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**All photos by authors unless otherwise stated.*

AN OVERVIEW OF THE ORINOQUIAN TURTLES IN VENEZUELA

A view of
the Orinoco River from an
airplane (photo by Charles
Brewer-Carias).

Turtles (Chelonia) are often overlooked, despite their dedicated fanbase of reptile enthusiasts. In comparison, lizards, snakes, and even crocodiles tend to draw much more attention. Lizards captivate with their ubiquity and the wide variety of shapes, sizes, and colors they exhibit. Snakes are iconic for their symbolism and mystery, while crocodiles impress with their immense size, formidable teeth, and prehistoric appearance. Turtles, on the other hand, represent a unique and lesser-known evolutionary branch of reptiles that truly deserves more recognition. During the time the first author spent in Venezuela, and with the second author still residing there, we developed a deep and abiding passion for all types of reptiles, including turtles.



One of the first tasks undertaken by Barrio-Amorós in Venezuela was a comprehensive survey of turtle populations in Amazonas state, conducted between 1997 and 1999. Together, we embarked on several expeditions through the country's diverse landscapes in search of rare species, including efforts to confirm reports of the elusive matamata turtle in the southern Maracaibo Lake basin. Despite our best efforts, we were unable to conclusively verify their presence, though unconfirmed sightings persist.

Venezuela, located on the northern coast of South America between the Equator and 12° North latitude, spans western longitudes from 60° to 74°. It is bordered to the north by the Caribbean Sea and to the northeast by the Atlantic Ocean. To the south, it shares borders with Brazil, to the east with Guyana, and to the west with Colombia. The country covers an area of 916,445 km², with a coastline stretching 4,261 km (Barrio-Amorós, 1998). Rivas et al. (2012) proposed 14 biogeographic regions for reptiles in Venezuela, with particular relevance to the 17 species of continental turtles found across the country. Turtles can be found in most regions of Venezuela, except for the high Andes, the tepui highlands and certain coastal areas, although sea turtles do utilize the beaches for nesting during certain seasons.

Venezuela is recognized as one of the world's most biodiverse countries, particularly in terms of freshwater and terrestrial turtle species. The country is home to 17 turtle species, including 3 endemic taxa (Trebbau & Pritchard, 2016).

The modern era of turtle research in Venezuela began with the publication of *Turtles of Venezuela* in 1984, a book edited by the Society for the Study of Amphibians and Reptiles (Pritchard & Trebbau, 1984). This book has remained an essential reference for researchers studying chelonians in Venezuela and northern South America. Despite the passage of time, it continues to serve as a primary source of information on turtles in the region. At that time, few Venezuelan researchers focused on turtles, and studies were mainly centered on species exploited for consumption, such as sea turtles and the famous Orinoco River turtle or Arrau. These species had long

captured the attention of travelers and naturalists from the 17th and 18th centuries. Research on the Orinoco River turtle laid the groundwork for much of the current knowledge we have of this species.

The Amazon River basin, the largest in the world, covers an area of 6,864,344 km², of which 51,000 km² lie within Venezuela. The Amazon basin is connected to the Orinoco basin via the Brazo Casiquiare, an arm of the Orinoco River that flows into the Amazon via the upper Río Negro. The Orinoco basin has 880,000 km² of which 65% are in Venezuela, and the rest in Colombia. Because of this geographic proximity, the faunas of the two basins are similar, although some species, like *Chelus fimbriata* (Schneider, 1783) and *C. orinocensis*, have evolved separately in each basin (see below).

The turtles of Venezuela (excluding marine species) are classified into six families, with notable species found particularly in Amazonas state (listed in black below): Chelidae, with 6 species: *Chelus orinocensis* (Vargas-Ramírez, Caballero, Morales-Betancourt, Lasso, Amaya, Martínez, Silva Viana, Vogt, Pires Farias, Hrbek, Campbell & Fritz, 2020), *Mesoclemmys gibba* (Schweigger, 1812), *Mesoclemmys raniceps* (Gray, 1856), *Mesoclemmys zuliae* (Pritchard & Trebbau, 1984), *Platemys platycephala* (Schneider, 1792), and *Phrynops tuberosus* (Peters, 1870); Podocnemididae, with 5 species: *Podocnemis erythrocephala* (Spix, 1824), *Podocnemis expansa* (Schweigger, 1812), *Podocnemis unifilis* (Troschel, 1848), *Podocnemis vogli* (Muller, 1935), and *Peltecephalus dumerilianus* (Schweigger, 1812); Emydidae, with 1 species: *Trachemys callirostris* (Gray, 1855); Geomydidae with 2 species: *Rhinoclemmys diademata* (Mertens, 1954), and *Rhinoclemmys punctularia* (Daudin, 1802); Kinosternidae with 1 species: *Kinosternon scorpioides* (Linnaeus, 1766); and Testudinidae with 2 species: *Chelonoidis carbonaria* (Spix, 1824) and *Chelonoidis denticulata* (Linnaeus, 1766). In total, there are 17 species of turtles in Venezuela, with 13 species specifically found in Amazonas state.

