DISTRIBUTION OF THE SOUTH AMERICAN CHELID TURTLE *PHRYNOPS GIBBUS*, WITH OBSERVATIONS ON HABITAT AND REPRODUCTION

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Made in United States of America
Reprinted from HERPETOLOGICA
Vol. 34, No. 1, March, 1978

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ABSTRACT: The South American chelid turtle *Phrynops gibbus* has previously been reported from Trinidad, Surinam, Guyana, French Guiana, the Iquitos region of Peru, eastern Ecuador, northeastern Venezuela, the Departamento of Meta, the Intendencias of Caqueta and Casanare and the Comisaria of Vaupes in Colombia, and the states of Para and Mato Grosso in Brazil. New locality records reported here extend the range of *P. gibbus* into southern Venezuela, the Vichada of Colombia and the upper Amazon region of Colombia and Brazil. Examination of the Mato Grosso specimen revealed that it is not *P. gibbus*. Clutch size in *P. gibbus* varies from 2 to 4 and eggs are laid in a variety of sites. Incubation period ranges from 178 to 200 days and hatchlings weigh 10 to 15 g and range in size from 43 to 48 mm. *Phrynops gibbus* lives in a variety of aquatic habitats, most of them stagnant or slowly flowing and muddy bottomed.

FEW data are available on the South American chelid turtle *Phrynops gibbus* (Schweigger, 1812)[1]. Its range is at present poorly defined, little is known of its habitat preferences and the only information on reproduction is provided by Medem (1973). In this paper, we review the published locality data for *P. gibbus*, cite several new localities which extend the range of this turtle, provide a distribution map, discuss the animal's habitat in Peru, Colombia, Surinam and Trinidad, and add to the information on reproduction.

Distribution.—Wermuth and Mertens (1961) and Pritchard (1967) give the range of *P. gibbus* as Trinidad, the Guianas and north and central Brazil, but the literature includes records from several other countries as well. *Phrynops gibbus* has been recorded from: Trinidad (Gray, 1868; Boulenger, 1889; Mole and Urich, 1894; Underwood, 1962; Kearney, 1972); Guyana (Gray, 1873; Boulenger, 1889; Pritchard, 1964); Surinam (Siebenrock, 1905; Medem, 1973); French Guiana (Dumeril and Bibron, 1835; Fretey, 1975, 1977); Brazil (Schenkel, 1901; Siebenrock, 1904); the Departamento of Meta, the Intendencias of Caqueta and Casanare and the Comisaria of Vaupes in Colombia (Dunn, 1945; Niceforo Maria, 1952; Medem, 1958, 1968, 1973); the Iquitos region of Peru (Dixon and Soini, 1975, 1977); and eastern Ecuador (Orces, 1949). Donoso-Barros (1965) also mentions it from northeastern Venezuela and the savannas of Venezuela, but does not give precise localities.

The Brazilian records for *P. gibbus* are from 2 localities widely separated from one another and from the rest of the range of the species. Schenkel (1901) and Siebenrock (1904) recorded it from the vicinity of Para [now Belem], state of Para, and from Cuiaba, state of Mato Grosso. We have examined the 2 specimens on which these records are based (NMW 11884:2, 15762). The animal from Belem is clearly *P. gibbus*. On the other hand, the one from Cuiaba (NMW 15762) is not. It represents a new species of *Phrynops* which will be described in a later paper.

Ruschi (1966) lists *P. gibbus* as a member of the fauna of the Brazilian state of Espirito Santo. This is almost certainly an error, probably based on another undescribed species resembling *P. gibbus*. Underwood (1962) gives the range of *P. gib-*

[1] Most earlier authors refer to this species as *Mesoclemmys gibba* (e.g., Wermuth and Mertens, 1961; Pritchard, 1967). Zangerl and Medem (1958) suggested that both *Mesoclemmys* and *Batrachemys* are at best subgenerically distinct from *Phrynops*, and Medem (1973) referred to *P. gibbus* as *Phrynops (Mesoclemmys) gibbus*. Bour (1973) elected to drop the subgeneric distinction and referred to the animal as simply *Phrynops gibbus* and we follow his decision here.

