

**DISTRIBUTION OF THE SOUTH AMERICAN CHELID TURTLES
PLATEMYS RADIOLATA AND *P. SPIXII***

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DISTRIBUTION OF THE SOUTH AMERICAN CHELID TURTLES *PLATEMYS RADIALATA* AND *P. SPIXII*.—The geographic distribution of the South American sideneck turtles *Platemys radiolata* and *P. spixii* (Pleurodira: Chelidae) has never been well defined, mainly because of the relatively few and scattered specimens of these species available in museum collections. We have examined specimens from many museums and have also obtained data on live animals from the wild. In this paper, we use these new data to clarify the geographic ranges of these two species.

Earlier definitions of the range of *P. radiolata* are vague, and include most of central and

northern South America. Wermuth and Mertens (1977), for instance, give its range as "middle and eastern South America from the Amazon to southwest of São Paulo" (our translation). Pritchard (1967) cites it as "much of northern South America, from the Amazon region to São Paulo, Brazil," and later modifies it to "Brazil (Amazonas south to São Paulo)" (Pritchard, 1979). Mlynarski and Wermuth (1972) provide a map depicting the range of *P. radiolata* as the entire southern half of the Amazon basin, Bolivia, Paraguay, central Brazil from Goiás through Minas Gerais, and the eastern coastal lowlands from Salvador to São Paulo. Ernst (1983c) presents a map with plotted unverified localities that shows a more restricted range, including the southeastern Amazon basin, the entire Rio São Francisco basin, eastern coastal Brazil south to São Paulo, and a questionable record from the Rio Paraguay region.

This apparently broad distribution of *P. radiolata* is, in fact, based on very few specimen citations. Those previously recorded are: São Sebastião, São Paulo (cited as Sebastianópolis) (Mikan, 1820); Espírito Santo (Wied, 1821); Rio de Janeiro (Duméril and Bibron, 1835); "Bahia" (Gray, 1873); Rio Taguahy, Rio de Janeiro (=Rio Itaguaí) and Caiçara, Rio Paraguaya, Mato Grosso (Siebenrock, 1904); Rio Doce, Espírito Santo and Belmonte, Bahia (Luederwaldt, 1926); and Rio Paraguay, Paraguay (Grünwaldt, 1980).

Previous literature on the distribution of *P. spixii* is also vague, though less so than that of *P. radiolata*. Wermuth and Mertens (1977) give the range of *P. spixii* as "northern Argentina and southern Brazil" (our translation). Pritchard (1967) cites only "Brazil," but later gives the same distribution as Wermuth and Mertens (Pritchard, 1979). Mlynarski and Wermuth (1972) provide a map that shows the range of *P. spixii* as Brazil south of Rio de Janeiro, Uruguay, and Argentina east of the Rio Parana and southeast of the Río de La Plata. Ernst (1983b) presents a map with plotted unverified localities that shows a range extending from the entire Rio São Francisco basin southward through coastal southeastern Brazil and Uruguay and westward into eastern Paraguay and northeastern Argentina.

Published locality records for *P. spixii* are more numerous than for *P. radiolata*, and include the following: Rio de Janeiro and Rio São Francisco (Spix, 1824); San Lorenzo, Rio Grande do Sul (Boulenger, 1866); São Paulo (Ihering, 1898);

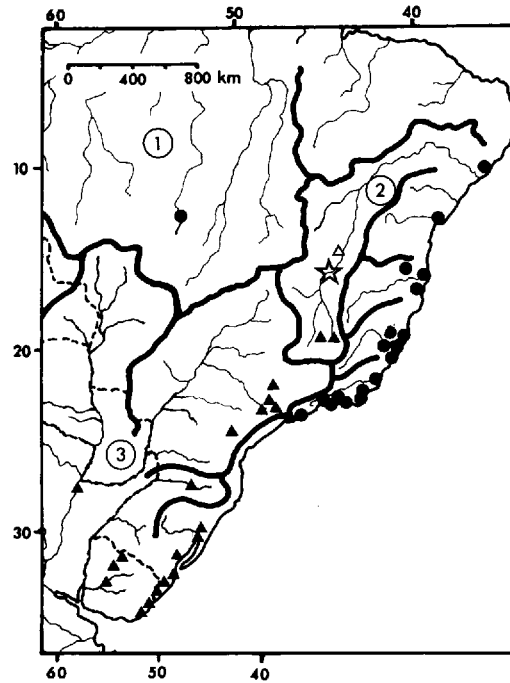


Fig. 1. Map of southeastern Brazil with adjacent Bolivia, Paraguay, Argentina, and Uruguay, showing distribution of *Platemys radiolata* (dots) and *Platemys spixii* (triangles). Open triangle indicates questionable record, star indicates restricted type locality of *P. spixii*. Dashed lines are national political boundaries, heavy solid lines represent watershed limits of major drainage basins. 1 = Rio Amazonas basin, 2 = Rio São Francisco basin, 3 = Rios Paraguay and Paraná basins.

