Southernmost Localities of *Trachemys dorbigni* and First Record of *Trachemys scripta elegans* for Argentina (Cryptodira: Emydidae)

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Abstract. We report two new localities for *Trachemys dorbigni* that expand the southern range border for approximately 120 km. These new localities are Arroyo Buñirigo and Arroyo Zapata. Both are streams related to the Río de La Plata shoreline at Buenos Aires province, Argentina. We also record the non-native *Trachemys scripta elegans* for the first time for Argentina.

Emydidae currently comprises ten genera and 50 species of aquatic and semiaquatic turtles. This diverse family is mainly restricted to North America; *Emys* species occur in the Western Palearctic and several *Trachemys* occur in tropical and subtropical regions of America (Ernst and Barbour 1989; Seidel 2002; Fritz and Havaš 2007; Turtle Taxonomy Working Group 2010). Two disjunctly distributed species of *Trachemys* are restricted to South America (Fritz et al. 2011); *Trachemys dorbigni* (Duméril and Bibron, 1835) is partitioned in two subspecies (see Fritz et al. 2011). It is distributed in regions more than 3000 km south of the ranges of the other *Trachemys*, over northeastern Argentina, southern Brazil, and Uruguay (*T. dorbigni d.*), and on northeastern Brazil (*T. d. adiutrix*) (Freiberg 1969; Seidel 1990; Cabrera 1998; Fritz and Havaš 2007).

Although the conservation status of the Brazilian populations of *Trachemys dorbigni* is not of concern, they are strongly affected by human activities, such as egg collection to supply pet trade (Bager et al. 2007). In Argentina, *Trachemys dorbigni* has been categorized as endangered, mainly by illegal capture for pet trade and the advance of the agricultural frontier on the few localized populations (Bertonatti 1994; Richard and Waller 2000). We report herein two new localities of *Trachemys dorbigni* for Buenos Aires province, Argentina; that extend the southern range border of this species for about 120 km. We also record for the first time the non-native *Trachemys scripta elegans* (Wied, 1839) for Argentina.

Trachemys dorbigni was first reported by d'Orbigny and Bibron (1847) from Argentina and Uruguay in the mouth of the Paraná and Uruguay rivers, and up the Paraná River; being especially

common in the low islands of Coronda River, Santa Fe, Argentina. Later, in Argentina, localized populations of this species were recorded in Chaco, Corrientes, Entre Ríos, and Santa Fe provinces along the Paraná and Uruguay rivers (Freiberg 1938; 1969; 1977; Gallardo 1982; del Barco and Larriera 1991; Cabrera 1995; 1998; and references therein). Most authors consider "Buenos Aires" as type locality of *Trachemys dorbigni* (e.g., Boulenger 1889; Freiberg 1969; 1977; Cei 1993; Cabrera 1998; Fritz and Havaš 2007) on the basis of the original description by Duméril and Bibron (1835). However, Duméril and Bibron (1835) state that the specimen used for description was "envoyée de Buenos-Ayres au Muséum d'histoire naturelle, par M. d'Orbigny". Later, d'Orbigny and Bibron (1847) stated that "Elle habite l'embouchure du Rio Parana et du Rio Uruguay, républiques de l'Uruguay et Argentine, jusqu'assez haut dans le Rio Parana. Elle est surtout commune dans les iles basses du Riacho de Coronda, au-dessous de Santa-Fé". Accordingly, "Buenos Aires" is the point from which the type material was sent to Paris by d'Orbigny, but is not the type locality. More recently, Lescure et al. (2002) published the complete list of Reptiles and Amphibians collected by d'Orbigny in South America and sent to the Museum of Paris and established the type locality of *Trachemys dorbigni* as "Río Paraná" according to the data associated with the holotype (MNHN 9221, Lescure et al. 2002; see also the catalogue of Reptiles and Amphibians of the Muséum National D'Histoire Naturelle accessible at http://coldb.mnhn.fr).

Marelli (1924) made a citation of *Trachemys dorbigni* in the Río de La Plata shoreline on Punta Lara (Ensenada, Buenos Aires province, Argentina) also cited by Freiberg (1938), Cei (1993), and Cabrera (1998). Moreover, Ringuelet (1955) mentioned that this species inhabits the Río de La Plata shoreline at Magdalena, Buenos Aires province. But in both cases, no voucher specimens exist in the studied herpetological collections (Cabrera 1995; present work). We herein report the presence of *Trachemys dorbigni* for two localities that extend the range approximately 120 km to the south of the mouth of the Paraná and Uruguay rivers (Fig. 1). These localities are Arroyo Zapata (34º59' S, 57º42' W) and Arroyo Buñirigo (35º01' S, 57º29' W) two streams related to the Río de La Plata shoreline in Partido de Magdalena, Buenos Aires province, Argentina.