ACCOUNTS

Order: Testudines – Suborder: Pleurodira – Family Chelidae

Chelus orinocensis (Eng. *Matamata turtle*; Spa. *Matamata/Caripatúa*).

The matamata has an unmistakable appearance. It has three dorsal keels on the carapace, a thick neck replete with protuberances which help it to be cryptic, a flat triangular head and a long, pointy snout. They grow to a considerable size. The senior author has registered the largest known specimens, one of 48 cm of straight carapace length (Barrio & Narbaiza, 1999) and another of 50,2 cm (19.8 in)



This matamata turtle specimen is bearing the largest size known to date for the genus, 50.2 cm of midline carapace length (photo by César Barrio-Amorós).

of midline carapace length (but 52,6 cm (20.7 in) of total carapace length) (Barrio-Amorós & Manrique, 2006), both surpassing measurements reported by Pritchard & Trebbau (1984) and Sánchez-Villagra et al. (1995). The matamata populations of the two major Venezuelan basins differ greatly in structural and morphological features, as reflected in Sánchez Villagra et al. (1995) and other authors. Recently Vargas-Ramírez et al. (2020) separated both populations and erected the Orinoco-Essequibo population as *C. orinocensis*.

The presence of this particular species is known along all the Orinoco and Essequibo drainages, entering the Paria Gulf in northeastern Venezuela (Cunha et al., 2021). The Casiquiare arm and upper Rio Negro could be a natural entrance for *C. fimbriatus* into the Venezuelan territory, as explained by Escalona (2024), or at least an area of intergradation. However, despite the recent report by Escalona (2024) of a juvenile matamata from the Maracaibo Lake, we still doubt the real occurrence there, although there is a small chance of a small population of *Chelus* living there. On the other hand, the presence of *C. fimbriata* in the Amazonian part of Venezuela must be supported by vouchers and molecular data.

The matamata inhabits certain aquatic environments, which share a series of common characteristics, such as slow current and an abundance of prey and refuges. These conditions are common in the majority of the rivers and lakes of the low tropical regions of Venezuela. The matamata is indifferent to the clarity of the water, inhabiting as much black waters as transparent or

brown, although we presume a preference for the latter, supporting the greatest biomass and in which it is easier to hide. When the waters begin to recede (November-December), the female matamata leaves the water and goes to the river banks, where she excavates a nest and lies between 12 and 28 eggs; or lay eggs directly on the inaccessible banks. These hatch in the beginning of the rainy season, between April and May.

This species depends entirely on live fish for food, assuming a mimicking and ambushing posture, and rapidly swallowing any small fish that comes close to see if the protuberances on its neck are edible. The species is not endangered, as most Amazonian inhabitants are reluctant to eat such a “horrible” looking animal! Presently, no trade threatens the Venezuelan populations.

Mesoclemmys gibba (Eng. Keeled sideneck; Spa. Galápago hediondo).

The keeled sideneck, based on information obtained in the states of Amazonas, Bolívar, Delta Amacuro and Monagas (eastern Venezuela) (see Pritchard & Trebbau, 1984; Mittermeier et al., 1978) is a small turtle (up to 23 cm (9.1 in) and possibly greater) with black or dark brown coloration. Animals observed in the Amazonas state are smaller (up to 18,5 cm (7.3 in)) and have a different coloration from that of the animals of the eastern (Guianan) populations.



Juvenile *M. gibba* (photo by Dick Lock).

We suspect a different taxonomic identity for the Amazonian populations. Their habits are relatively secretive. They inhabit small streams and lakes in the interior of the rainforest, making them easier to detect at night when they can be found in search of food. One adult female was taken by a hook with fish bait. There is no concrete data on their

biology in Venezuela. We extrapolate that they make a nest with 2 to 4 eggs among the humus of the forest (as is referred to by Mittermeier et al., 1978; Medem, 1983), in places such as the foot of a trunk or termite mound (Ye'kuana indians, pers. com.).

Mesoclemmys raniceps (Eng. Wreathed toadheaded sideneck; Spa. *Galápago sapo*).

