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REDESCRIPTION OF *PODOCNEMIS ERYTHROCEPHALA* (SPIX, 1824), AN AMAZONIAN PELOMEDUSID TURTLE

RUSSELL A. MITTERMEIER
ROBERT A. WILSON

ABSTRACT

This paper provides a redescription and synonymy for the Amazonian pelomedusid turtle Podocnemis erythrocephala *(Spix, 1824). Specimens of* P. erythrocephala *have been incorrectly called* Podocnemis cayennensis *(Schweigger, 1812) by recent authors.* P. erythrocephala *differs from all other* Podocnemis *in palatal morphology and in having red or reddish-orange nostrils and a broad band of the same color extending between the tympani and over most of the interparietal and parietal head scales. The majority of specimens of* P. erythrocephala *come from the black water Rio Negro system in Brazil, but there are also isolated records from southern Venezuela and from other parts of Brazil. Its closest living relative is* Podocnemis unifilis *Troschel, 1848.*

INTRODUCTION

The pelomedusid turtle genus *Podocnemis* is represented by seven living species in South America and one in Madagascar. Specimens of the poorly known Amazonian species *Podocnemis erythrocephala* (Spix, 1824) have been called *Podocnemis cayennensis* (Schweigger, 1812) by most recent authors. The present paper redescribes *P. erythrocephala* and provides a synonymy to clarify the taxonomic and nomenclatorial confusion surrounding the animal.

Podocnemis erythrocephala (Spix, 1824)

(Figs. 1-7)

Emys erythrocephala Spix, 1824:9, pl. 7 (original description; type locality "Rio Solimoens" = Rio Solimões; type in München, Zoologische Sammlung des Bayerischen Staates — MZSBS 2517/0).

Podocnemis expansa Wagler, 1830: 135 (in part; includes *E. erythrocephala* Spix under *P. expansa*).

1. Department of Anthropology and Museum of Comparative Zoology, Harvard University, Cambridge, Mass, 02138.
2. Tapir Research Institute, P. O. Box 382, Claremont, Calif, 91711.

Hydraspis expansa var. *erythrocephala* Gray, 1831a:42.

Chelys (*Hydraspis*) *expansa* var. *erythrocephala* Gray, *in* Griffith, 1831b:17.

Emys enythrocephala Schinz, 1833:45 (typographical error).

Podocnemis dumeriliana Duméril & Bibron, 1835:387 (in part; not of Schweigger, 1812).

Podocnemis agassizi Coutinho, 1868:150 (type locality: Rio Negro, Amazonas, Brazil).

Podocnemis coutinhii Goeldi, 1886:279, pl. 5 (type locality: Rio Negro, Amazonas, Brazil).

Podocnemis cayennensis Siebenrock, 1902: 167, Fig. 2 (not of Schweigger, 1812 or Gray, 1831a).

Podocnemis dumeriliana Goeldi, 1904-6: 726 (not of Schweigger, 1812; Gray, 1855, 1864, 1870; Strauch, 1862, 1865; Boulenger, 1889).

Podocnemis cayennensis Luederwaldt, 1926 (in part; not of Schweigger, 1812).

Podocnemis cayennensis Müller, 1935: 104 (not of Schweigger, 1812).

Podocnemis cayennensis Williams, 1954:287 (not of Schweigger, 1812).

Diagnosis. The smallest of living *Podocnemis, P. erythrocephala* is most closely related to *P. unifilis.* Live specimens (up to at least 120 mm) are distinguished from all other *Podocnemis* by the bright red or reddish-orange color pattern on the head. In adult males, this color persists throughout life; in adult females, it starts to fade to a dull brown at approximately 120-150 mm. In preserved specimens, the red or reddish-orange color pattern appears as: 1) a broad band of light color stretching from tympanum to tympanum and including most of the lateral parts of parietal scales and all of interparietal scales except for the posterior tip (Fig. 1a.); 2) light color on nostrils and on immediately adjacent parts of maxillary (light colored nostrils unique among *Podocnemis* — Figs. 1 and 8c); 3) light colored triangular band on anteromedial part of mandible (Fig. 1b). The heart-shaped and very broad interparietal scale is also characteristic (Fig. 1a.). Shell similar to that of *P. unifilis,* but much more expanded posteriorly, especially in adults. Skull similar to *P. unifilis,* but distinguished by presence of small vomer, joined to anterior projection of palatines by connective tissue and dividing choana into two roughly oval halves (Fig. 4b). (In *P. unifilis,* the vomer is sometimes present, but the palatine projections when present do not divide the choana into oval halves. See figure of *P. unifilis* in Williams, 1954 for comparison.).

External characters

Head. Forehead grooved. Masseteric scale not reaching orbit. Upper jaw notched medially, notch sometimes continued to nostrils as a feeble groove (Fig. 1c). Interparietal scale heart-shaped and almost always wider than long (Fig. 1a.) (exception, one in 100 specimens has interparietal scale slightly longer than wide); in specimens up to 80-90 mm, length of interparietal is usually less than or equal to two-thirds the width; in specimens larger than 90 mm, the interparietal elongates somewhat, but retains basic shape. Parietals usually meet behind the interparietal (exception, one in 100 specimens). Suboculars usually present (exception, one in 100 specimens: AMNH 97631 has a tiny subocular on one side, none on the other).

