## Catalogue of American Amphibians and Reptiles.

Berry, J.F. and J.B. Iverson. 2001. *Kinosternon scorpioides*.

### *Kinosternon scorpioides* (Linnaeus)
**Scorpion Mud Turtle**

*Testudo scorpioides* Linnaeus 1766:352. Type locality, "Surinam." Holotype, apparently lost (Smith and Smith 1979 [1980]).

*Testudo tricarinata* Retzius, *in* Schoepff 1792:9, Table 2. Type locality and holotype unknown.

*Testudo Retzii* Daudin 1802:171, 174. Type locality and holotype unknown.

*Testudo Pensylvanica* var.: Shaw 1802:61, Plate 15.

*Emys Retzii*: Schweigger 1812:231, 312, 434.

*Emys scorpioidea*: Schweigger 1812: 231, 312, 435.

*Emys scorpioides*: Oken 1816:347.

*Terrapene tricarinata*: Merrem 1820:28.

*Chersine scorpioides*: Merrem 1820:33.

*Kinosternon longicaudatum* Spix 1824:17. Type locality, "Braziliam" (Brasil). Cotypes: Zoologisches Sammlung des Bayerischen Staates in München (ZSM) 2375/0, an adult male in alcohol (figured in Spix 1824), and 3000/0, an adult male skeleton (date and collector unknown). ZSM 2375/0 was designated the lectotype by Hoogmoed and Gruber (1983) (examined by JBI).

*Kinosternon brevicaudatum* Spix 1824:18. Type locality, "fluminis Solimoëns" (= Río Solimoes, Brasil). Holotype unknown (Hoogmoed and Gruber 1983).

*Kinosternon shavianum* Bell 1825:302. Type locality and holotype unknown.

*Terrapene scorpioidea*: Fitzinger 1826:45.

*Terrapene tricarinata*: Gravenhorst 1829:16.

*Cinosternon scorpioidea*: Wagler 1830:137.

*Cinosternon brevicaudatum*: Wagler 1830:137.

*Cinosternon Shavianum*: Wagler 1830:137.

*Cinosternon scorpioidei*: Wagler 1830: Plate V, Fig. XXXI, legend.

*Kinosternon scorpioides*: Gray 1831:34. First use of combination.

*Uronyx scorpioides*: Rafinesque 1832:64.

*Monoclida retziana*: Rafinesque 1832:64 (*nomen substitutum* for *Testudo retzii* Daudin).

*Terrapene scorpioides*: Schinz 1833:46.

*Cinosternon Scorpioides*: Duméril and Bibron 1835:363.

*Clemmys (Cinosternon) scorpioidea*: Fitzinger 1835:125.

*Cinosternon scorpioideum*: Fitzinger 1843:29.

*Kinosternon scorpoides*: Gray 1844:32. *Ex errore*.

*Kinosternon scorpiodes*: Gray 1844:32. *Ex errore*.

*Cinosternon cruentatum* Duméril and Bibron, *in* Duméril and Duméril 1851:16. See subspecies synonymy.

*Kinosternum longicaudatum*: LeConte 1854:181.

*Kinosternum scorpioides*: LeConte 1854:181.

*Kinosternum Mexicanum* LeConte 1854:182. Type locality, "Mexico," restricted by Smith and Taylor (1950b) to "San Mateo del Mar, Oaxaca," México. Holotype, Academy of Natural Sciences, Philadelphia (ANSP) 90, juvenile, collected by Mr. Pease (date uncertain)(examined by authors).

*Kinosternum cruentatum*: LeConte 1854:186.

*Kinosternon cruentatum*: Gray 1855:44.

*Cinosternum scorpioides*: Agassiz 1857:426.

*Thyrosternum scorpioides*: LeConte 1859:6.

*Kinosternum triliratum* LeConte 1859:6. Type locality, "Mexico," restricted by Smith and Taylor (1950b) to "San Mateo del Mar, Oaxaca," México. Holotype formerly in the ANSP, but now presumably lost, collected by Mr. Pease (date uncertain).

*Thyrosternum longe caudatum*: LeConte 1859:6.

*Cinosternon mexicanum*: Strauch 1862:41.