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bus as "Trinidad and the Guianas to southern Brazil." The term southern Brazil is misleading and apparently based on the location of Cuiaba. We have no definite records of *P. gibbus* from southern Brazil and do not believe that it occurs south of the Amazon drainage.

The records from French Guiana are based on Fretey (1975, 1977) and on a specimen described as *Platemys miliusii* by Dumeril and Bibron (1835). Wermuth and Mertens (1961) speculated, and Bour (1973) proposed that *Platemys miliusii* is synonymous with *Phrynops gibbus*, though Fretey (1975, 1977) considers them to be distinct. Recent work by R. Bour (*personal communication*) shows that *P. miliusii* is in fact synonymous with *P. gibbus*. We have also obtained 2 other specimens of *P. gibbus* from French Guiana, both from the vicinity of Remire (AGJR 111, L-341, collected by R. Renau Ferrer, 1975).

The literature record of *P. gibbus* from northeastern Venezuela (Donoso-Barros, 1965) was probably based on 2 specimens in the American Museum of Natural History from Caripito, state of Monagas. In addition, the animal has been collected by P. Trebbau at San Carlos de Rio Negro, state of Amazonas, in the extreme southern part of the country (ZMA 15147, collection of Hoogmoed, and P.C.H. Pritchard, *personal communication*) and at La Barra, Territorio Delta Amacura (H. Ollos, *personal communication*).

Phrynops gibbus also occurs in the upper Amazon region of Brazil and Colombia. A specimen was collected by R. Foote in 1975 in the Quebrada Urumutu, a tributary of Quebrada Tacana, 3 km northeast of Leticia, Amazonas, Colombia (live in collection of Medem, IRF 766). In addition, a specimen in Harvard's Museum of Comparative Zoology (MCZ 57130) bears the locality "Leticia, Colombia, bought from Tarpon Zoo" [an animal importing company in Tarpon Springs, Florida, USA] and Mittermeier has seen several *P. gibbus* in the compounds of animal dealers in Leticia. Leticia is situated on the Brazilian—Colombian—Peruvian border and dealers obtain animals from all 3 countries.

Finally, we have specimens that extend the range of *P. gibbus* into the Comisaria of Vichada in Colombia. This record is based on 2 animals obtained by Medem in 1968 (IRF 225-6). They were collected by a Guahibo Indian and lack precise locality data, but come from the Rio Muco area.

All known localities from which *P. gibbus* has been recorded are indicated in Fig. 1. Included in this figure are literature records and previously unpublished data from museum specimens or specimens that we have collected.

Reproduction.—Data on reproduction in *P. gibbus* are based on 5 egg clutches from Colombia, Peru and Surinam (Table 1). Eggs are white, elongate, hard-shelled, fairly uniform in size, and weigh from 22.5 to 28.0 g. Clutch size varies from 2 to 4 eggs. Eggs are apparently laid in a variety of sites. Two nests have been observed in the wild. A nest from the Cano Negro, Colombia, was found in the vegetable garden of a local villager. It was situated 8 m from the bank of a small stream and received some sunlight, but was in the shade most of the day. The soil was dark and moist and the nest hole $\approx$ 10 cm deep. The last egg of the 4 in this clutch was only about 1 cm below the surface. A "nest" in Surinam was found between the roots of a tree by the side of a small stream. The 2 eggs were on the surface of the ground and were not covered. Data are also available on 2 clutches laid by captive *P. gibbus*. A female from the Rio Vaupes laid 3 eggs in a 2-cm excavation under rotten banana leaves in an outdoor enclosure. Another female from the Rio Momon in Peru laid 3 eggs in sand in her enclosure. One of the 3 eggs from the latter clutch was opened after 153 days and found to contain a well-formed hatchling that lived for 3 days (Dixon and Soini, 1977). The second hatched spontaneously after 200 days. The incubation periods of the 4 animals which hatched spontaneously ranged