Just two records in Venezuela are attributable to this species. One of them, the holotype of *M. heliostemma*, which was collected during the Cerro de la Neblina expedition (McCord et al., 2001; McDiarmid & Paolillo, 1988), now is a junior synonym of *M. raniceps* (Molina et al., 2012; Cunha et al., 2019). Some hatchlings in this species display bright yellow to orange facial bands, a unique character among toadheads, that fades when adults. There is no data about behavior, habitat or reproductive habits from Venezuela. In Peru, the species dwells in small forest streams, as is expected also in the rest of its distribution. The second individual is a young specimen collected in the Orinoco River (without a precise location), referred in the literature as *Phrynops nasutus wermuthi*, a species described as *Phrynops nasutus* (Schweigger, 1812) and later considered synonym of *P. raniceps*. However, *P. wermuthi* has been resurrected recently, pending the status of this individual (Rivas & Barrio-Amorós, in preparation).



Wreathed toadheaded sideneck juvenile, with the conspicuous yellow markings from which was described *M. heliostemma* (the holotype was an individual very similar to this one; photo by Bill Lamar).

On the other hand, previous records of *M. nasutus* in Venezuela are discussed by Rivas et al

(2015). This species does not occur in Venezuela, being endemic to French Guiana and Surinam.

Lately the taxonomy of *Mesoclemmys* has been quite messy, describing new species just to be synonymized immediately after (Cunha et al., 2021, 2022; Gallego et al., 2023).

Platemys platycephala (Eng. Grooved sideneck; Spa. *Chata o Galápago Chato*).

This small turtle (maximum length 17 cm (6.7 in)) is found in forested areas of southern and eastern Venezuela. This is the sole species in the area bearing two parallel keels (or a median groove, depends on the observer's view) in the carapace. The specimens from southern Amazonas state are much lighter in color than the others from elsewhere in the country and northern South America. The dark carapace pattern is reduced, having a bilaterally symmetrical dark blotch, configured symmetrically on each side, on a beige background. They can be found as often on land as immersed in pools and shallow lakes. We know very little of their biology in our area, but we can assume similar habits to those described for the species in other places (Dixon & Soini, 1977;



Grooved sideneck, a small and pretty semi-aquatic turtle that can be common in some areas of the Amazon (photo by Dick Lock).

Medem, 1983; Métrailler, 2001). They lay only one large egg per clutch. Details of nesting, incubation and hatching are unknown as well as feeding habits for Amazonas specimens. However, we captured a male at night in a creek with a trap using fish bait, and juveniles during the day in small forest pools. The grooved sideneck can be locally common in shallow ponds inside the forest. Indigenous people feed on them in SE Venezuela.

**Order: Testudines – Suborder: Pleurodira –
Family Podocnemididae**

Peltocephalus dumerilianus (Eng. *Big-headed sideneck*; Spa. *Cabezón*; *tortuga Lora*).

P. dumerilianus is a very unique and peculiar turtle. It is readily distinguished from others of similar size principally by the disproportionate size of the head and its upper jaw, which resembles anteriorly a macaw beak. The resemblance is so striking that the name for the species in Ye'kuana language refers directly to this feature (“Karuay” = Macaw). The coloration of this turtle is from dark blue to black. Sexual dimorphism is demonstrated by the fact that the male (up to 48 cm (18.9 in)) is larger than the female (38 cm (14.9 in)), a characteristic shared only with the Scorpion mud turtle (*K. scorpioides*), among Venezuelan turtles. They are distributed in almost all the rivers and waterways of the Amazonas state, being especially abundant in those of black waters. The big headed sideneck is used extensively as a food source by the indigenous and Creole (or criollo) populations in the areas which it inhabits, and is of great importance to the subsistence economy. Approximately 1,000 cases of poaching were reported per year up to 1998 (Barrio-Amorós & Narbaiza, 2008). The turtles are sold to the garimpeiros from Brazil, who are involved in the illegal mining industry in the Siapa River region,



Big-headed sideneck is a large, highly aquatic species, rarely seen basking on black water rivers; sometimes, when doing so, they open the mouth (photo by César Barrio-Amorós, courtesy of Quetzal Dwyer).

in the southern part of Amazonas state. One of the few studies done on this species (Pérez-Emán, 1990, Pérez-Emán & Paolillo, 1997) provides the

only data about its feeding and reproductive cycles in Venezuela. Pérez-Emán (1990) states, based on the presence and size of the ovarian follicles and fat bodies that the expected nesting period can be between December and April. Nesting periods given in literature seem to correspond to the rainy season; for example, between August and September in Río Negro, Brazil (Vanzolini, 1977); between July and August in the northern part of Amazonas (Pritchard, 1979) or between July and August and until January in the Colombian Amazon (Medem, 1983).