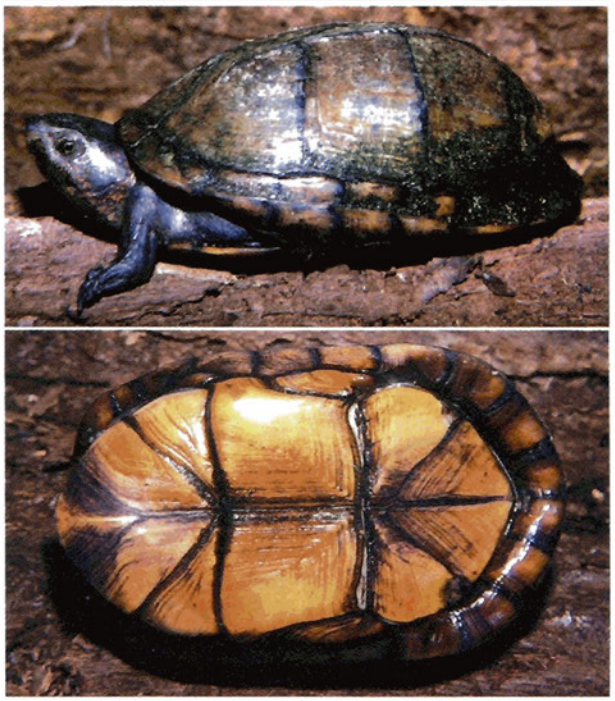


**FIGURE 1.** Adult male *Kinosternon scorpioides* from Belize, Orange Walk Town District, in the vicinity of Orange Walk Town (photographs by John B. Iverson).

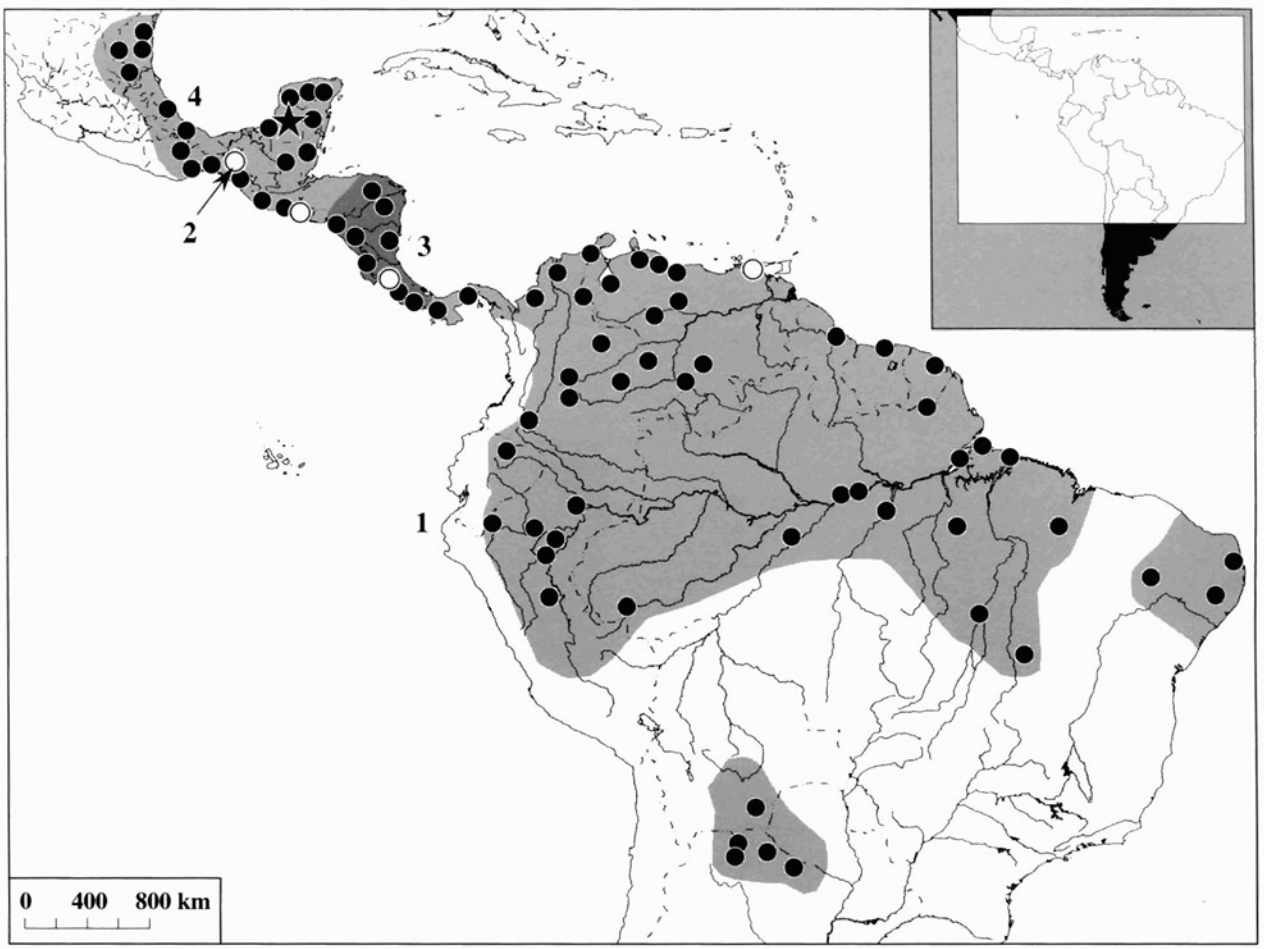
**FIGURE 2.** Adult male *Kinosternon scorpioides* from Costa Rica, Puntarenas Province, in the vicinity of Parrita (left; photograph by R. Powell); adult female *K. scorpioides* from Costa Rica, Guanacaste Province, at the junction of the Río Corobizi and the Pan American Highway (photograph by John B. Iverson).