Apalúe, Paraguay (Schenkel, 1901); Rio Ypanema, nr. Mogi-guaçu Lake, São Paulo (Siebenrock, 1904); Ypiranga, São Paulo (Luederwaldt, 1926); Corrientes and Resistencia, Chaco, Argentina (Freiberg, 1940); Pozo del Tigre, Formosa, Argentina (Saporiti, 1943); Cabo Polonia, Rocha, Uruguay (Vaz-Ferreira and Soriano, 1960); Río Negro, Tacuarembó and La Coronilla, Rocha, Uruguay (Mañé-Garzón and Holman-Spector, 1969); Chui, Rio Grande do Sul, Brazil, Paraje Batovi, Rivera, and Santa Teresa Parque Nacional, Rocha, Uruguay (Lema and Fabian-Beurmann, 1977); Pôrto Alegre, Gravataí, and Viamão, Rio Grande do Sul (Lema et al., 1980); and Taím, Rio Grande do Sul (Gomes and Krause, 1982).

As part of an ongoing revision of the South American chelid turtles, we have recently ex-

amined 63 specimens of *P. radiolata* and have obtained data on an additional 8 museum specimens, for a sample size of 71 animals. We have also examined 24 specimens of *P. spixii* and have data on 36 others, for a sample of 60 animals. The localities for these specimens and the confirmable literature records are shown on the map in Fig. 1.

The distribution of *P. radiolata* is much more restricted than previously stated. Almost all known specimens come from a very narrow, low-altitude coastal strip in eastern Brazil that extends from Alagoas in the north as far south as the vicinity of Rio de Janeiro. *P. radiolata* does not appear to occur in the Rio São Francisco drainage except at its mouth. However, there may be a small disjunct western population that is represented by only two known animals (mature females) from Jacaré, Rio Kuluene, Mato Grosso (MNRJ 2465-6). This isolated population is separated from the eastern population by a portion of the range of *P. spixii*. This disjunct distribution does not appear to be an artifact of inadequate samples. We have examined nearly one thousand chelid turtles from South America, with particularly good sample representation from the region separating the western and eastern populations of *P. radiolata*. The lack of any specimens of *P. radiolata* from this region appears to confirm this discontinuous distribution. The two available representatives of the western population display no apparent features that differentiate them, even at the subspecific level, from coastal *P. radiolata*. We assume at this time that the Rio Kuluene locality is a correct one, and not a case of curatorial mislabeling, but in view of its surprising discontinuity this needs verification through field work.

Disjunct distributions of this kind are not unknown among turtles. The North American emydid *Emydoidea blandingii* displays a very similar pattern, with small, isolated populations in Nova Scotia and New England and the bulk of the range centered in the Great Lakes region (McCoy, 1973).

Siebenrock's (1904) citation of a specimen of *P. radiolata* from Mato Grosso (NMW 1293 from Caiçara, Rio Paraguaya) is not referable to the western population of *P. radiolata*, but rather represents a specimen of the new species, *Platemys macrocephala*, recently described by Rhodin et al. (1984). Grünwaldt's (1980) citation of a *P. radiolata* from the Rio Paraguay probably also represents this new species, as does Ernst's

(1983c) plotting of a Rio Paraguay locality for *P. radiolata*. Ernst's (1983c) depiction of two localities for *P. radiolata* from the upper Rio São Francisco basin and one from the upper Rio Tocantins drainage of the southeastern Amazon basin are apparently in error, unverified by our data.

The range of *P. spixii* is also much more restricted than previously stated, but conforms somewhat to the maps presented by Mlynarski and Wermuth (1972) and Ernst (1983b). There are, however, several important differences; *P. spixii* does not inhabit the coastal drainages of Brazil north of Rio Grande do Sul, it does occur in at least the upper Rio São Francisco basin of Minas Gerais and possibly southern Bahia, and it does not occur in the lower Rio São Francisco basin. The single specimen (MZUSP 85) collected at "Rio São Francisco, Bahia" has inexact enough locality data to shed some doubt on the occurrence of *P. spixii* in Bahia. In addition, the possible presence of *P. spixii* southeast of the Río de La Plata in Argentina has not been confirmed by our sample or any known literature records. The coastal locality of "Rio de Janeiro" given by Spix (1824) is also incorrect.