In our experience, the nesting period in the Venezuelan Amazon is between August and September as well. Although Pritchard & Trebbau (1984) indicate clutch size between 7 and 25 eggs, our data indicates 8 to 12 eggs. Pérez-Emán (1990) argues reasons of competition to explain different habits with respect to laying sites between *Peltocephalus* and *Podocnemis*. The “Cabezón” does not use the river beaches to make their nests due to their flooding during the rainy season but rather lay their eggs in the forest, far from the river. On the other hand, all *Podocnemis* species nest on the beaches of the rivers in the dry season. *P. dumerilianus* should be considered an opportunistic omnivorous turtle. It feeds principally on fruits, seed, fish and carrion. But adults are caught with fish baits or attracted to traps also with rotten fish. In captivity they are aggressive with smaller turtles, biting and sometimes killing them.

Podocnemis erythrocephala (Eng. *Red-headed sideneck*; Spa. *Chipiro*).

The red-headed sideneck is the smallest representative of the genus *Podocnemis*. It has an oval shell that is narrower anteriorly than posteriorly. They are reddish brown in carapace color with the females being darker than the males. At all stages males present spots on the head of a remarkable vermilion red color. The average shell length is 27 cm (10.6 in), the largest not exceeding 32 cm (12.6 in). *P. erythrocephala* is a characteristic inhabitant of “black water” rivers and lagoons. Their distribution is continuous through the hydrographic net of black water rivers in the south of the state, especially the Brazo Casiquiare and its tributaries, the Atabapo River and the Río Negro. It was introduced at Caño Tamatama by the Piaroa Indians that live there. The species is believed to be omnivorous, but we have no concrete

data about feeding habits. The “chipiro” begins its reproductive season before the other *Podocnemis*, in October and November, when the waters start to recede. Females lay 4 to 8 eggs in beaches along both the channels of black waters where the species inhabits, as well as to a distance from the creeks in mainland (forest or savanna).



The smallest *Podocnemis* species, Red-headed sideneck with the characteristic red markings on the head. Photo Bill Lamar.

Hatchlings occur from January to March. Mittermeier & Wilson (1974) states a clutch size between 5 to 12 eggs. The species is fairly common where not under pressure from poachers. Despite being small in size, it is pursued and captured together with the big-headed sideneck, since they are sympatric. Michels & Vargas Ramírez (2018) found a certain degree of genetic differentiation between the populations of this species in the Orinoco and Amazon basins, similar to that in *Chelus*.

Podocnemis expansa (Eng. Arrau turtle or Orinoco giant turtle; Spa. *Tortuga arrau*, *charapa*).

The Arrau turtle is the largest freshwater turtle of South America and one of the largest in the world

(only marginally smaller than *Macrochelys*, *Chitra* and some *Rafetus* (Pritchard, 1979). Although not the norm, it is possible to find females up to 80 cm of carapace length. The average size of adult females varies between 60 and 70 cm (23.6-27.5 in). Females have an average weight of 23 kg (and have been reported weighing up to 118 kg, probably due to some error). All information obtained in Venezuela about this species since the time of Humboldt (from the eighteenth century to date) is based on the studies realized at the nesting beaches of the Middle Orinoco (Ramírez, 1956; Mosqueira Manso, 1960; Roze, 1964; Paolillo, 1982; von Humboldt, 1991). The senior author spent 2 years (1997-1999) in the Venezuelan Amazonas taking new data on the species in the Upper Orinoco (Barrio-Amorós & Narbaiza, 2008).

Since the times of Humboldt, it had been assumed that the Arrau turtle could not swim farther upriver than the Atures rapids near Puerto Ayacucho and therefore was restricted to the Middle and Lower Orinoco. Until this date there were only occasional sightings in the upper Orinoco, at Tamatama and Boca Mavaca (Pritchard & Trebbau, 1984), reported by missionaries and anecdotal visitors. The Zoologisches Museum in Hamburg holds a report of four individuals sighted in Río Negro, Venezuela, but there was no precise locality. Pritchard & Trebbau (1984) state that there is no confirmation of the passing of this species through the Brazo Casiquiare that connects the Amazonian and the Orinoquian populations of *P. expansa*. Nevertheless, Schinz (1833; in Pritchard & Trebbau, 1984: 43) gave a description of *Emys arrau* Schinz, 1833 (a synonym of *P. expansa*) with type locality situated between the Atabapo River and the Brazo Casiquiare. This report did not convince Wermuth & Mertens (1961), who restricted the



Photo by Ali Vargas.