**FIGURE 3.** Adult female *Kinosternon scorpioides* from Venezuela, Estado Cojedas, Municipio Cojedas Camoruro, Finca la Coromoto (photograph by John B. Iverson).

*Cinosternon triliratum*: Strauch 1862:41.
*Cinosternon longicaudatum*: Strauch 1865:98.
*Kinosternon mexicanum*: Müller 1865:598.
*Cinosternum shavianum*: Cope 1866:123. Apparently a substitute name for *Kinosternum Mexicanum* LeConte; see discussion in Smith and Smith (1979 [1980]).
*Swanka scorpoides*: Gray 1869:181.
*Cinosternon albogulare* Duméril and Bocourt 1870:24. See subspecies synonymy.
*Swanka mexicana*: Gray 1870:69.
*Swanka longicaudata*: Gray 1870:69.
*Swanka cruentata*: Gray 1870:69.
*Swanka trilirata*: Gray 1870:69.
*Swanka scorpioides*: Gray 1873:301.
*Cinosternum albogulare*: Cope 1875:153.
*Cinosternon Shawianum* Bocourt 1876:387, 397–398. Apparently a substitute name for *Cinosternum shavianum* Bell; see discussion in Smith and Smith (1979 [1980]).
*Ciniosternon shawianum*: Sumichrast 1880:169. *Ex errore*.
*Cinosternon Shawianum*: Sumichrast 1882b:34
*Thyrosternum cruentatum*: Garman 1884:8.
*Thyrosternum shavianum*: Garman 1884:8.
*Cinosternum leucostomum*: Cope 1885:389 (part, Cozumel).
*Cinosternum triliratum*: Günther 1885:14.
*Cinosternum integrum*: Cope 1887:23 (part, Vera Cruz).
*Cinosternum shawanianum*: Velasco 1892:80.
*Kinosternon abaxillare* Baur, *in* Stejneger 1925:462. See subspecies synonymy.
*Kinosternon cruentatum*: Dunn and Emlen 1932:25.
*Kinosternon crenulatum*: Pearse 1945:222. *Ex errore*.
*Kinosternon panamensis* Schmidt 1946:5. Type locality, "Panamá Railroad, C.Z. [Canal Zone], Panamá." Holotype: National Museum of Natural History (USNM) 117369 (formerly Museum of Comparative Zoology at Harvard University, MCZ, 7996; Cochran 1961), adult male in alcohol collected by Dr. Thomas Barbour, 10 June 1932 (examined by authors); placed into the synonymy of *K. s. scorpioides* by Berry (1979).
*Kinosternon escorpioides*: Zerecero y D. 1948:516.
*Kinosternun cruentatum*: Alvarez del Toro 1973:18. *Ex errore*.
*Kinosternun abaxillare*: Alvarez del Toro 1973:20. *Ex errore*.