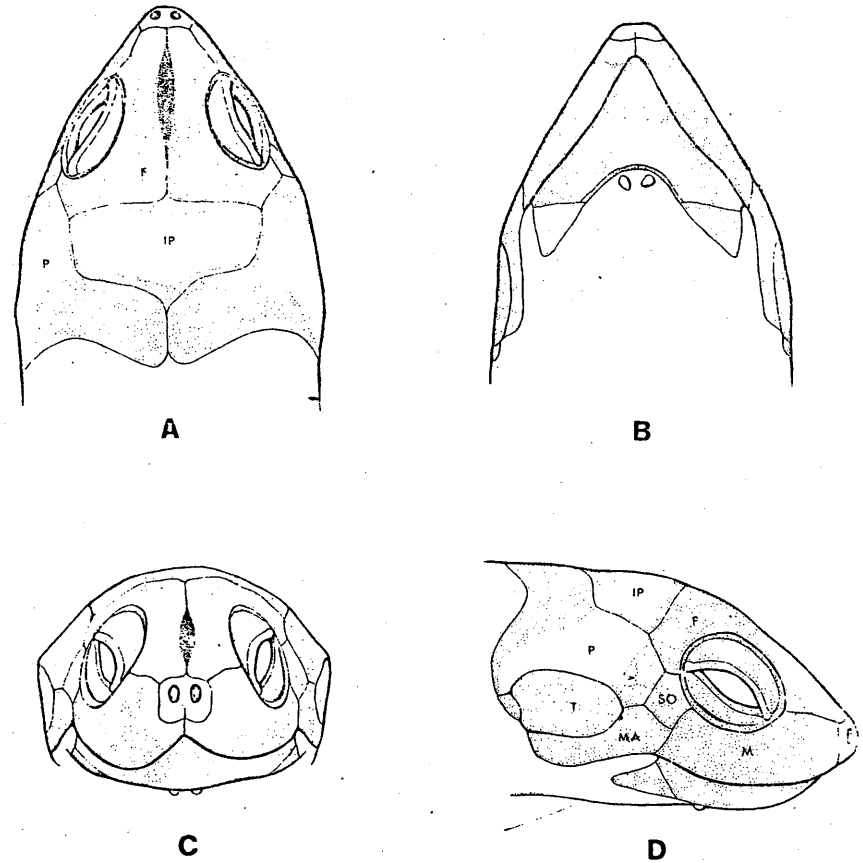

Figure: 1: Dorsal, ventral, frontal and lateral views of the head of a juvenile *P. erythrocephala* approximately 100 mm in carapace length: *a.* Dorsal view of head. Note the shape of the interparietal scale (IP) and the distribution of the light color pattern on the nostrils and the interparietal and parietal (P) scales. In living juveniles and living adult males, the light color pattern is red or reddish-orange. In adult females, it fades to dull brown. In alcoholic specimens, it fades to light reddish-brown, yellowish-brown, yellowish white or white. F = frontal scale. *b.* Ventral view of head. Note the two barbels and the light-colored, roughly triangular band on the anteromedial part of the mandible. *c.* Frontal view of head. Note the light-colored nostrils, unique among the *Podocnemis.* In living juveniles, this color is red or reddish-orange. *d.* Lateral view of head. Note the distribution of light color pattern. SO = subocular scale, MA = masseteric scale, T = tympanum, M = maxillary scale.

Shell. Shell distinctly convex, slightly expanded posteriorly in young, much expanded posteriorly in specimens longer than 100 mm. Greatest width of shell over third or anterior part of fourth vertebral, in vicinity of seventh and eighth marginals. Vertebral keel present and most prominent on vertebrals two and three. Weak nuchal indentation present in most specimens. Concentric growth rings evident; in specimens roughly 50-95 mm in length, original hatchling scutes still visible and distinguished from surrounding growth rings by being wrinkled. First marginal scute usually wider than long, rarely as long as or longer antero-posteriorly than wide in juveniles less than 120 mm (12% of specimens examined had first marginal as long as or longer than wide). In adults, the first marginal is frequently as long as or longer than wide and is, in general, more elongate than the first marginal of other *Podocnemis*. Dorsal surface of marginal six more than half as wide as long. First or second vertebral longest, second or third vertebral widest.

Front plastral lobe always longer than rear lobe; front or rear lobe may be widest (50-50 breakdown in specimens examined). Intergular scute always longer than gulars; width of intergular almost always less than length of intergular-gular suture (exception, one in 43 specimens examined for this character) (Figs. 2b, 3b). Abdominal-abdominal suture always longest; pectoral-pectoral suture usually second longest, although femoral-femoral may sometimes be (6% of specimens examined had femoral-femoral suture longer than pectoral-pectoral suture). Adult

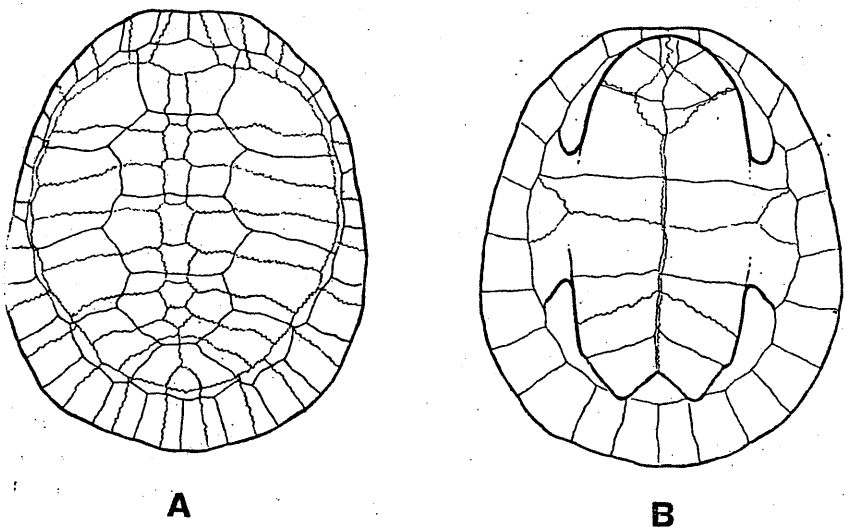

Figure 2: Carapace and plastron of a juvenile *P. erythrocephala* 79 mm in carapace length. The scutes are here outlined in solid lines; the bone sutures are shown by jagged lines. *a*. Carapace. Note the slight posterior expansion of the carapace. *b*. Plastron. Note the length of the intergular scute and the relative lengths of the median sutures between the other plastral scutes.

