

**THE OCCURRENCE OF *MABUYA BISTRIATA* (SPIX, 1825)
(SAURIA: SCINCIDAE) IN FRENCH GUIANA**

JEAN-CHRISTOPHE DE MASSARY¹, JEAN-PIERRE GASC² AND MICHEL BLANC³

¹ Muséum national d'Histoire naturelle, Laboratoire de Zoologie (Reptiles & Amphibiens),
25 rue Cuvier F-75005 Paris, France. E-mail: massary@mnhn.fr [author for correspondence]

² Muséum national d'Histoire naturelle, Laboratoire d'Anatomie comparée, 55 rue Buffon
F-75005 Paris, France. E-mail: gasc@mnhn.fr

³ 24 les Jardins Sainte Agathe 97355 Macouria, French Guiana.

IN some relatively recent papers (Gasc, 1976, 1981, 1990; Hoogmoed, 1973; Hoogmoed & Lescure, 1975; Hoogmoed, 1979), the scincid lizards of French Guiana were named as *Mabuya mabouia* (La Cépède, 1788). This species was considered to be the most common skink in Amazonia (Dunn, 1936), reaching Mexico and the Lesser Antilles (Peters & Donoso-Barros, 1970). Rebouças-Spieker (1981a) resurrected the name *M. bistriata* to designate the common skink of Amazonia and described a new species (1981b), *M. ficta* from Amazonia; she indicated that this new species is widespread through Amazonia and sympatric with *M. bistriata*. Subsequent authors (e.g. Hoogmoed & Gruber, 1983; Cunha et al., 1985; Nascimento, Avila-Pires & Cunha, 1988; Hoogmoed & Avila-Pires, 1990, 1991) adopted these new views and used the name *M. bistriata* to designate, for example, the skinks of French Guiana (Hoogmoed & Avila-Pires, 1990, 1991). Later, Avila-Pires (1995) indicated that in fact *M. ficta* is a junior synonym of *M. bistriata* (after seeing the lectotype specimen of *M. bistriata* RMNH 2512), so that the proper name to apply for the specimens previously called *M. bistriata* is *M. nigropunctata* (Spix, 1825). This situation partially explains the confusion still existing in French Guiana over the naming of these lizards; indeed, the name *M. bistriata* is still erroneously used for the Mabuyas of French Guiana (Born, 1996; Ringuet et al., 1998; Massary, 1999) and in other countries (e.g. Murphy, 1997 for Trinidad and Tobago; Gorzula & Señaris, 1999 for the Venezuelan Guayana) that are in fact *M. nigropunctata*.

Five specimens collected by JPG from areas in the southern French Guiana were recently studied. Moreover, during an ecological study led by JCDM at the Saint-Eugène field station (Courcibo River) of the Muséum national d'Histoire naturelle, Paris (MNHN), thirteen further specimens were collected and deposited at the MNHN; a further specimen was recently caught near the coast by MB, and was also deposited at the MNHN. This new material was compared with those specimens from French Guiana already available in the MNHN collections. After a thorough examination, it is clear that both *M. bistriata* and *M. nigropunctata* occur in French Guiana. We provide some characters based on the French Guianan specimens only, which allow separation of these two closely related species. In addition, the distribution map for both *M. nigropunctata* and *M. bistriata* in French Guiana is presented.

MATERIAL AND METHODS

The following characters were noted for all French Guianan Mabuyas available in the MNHN collection as well as the new material collected (for details, see Appendix 1): the snout-vent length as the linear distance from snout to cloacal vent; the number of supralabials; the number of infralabials; the number of scale rows around midbody; the number of lamellae occurring under the fourth toe; the number of supraciliaries; the contact between the parietals; the occurrence of keeled scales on the back. The specimens were also classified according to their colouration pattern.

Figures were made using colour pictures. The distribution map was made only using data for which the identifications were unambiguous. We systematically rejected the localities in French Guiana from which *Mabuya* is recorded in those cases where no picture or voucher specimen was available. Neither did we include localities from which no accurate description, allowing identification of the species, was available.