Collecting permits were authorized by Secretaría de Agricultura, Ganadería y Pesca de la Provincia de Buenos Aires, Argentina (Disposición # 178).

The record for Arroyo Zapata is based on one adult female (20 cm of carapace) collected near the riverbank, on November 2000 by Víctor Piasecki. The specimen is housed on the Museo de La Plata (MLP Q.057). The Arroyo Zapata (Fig. 2A) is a pampas stream with many meanders and moderate depth (not more than 2 m at some points) with submersed (*e.g. Cabomba caroliniana* Gray, 1837; *Ceratophyllum demersum* Linnaeus, 1753); floating (*e.g. Hydrocleys nymphoides* Buchenau, 1869; *Nymphoides indica* Kuntze, 1891); and emerged aquatic vegetation (*e.g. Polygonum punctatum* Elliott, 1817; *Thalia geniculata* Linnaeus, 1753). This stream runs discontinuous towards the end in the Río de La Plata and is mostly affected by cattle ranching.

The record for Arroyo Buñirigo is based on three adult specimens: one female caught on 18 December 2005, and two males caught on 3 February and 30 September 2007 (Figs. 3 and 4A). They were collected during field works about ecological aspects of *Hydromedusa tectifera* Cope, 1869 and *Phrynops hilarii* (Duméril and Bibron, 1835) (Chelidae; Alcalde et al. 2010). All turtles were marked and then released to apply capture-recapture models. Arroyo Buñirigo shows two distinct areas and *Trachemys dorbigni* inhabits in both. One area (site 1, Fig. 2B) is under the influence of the Río de La Plata by daily changes on depth (0.2-2.5 m) and its margins present mostly native vegetation (*e.g. Celtis tala* Gillies, 1848; *Passiflora caerulea* Linnaeus, 1753; *Salix humboldtiana* Willdenow, 1806) with presence of some introduced shrubs (*e.g. Lonicera japonica* Thunberg, 1784) and trees (*e.g. Morus* sp.; *Ligustrum* sp.; *Phoenix* sp.) The second area (site 2, Fig. 2C) is more homogeneous in depth (usually no more than 1 m) except in rain season. This area shows important changes of slope at some points, that determinates the presence of small waterfalls (0.5 m height). The impact of cattle ranching causes that riverbanks have few vegetation except some native (*e.g. Celtis tala*) and exotic (*e.g. Morus* sp.; *Phoenix* sp.) trees, with clear prevail of the last ones. Submersed vegetation is scarce and the bottom is hard in both areas.

Native populations of *Trachemys scripta elegans* range from northern Illinois to the Gulf of Mexico (USA, Seidel 2002; Fritz and Havaš 2007). This species was exported from USA since the 1970s to supply the growing demand for the international pet trade. As a consequence of this trade, the species was introduced in many countries in Africa, Central and South America, Asia, Australia, Europe, and also in regions of USA that do not correspond with the natural range of the species (Cadi et al. 2004; Feldman 2007; Turtle Taxonomy Working Group 2010). In South America, this species was introduced in Brazil, Chile, Colombia, Ecuador, and Guyana (Iriarte et al. 2005; Turtle Taxonomy Working Group 2010). We caught one adult male of *Trachemys scripta elegans* in site 2 of the Arroyo Buñirigo on 3 November 2007 during the course of the field works mentioned previously. The specimen (15 cm of carapace, MLP R.5505, Figs. 4B and 5) was removed from the environment and nowadays is housed in the reptilian collection of the Museo de La Plata (MLP R. 5505). This represents the first record of the non-native *Trachemys scripta elegans* for Argentina.