males have a large semicircular notch in the anal region of the plastron by the tail; in adult females this notch is more triangular and not as large (Fig. 3b).

Barbels on chin. Always two (Figs. 1b, 1c).

Foot scales. Almost always three, rarely two (two of 100 specimens examined had two scales). First scale always the largest (Fig. 5).

Coloration

Head coloration. Ground color dark brown. Light color on head red or reddish-orange in all live specimens up to 12 mm (unique among the *Podocnemis*); this red or reddish-orange color persists into adulthood in live adult males, but fades to dull brown in adult females; red or reddish-orange also fades to light reddish-brown, yellowish-brown, yellowish-white or white in alcoholics. Band of red or reddish-orange stretches from tympanum to tympanum, covering interparietal scale (except for posterior tip) and most of lateral parts of both parietals above tympani; band broken only slightly by sutures between parietals and interparietal. Nostrils and adjacent parts of maxillary scales and anterior two thirds of frontal scales (on both sides of forehead groove) also red or reddish-orange (light colored nostrils unique among *Podocnemis* — Fig. 1). Longitudinal band of red or reddish-orange on antero-medial part of mandible (Fig. 1b). No red or reddish-orange on subocular scales (exception, one of 100 specimens had light color on subocular on one side of head and none on other side).

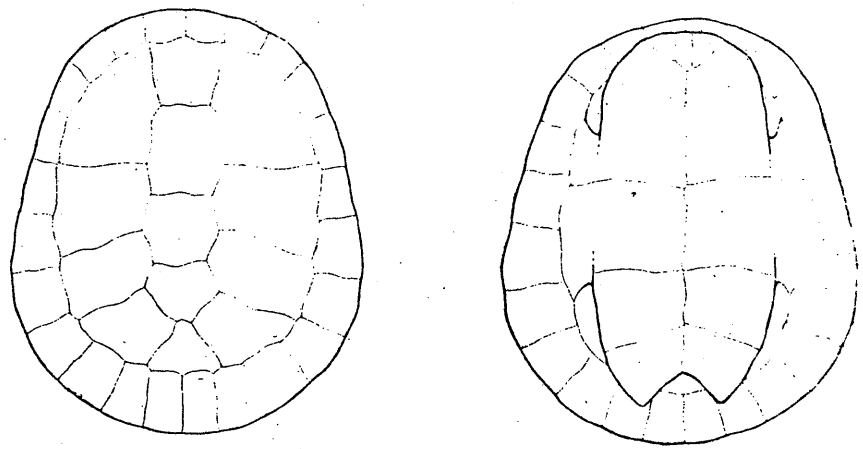

Figure 3: Carapace and plastron of an adult *P. erythrocephala* ♀ 255 mm in carapace length. *a*. Carapace. Note the elongation of the carapace and the greater posterior expansion compared with the juvenile in Fig. 3. Note also the width of the first marginal. *b*. Plastron.

Neck and limbs. Skin on neck and dorsal surfaces of limbs usually dark grey (may sometimes be brown in preserved specimens). Ventral surfaces of limbs vary from whitish-grey to dark grey. Inguinal pockets yellowish-, brownish- or whitish-grey.

Carapace. Color always chestnut brown or dark chestnut brown, although this color may fade in specimens that have been preserved for a very long time. Very fine yellowish, pinkish or orange line on rim of carapace, extending ventrally to extreme edges of ventral surfaces of marginals.

Plastron. Plastron yellow to yellowish-brown along midline, grading into brownish-grey on edges of plastron, bridge and ventral surfaces of marginals. Plastron sometimes has an orange or pinkish tint, especially in juveniles.

Size. The smallest of living *Podocnemis.* The 156 specimens examined ranged in size from 37 to 320 mm. (Siebenrock (1902) and Williams (1954) give 275 mm as the adult size of this turtle.) In the past, adult specimens were very difficult to obtain. A thorough search of major European and American museums in 1971 and 1972 revealed only five: three in Vienna, collected in 1831 by Natterer (195 mm male, 205 mm female, third specimen not measured), one in Paris, collected in the beginning of the nineteenth century (255 mm female — not one of the Schweigger types!) and the type in Munich, collected by Spix (incomplete specimen). However, during a 1973 trip to the Rio Negro, the senior author collected a series of 18 adults and found them to be common, especially during the nesting season. In addition, P. E. Vanzolini of the Museu de Zoologia in São Paulo collected a series of 36 specimens near Tapurucuara, Rio Negro in 1972.

Sexual dimorphism. On the basis of the small sample of adults examined, males have a much longer, thicker tail than females. In addition, the large anal notch on the male plastron is roughly semicircular and easily distinguished from the relatively small, triangular notch on the female plastron (Fig. 3b).