Photo by Bill Lamar.

Orinoco giant turtles (adult and juveniles).

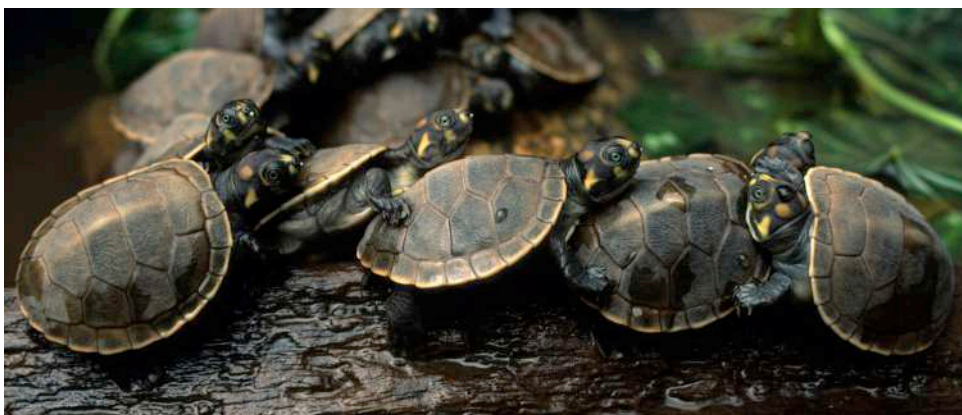
type locality of the species to the confluence of the Apure with the Orinoco rivers and the great cataracts (meaning the Atures rapids we suppose, because there are not large waterfalls in the zone). Later investigators took this previous data as a fact and did not consider the possibility of the Arrau inhabiting upriver of the Atures rapids, a belief carried through to the present day. Thus, its distribution in Venezuela has been confined to the Orinoco River and tributaries below these rapids. It appears, according to information gathered by us in the communities above Atures, that the distribution of the species is not throughout in the upper Orinoco, but definitely extends above the rapids of Atures as far as the rapids of Peñascal (near the headwaters of the river), where the Orinoco narrows in a manner seemingly unsuitable for this turtle. Thus, it is present along the upper Orinoco and wide areas of the Ventuari, Casiquiare, Siapa, Padamo, Matakuni, Mavaca, Ocamo and Cunucunuma rivers. This fact indicates a clear distributional continuity between the basins of the Orinoco and the Amazon, without a geographic barrier separating them as had been assumed. The reproduction of this turtle in the middle Orinoco region has been well studied; however, data for the upper Orinoco region is minimal. During our census in 1998 we found 435 nests in the Brazo Casiquiare, almost all predated by human activity (Barrio-Amorós & Narbaiza, 2008). For many years, FUDECI (an important Venezuelan NGO) has been studying the population status of the Arrau turtle, and encouraging its protection through environmental educational workshops aimed at the educators and children inhabiting the region. Every year, FUDECI releases thousands of yearling turtles after a year raising specimens in captivity (to avoid predation of hatchlings by large catfish and piranhas). The status of the species in

the Upper Orinoco is currently unknown. Probably much more endangered than before, or even locally extinct due to the presence of illegal gold miners.

Podocnemis unifilis (Eng. Yellow-headed sideneck; Spa. Terecay).

P. unifilis is an aquatic turtle of medium to large size, with a characteristic anterior vertebral keel and without the expansion of the posterior region typical of *P. expansa* and *P. erythrocephala*. It has a more oval and deeper convex shell. The carapace color is uniform dark brown to olive green. Hatchlings and juveniles have a black or brown head with yellow-orange markings which fade with maturity in females but remain in males. The female gets considerably larger than the male, reaching a straight-line carapace length of 50 cm (19.7 in) (Barrio, 2001), while males do not exceed 33,5 cm (13.2 in) in length. The yellow-headed sideneck is widely distributed in South America. It inhabits much of both the Amazon and Orinoco River basins. A deep genetic distance has been noted between both hydrographic basins, similar to that in *Chelus*, without reaching any nomenclatural decision (Escalona et al., 2009a). In the Amazonas state, Venezuela, it inhabits all the white or brown waters, and some black water rivers. This herbivorous and frugivorous turtle is markedly aquatic, but does like to bask either solitary or in groups. The reproductive data of the Terecay in the Amazonas state is similar to data obtained in other areas of their distribution. Some nests we examined revealed 11 to 27 eggs.