We found that the extension of the geographic range of *Trachemys dorbigni* presented herein is important for the following reasons: (1) to confirm the records of Marelli (1924) and Ringuelet (1955) about the presence of this species in aquatic environments related to the Río de La Plata shoreline; (2) the fact that the most southern localities described herein for the species are virtually isolated from the northern populations by one of the biggest South American metropolises (Buenos Aires), and (3) the fact that Arroyo Buñirigo is highly impacted by human activities (cattle ranching, alimentary industry, and tannery) and the presence of the non-native *Trachemys scripta elegans*. Further, the impact of industry effluents and herbicides in the water and sediments of Arroyo Buñirigo is well documented (Bauer et al. 2002). This environmental disturbance may affect the population dynamic of the native turtles of Arroyo Buñirigo. Since August 2005 to December 2008 we were sampling monthly or bi-monthly in Arroyo Buñirigo. At present we identified more than 60 *Phrynops hilarii*, about 30 *Hydromedusa tectifera*, and three *Trachemys dorbigni*. Local people told us that turtles in general, but *Trachemys dorbigni* in particular, are become rare compared to 20-30 years ago. The apparent low population density of *Trachemys dorbigni* in its

southernmost locality made the species particularly vulnerable at the local level. Many authors recognize the evolutive importance of marginal populations because they should be more susceptible to disappear or to speciate by geographic isolation (Lande 1998).

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Figure captions

Figure 1. Geographic distribution map of *Trachemys dorbigni d.* Black dots: literature [d'Orbigny & Bibron (1847), Cabrera (1998), Carreira et al. (2005)] and museum records (Museo Argentino de Ciencias Naturales Bernardino Rivadavia – MACN: Buenos Aires, Argentina; Museo de La Plata - MLP: La Plata, Argentina; and Diego Baldo collection housed at the MLP). Red dots: new records from Arroyo Zapata (1) and Arroyo Buñirigo (2), Buenos Aires province, Argentina.

Figure 2. Habitats used by *Trachemys dorbigni* in Arroyo Zapata (A) and sites 1 (B) and 2 (C) of Arroyo Buñirigo, Buenos Aires, Argentina. Photo A: Guillermo Natale.

Figure 3. Specimens of *Trachemys dorbigni* from Arroyo Buñirigo, Buenos Aires, Argentina; dorsal (A, C) and ventral (B, D) view of an adult female (A, B) and an adult male (C, D) in process of melanization. Bar = 10 cm.

Figure 4. Details of the head of an adult male of *Trachemys dorbigni* (A) and an adult male of *Trachemys scripta elegans* (B) from Arroyo Buñirigo, Buenos Aires, Argentina.

Figure 5. Adult male of *Trachemys scripta elegans* from Arroyo Buñirigo, Buenos Aires, Argentina; dorsal (A) and ventral (B) view. Bar = 5 cm.