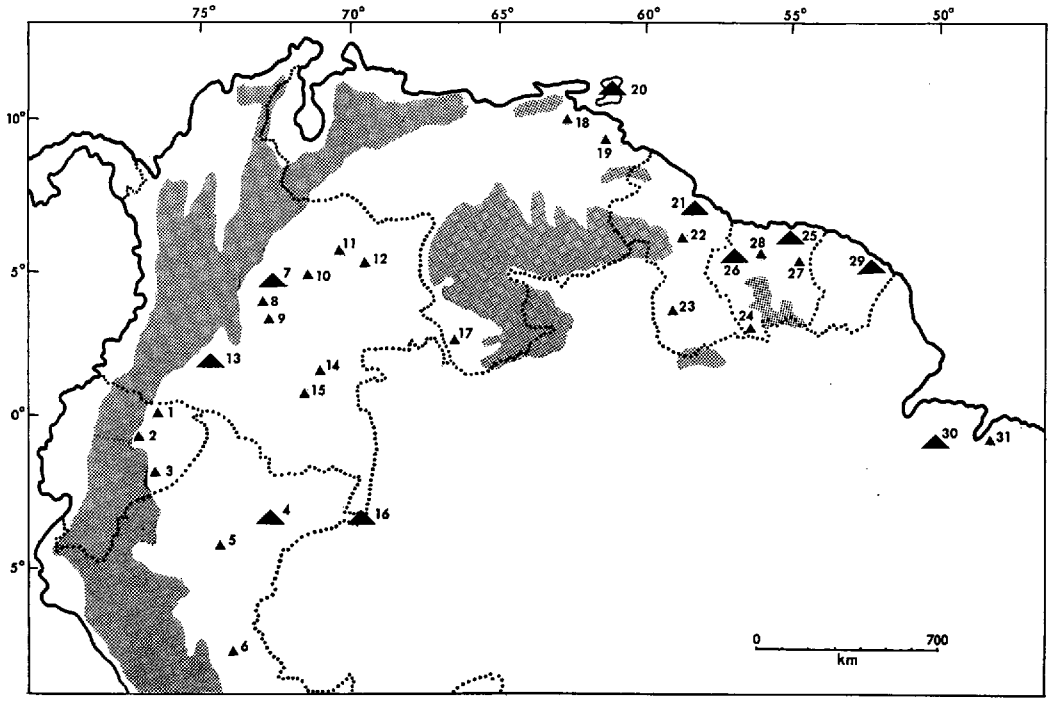

FIG. 1.—Map showing collecting localities for *Phrynops gibbus* in South America. Shaded areas indicate elevation > 500 metres. Numbers refer to locality listing presented below. The museum number or literature citation for each specimen is given in parentheses after each locality. AMNH = American Museum of Natural History, New York; FMNH = Field Museum of Natural History, Chicago; MCZ = Museum of Comparative Zoology, Harvard University; MPM = Milwaukee Public Museum; TCWC = Texas Cooperative Wildlife Collection, Texas A&M University; UK = University of Kansas; UMMZ = University of Michigan Museum of Zoology; USNM = United States National Museum, Washington, D.C.; AGJR = personal collection of Rhodin; BMNH = British Museum of Natural History, London; ENPQ = Escuela Nacional Politecnica, Quito, Ecuador; FT = personal collection of Fretey; ILS = Instituto La Salle, Bogota, Colombia; IRF = Instituto Roberto Franco, Villavicencio, Colombia; MHNP = Museum d'Histoire Naturelle, Paris; MHNJP = Museo de Historia Natural "Javier Prado," Lima, Peru; MZUSP = Museu de Zoologia, Universidade de São Paulo, Brazil; NMW = Naturhistorisches Museum Wien, Austria; RMNH = Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands; SMF = Senckenberg Museum, Frankfurt, West Germany; ZMA = Zoologisch Museum Amsterdam, Netherlands.