RESULTS

The examination of the *Mabuyas* from French Guiana, clearly shows that two species occur in this country; *M. bistrata* and *M. nigropunctata*. These species can easily be separated. First, the most practical way to do this in the field is by coloration pattern which can be readily used to separate the species visually, without the need for systematic collection of specimens. *M. bistrata* (Plate 1) is a light brown lizard with a dark brown lateral band at each side ; this band is bordered by two light well defined stripes. The upper one is sometime incomplete and may only occur in the anterior part of the body; this upper light stripe is bordered by a small brown

stripe in the anterior part of the body ; the back is bronze, either with no dark spots or some weakly marked one. The background coloration of *M. nigropunctata* (Plate 2) is darker than that of *M. bistrata*. Like *M. bistrata*, *M. nigropunctata* has a dark brown band at each side, often with irregular limits. There are generally no light stripes bordering this lateral dark band, but sometimes (apparently often in juveniles), one more or less ill-defined ventral light stripe occurs. Often, the lower part of the flanks presents a mixture of dark and light spots. The back is bronze, with some dark spots dispersed on its surface sometimes forming incomplete transverse or longitudinal stripes; sometimes those spots do not occur or are hardly noticeable.

Alternatively, there are some distinct scalation characters which enable those two species to be distinguished. Two of them are useful because they allow a clear identification in every single case. (1) The parietals are mostly well separated in *M. nigropunctata* (Fig. 1a) or just with a sharp point contact (Fig. 1b) whereas they are distinctly in contact in *M. bistrata* (Fig. 1c). (2) In *M. nigropunctata*, the dorsal scales are

Characters	<i>Mabuya bistrata</i>	<i>Mabuya nigropunctata</i>
Contact between the 2 parietals	yes, distinctly	no, or hardly in a sharp point
Dorsal scales tricarinate	no	yes (weakly marked in juveniles)
Number of supraciliaries	often 4 (73%), rarely 5 or 6, the	4 to 6, often 5 subequal (82,8%)
Number of supralabials	6 or 7	7 to 9, often 8 (91,7%)
Number of infralabials	6 to 8, mostly 5 (59%)	7 to 9 (rarely 7)
Maximum snout-vent-length	83 mm	123 mm
Occurrence of a lateral dark band delimited by two distinct light stripes (at least in the anterior part for the dorsal one) at each side; the dorsal one is itself bordered partially by a dark stripe	yes	no

Table 1. Table comparing characters for *Mabuya bistrata* and *Mabuya nigropunctata* in French Guiana.