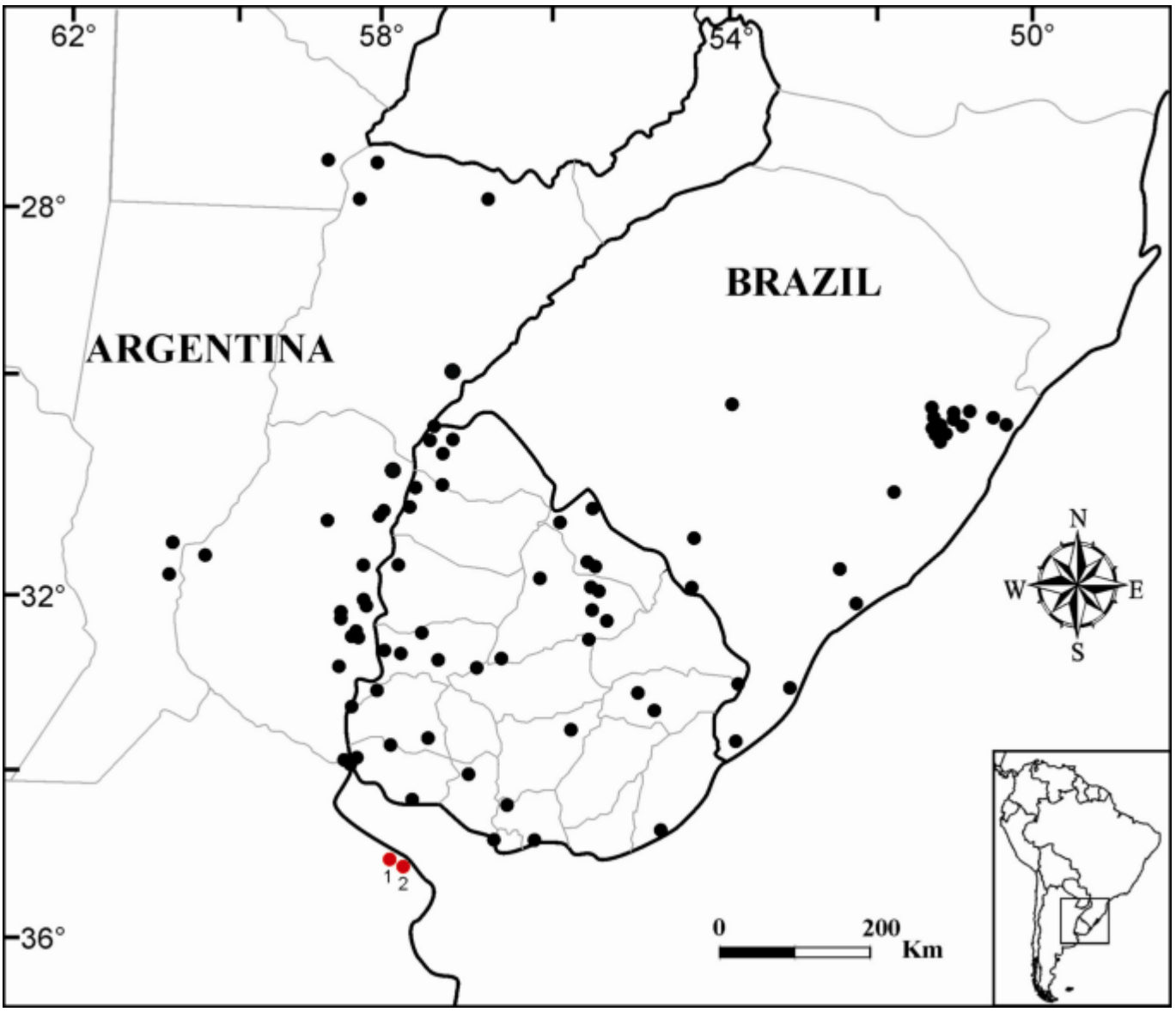

Fig.1

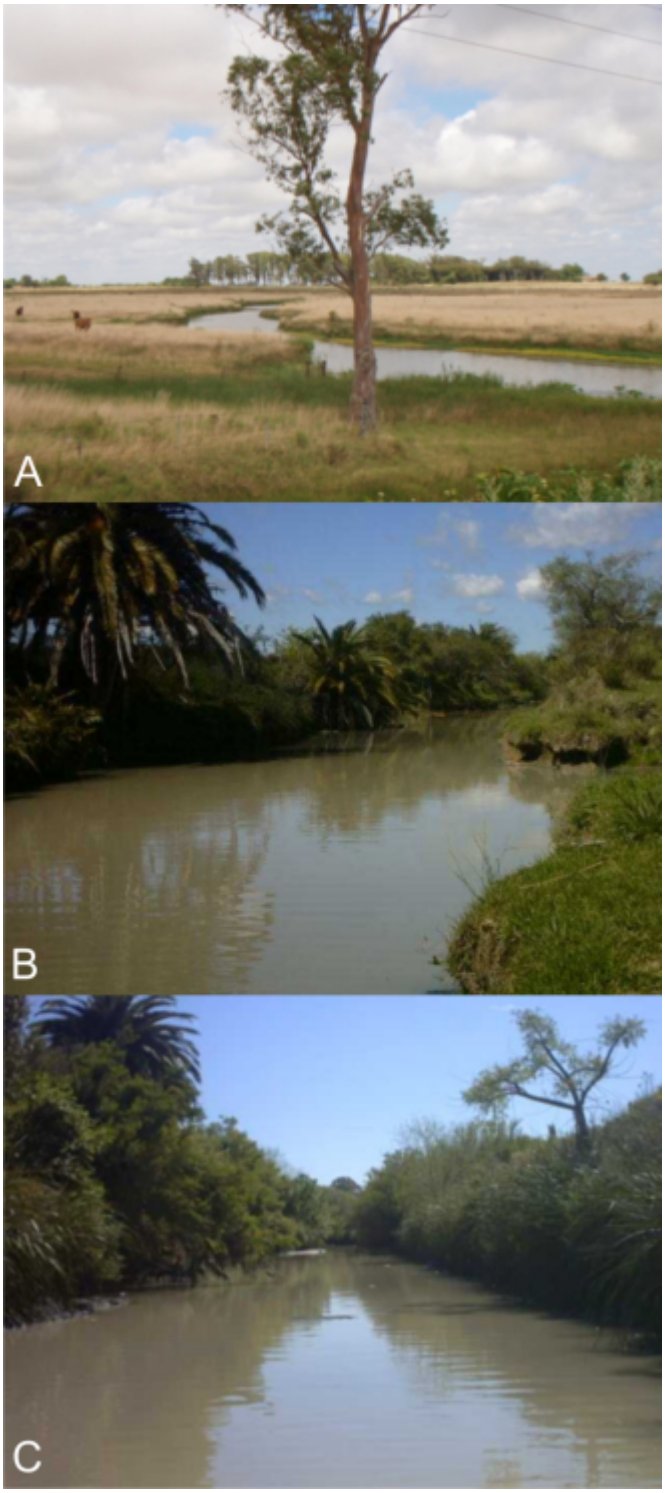