Osteology

Skull. Skull moderately elongate. Jugal bone meeting parietal bone. Quadrate bone not meeting jugal bone (Fig. 4a). Two parallel longitudinal ridges on surface of maxilla. Small vomer present. Premaxillae not reaching choanal margin, but joining with vomer to separate maxillae. Foramina incisiva well within borders of premaxillae. Incomplete bony choanal septum formed by vomer and anterior projections of palatines. Septum completed by strip of connective tissue; divides choana into two roughly oval halves (Fig. 4b). Dorsal and ventral emargination of temporal region well-marked. Deep precolumellar fossa. Entrance to post-otic antrum large. Width of orbit greater than width of cavum tympanum in specimens up to 120 mm.

Shell. Carapace with 16 costals, seven neurals, single suprapygal, pygal, nuchal, and 22 peripherals; seventh neural small (Fig. 2a).

Plastron with roughly diamond-shaped entoplastron; mesoplastra roughly ellipsoid (Fig. 2b).

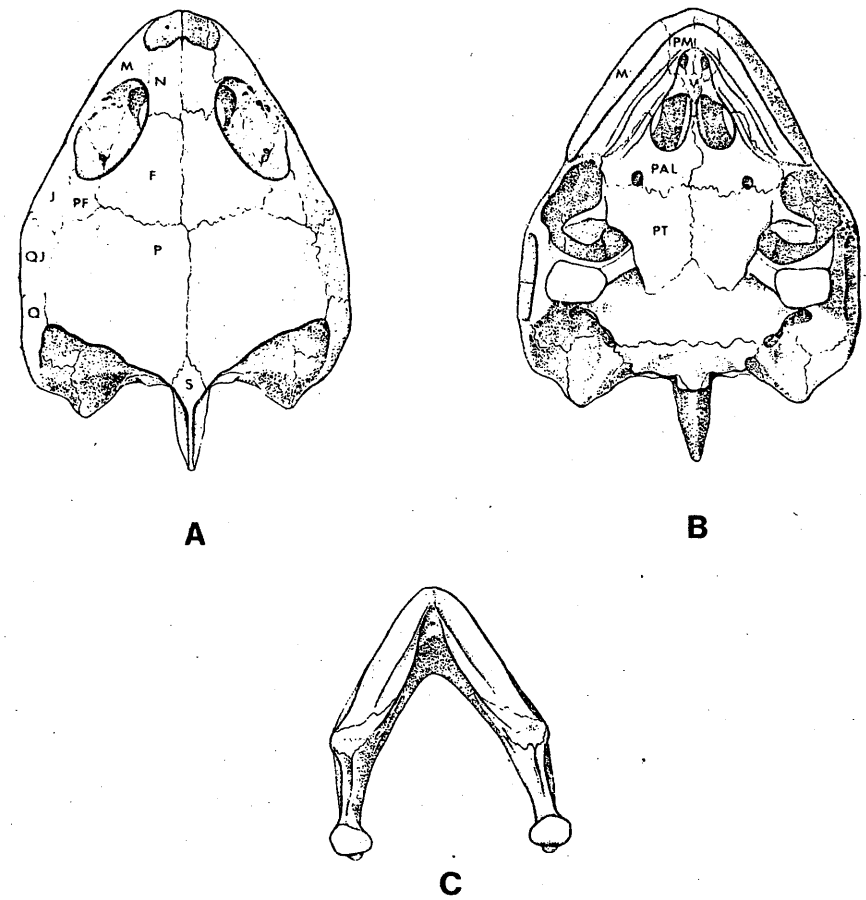

Figure 4: Dorsal and ventral views of the skull and dorsal view of the mandible of a *P. erythrocephala* approximately 100 mm in carapace length. *a*. Dorsal view of skull. Note the contact between the jugal (J) and parietal (P) bones and the lack of contact between the jugal and the quadrate (Q). PF = postfrontal, QJ = quadrato jugal, M = maxilla, N = nasal, S = supraoccipital. *b*. Ventral view of skull. Note the small vomer (V), the anterior projection of the palatines (PAL), the shape of the choanae and the two parallel longitudinal ridges on the surface of the maxillae (M). The premaxillae (PM) do not reach the choanal margin, but join with the vomer to separate the maxillae. PT = pterygoid. *c*. Mandible.

Distribution and Ecology

Distribution. Williams (1954), summing up available data, gives the Guianan and Amazonian regions and the Orinoco as the range of this species. Wermuth and Mertens (1961) list northern South America, including Venezuela, the Guianas and northern Brazil (Amazon region). Siebenrock (1909) gives Brazil, Marabitanas on the Negro; Venezuela, Orinoco and Cassiquiare.

The ranges given by Williams (1954) and Wermuth and Mertens (1961) are, on the basis of museum specimens now available, too extensive. The single specimen from the Guianas (MNHP 613, from Cayenne, French Guiana) was collected in the early part of the nineteenth century. It could have come from anywhere in northern South America, since many specimens going to France at that time left through the port of Cayenne.

Figure 5: Enlarged foot scales on the hind foot of a juvenile *P. erythrocephala* approximately 100 mm in carapace, length. *P. erythrocephala* almost always has three such scales.

Siebenrock's (1909) records from the Orinoco and Cassiquiare in Venezuela were probably based on two adult specimens collected by Natterer in 1831 and still in the Vienna Naturhistorisches Museum. It appears that *P. erythrocephala* definitely occurs in the Cassiquiare (Anonymous, 1973), but its occurrence in the Orinoco remains uncertain. However, since the Cassiquiare forms a link between the Orinoco and the Negro, it is possible that *P. erythrocephala* also extends into the Orinoco.