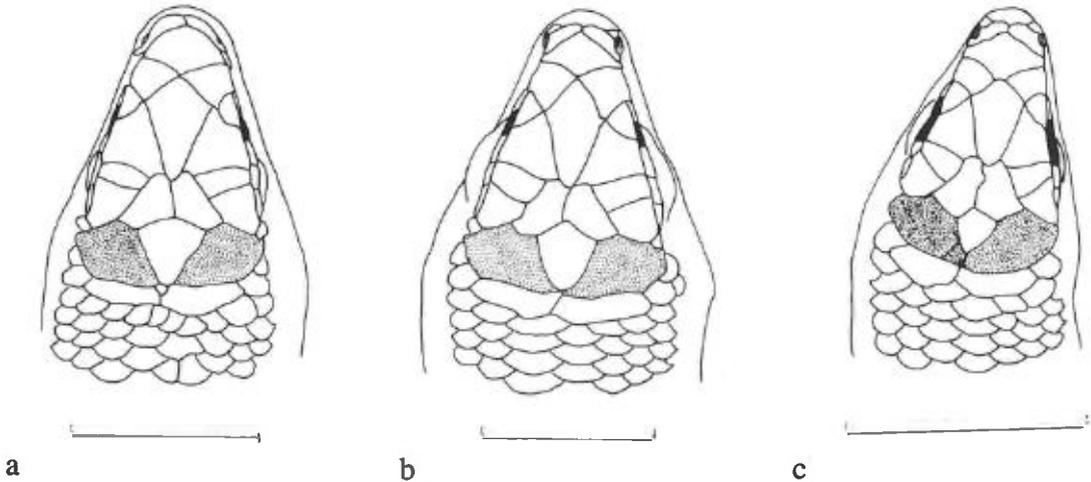


Fig. 1. Dorsal view of the head in *M. nigropunctata* MNHN 1997.2211 (a) and MNHN 1997.2213 (b), and in *M. bistriata* MNHN 1902-266 (c). Note the clear contact between the parietals in *M. bistriata* whereas this condition seems not to occur in *M. nigropunctata* in French Guiana. The second supraciliary is black coloured. Scale bars = 1cm.

tricarinate, especially in males; this character is more marked in subadult and adult males than in females; the keels are nearly invisible in juveniles. In contrast, *M. bistriata* never has keeled scales on the back, whatever its sex and maturity.

Three other characters are different for the two species, but with some degree of overlap. Seven to 6 or 7 (6.50 ± 0.51 , $n = 17$) supralabials occur in *M. bistriata* against 7 to 9, often 8 (8.04 ± 0.34 , $n = 26$) in *M. nigropunctata*; 6-7, rarely 8 (6.65 ± 0.86 , $n = 17$) infralabials occur in *M. bistriata* against 7 to 9, often 8 (8.23 ± 0.59 , $n = 26$) in *M. nigropunctata*; likewise, there are 4 to 6 subequal supraciliaries, must often 5 (77%) in *M. nigropunctata* (Fig. 1a-b) and 4 to 5, must often 4 (76%) in *M. bistriata*, with the second one at least twice as long as the others (Fig. 1c). The number of scale rows around midbody is of little interest because both species have 29-30, rarely 32 (*M. bistriata*: 29.67 ± 1.00 , $n = 9$ and *M. nigropunctata*: 29.85 ± 0.9 , $n = 13$). Lamellae under the fourth toe number 15 to 18 (17.44 ± 1.67 , $n = 16$) and 15 to 19 (16.69 ± 0.93 , $n = 26$) in *M. bistriata* and *M. nigropunctata*, respectively.

The maximum SVL's are very different in *M. bistriata* and *M. nigropunctata*. *Mabuya bistriata* is a medium sized lizard reaching 49 mm in a female (MNHN 1902.272) and 83 mm in a male (MNHN 1902.265); Avila-Pires (1995:567) indicated also 83 mm as maximum SVL for a female (MPEG 14534). *M. nigropunctata* is more stout and clearly larger than *M. bistriata* reaching a SVL of 101 mm in females (MNHN 1997.2213, 103 mm when alive) and 123 mm in males (specimens released). These data agree well with the maximum SVL indicated by Avila-Pires (1995) in Brazilian Amazonia (107 mm in males and 113 mm in females), except the (released) male with SVL 123 mm is the maximum SVL recorded for this species.

Table 1 summarises the characters allowing an easy identification of both *M. bistriata* and *M. nigropunctata* in French Guiana. Figure 2 provides the actual known range of these two species in French Guiana.

DISCUSSION AND CONCLUSION

Through the examination of new material from French Guiana, this study reveals that both *M.*

