection of the Staatliches Museum für Tierkunde Dresden. Likewise, two voucher specimens (AMNH R-58423, BMNH 1929.12.1.15) from Kachin province in northern Myanmar exhibit somewhat intermediate characters. Other specimens caused the same province are characteristic *C. oldhamii* (BMNH 1974.2494, MTKD 40842-40843). The same is true for a *C. oldhamii* (BMNH 1930.6.8.4) from the Naga Hills in neighbouring Assam (India).

AMNH R-58423 from Singkaling H' Kamti (Myanmar) is a juvenile with a carapace length of 89.7 mm. This specimen caused **McDowell** (1964: 267) to synonymize *Geoemyda tcheponensis* with *C. dentata*: "The figures of *Geoemyda tcheponensis* given by **Bourret** (1941) compare almost perfectly with AMNH 58423 (Upper Chindwin River, Burma), a specimen that is plainly a juvenile *Cyclemys*". Actually, AMNH R-58423 resembles *C. oldhamii* rather than *C. tcheponensis*. Head and neck are virtually unstriped, and the top of the head is unmarked. However, there still are rudiments of the hatchling pattern visible on the plastron, and these correspond with the condition found in *C. tcheponensis* as depicted by **Bourret** (1939b, 1941) (see our Fig. 8). The second intermediate specimen, BMNH 1929.12.1.15 (juvenile, carapace length 105.0 mm), from Lake Indawgyi (Myitkyina district), is lacking such rudiments of a *tcheponensis*-like plastral figure but its head and neck are feebly striped and the top of its head bears a few black spots.

An adult *Cyclemys* figured in **Thirakhupt and van Dijk** (1994) from the Huai Kha Khaeng Wildlife Sanctuary, western Thailand exhibits a faintly yellowish striped head and neck pattern, much weaker than of *C. tcheponensis* but still discernible.

In contrast to the distributional situation in Laos and Chiang Mai (Thailand) outlined above, these observations suggest a genetic interchange between *C. oldhamii* and *C. tcheponensis*. Further studies, especially in Laos and eastern Thailand are urgently needed to clarify the situation there and whether *C. tcheponensis* and *C. oldhamii* are conspecific or not.

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RÉSUMÉ

Contribution à la connaissance de *Cyclemys tcheponensis* (Bourret, 1939) et à la répartition de *Cyclemys* dans la région indochinoise (Reptilia: Testudines: Bataguridae).

Dans une récente révision des Tortues sud-asiatiques du genre *Cyclemys*, **Fritz et al.** (1997) considèrent que 4 espèces sont valides : *dentata* (Gray, 1831) ; *oldhamii* Gray, 1863 ; *pulchristriata* Fritz et al., 1997 ; et *tcheponensis* (Bourret, 1939). *C. tcheponensis* est, avec *C. pulchristriata* et la récemment décrite *C. atripons* Iverson et McCord, 1997, l'une des espèces les moins bien connues du genre.

A l'origine, *tcheponensis* fut rapportée au genre *Geomyda*, sur la base d'un juvénile du versant laotien de l'aire frontalière Laos-Vietnam. **McDowell** (1964) fut le premier à souligner la claire ressemblance de *tcheponensis* avec *dentata* s. lat. ; ensuite, *tcheponensis* fut considérée comme un synonyme récent de *dentata*, ce que contesta **McMorris** (1976), en séparant les espèces d'après la présence ou l'absence (*tcheponensis* vs *dentata*) de rayures colorées sur le cou et la tête. Toutefois, **Fritz et al.** démontrèrent que les types de *dentata* possèdent en fait le patron de coloration attribué à *tcheponensis*. En fait, la seule espèce de *Cyclemys* sans rayures sur la tête et le cou est *C. oldhamii* alors que quatre espèces avec des bandes sur la tête et le cou sont connues : *C. dentata* s.str., *C. atripons*, *C. pulchristriata* et *C. tcheponensis*.

Sont présentés ici de nouveaux documents sur le patron de coloration, la morphologie et la distribution de *C. tcheponensis*. En outre, les distributions en Indochine de *C. atripons*, *pulchristriata* et *oldhamii* sont discutées.