Spix (1824) gives the Rio Solimões as the type locality for *P. erythrocephala.* Solimões is the name given to the mainstream of the Amazon between Colombia and Manaus, Brazil, so Spix's specimens could have come from anywhere in this vast area.

Verified locality records are mapped in Fig. 6. Most well documented specimens come from the Rio Negro and its tributaries. However, in addition to these and the Orinoco and Cassiquiare records mentioned above, a few specimens have also come from the Rio Canumã (a small tributary of the Rio Madeira, south of the Amazon), Tefé and Santarém. A specimen labelled "Belem? Brazil" probably came from the collection of the Goeldi Museum and not from the rivers around Belém.

Ecology. Little is known of the ecology of *P. erythrocephala.* It appears to prefer black water rivers, since most of the known specimens come from the Rio Negro, largest black water tributary of the Amazon.

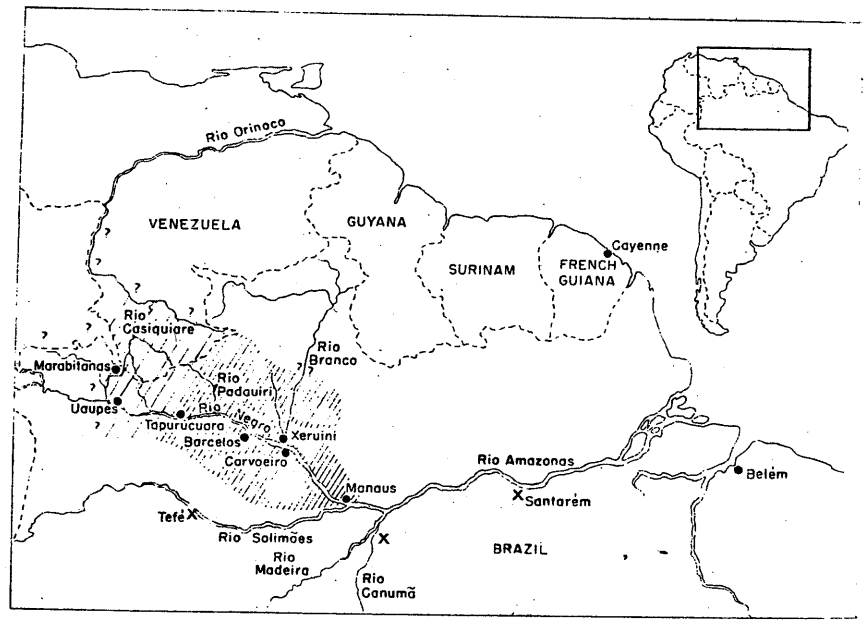

Figure 6: Map showing the approximate distribution of *P. erythrocephala.* The range is largely within the drainage of the black water Rio Negro in Brazil. Localities mentioned in the text or under materials examined are shown on the map. Isolated specimens from outside the Rio Negro system are marked by an "X" (Tefé, Santarém, Rio Canumã). Most recent specimens have come from the lower Negro region, indicated here by closely spaced oblique lines. Most of the specimens in the last century came from the upper Negro region, indicated here by widely spaced oblique lines. The question marks indicate uncertainty regarding the extent of the range of *P. erythrocephala.* It is not known whether the animal occurs above the Uaupés rapids or if it regularly occurs in the lower reaches of the Rio Orinoco. Only one specimen, collected in 1831, is known from the Orinoco. However, since the animal apparently does exist in the Casiquiare in Venezuela, it may also extend into the Orinoco. The extent of the range in the Rio Branco is also unknown.

The Cassiquiare is also a black water river. The Rio Madeira is white water, but the single juvenile from that river system came from the Rio Canumã, a small black water tributary separated from the black waters of the Rio Negro by a huge stretch of white water that includes the mainstream of the Amazon itself (P. E. Vanzolini, personal communication).

Within the Rio Negro system, *P. erythrocephala* shows a preference for small black water lakes and affluents and is rarely found in the mainstream.

However, *P. erythrocephala* is also sometimes found in rivers that are not black. Four specimens came from the Rio Branco, a milky white tributary of the Negro. (It may be that specimens obtained in the Rio Branco from local inhabitants actually came from small black water affluents of the Branco (N. Smith, personal communication). This is yet remains unclear.) One 1831 specimen came from the Orinoco, a clear water river. The exact provenance of the Tefé and Santarém specimens is unknown. Since clear, white and black water occur in the Tefé area and clear and white water in the Santarém area, there are several possibilities. We were unable to obtain *P. erythrocephala* in the Tefé and Santarém areas in 1973 and local inhabitants were unfamiliar with the animal. It remains to be determined if clear and white water rivers are actually part of the normal habitat of *P. erythrocephala* or if the specimens from them were nothing more than stragglers from black water rivers.

P. erythrocephala lays eggs from late August to early November in Rio Negro, with the peak of the nesting season apparently coming in September and October. The number of eggs laid varies from 5-14 and egg-laying usually occurs at night in sandy, brush-covered areas called "Campinas". The eggs of *P. erythrocephala* are white, elongate and either hard-shelled or slightly flexible.

Analysis of stomach contents reveals that adult are primarily herbivorous, feeding on aquatic plants and fallen fruit in igapó forest. However, they are frequently caught on lines baited with fish, so fish undoubtedly also play a role in their diet. Captive juveniles readily accept raw meat and fish and occasionally take vegetable matter.