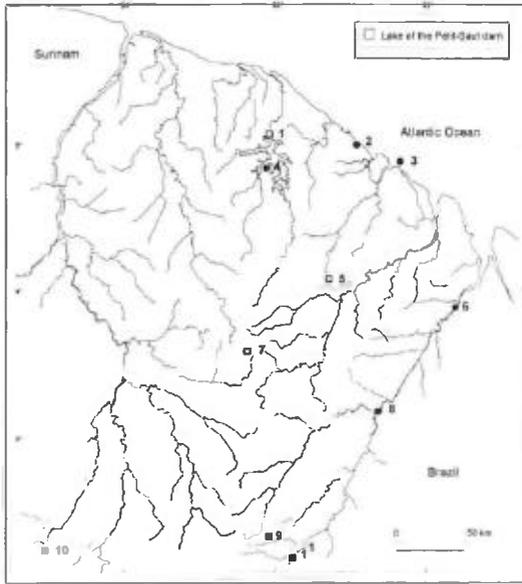


Fig. 2. Distribution map of *Mabuya bistrata* (circles) and *Mabuya nigropunctata* (squares), in French Guiana. Closed symbols = material studied; open symbols = data from literature (Hoogmoed & Avila-Pires, 1990, 1991; Born, 1996) and observations with photos (Gaucher, 1999; Haxaire, 1999). 1, Petit-Saut. 2, Macouria. 3, La Mère Islet. 4, Saint-Eugène field station. 5, field station of the Nouragues. 6, Vicinity of Saint-Georges. 7, Saül. 8, Camopi. 9, Saint-Marcel Mount. 10, Mitaraca. 11, Trois Sauts.

bistrata and *M. nigropunctata* occur there. The two species of *Mabuya* can easily be identified according to the characters given above or by using the key provided by Avila-Pires (1995) for the lizards of Brazilian Amazonia. The characters given by this author for these two species are matched very well by the *Mabuyas* of French Guiana, including the problematic specimens mentioned by Avila-Pires as potential *M. bistrata*. In fact, unlike Avila-Pires (1995), we did not find that the supraciliaries are so variable as she did. Indeed, the second supraciliar always is at least twice as long as the other supraciliaries, which agrees with what she indicated when describing *M. bistrata*. The difficulty very probably arose from the eventual

subdivision that may occur in the last supraciliaries (e.g. MNHN 1902.268).

The present data suggest that *M. bistrata* is confined to the eastern part of French Guiana whereas *M. nigropunctata* is widespread throughout the country (Fig. 2). To date, there is no evidence that these two species are found in sympatry in French Guiana, though this is highly likely since this situation is known in Brazil (see Avila-Pires, 1995). During his trip in the eastern part of French Guiana between 1899 and 1901, F. Geay collected the two species. It is very interesting to note that among the six *Mabuyas* he collected, only one specimen was *M. nigropunctata*. Unfortunately, the exact locality of this specimen is unknown and thus, we cannot be sure that it was found sympatrically with *M. bistrata*. Because this is an old record, we could question the specimen's origin, the more so as the borders of French Guiana at the time of Geay's collecting encompassed the northeastern part of present day Brazil. However, we analysed Geay's hand-written manuscript (1901) which is kept in the library of the reptiles and amphibians laboratory of the MNHN; the indications he gave are accurate and he also provided a detailed colour map which indicates the route he took. Moreover, we have no doubt concerning the origin of his specimens. Two specimens collected by Leprieur are said to come from 'Cayenne' but we cannot check the accuracy of this data. We recently received a specimen of *M. bistrata* (MNHN 1999.8349) caught at Macouria in French Guiana by MB. This new record constitutes further strong proof of the occurrence of *M. bistrata* in French Guiana. Before the new material was collected by the authors, the number of *M. nigropunctata* in the MNHN collections had been very small despite the fact that it is more widely distributed than *M. bistrata* in French Guiana. Added to the nomenclatural problems, this situation explains the frequent misuse of the name *M. bistrata* to designate all skins of French Guiana.

Until the present study, *M. bistrata* was not recorded from the Guianas (except erroneously). Avila-Pires (1995:573) mentioned the possible



Plate 1. *Mabuya bistrata* (Spix, 1825), in a garden, Macouria, French Guiana. Photograph by M. Blanc.



Plate 2. *Mabuya nigropunctata* (Spix, 1825), in primary forest, MNHN Saint-Eugène field station, French Guiana. Photograph by J.-C. de Massary.

existence of *M. bistrata* in Surinam, but her data is based on 'a half-grown specimen with no exact locality data, [...] preserved for more than 100 years'.