According to locals interviewed, the clutch range is from 18 to 54 eggs, although stated to be up to 49 eggs in Peru (Pritchard & Trebbau, 1984). The median size of the elliptic eggs is 42,5×30,4 mm (1.7×1.2 in), based on a sample of 33 eggs. Measured nests had depths from 17 to 21 cm (6.7-8.3 in). Terecay



Aggregation of hatchlings of Yellow-headed sideneck previous to liberation at the Nichare river, Venezuela (photo by Tibisay Escalona).

are less particular than the Arrau as to where they nest and deposit their eggs. They often use sandy beaches like the Arrau, but may also walk distances from the shore to nest. The nesting season is the same as that for the Arrau, beginning in January, but hatchling occurs later, when the rivers begin to rise. This species has been extensively studied by Tibisay Escalona in the Caura river basin (Escalona et al., 2009a, 2009b, 2018, 2019). When compared with the Arrau and the big headed sideneck, the Terecay and its eggs are more sought after as food items, yet it still maintains some demographic abundance. The adults are caught using a float, nylon line and fishhook with banana as bait. During the dry season in the Casiquiare arm, thousands of nests are plundered by humans. During a visit to a Yeral Indian community we viewed Terecay and eggs being cooked. We later found a fisherman who was cooking an adult male Terecay, and tasted it to better understand why these turtles are so pursued. We now understand, as it was extremely delicious!

Podocnemis vogli (Eng. Llanos sideneck; Spa. Galápago sabanero).

This is a medium sized *Podocnemis* intermediate between *P. erythrocephala* and *P. unifilis*, with a carapace length up to 36 cm (14.2 in) in females and no more than 26 cm (10.2 in) in males. Both sexes are light to dark brown. The plastron is pale in color. The juveniles have white-yellowish spots on the head that some males retain into adulthood.



Subadult *Llanos sideneck* under water (note blue eyes) (photo by Ivan Mikolji).

Although there is no bibliographic or museum data of the presence of this species in Amazonas state, it is confirmed in Northern Bolívar state, inhabiting the same biotope found in northern Amazonas state. According to local inhabitants,

its presence is recognized by illustrations and is distinguished from *P. unifilis* by size and behavior. We restrict the distribution in Amazonas state to the northern savanna range, from Samariapo to the border with Bolívar state. Additionally, locals report the presence of a “galápago” that basks in large numbers, clearly distinguishable from Terecay, in the relict savannah of the Ventuari River. *P. vogli* is a lagoon dweller, not found in large rivers. They bask in groups, are extremely shy, diving as soon as they notice danger. They are primarily herbivorous, opportunistically eating invertebrates, fishes and carrion. The llanos sideneck nests in the savanna, sometimes far from water, from November to January. The clutch size varies from 7 to 17 eggs, hatching 3 months later.

Order: Testudines – Suborder: Cryptodira – Family Geomydidae

Rhinoclemmys punctularia (Eng. Guianan wood turtle; Spa. Tortuga de bosque Guayanesa).



Large individual of Guianan wood turtle from Imataca Forest reserve (photo by César Barrio-Amorós).

Paolillo (1985) described a subspecies of the common wood turtle with the name *Rhinoclemmys punctularia* subsp. *flamigera* Paolillo, 1985. It differs from the nominal subspecies in the disposition of the red supracephalic spots arranged in a radial pattern (compare head pattern variation in Paolillo 1985: 300, with Fretey et al., 1977: 72). Gorzula & Señaris (1998) consider *R. p. flamigera* either a western extreme cline, or a local aberration of *R. punctularia*. As there is no connection between the distribution of the nominal subspecies in eastern Venezuela and *R. p. flamigera*, Barrio-Amorós

& Narbaiza (2008) raised the subspecies status to species, as *R. flammigera* Paolillo 1985, mostly by isolation reasons and a different head pattern. But nowadays we know that the distribution of *R. punctularia* in southern Venezuela is wider than previously expected, with confirmed records from the Caura river basin.