Three literature citations of "*Platemys spixii*" have recently been identified as previously unrecognized records for *Platemys pallidipectoris* (Rhodin, 1981, 1982; Ernst, 1983a). Schenkel's (1901) specimen from Apalúe, Paraguay, Saporiti's (1943) animal from Pozo del Tigre, Formosa, Argentina, and one of Freiberg's (1940) juveniles from Resistencia, Chaco, Argentina (MER 2474) are all clearly identifiable as *P. pallidipectoris*. However, based on the published photographs, Freiberg's (1940) adult from Corrientes, Argentina is apparently a *Platemys spixii* and confirms the westward extension of the range to Argentina. The identity of Freiberg's second juvenile from Resistencia (MER 2475) has not been verified.

Having defined the actual range of *P. spixii*, we encounter a problem with the type locality of the species. Since *P. spixii* Dumeril and Bibrón, 1835 is a replacement name for *Emys depressa* Spix, 1824 (preoccupied by *Emys depressa* Merrem, 1820), the types of *E. depressa* Spix become the types of *P. spixii*. In his original description, Spix gives the localities of *E. depressa* as "aquis paludosis provinciarum Rio de Janeiro et fluminis Sti Francisci." Despite the two localities mentioned, however, only one type specimen exists. This specimen (ZSM 3003/0) is an adult shell said to come from Rio de Ja-

neiro. Ernst (1983b) subsequently labels Rio de Janeiro on his map as being the type locality for *P. spixii*, ignoring the Rio São Francisco locality also mentioned by Spix. Unfortunately, the species does not occur in Rio de Janeiro, whereas it does occur in the Rio São Francisco. The source of the confusion regarding the possible presence of *P. spixii* in Rio de Janeiro appears to stem from the fact that Spix examined at least two specimens of "*E. depressa*." One was the adult which was described, measured, and figured, and is clearly the same animal as the extant holotype of *P. spixii* down to the minor scute abnormality visible between vertebrals 4 and 5 on Spix's published figure. Spix also examined a juvenile specimen which was evidently not preserved, or perhaps lost. His description of the juvenile; "*scuta in junioribus brunnescentia, reticulata, medio nodosa, subaspera striis in tuberculum medium convergentibus*," more closely characterizes *P. radiolata* than *P. spixii*. In fact, Spix himself questioned whether his *E. depressa* was the same species as *P. radiolata* (Mikan). *P. radiolata* is common in the Rio de Janeiro area, and we believe that the juvenile specimen Spix examined was a *P. radiolata* from Rio de Janeiro, whereas the extant adult holotype of *P. spixii* came from the Rio São Francisco. In our opinion, this type specimen was probably mislabeled, someone choosing Rio de Janeiro instead of the second mentioned locality of Rio São Francisco when cataloguing the one specimen available of *E. depressa* Spix. It should be noted that Vanzolini's (1981) statement that *E. depressa* Spix does occur in both the Rio São Francisco and Rio de Janeiro regions is erroneous, based on his mistaken conclusion that *E. depressa* Spix is a synonym of *Phrynops Geoffroanus*, which does occur in both regions. This error probably resulted from confusion related to the fact that *E. depressa* Merrem is in actuality a synonym of *P. Geoffroanus*.

Based on the above information, we believe that the restricted type locality of Rio de Janeiro for *P. spixii* as given by Ernst (1983b) should be corrected and instead restricted to somewhere within the Rio São Francisco drainage. Since the original description was vague, we follow ICZN Recommendation 72E and base our restriction of the type locality on the collector's itinerary. According to Papavero (1971) and Vanzolini (1981) Spix crossed the Rio São Francisco in four locations. He first reached it in August, 1818 at Capão, a ranch across from the mouth of the Rio dos Pandeiros, Minas Gerais