The occurrence of *M. bistrata* in the eastern part of French Guiana extends somewhat the northern limit of the known range for the species. This is interesting because we can envisage that other Brazilian species not yet recorded in French Guiana, and having a similar distribution pattern throughout Amazonia, could be expected to occur in this country.

As for the other lizard species in French Guiana, the range of those two species remains very poorly known and should encourage further herpetological investigations in this country, particularly in its eastern parts which remains

underprospected. Moreover, both *M. bistrata* as *M. nigropunctata* show large ranges throughout Amazonia. A thorough revision of these two species, with the inclusion of new material from the Guianan region is necessary to determine whether the current understanding of their systematics accurately reflects biological reality.

ACKNOWLEDGEMENTS

The authors are very grateful to Teresa Avila-Pires, Richard Davies, A. Dubois, M. S. Hoogmoed, I. Ineich, and J. Lescure for reviewing the original version of the paper. Thanks are also due to le Ministère de l'Environnement, Direction de la Nature et des Paysages, for granting the collecting permit (n° 307/96). The research work led by JCDM in French Guyana has been supported by Electricité de France (EDF) (convention EDF/MNHN GP7531).

REFERENCES

- Avila-Pires, T. C. S. (1995). Lizards of Brazilian Amazonia (Reptilia, Squamata). *Zoologische Verhandelingen Leiden* **299**, 1-706.
- Born, M. (ed.), 1996. *Reptiles and amphibians of Nouragues, French Guiana*. Wageningen Agricultural University, Wageningen. 55 pp.
- Cunha, O. R. (da). (1961). II. Lacertílios da Amazônia. Os lagartos da Amazônia Brasileira, com especial referência aos representados na coleção do Museo Goeldi. *Boletim do Museu Paraense Emilio Goeldi, Zoologia* **39**, 1-189.
- Cunha, O. R. (da), Nascimento, F. P. (do) & Avila-Pires, T. C. S. (1985). Os Répteis da área de Carajás, Pará, Brasil (Testudines e Squamata). I. *Publicações Avulsas do Museu Goeldi* **40**, 9-92.
- Duméril, A.-M.-C. & Bibron, G. (1839). *Erpétologie générale ou Histoire naturelle complète des Reptiles*, tome 5. Paris: Roret.
- Dunn, E. R. (1939). Notes on the American Mabuyas. *Proceedings of the Academy of Natural Sciences of Philadelphia* **87**, 533-557.
- Gasc, J.-P. (1976). Contribution à la connaissance des Squamates (Reptilia) de la Guyane Française. Nouvelles localités pour les