Relationships with Other Species. *P. erythrocephala* is most closely related to *P. unifilis*, and externally resembles *P. lewyana* in a number of characters. All three species are fairly similar in palatal morphology and possess two roughly parallel ridges on the triturating surfaces of the maxillae. All three also have fairly elongate heads compared to the other *Podocnemis*.

P. erythrocephala usually has a small vomer connected to anterior projections of the palatines by connective tissue. These form an interchoanal septum dividing the choana into roughly oval halves (Fig. 4b). *P. unifilis* often lacks the vomer. The interchoanal septum, which may or may not be complete, is formed by anterior projections of the palatines. In *P. lewyana*, a vestigal vomer is sometimes present but the interchoanal septum is almost always lacking. The shape of the choana also differentiates the three species. (For *P. unifilis* and *P. lewyana*, see Williams, 1954).

Externally, *P. lewyana* and *P. unifilis* between 200 and 300 mm may be confused with *P. erythrocephala* of the same size, especially if the diagnostic head band in *P. erythrocephala* has faded. However, the shell of *P. erythrocephala* is convex, bears a distinct keel and flares widely at the rear. The shell of *P. lewyana*, on the other hand is fairly flat, has no keel (or a very weak one) and is more rounded. The shell of *P. unifilis* is also convex and keeled, but is roughly oval in shape and does not flare posteriorly. Shell size in *P. erythrocephala* reaches 320 mm. *P. lewyana* may attain 460 mm (personal observation). *P. unifilis* is the largest of the three, growing to 680 mm (Siebenrock, 1902).

The heads of adults can be distinguished in several ways. *P. erythrocephala* and *P. lewyana* have two chin barbels, while *P. unifilis* usually only has one. The interparietal head scale is very broad and heart-shaped in *P. erythrocephala*, broad and heart-shaped in *P. lewyana* and elongate and roughly teardropshaped in *P. unifilis*. The upper jaw is notched in *P. erythrocephala*, notched or feebly notched in *P. unifilis* (may be rounded in very large specimens) and rounded in *P. lewyana*.

Juveniles can easily be distinguished from each other. In live *P. erythrocephala*, the red or reddish-orange on the nostrils, along the anterior two-thirds of the forehead groove and on the tympanum to tympanum band are diagnostic. Juvenile *P. unifilis* have bright yellow spots on the head, two of them on the interparietal scale, two along the forehead groove above the nostrils and several on the sides of the head. *P. lewyana* has a white or yellowish-white blotch on the sides of the head above the tympani, but never any light color on the interparietal scale or along the forehead groove. Adult males of all three species retain the juvenile color pattern throughout life.

Geographically, *P. lewyana* and *P. erythrocephala* are nowhere sympatric. *P. lewyana* is restricted to the Magdalena and Sinú drainages in Colombia, whereas *P. erythrocephala* is found much further to the east, especially in the Rio Negro. *P. unifilis* is not sympatric with *P. lewyana* either, but its large range completely encompasses that of *P. erythrocephala*.

Although these three forms resemble each other in many characters, *P. lewyana* differs from *P. unifilis* and *P. erythrocephala* and from all other living *Podocnemis* in one important feature: the lack of a suprapygal bone in the carapace (Wood and Diaz de Gamero, 1971; personal observation). Since both *P. erythrocephala* and *P. unifilis* have this bone and also a convex shell, they are considered more closely related to each other than either is to *P. lewyana*.

These three species and *Podocnemis vogli* Müller, 1935 make up a subgroup of the genus *Podocnemis* that we call the "vomerine group". *P. vogli* is the most primitive member of this group and differs from the other three in having three triturating ridges on the maxillae, a large vomer extending from premaxillae to palatines and an oval, keelless or very weakly keeled shell. Like *P. unifilis* and *P. erythrocephala*, it has a suprapygal bone. Adults can always be distinguished from *P. erythrocephala* by the shape of the shell, which never flares posteriorly. Juveniles have yellow or yellowish-white spots on the head and almost never any light color on the interparietal scale.

Discussion

Status of the name Podocnemis cayennensis (Schweigger, 1812). Recent authors, starting with Siebenrock (1902), assign specimens of

P. erythrocephala to *P. cayennensis* (Schweigger, 1812) (Luederwaldt, 1926; Müller, 1935; Williams, 1954; Wermuth and Mertens, 1961; Neill, 1965; Pritchard, 1967). However, a careful reading of Schweigger's Latin description of *Emys cayennensis* shows that it cannot possibly refer to *P. erythrocephala*. The only character mentioned that is of value at the specific level is "maculis 2 luteis in vertice" (two yellow spots on top of head) and *P. erythrocephala* invariably has a broad band on top of its head.

The original description of *cayennensis* (Schweigger, 1812) may have been based on juvenile specimens of the species subsequently described by Troschel (1848) as *P. unifilis*, which is characterized by yellow spots on top of the head. However, since the types of *Emys cayennensis* no longer exist (a through search of Paris collection by Williams (1954) and by the senior author in 1972 failed to discover them) and since Schweigger's description fails to mention sufficient diagnostic characters, the identity of Schweigger's types cannot be resolved.

Historical Review. Since the name *P. cayennensis* (Shweigger, 1812) does not refer to the turtle discussed in this paper, it can no longer be used. *Emys erythrocephala* Spix, 1824 is the first assignable name. Spix's description and figure point out several diagnostic characters of the species (Fig. 7b). Furthermore, although part of the type specimen of *Emys erythrocephala* (MZSBS 2517/0) was destroyed during the Second World War, enough of it still exists for identification to be made. The name "*erythrocephala*" (red head) also happens to be more descriptive than "*cayennensis*" (from Cayenne, French Guiana), since it is unlikely that the animal occurs in or near Cayenne.