ECUADOR 1. Santa Cecilia, Napo [0°05′N, 76°50′W] (UK 105438, 109857, 148409–10)
2. Loreto, Lower Rio Suno, Rio Napo, Napo [0°40′S, 77°22′W] (ENPQ 4612, 4614, MCZ 68859)
3. Rio Conamba, Pastaza [2°05′S, 76°25′W] (MCZ 68858)

PERU 4. a. Iquitos, Loreto [3°42′S, 73°15′W] (Dixon and Soini, 1977, MHNJP 17, MPM 8580, MCZ uncatalogued ♀ collected by Soini, 1972)
b. Rio Itaya [3°45′S, 73°17′W] (Dixon and Soini, 1977, TCWC 41806)
c. Rio Momon, Rio Nanay [3°37′S, 73°17′W] (live specimen obtained by Soini, 1973)
5. Maipuco, Rio Maranon, Loreto [4°47′S, 75°10′W] (Dixon and Soini, 1977, AGJR L-296—live specimen obtained by Soini, 1972)
6. Yarinacocha, Rio Ucayali, Loreto [8°15′S, 74°35′W] (FMNH 45668–71)

COLOMBIA 7. a. Villavicencio, Meta [4°10′N, 73°37′W] (ILS 79, USNM 108581)
b. Acacias [4°00′N, 73°45′W] (Niceforo Maria, 1952, ILS 76)
c. Rio Ocoa and Aguas Claras [4°08′N, 73°35′W] (Medem, 1958, FMNH 73422–30, SMF 51477)

d. Cano Catatumbo [4°08′N, 73°40′W] (MCZ 127406)
e. Cano Negro [4°08′N, 73°37′W] (Medem, 1973)
8. Sabana de San Juan de Arama, Meta [3°33′N, 73°50′W] (Medem, 1958)
9. Quebrada Honda, upper Rio Guejar, Meta [3°15′N, 73°45′W] (Medem, 1958)
10. Puerto Lopez, Meta [4°06′N, 72°56′W] (Medem, 1958)
11. Orocue, upper Rio Meta, Casanare [4°48′N, 71°20′W] (Medem, 1958)
12. Rio Muco, Vichada [4°30′N, 70°50′W] (IRF 225–6)
13. a. Florencia, Caqueta [1°35′N, 75°37′W] (Niceforo Maria, 1952, ILS 74, 77, 125, 129–31, 144)
b. Rio Hacha [1°40′N, 75°37′W] (ILS 78, UK 124941)
c. Rio Ortequaza [1°35′N, 75°32′W] (ILS 75)
d. Quebrada La Perdiz [1°33′N, 75°37′W] (ILS 145)
e. Ceilan [1°35′N, 75°37′W] (ILS 146)
f. Pueblonuevo [1°35′N, 75°37′W] (ILS 147)
14. Rio Vaupes, Vaupes [1°30′N, 72°10′W] (Medem, 1973)
15. Puerto Uva, upper Rio Apaporis, Vaupes [0°30′N, 71°30′W] (IRF 254)
16. a. Leticia, Amazonas [4°11′S, 69°57′W] (MCZ 57130, IRF 765, FT 206)
b. Quebrada Urumutu, Quebrada Tacana [4°09′S, 69°56′W] (IRF 766)

VENEZUELA 17. San Carlos de Rio Negro, Amazonas [1°55′N, 67°04′W] (ZMA 15147 —live specimen in collection of Hoogmoed, P. Pritchard, *personal communication*)

18. Caripito, Monagas [10°08′N, 63°05′W] (AMNH 65540, 65555)
19. La Barra, Delta Amacura [8°45′N, 61°30′W] (H. Ollos, *personal communication*)

TRINIDAD 20. a. Sangre Grande [10°35′N, 61°07′W] (MCZ 66028)
b. Cumaca River, Arima [10°36′N, 61°15′W] (MCZ 100901)
c. Near Mt. Tamana [10°28′N, 61°12′W] (BMNH 1947.3.4.18—type of *Hydraspis gordoni* Gray, 1868)
d. Trinidad (BMNH 1917.9.27.3)

GUYANA 21. a. Dunoon, Demerara River, Demerara [6°25′N, 58°20′W] (UMMZ S46672–4, 53979)
b. Kartabo [6°23′N, 58°42′W] (AMNH 64721)
22. Demerara Falls [5°20′N, 58°32′W] (BMNH 1946.1.22.86—type of *Hydraspis bicolor* Gray, 1873)
23. Parabam, near Marudi River, Kuyuwini River, Essequibo [2°08′N, 59°06′W] (AMNH 61521)