A curious fact is that some Makiritare indigenous communities migrate from the Ventuari region (region of *R. flammigera*) to the Caura, bringing with them those turtles (without a clear reason, maybe for food, or for empathy like in many cultures around the world). Same is happening with the Colombian Piaroa Indians bringing *R. punctulatia* from Venezuela to the Vichada region (Osorno-Muñoz et al. 2021). In any case, we say that the Amazonian *R. punctularia* could be introduced, but maybe some kind of mixing happened with those local and escaped populations in the Venezuelan Amazon and neighboring Colombia. Pending a molecular test that confirms or weakens this theory, currently the subspecies *R. flammigera* is considered a synonym of *R. punctularia*. This rare turtle is terrestrial, living in humid rainforest, where it is common to find them submerged in shallow muddy ponds. They are omnivorous, seeking palm seeds as much as worms or rotten fish. Eggs of this species are exceptionally large for the size of the turtle, and elongated. They are usually left one by one without special care on the leaf litter, from 1 to 4.

Order: Testudines – Suborder: Cryptodira – Family Kinosternidae

Kinosternon scorpioides (Eng. Scorpion mud turtle; Spa. Pechoquebrado).

The scorpion mud turtle is a small turtle (up to 17 cm (6.7 in)) recognized by its mobile plastron with two hinges, the immense head of the males, and the stinger-like tip of male's tail. The species occurs practically in all the country from sea level to more than 1000 m a.s.l., avoiding high mountains. It is exclusively carnivorous, feeding on invertebrates, fish and carrion. If we extrapolate from the existing data on reproductive tendencies from other regions, we can speculate that a nest contains 1 to 3 eggs. In the Venezuelan Amazon their distribution is greatly unknown. The only existing data comes from museum voucher specimens collected from several dispersed localities, all in savannah habitat. The species doesn't appear to inhabit the rainforest south of Ventuari river, based on the fact the species



Scorpion mud turtle is only found in Savannah remnants in the Orinoco basin (photo by César Barrio-Amorós).

is not recognized by Ye'kuana and Yanomami Indians who inhabit the Upper Orinoco region.

Order: Testudines – Suborder: Cryptodira – Family Testudinidae

Chelonoidis denticulatus (Eng. Yellow-footed tortoise; Spa. Morrocoy montañoero).

C. denticulatus is the characteristic tortoise of lowland rainforests in southern Venezuela as well as the whole Amazonian region. The adults have a very convex and elongated shell while that of the juveniles is oval, almost spherical. The hatchlings display a fine denticulate on the border of the marginal scutes that explains the nomenclature of the species (*C. denticulatus* means tooth-like). The carapace of an



Subadult Yellow-footed tortoise in the Amazonian rainforest of Venezuela (photo by César Barrio-Amorós).

adult is yellowish brown or orange in the center of each dorsal scute, surrounded by black. The plastron is variably yellowish brown. Sexual dimorphism is characterized by a deep plastral concavity in males (also patent in *C. carbonarius*). The plastron of the females is flat. The average size of female adults is up to 48 cm (18.9 in), less in males, although this is not necessarily always true. We speculate that the maximum size of the species could surpass 80 cm (31.5 in) in length. In fact, this must be the third species in length among all tortoises, after all Galapagos species complex, *Chelonoidis niger* (Quoy & Gaimard, 1824) and related species and *Aldabrachelys gigantea* (Schweigger, 1812) from Seychelles, and similar to *Centrochelys sulcata* (Miller, 1779) (up to 83 cm (32.7 in); Bour, 2004; Maran, 1999). The record for the species is considered to be 82 cm (32.3 in) from a male alive (in 1984) in a zoo of Manaus but from an unknown origin. Interviews with Yanomami and Ye'kuana Indians confirm the existence of a gigantic morrocoy (known as *Toto*) that they compare in length with the Arrau turtle. When the hunters find one in the forest, they cut it *in situ*, because it is too heavy to carry in one piece back to the community. We believe these giants are very old individuals who are an exception to the normal growth due to an unknown variable, since not all of adults grow to this size. Very little is known of the natural habits of this species, as our only data is from brief encounters with natives. It is an omnivorous tortoise that forages for fruits and vegetables, adding to its diet small animals and carrion opportunistically. The people of La Esmeralda tell how when recovering crashed planes in the forest they have found "morrocayos" eating the corpses.

Very few researchers have observed the reproductive pattern of *C. denticulatus*. Some females have been observed to have a clutch size between 10 to 20 eggs. The breeding season is roughly estimated to be from January to March within the Amazonas state of Venezuela. Pritchard & Trebbau (1984) report a clutch size of 10 to 20 eggs, while Castaño-Mora & Lugo (1981) found only from 1 to 8 eggs. The reported period of incubation is from 128 to 152 days. Sometimes the female lays her eggs in ant or termite colony, possibly to avoid nest predation. The morrocoy is an important source of protein for the communities not living near rivers where fish and aquatic turtles are eaten.