- Sauriens. *Compte Rendu des Séances de la Société de Biogéographie* **454**, 17-36.
- Gasc, J.-P. (1981). Quelques nouvelles données sur la répartition et l'écologie des sauriens en Guyane française. *Revue d'Ecologie la Terre et la Vie* **35**, 273-325.
- Gasc, J.-P. (1990). *Les lézards de Guyane*. Paris: R. Chabaud (Ed.).
- Gasc, J.-P. & Lescure, J. (1977). Données sur l'herpétoconose en milieu ouvert dans la forêt amazonienne. *Bulletin du Muséum national d'Histoire naturelle, Paris* (3), **440**, (Ecol. Gén.), 35, 35-44.
- Geay, F. (1901). Collection venant de la Guyane française et envoyée par M. F. Geay, chargé de mission au Laboratoire d'Ichtyologie et d'Erpétologie du Muséum (septembre 1899-mars 1901). Manuscrit (non publié) des archives n°4 du Laboratoire reptiles & amphibiens du Muséum, Paris, 1-49.
- Gorzula, S. & Señaris, J. C. 1999 (1998). *Contribution to the herpetofauna of the Venezuelan Guayana. I. A data base*. Scientia Guaianæ, **8** (1998). Hubert, O. (Ed.). Caracas: Fundacite-Guayana. i-xxviii + 1-269.
- Hoogmoed, M. S. (1973). Notes on the herpetofauna of Surinam. IV. The lizards and amphisbaenians of Surinam. *Biogeographica* **4**, i-ix + 1-419.
- Hoogmoed, M. S. (1979). The herpetofauna of the Guianan Region. In *The South American Herpetofauna, its Origin, evolution and dispersal*, pp. 241-279. Duellman, W. E. (Ed.). Monograph of the Museum Natural History, The University of Kansas, 7.
- Hoogmoed, M. S. & Avila-Pires, T. C.S. (1990). Observations on the herpetofauna of Petit Saut Sinnamary River, French Guiana. In *Biologie d'une canopée de forêt équatoriale*, 222-229. Hallé, F. & Blanc, P. (Eds.). Rapport de Mission Radeau des Cimes Octobre-Novembre 1989, Guyane Française. Xylo, Département Industrie de Xylochimie.
- Hoogmoed, M. S. & Avila-Pires, T. C. S. (1991). Annotated checklist of the herpetofauna of Petit Saut, Sinnamary River, French Guiana. *Zoologische Mededelingen* **65**, 53-88.
- Hoogmoed, M. S. & Gruber, U. (1983). Spix and Wagler type specimens of reptiles and amphibians in the natural History Museum in Munich (Germany) and Leiden (The Netherlands). *Spixiana. Supplement* **9**, 319-415.
- Hoogmoed, M. S. & Lescure, J. (1975). An annotated checklist on the lizards of French Guiana, mainly based on two recent collections. *Zoologische Mededelingen* **49**, 141-171.
- Massary, J.-C. (de). (1999). Hagedissen en bosversnippering in Frans-Guyana. *Lacerta* **57**, 97-105.
- Murphy, C. J., 1997. *Amphibians and Reptiles of Trinidad and Tobago*. Malabar, Florida: Krieger Publishing Company.
- Nascimento, F. P. (do), Avila-Pires, T. C. S. & Cunha, O. R. (da). (1988). Reotéis squamata de Rhodônia e Mato Grosso coletados através do Programa Polonoeste. *Boletim do Museu Paraense Emilio Goeldi, Zoologia* **4**, 21-66.
- Peters, J. A. & Donoso-Barros, R. (1970). Catalogue of the Neotropical Squamata. Part II. Lizards and Amphisbaenians. *United States National Museum Bulletin* **297**, i-viii + 1-293.
- Rebouças-Spieker, R. (1981a). Sobre uma nova espécie de *Mabuya* do nordeste de Brasil (Sauria, Scincidae). *Papéis Avulsos de Zoologia* **34**, 121-123.
- Rebouças-Spieker, R. (1981b). Sobre uma nova espécie de *Mabuya* da Amazônia Brasileira (Sauria, Scincidae). *Papéis Avulsos de Zoologia* **34**, 161-163.
- Ringuet, S., Claessens, O., Cosson, J.-F., Massary, J.-C. (de), Granjon, L. & Pons, J.-M. (1998). Fragmentation de l'habitat et diversité des petits vertébrés en forêt tropicale humide, l'exemple de Petit Saut (Guyane française). *Journal d'Agriculture Tropicale et de Botanique Appliquée* **40**, 11-30.
- Vanzolini, P. E. (1972). Miscellaneous notes on the ecology of Brazilian lizards (Sauria). *Papéis Avulsos de Zoologia* **26**, 83-115.