• **CONTENT.** Four subspecies are recognized: *Kinosternon scorpioides scorpioides*, *K. s. abaxillare*, *K. s. albogulare*, and *K. s. cruentatum*.

• **DEFINITION.** *Kinosternon scorpioides* is a medium to large *Kinosternon*, with males in some populations exceeding 205 mm in carapace length, and females exceeding 180 mm. The carapace is moderately to strongly tricarinate in all but the oldest, largest individuals. The first vertebral scute is wider than long; vertebral scutes 1–4 have distinct posterior notches at the midline in all but the oldest, largest individuals. The tenth marginal scutes are higher than the ninth, and usually (73%) higher than the eleventh. The shape of the carapace is approximately oval; the margins are distinctly flared outward in some popula-




**MAP.** Distribution of *Kinosternon scorpioides*. Circles indicate type localities; note that the type (and only known) locality of *K. s. abaxillare* is within the range of *K. s. cruentatum*). Dots mark other records (some represent more than one proximate locality) and the star denotes a fossil locality.

tions, but only slightly flared or not flared in others. The carapace is highly variable in color, ranging from light brown to olive to black, with darker seams in all but the darkest individuals.

The plastron has two kinetic hinges, anterior and posterior to the abdominal scutes, and is concave to flat in males but slightly convex or flat in females. The plastron completely closes the shell in some populations but not in others, with adult males nearly always having a smaller plastron than females. The posterior lobe of the plastron bears little or no anal notch; if present, it is larger in males than in females. The interanal scute seam is long, averaging 30% of carapace length (19–39%), and the interpectoral seam is short or occasionally (27%) absent. The color of the plastron may be gray, yellow, orange, brown or black, usually with darker seams.

The dorsal head shield is rhomboidal, bell-shaped or triangular, but rarely v-shaped. The maxillary sheaths are weakly to very strongly hooked, more strongly hooked in older males than in females or younger individuals. The color pattern on the head is extremely variable, with a brown, gray, or black background and a reticulated or spotted pattern of cream, yellow, orange, pink, or red. The jaw sheaths are cream to yellow with darker vertical streaks most conspicuous in older males. The skin of other soft parts is gray or brown, usually with many small, darker spots. Three to four pairs of gular barbels are present, with the most anterior pair the largest. Elevated patches of horny scales ("clasping organs" or "vinculae") are absent from the posterior thigh and leg of both males and females. Males have longer, more prehensile tails than do females; the cloacal aperture is at or posterior to the shell margin in males, but is anterior to the shell margin in females. The tails of both sexes have terminal spines, but the spine is larger in males.

• **DESCRIPTIONS.** General descriptions are in Alvarez del Toro (1960, 1973, 1982), Berry (1978), Boulenger (1889), Cabrera (1998), Casas Andreu (1965, 1967), Ernst and Barbour (1989), Hellmich (1958), Mertens (1952a), Mertens and Wermuth (1955), Müller and Hellmich (1936), Pritchard (1979a), Pritchard and Trebbau (1984), Rogner (1996), Siebenrock (1904, 1906, 1907, 1909), Smith and Smith (1979 [1980]), and Wermuth and Mertens (1961, 1977). Specific descriptions include comparisons with other *Kinosternon* (*K. alamosae*, Berry and Legler 1980; *K. angustipons*, Legler 1965; *K. creaseri*, Iverson 1988b; *K. chimalhuaca*, Berry et al. 1997; *K. dunni*, Schmidt 1947; and *K. oaxacae*, Berry and Iverson 1980), osteology (Rutimeyer 1873), skull structure (Siebenrock 1897; Kilias 1957), head muscles and laryngeal skeleton (Schumacher 1973), head muscles and nerves (Poglayen-Neuwall 1953), shell shape (Schubert-Soldern 1947), shell kinesis (Bramble et al. 1984), shell morphometrics (Acuña-Mesén et al. 1993), cervical vertebrae (Williams 1950), neural bone patterns (Iverson 1988a), bladder epithelium and cytochemistry (Polver and Novelli 1971), choanal structure (Parsons 1968; Parsons and Stephens 1967), lack of cloacal bursae (Smith and James 1958), penial morphology (Zug 1966), rostral pores (Winokur and Legler 1974), musk glands (Waagen 1972), and integumentary appendages (Winokur 1982).