Duméril and Bibron (1835) made an error which confused *Podocnemis* taxonomy for more than 135 years. They lumped *Emys cayennensis* Schweigger and *Emys erythrocephala* Spix under the name *Podocnemis dumeriliana* and used the name *Peltocephalus tracaxa* for *Podocnemis dumeriliana* (Schweigger, 1812). The problems that resulted from this will be discussed in another paper.

Coutinho (1868) briefly described *Podocnemis agassizi* (without ever formally using that binomial), a species of *Podocnemis* apparently restricted to the Rio Negro and known locally as "arapuça". His short description, the vernacular name and the restricted Rio Negro range all correspond to *P. erythrocephala*. We therefore consider *P. agassizi* a synonym of *P. erythrocephala*.

Sclater (1871) mentioned that Spix's *Emys erythrocephala* might possibly be synonymous with *Bartlettia pitipii* Gray, 1870. However, *Bartlettia pitipii* is clearly a synonym of *Podocnemis sextuberculata* Cornalia, 1849 and definitely distinct from Spix's *Emys erythrocephala*.

Goeldi (1886) described a new species of *Podocnemis, P. coutinhii*, on the basis of two juvenile specimens from the Rio Negro. Siebenrock (1902) synonymized *P. coutinhii* with *P. lewyana* Duméri, 1852 and was followed in this by Wermuth and Mertens (1961), though not by Williams (1954). Siebenrock was, however, incorrect since the plate of *P. coutinhii* clearly depicts a specimen of *P. erythrocephala* (Fig. 7a).

Baur (1893) stated that the type of *Emys erythrocephala* Spix was identical with *P. unifilis* Troschel, 1848. He was in error.

Siebenrock (1902) was the first to use the combination *Podocnemis cayennensis* (Schweigger, 1812) for *P. erythrocephala*. His description

of the animal is useful, but leaves out a number of important characters. He also incorrectly considered "*P. dumeriliana*" (Boulenger, 1889) a synonym of *P. erythrocephala*. The specimens called "*P. dumeriliana*" by Boulenger were actually *P. unifilis* Troschel, 1848 (Williams, 1954).

Goeldi (1906) copied part of Siebenrock's description of *P. erythrocephala*, but used the name "*P. dumeriliana*" for the animal.

Additional but incomplete descriptions of *P. erythrocephala* were given by Luederwaldt (1926), Müller (1935), Williams (1954), Neill (1965) and Pritchard (1967). Luderwaldt's (1926) description combined information from Boulenger's (1889) "*P. dumeriliana*" and Siebenrock's (1902) *P. cayennensis* and was therefore useless. Müller (1935) added a few comments on the skull to Siebenrock's (1902) description. Williams (1954) used data from Siebenrock (1902) and Müller (1935), but himself examined only two specimens. Neill (1965) discussed juvenile color pattern. Pritchard (1967) showed a color plate of the animal, but did not discuss it beyond the plate caption. All these authors followed Siebenrock (1902) in calling *P. erythrocephala* by the name *P. cayennensis*.

Additional Comments on Nomenclature. Several authors have incorrectly used the name *P. cayennensis* when referring to *P. vogli* Müller, 1935 in Venezuela (Fiasson, 1945; Röhl, 1949; Mondolfi, 1955). Vanzolini (1967), in citing Mondolfi's (1955) work, also used the name *P. cayennensis* when referring to *P. vogli*. In all these cases, the animal referred to is *P. vogli*, not *P. erythrocephala*.

Vernacular Names. Several vernacular names are used for *P. erythrocephala*. In the Rio Negro, from Manaus at least as far as Tapurucuara. the most commonly used name is "irapuca". Goeldi (1906) cites four other names: "arapuça", "uirá-pocca", "uira-pequé" and "uyrapequé". These are probably local Indian names from which "irapuca" is derived. In the same area, *P. unifilis* is known as "tracajá", *P. dumeriliana* (Schweigger, 1812) as "cabeçudo", *P. expansa* (Schweigger, 1812) as "tartaruga" and *P. sextuberculata* Cornalia, 1849 as "aiaçá" or "pitiú". In the Cassiquiare, *P. erythrocephala* is known as "chimpire" (Anonymous, 1973). In English, the animal is usually called "red-headed Amazon sideneck".

Relations with Man and Conservation. In the Rio Negro, *P. erythrocephala* is hunted by man for its meat and eggs. It is caught by harpooning, by net and on baited line. Females are captured on the "campinas" during the nesting season as well. The animal still appears to be abundant, especially in the smaller black water tributaries of the Negro. However, like all the South American *Podocnemis*, it is heavily exploited and, in the smaller, more remote towns, there is little or no control of exploitation. As a result, *P. erythrocephala* would best be considered a *vulnerable* species at the present time.