Fig. 2

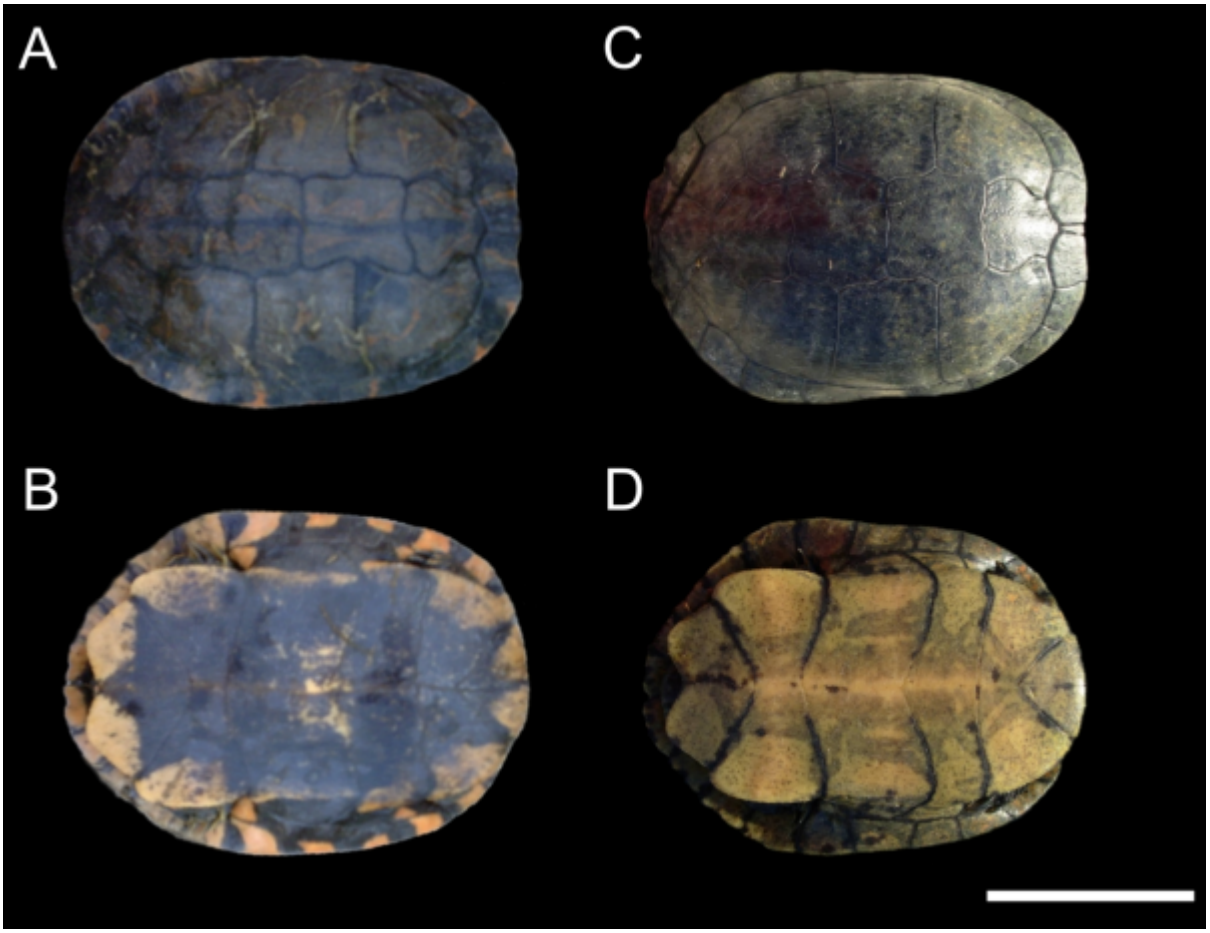

Fig. 3