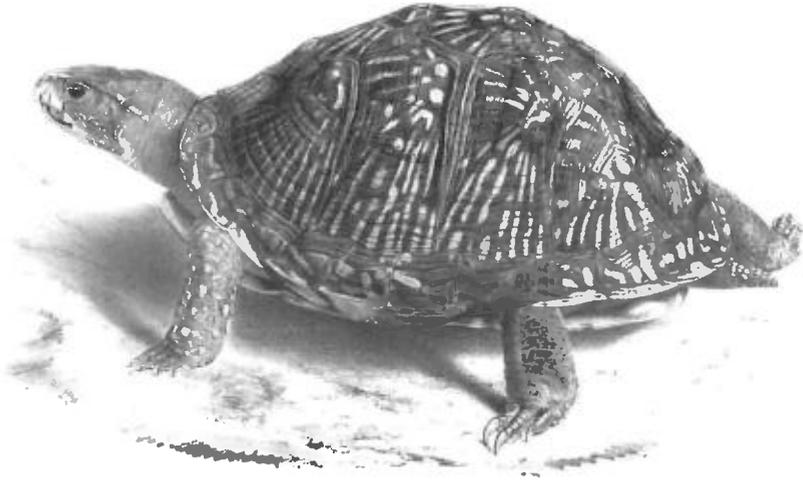
Appendix 1. List of the French Guianan skins examined from Jean-Pierre Gasc's collection (JPG) and at the Muséum national d'Histoire naturelle, Paris (MNHN). The data in parenthesis correspond to either the date or period of collection (abbreviation: ind. for indeterminate sex; juv. for juvenile; leg. for legacy).

Mabuya bistrata

FRENCH GUIANA (9 specimens): **without locality**: 2 ind. MNHN 735 and 735A (2 syntypes of [*Gongylus*] (*Eumeces*) *Spixii* Duméril & Bibron, 1839: 642), leg. F. Leuprieur; 1 ind. MNHN 1997.2264 (1992), leg. C. Marty; 1 ♂ MNHN 1902.266 (ix.1899-ii.1901), leg. F. Geay; **Camopi**: 1 ♀ MNHN 1902.272 (1900), leg. F. Geay; **Vicinity of Saint-Georges**: 2 ♂♂ MNHN 1902.267-268 (1900), leg. F. Geay; **La Mère Islet**: 1 ind. MNHN 1903.22 (iv.1902), leg. F. Geay; **Macouria**: 1 ♂ MNHN 1999.8349 (27.xi.1999), leg. M. Blanc.

Mabuya nigropunctata

FRENCH GUIANA (19 specimens): **without locality**: 1 ♂ MNHN 1902.265 (ix.1899-ii.1901), leg. F. Geay; 1 ♂ GRH 81 (1972-1976), leg. J.-P. Gasc; **Mitaraca**: 1 ♂ JPG 72.120 (16.viii.1972), leg. J.-P. Gasc; **Trois Sauts**: 2 ♂♂ JPG 467-468 (2.iv.1976), leg. J.-P. Gasc; **Saint-Eugène field station**: 1 ♂ MNHN 1996.4572 (1.xii.1995), leg. G. Dubost; 1 ♂ MNHN 1996.4570 (15.ix.1993), 1 ♂ MNHN 1996.4630 (24.ix.1993), leg. I. Ineich; 1 ♀ MNHN 1996.4571 (24.xi.1995), 1 ♀ MNHN 1997.2206 (10.xi.1996), 1 juv. MNHN 1997.2207 (8.xi.1996), 1 ♀ MNHN 1997.2208 (5.xi.1996), 1 ♂ MNHN 1997.2209 (24.x.1996), 1 ♂ MNHN 1997.2210 (7.xi.1996), 1 ♂ MNHN 1997.2211 (31.x.1996), 1 ♂ MNHN 1997.2212 (25.xi.1996), 1 ♀ MNHN 1997.2213 (7.xi.1996), leg. J.-C. de Massary; **Saint-Marcel Mount**: 1 ♀ JPG 422 (18.iii.1976), leg. J.-P. Gasc, 1 ♂ JPG 469 (2.iv.1976), leg. J.-P. Gasc.



Mexican Box Turtle (*Terrapene carolina mexicana*), from an original lithographed plate in *Proceedings of the Zoological Society of London*, 1848. Reproduction courtesy of the Zoological Society of London.