SURINAM 24. New River (Coeroeni River), 750 feet [= 228.6 m] = Kutari headwaters, Nickerie [2°15′N, 56°50′W] (BMNH 1939.1.1.107)

25. a. Paramaribo, Suriname [5°50′N, 55°10′W] (NMW 18791)
b. Carolina Creek, Para [5°25′N, 55°10′W] (Medem, 1973)
c. Between Powakka and Carolina, Suriname [5°25′N, 55°05′W] (RMNH field number MSH 1975-301 live specimen in collection of Hoogmoed)
d. Berlijn, Para [5°24′N, 55°13′W] (RMNH field number MSH 1968-456 live specimen in collection of Hoogmoed)
26. a. Kaboeri Creek, Nickerie [5°15′N, 57°15′W] (RMNH field number DGR 1971-H160)
b. Avanavero Road, Kilometre 246 west of Saronbridge [4°50′N, 57°10′W] (DOR specimen, not collected, identified by Hoogmoed)
27. Poite Ede, upper Commewijne River, Commewijne [5°19′N, 54°37′W] (P. Pritchard, *personal communication*)
28. 83 km from Saramacca Bridge in direction of Bitagron on Zanderij-Bitagron Road [5° 15′N, 55°50′W] (AGJR L-544—live specimen collected by Mittermeier, 1977)

FRENCH GUIANA 29. a. Remire, Guyane [4°52′N, 52°18′W] (AGJR 111, L-341—specimens collected by Ramon Renau Ferrer, 1975, MHNP 1974-1005, FT 210)
b. Cayenne [4°55′N, 52°20′W] (MHNP 8755—type of *Platemys miliusii* Dumeril and Bibron, 1835, FT 146, 152)

BRAZIL 30. a. Corcovado, near Breves, Para [1°40′S, 50°30′W] (MZUSP 2684-5)
b. Marajo Island (MHNP 5339)
31. Belem, Para [1°30′S, 48°30′W] (Schlegel, 1901, Siebenrock, 1904, NMW 11884:2, SMF 42011)

TABLE 1.—Data on reproduction in *Phrynops gibbus*.

Egg source	Eggs in clutch (*n*)	Egg size (mm) Length	Width	Egg wt (g)	Date laid	Date hatched	Incubation time
196 mm ♀ from Florencia, Caqueta, Colombia; dissected 22 July 1952 (Niceforo Maria, 1952)	4	44.5	30.0	25.0	...	...	...
		44.0	30.0	24.0			
		42.0	30.0	22.5			
		42.0	29.5	23.0			
183 mm, 700-g ♀ from Rio Vaupes, Colombia; eggs laid in captivity (Medem, 1973)	3	44.5	29.5	24.5	23 Nov 1971	19 May 1972	178
		44.0	30.5	25.0	23 Nov 1971	6 Jun 1972	184
		44.0	30.0	24.2	23 Nov 1971	16 Jun 1972	194
♀ from Rio Momon, Loreto, Peru; eggs laid in captivity (Dixon and Soini, 1977)	3	44.0	32.0	...	3 Aug 1973	opened after 153 days	
		43.5	31.5	...	3 Aug 1973	18 Feb 1974	200
		not measured		...	unknown	...	...
Nest found in tributary of Cano Negro, 20 km SE Villavicencio, Colombia, 23 Nov. 1972 (Medem, 1973)	4	44.5	31.5	27.5	...	...	...
		44.0	32.0	28.0			
		43.0	32.0	26.7			
		42.5	31.5	26.4			
Nest found near Carolina Creek, Para, Surinam, 12 Dec 1971 (Medem, 1973)	2	41.0	30.0	...	...	...	...
		not measured					

from 178 to 200 days. Hatchling size and weight are given in Table 2. Very small, triangular, sharply-pointed egg caruncles were present on the 3 hatchlings from the Vaupes female's clutch. They detached at 22, 24 and 29 days after hatching. Although the 5 hatchlings observed had access to water, they all preferred to hide in leaf litter immediately after hatching.