(15°43'S, 44°35'W), where several collections were made. Next, he collected at Januária, Minas Gerais (then called Porto do Salgado, 15°29'S, 44°23'W). Later, he crossed the river at Carinhanha, Bahia (14°21'S, 43°47'W), where no collecting was attempted. Finally, he crossed the lower Rio São Francisco at Joazeiro, Bahia (9°24'S, 40°30'W), where he also collected. The Joazeiro locality is far north of the range of *P. spixii* and can be excluded as the type locality. The Carinhanha locality might be within the range, as one specimen examined (MZUSP 85) was supposedly collected in "Rio São Francisco, Bahia." The locality is vague, however, and we are not convinced that *P. spixii* occurs in Bahia. In addition, Spix did not collect while in Carinhanha, so it can be excluded as a type locality. The localities of Rio dos Pandeiros and Januária, however, are both only about 400 km north of Sete Lagoas, Minas Gerais, the nearest confirmable record of the occurrence of *P. spixii* in the Rio São Francisco drainage. Because the former of these two localities is the closest to Sete Lagoas, and also the first locality along the Rio São Francisco at which Spix collected, we hereby restrict the type locality of *P. spixii* to Rio São Francisco, near Rio dos Pandeiros, Minas Gerais, Brazil, rejecting the designation by Ernst (1983b) of Rio de Janeiro.

Though most recent authors consider *P. radiolata* and *P. spixii* to be distinct species, Pritchard (1979) hypothesizes that they may be only subspecifically distinct and reduces *P. spixii* to a subspecies of *P. radiolata*. Although the distributions of these two turtles are entirely allopatric, we find no evidence of intermediate forms in areas where their ranges approach one another. For example, specimens of *P. radiolata* from the Jacarepagua region west of the city of Rio de Janeiro show no signs of intergradation with the nearby (though quite separate) population of *P. spixii* around the city of São Paulo. In addition, their external and skeletal morphology are sufficiently distinct for them to be considered separate species (Rhodin and Mittermeier, in prep.), as are the karyotypes (McBee et al., in press), and serum electrophoretic patterns (Frair, 1982). Furthermore, observations of mixed captive assemblages of the two species indicate that there may be behavioral isolating mechanisms which prevent hybridization. For instance, a pair of *P. spixii* being kept with several dozen *P. radiolata* frequently copulated with one another, but never with the *P. radiolata* (R. da Rocha e Silva, pers. obs.). Consequently, we

believe that all available evidence indicates *P. radiolata* and *P. spixii* are distinct species.

Locality data.—Bold-faced numerals identify specimens of *Platemys radiolata* and *P. spixii* actually examined or confirmable literature records. AGJR = Personal Collection of A. G. J. Rhodin (L = Live Specimen, P = Voucher Photo Collection); AMNH = American Museum of Natural History; BMNH = British Museum of Natural History; CM = Carnegie Museum, Pittsburgh; MCNRGS = Museu de Ciencias Naturais de Fundação Zoobotânica do Rio Grande do Sul, Brazil; MCZ = Museum of Comparative Zoology, Harvard University; MER = Museo de Entre Ríos, Argentina; MNHNM = Museo Nacional de Historia Natural, Montevideo, Uruguay; MNRJ = Museu Nacional, Rio de Janeiro, Brazil; MZUSP = Museu de Zoologia da Universidade de São Paulo, Brazil; MZVC-R = Museo de Departamento de Zoologia Vertebrados, Facultad de Ciencias, Universidad de la Republica, Montevideo, Uruguay; NMW = Naturhistorisches Museum, Wien, Austria; SMF = Senckenberg Museum, Frankfurt, Germany; SPC = Personal Collection of S. P. Carvalho e Silva; UK = University of Kansas; UMMZ = University of Michigan Museum of Zoology; USNM = United States National Museum; ZSM = Zoologische Staatssammlung, Munchen, Germany.

Platemys radiolata. Brazil: Alagoas: AGJR **L580-3**, **L586-9**; São Miguel dos Campos (9°47'S, 36°05'W): AGJR **L567**, **P8**; Bahia: Gray, 1873: 304; Belmonte (15°53'S, 38°54'W): MZUSP **337**, Luederwaldt, 1926:**438**; Ilha Madre de Deus (12°47'S, 38°39'W): UK **29481**; Itapetinga (15°15'S, 40°15'W): MNRJ **3528**; Porto Seguro (16°25'S, 39°05'W): AGJR **L597**; Espírito Santo: Espírito Santo (=Vila Velha) (20°17'S, 40°17'W): AMNH **7073**, Wied, 1821:**91**; Ibiracú (19°50'S, 40°22'W): AGJR **L569**; Linhares (19°22'S, 40°04'W): MZUSP **2696**, MCZ **3741**, SPC **18-19**; Rio Doce (19°40'S, 40°00'W): MZUSP **62**, **64**, Luederwaldt, 1926:**438**; Santa Teresa (19°50'S, 40°35'W): MNRJ **1052-9**; Mato Grosso: Jacaré, Rio Kuluene (12°02'S, 53°25'W): MNRJ **2465-6**; Rio de Janeiro: Agriarimim: SMF **47835**; Buzios (22°45'S, 41°53'W): AGJR **L568**; Cabo Frio (22°51'S, 42°03'W): MZUSP **2695**, MNRJ s/n, AGJR **P4-6**, Jacarepagua: MNRJ **2415**; Nilopolis (22°50'S, 43°25'W): AGJR **P9**; Recreio dos Bandeirantes: MNRJ **1050**, **2485-6**, UMMZ **103572**, USNM 98661-2, 102716-7; Rio de Janeiro (22°53'S, 43°17'W):