• **ILLUSTRATIONS.** Color photographs are in Acuña-Mesén (1993, full body; 1998, anterolateral view), Alderton (1988, full body), Aria (1998, full body), Bonin et al. (1996, lateral view), Cabrera (1998, lateral and ventral views), Campbell (1998, lateral view); Cei (1993, dorsal view and head), Freiberg (1981, dorsal view), Koshikawa (1996, lateral view), Lee (1996, 2000; lateral and full body views), Magnan and Maran (1999, full body), Métrailler and Le Gratiet (1996, biotope, lateral and ventral views, hatchling and hatching egg), Mueller (1998, head and full body), Murphy (1997, lateral full body view), Norman (1994, lateral view), Pritchard (1967, 1979a; dorsal view), Pritchard and Trebbau (1984, dorsal and ventral views of series, and color painting of adult), Rogner (1996, dorsal view), Rudloff (1990, female nesting), Stafford and Meyer (2000, anterolateral view), and Vanzolini et al. (1980, anterodorsal view). Black and white photographs are in Acuña-Mesén et al. (1983, dorsal and ventral views; 1993, bony elements of the shell), Alvarez del Toro (1960, 1973, 1982; dorsal views), Berry (1978, dorsal, ventral, and lateral views, and head), Berry and Legler (1980, dorsal, ventral, and lateral views, and head), Casas Andreu (1967, dorsal and ventral views), Church (1963, lateral view), Ernst and Barbour (1989, dorsal views), Ewert (1991, embryo at pipping), Freiberg (1936, 1977, dorsal and ventral views; 1972, dorsal views; 1981, dorsal and ventral views), Garrison (1971, lateral and ventral views), Gijzen and Wermuth (1958, dorsal, ventral, and lateral views), Killebrew (1975, chromosomes), Mertens (1952a, dorsal view), Métrailler and Le Gratiet (1996, hatchling and kyphotic adult), Mudde and Van Dijk (1984, dorsal view), Nemuras (1967, anterolateral view and ventral view of neonate), Nöllert (1987, lateral view), Pritchard (1964, lateral and ventral views; 1967, dorsal view; 1979a, dorsal and ventral views), Richard et al. (1990, dorsal and ventral views, and head), Rust (1938, dorsal and ventral views), Sexton (1960, male and female mating behavior), and Vanzolini et al. (1980, dorsal and lateral views). Black and white photographs in Boulenger (1914, labelled "*Cinosternum cruentatum*") are actually *Kinosternon leucostomum*. Black and white drawings are in Acuña-Mesén (1998, dorsal and ventral views), Bramble et al. (1984, pelvis, and posterior plastron and hinge), Cabrera (1998, dorsal, ventral, and lateral skull, dorsal and ventral bony shell), Cunha (1970, dorsal, ventral, lateral, anterior, and posterior views of the shell, and ventral views of the skull of male and female), Duméril (1852, lateral and ventral views), Freiberg (1936, 1977; bones of the shell), Günther (1885, lateral, dorsal, and ventral views of male, female, and hatchling), Métrailler and Le Gratiet (1996, dorsal and ventral views), Müller and Hellmich (1936, ventral view), Pritchard and Trebbau (1984, dorsal and ventral views of bony shell, and dorsal, ventral and lateral views of skull); Schubert-Soldern (1947, dorsal and lateral views of skull and head), Shaw (1802, dorsal view), Siebenrock (1898, hyoid apparatus; 1907, ventral view of skull), Smith and Smith (1979 [1980], dorsal, ventral, and lateral views of the shell from Wermuth and Mertens 1961, and dorsal and ventral views of the shell from Günther 1885); and Wermuth and Mertens 1961 (dorsal, ventral, and lateral views of shell and skull).