Color in the 5 hatchlings observed showed little variation: carapace uniformly black, with ventral surfaces of marginals orange in the Colombian specimens, yellow in the Surinam and Peruvian specimens; sutures between ventral marginals black; bridge primarily black with yellow or orange on posterior and anterior edges; plastron uniformly black in the Colombian and Surinam specimens; Peruvian specimens with 2 pairs of yellow spots on lateral edges of anterior

TABLE 2.—Size and weight of *Phrynops gibbus* hatchlings. Measurements in millimeters; weights in grams.

	Midline length carapace	plastron	carapace width (max)	shell height (max)	weight
Clutch of Rio Vaupes ♀					
Hatchling of 19 May 1972	48.0	38.0	36.0	17.5	15.6
Hatchling of 6 June 1972	48.0	38.0	35.0	17.0	12.2
Hatchling of 16 June 1972	48.0	37.5	35.5	17.5	13.5
Clutch of Rio Momon ♀					
Hatchling of 18 Feb 1974	48.0	37.0	35.0	...	...
Surinam hatchling	43.0	34.0	31.0	15.5	10.0

plastral lobe, 1 pair on gulars, 1 on humerals; posterolateral edges of femorals and edges of anals also yellow in Peruvian specimens; mandible and dorsal and lateral surfaces of head black with lighter gray reticulations; tympanum black; maxilla light gray with black spotting; feet and tail uniformly black; iris black with a very narrow yellowish white rim around the free inner edge; chin barbels white to yellowish white and 2 in number. It is unclear whether differences among Peruvian, Colombian and Surinam specimens represent geographic or individual variation.

Habitat.—In Peru and Surinam, *P. gibbus* is found mainly in small forest streams, ponds and small black water rivers, and usually stays under closed canopy. Most of the streams and rivers it inhabits in Peru have muddy bottoms. In Surinam it also occurs in standing bodies of water with a thick layer of mud on the bottom, such as roadside ditches in more or less cultivated regions. In Peru, *P. gibbus* is not known to be common anywhere in the country (even though sympatric *Phrynops nasutus* is rather common in some parts of the Amazonian drainage region [e.g., the Rio Nanay near Iquitos]). In most Colombian localities, *P. gibbus* lives in streams running over a muddy bed, and in muddy lagoons and ponds in both rain forest and gallery forest in the plains. In the Vichada area, it lives mainly in the *morichales* (palm groves) of *Mauritia flexuosa*. Within these groves, the habitat consists of ponds shadowed by the palms. The ponds have a muddy bed and may dry partially or totally during the dry season. Captive *P. gibbus* sometimes estivate in dry weather and it is probable that free-living animals also engage in such behavior. In Trinidad, this turtle lives in clear, flowing streams with partly muddy, partly gravel-covered beds (Kearney, 1972; F. Medem, *personal observation*).

Phrynops gibbus is primarily nocturnal. In captivity, it may occasionally bask in the early morning or late afternoon. Captive specimens eat fish, meat, worms, insects, crustaceans, newborn mice, commercial dog food, and sometimes take plant matter (e.g., leaves of *Colocacia* sp.).

Size.—The largest recorded specimen of *P. gibbus* is a female from Ecuador (ENPQ 4612). It measures 232.5 mm in midline carapace length, 193 mm in midline plastron length and 67 mm in maximum shell height.

Acknowledgments.—We thank T. Blohm, R. Bour, W. Duellman, H. Ollos, G. Orces, P. Pritchard, P. Trebbau and P. Vanzolini for providing unpublished locality data and other information, and J. Eiselt, A. Kluge, F. Tiedemann, E. E. Williams and R. Zweifel for allowing us to examine specimens in their collections. Peter Pritchard also read and commented on the manuscript. Mittermeier's studies in South America were partly funded by a National Science Foundation Graduate Fellowship and partly by the New York Zoological Society. Hoogmoed's field work in Surinam in 1968 and 1974–1975 was funded by the Netherlands Foundation for the Advancement of Tropical Research (WOTRO Grants W 956-2 and W 87-78).

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Received: 26 April 1976
Accepted: 31 October 1977

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