SMF **28124**, ZSM **85/1972**, Duméril and Bibron, 1835:**415**, Rust, 1936:**134**; Rio Taguahy (=Rio Itaguaí), nr. Sepetiba (22°55'S, 43°48'W): NMW **1295**, Siebenrock, 1904:**27**; São João da Barra (21°40'S, 41°05'W): MNRJ **2488-90**, UMMZ **115655**; S. São Francisco, Niteroi (22°55'S, 43°05'W): MNRJ **5565**; São Paulo: Sebastianópolis (=São Sebastião) (23°45'S, 45°25'W): NMW **23390**, Mikan, 1820.

Platemys spixii. Argentina: Corrientes: Corrientes (27°30'S, 58°48'W): MER 2473, Freiberg, 1940:**5**; Brazil: Bahia: Rio São Francisco (ca. 14°20'S, 43°45'W): MZUSP **85**, Spix, 1824:**4**; Minas Gerais: Lagoa Santa (19°39'S, 43°44'W): MNRJ **1397-8**, UMMZ **115653**; Sete Lagoas (19°29'S, 44°15'W): MZUSP **2698**; Paraná: Piraí-mirim (=Piraí do Sul) (24°31'S, 49°57'W): MZUSP **2039**; Rio Grande do Sul: Chui (33°45'S, 53°24'W): MNHNM 1696, Lema and Fabian-Beurmann, 1977:**65**; Gravataí (29°57'S, 50°59'W): MCNRGS 2953, Lema et al., 1980:**28**; Lagoa de Mangueira (33°00'S, 53°00'W): MNHNM s/n; Pôrto Alegre (30°03'S, 51°10'W): MCNRGS 5204, Lema et al., 1980:**28**; Rio Pelotas (ca. 27°25'S, 51°55'W): AGJR **P247**; São Lourenço do Sul (31°21'S, 52°00'W): BMNH 86.1.19.1, Boulenger, 1886:**424**; Taím (32°30'S, 52°35'W): MZUSP **3015**, Gomes and Krause, 1982:**74**; Viamão (30°05'S, 51°01'W): MCNRGS 813, 1224, Lema et al., 1980:**28**; São Paulo: Ihering, 1898:**101**; Alumínio (23°33'S, 47°14'W): MZUSP **2697**; Ypiranga (=Ipiranga) (23°40'S, 46°35'W): MZUSP **302**, 488, Luederwaldt, 1926:**464**; São Lorenzo: SMF **8029**; São Paulo (23°33'S, 46°39'W): ZSM 66/1935, SMF **62543**, AGJR **P181-2**; Sorocaba (23°30'S, 47°28'W): AGJR **P2**; Rio Ypanema, nr. Mojiguaçu Lake (22°20'S, 46°55'W): Siebenrock, 1904:**28**; URUGUAY: Rivera: Batovi: MNHNM 1416, Lema and Fabian-Beurmann, 1977:**65**; Rocha: Cabo Polónia (34°20'S, 53°50'W): MNHNM 1417, 1551A-B, 1657, 1694, CM **56469-70**, **62244**, MZVC-R 181-2, 191, 247, 252-4, 256, MCZ **159027**, Vaz-Ferreira and Soriano, 1960:**7**; Laguna Negra (34°05'S, 53°40'W): MZVC-R s/n; Santa Teresa Parque Nacional (34°00'S, 53°35'W): MNHNM 1695, Lema and Fabian-Beurmann, 1977:**65**; Valizas: MZVC-R s/n; La Coronilla: Mañé-Garzón and Holcman-Spector, 1969:**4**; Tacuarembó: Cavo de los Cuervos, Arroyo Tacuarembó Chico: MZVC-R s/n; Paso de los Toros, Río Negro (32°50'S, 56°30'W): MNHNM s/n, Mañé-Garzón and Holcman-Spector, 1969:**4**.

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