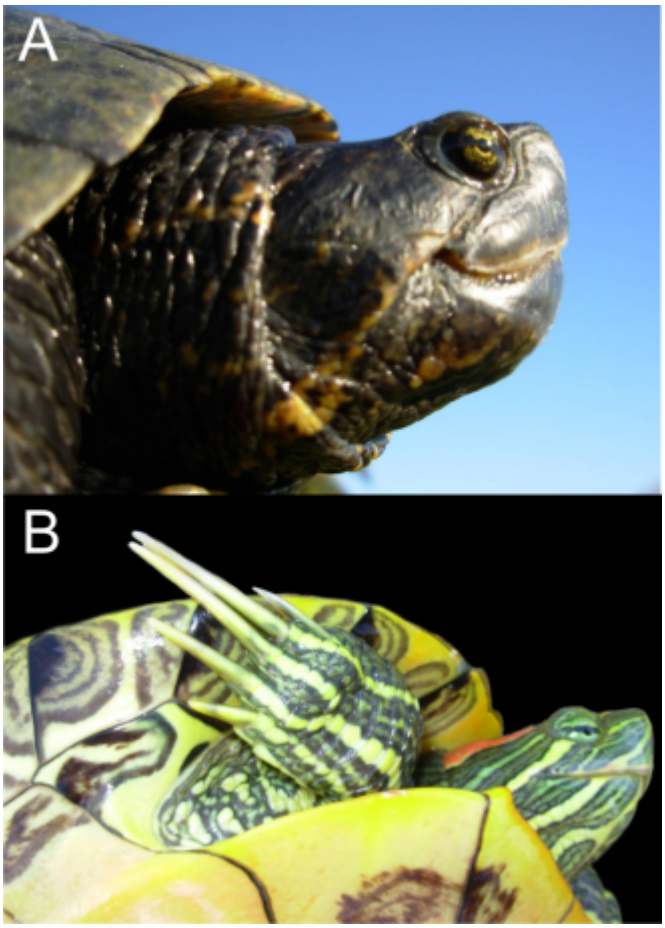

Fig. 4

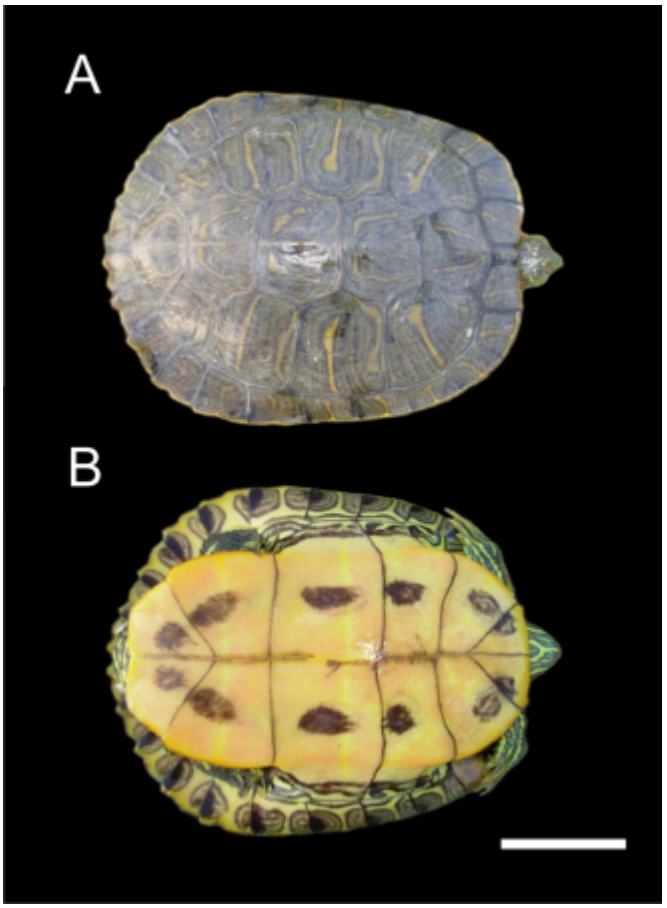

Fig.5