It is also common to find it as a pet. In Culebra, in the upper Cunucunuma river, the Ye'kuana people use the morrocoy as a medicinal remedy for asthma, grinding the shell into a pulp and mixing it with water.

Chelonoidis carbonarius (Eng. Red-footed tortoise; Spa. Morrocoy sabanero).



Juvenile Red-footed tortoise (photo by César Barrio-Amorós).

The Red-footed tortoise is very similar to the yellow-footed tortoise in form and proportions, with an average size of 40 cm (15.7 in). It has a high domed convex carapace, black in color with yellow areolae in the center of each carapace scale. The black forelimbs are ornate with red coloring, while the head is yellow in Venezuelan populations. The record size for this species is from a Paraguayan specimen, measured at 59,3 cm (23.3 in) (Vinke & Vinke, 1999). In Estado Amazonas, the red footed tortoise is found only in the savannas of the northern part of the state as well as the Ventuari river valley. It is quite common to find albino young animals in the wild.

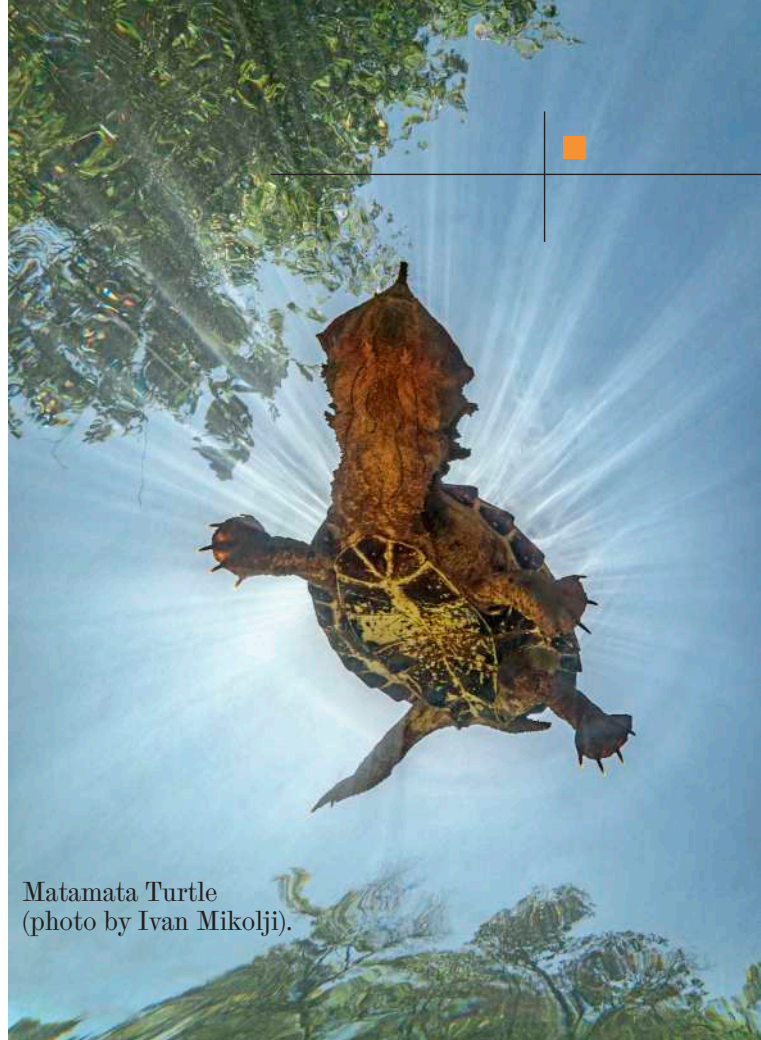
Probable species

Two unconfirmed species are thought to be found in Amazonas state. *Rhinemys rufipes* (Spix, 1824) and *Phrynops geoffroanus* (Schweigger, 1812). No clear data was obtained, as our informers confused *Rhinemys rufipes* with *Podocnemis erythrocephala* in photos. One specimen of *Rhinemys rufipes* was brought in 1997 to Íñigo Narbaiza just few previous the first

author could see it. Iñigo kept it in captivity in Puerto Ayacucho, but the next day the animal disappeared. There is no locality data, thus it could be from Venezuela or Colombia (Puerto Ayacucho lies on the boundary of the two countries). Both these species are known from close localities in Colombia, and are elusive inhabitants of rainforest streams, thus their presence in Venezuela is likely. Also, close reports of *Phrynops geoffroanus* are known in Colombia, but to date, not a clear sight is from Venezuela.

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Matamata Turtle
(photo by Ivan Mikolji).

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