Material studied. A total of 156 specimens were examined. 72 of them preserved and 84 alive: MCZ 3413, 1 specimen, Tefé, Brazil, 1866, Thayer Expedition; MCZ 76672-76, 5 specimens, 1963, Manaus region, Brazil; MCZ 100496, 1 specimen, Belém?, Brazil, donated by Carvalho; MCZ 119680, 1 specimen, Rio Negro, Brazil, donated by Ayres, 1968; MCZ 127388-89, 91, 3 specimens, Xeruini village, close to mouth of Rio Branco, Rio Negro, Brazil, collected by Medem, 1971; MCZ 132543-62, 20 specimens, Carvoeiro, Rio Negro, Amazonas, Brazil, collected by Vanzolini, 1972; MCZ uncatalogued, 1 specimen, no data; AMNH 90564,

)2220, 2 specimens, Rio Padauiri (above the Rio Branco, above Manaus), Amazonas, Brazil, collected by Finnegan, 1962; AMNH 97631-32, 104636, 3 specimens, no data; Instituto Roberto Franco (IRF), Villavicencio, Colombia: 23 specimens, Xeruini, Rio Negro, Brazil; Naturhistorisches Museum, Vienna (NMV): NMV 8625, 1 specimen, Brazil, collected by Natterer, 1831; NMV 12027, 1 specimen, Cassiquiare, Orinoco, collected by Natterer, 1831; NMV no number, 1 specimen, Orinoco, Venezuela, collected 1831; NMV no number, 1 specimen, Orinoco, Venezuela, collected by Natterer, 1831; NMV 12627, 1 specimen, Rio Negro, Brazil, 1905; Zoologische Sammlung des Bayerischen Staates, Munich (MZSBS): MZSBS 2517/0 type specimen, Rio Solimoens (=Rio Solimões), Brazil, collected by Spix; MZSBS 1/1971, 2 specimens, Rio Negro, Brazil, collected by Werner, 1971; MZSBS 2/1971, 4 specimens, Rio Branco, Brazil, collected by Werner, 1971; Musée d'Histoire Naturelle, Paris (MHNP): MHNP 513, 1 specimen, Cayenne, collected by Richard; Naturmuseum und Forschungsinstitut Senckenberg, Frankfurt (SMF): SMF 57952-3, 2 specimens, Santarém, Amazonas, Brazil, collected by de Rover, 1960; SMF 60055, 1 specimen, no locality, Luttenberger, 1964; SMF 67601, 1 specimen, Santarém, Amazonas, Zoo-Nitsche, 1971; SMF 67608-9, 2 specimens, Xeruini, close to mouth of Rio Branco, Rio Negro, Amazonas, Brazil, 1969, 1970; in private collections, no data, 22 specimens. In addition to the above mentioned, 56 specimens (38 juveniles, 18 adults) were obtained live in the field during 1973. These have been deposited in the Museu de Zoologia of the Universidade de São Paulo and the Museum of Comparative Zoology, Harvard University.

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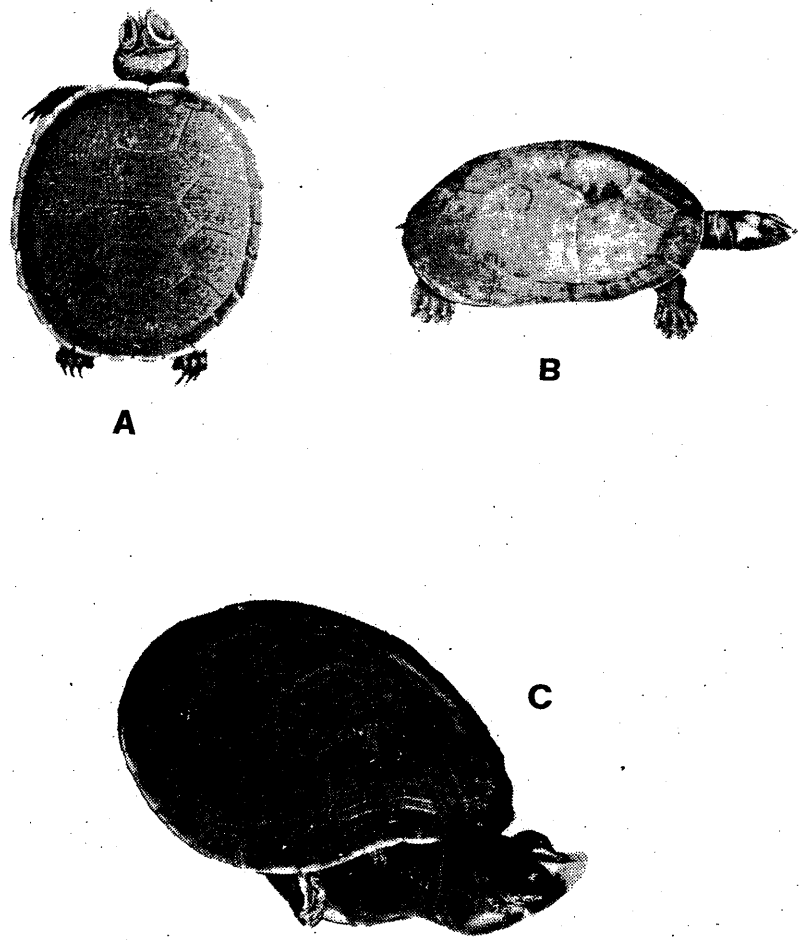

Figure 7: *a*. Plate of *Podocnemis coutinhii* Goeldi, 1886, a species described on the basis of two juvenile specimens from the Rio Negro. *P. coutinhii* is a junior synonym of *P. erythrocephala* since the animal depicted by Goeldi is clearly a juvenile *P. erythrocephala*. Note especially the light-colored nostrils, the tympanum to tympanum band of light color and the shape of the interparietal scale. *b*. Plate of the type specimen of *Emys erythrocephala* Spix, 1824. Note again the light-colored nostrils and the tympanum to tympanum band of light color. Part of this type specimen (a skeletonized shell) still exists in München. *c*. Live juvenile *P. erythrocephala* approximately 70 mm in carapace length. Note especially the light-colored nostrils.