• **DISTRIBUTION.** *Kinosternon scorpioides* occurs in a variety of permanent, semipermanent, and temporary aquatic habitats, primarily at lower elevations throughout its range. It apparently reaches its northernmost limit in the Río Soto la Marina drainage in Tamaulipas, México, occupying Gulf of Mexico drainages (seaward of the Sierra Madre Oriental; Iverson and Berry 1979, Seidel 1976) southward to the Isthmus of Tehuantepec and the Península de Yucatán of México and Belize, and on Isla Cozumel. This species occurs in Caribbean drainages in Honduras and Nicaragua (but not Costa Rica or eastern Panamá), and on Isla de San Andres, Colombia. In Pacific drainages, it occurs from the Río Tehuantepec southward throughout Central America to Panamá. In South America, *K. scorpioides* is apparently restricted to Atlantic drainages, where it is common in most coastal lowland drainages in northern and eastern South America. It is apparently rare at most inland localities as reported by Duellman (1978) in Ecuador and Dixon and Soini (1977) in Perú, although significant inland populations occur on Serra Norte, a 700-m plateau in the Serra dos Carajas in Pará,

Brasil, and the upper Río Paraná Basin (Gran Chaco) of northern Argentina and southern Bolivia. The general distribution of *Kinosternon scorpioides* was discussed by Berry (1978), Ernst and Barbour (1989), Iverson (1986, 1992), Pritchard (1967, 1979a), Pritchard and Trebbau (1984), Rogner (1996), and Smith and Smith (1979 [1980]). Additional distributional information is available for México (Alvarez del Toro 1982; Barrera 1963; Berry and Legler 1980; Berry and Iverson 1980; Berry et al. 1997; Campbell 1998; Casas Andreu 1965, 1967; Cochran 1961; Davis 1953; Dixon et al. 1972; Duellman 1965; Dugés 1894, 1896; Dundee et al. 1986; Gadow 1905; Gaige 1936; Greene 1972; Hartweg and Oliver 1940; Iverson and Berry 1979; Lee 1980, 1996, 2000; Martin 1955, 1958; Nelson and Nickerson 1966; Pearse 1945; Pérez-Higareda 1980; Schmidt and Shannon 1947; Siebenrock 1906; Smith 1938; Smith and Taylor 1950a, 1950b; Taylor 1952; Velasco 1892; and Williams and Wilson 1966), Belize (Allen and Neill 1959, Henderson and Hoevers 1975, Iverson 1976, Neill 1965, Sanderson 1941, Schmidt 1941, Stafford and Meyer 2000), Guatemala (Campbell 1998; Stuart 1935, 1948, 1954, 1963), Honduras (Dunn and Emlen 1932; Meyer 1966, 1969; Meyer and Wilson 1973; Werner 1896; Wilson et al. 1979), El Salvador (Mertens 1952a, 1952b; Rand 1957), Nicaragua (Köhler 1999), Costa Rica (Acuña-Mesén 1990, 1993, 1998; Acuña-Mesén et al. 1983; Heyer 1967; Savage 1974; Scott and Limerick 1983; Teska 1976; Wettstein 1934), Panamá (Busack 1966; Dunn 1933; Moll and Legler 1971; Schmidt 1946; Swanson 1945), West Indies (Dunn and Saxe 1950; Schwartz et al. 1978; Schwartz and Henderson 1988, 1991; Tamsitt and Valdivieso 1963; Valdivieso and Tamsitt 1963), Colombia (Dahl and Medem 1964; Dunn 1945a, 1945b; Dunn and Saxe 1950; Medem 1957, 1958, 1960, 1962, 1965; Methner 1989; Nemuras 1967, 1968; Orces 1949; Ruthven 1922; Tamsitt and Valdivieso 1963; Valdivieso and Tamsitt 1963), Perú (Dixon and Soini 1977, Duellman and Salas 1991), Ecuador (Duellman 1978, Orces 1949), Venezuela (Fiasson 1945; Larrea 1948; Mijares-Urrutia and Arends 1992, 2000; Pritchard and Trebbau 1984; Staton and Dixon 1977; Test et al. 1966), Trinidad (Murphy 1997), Guyana (Beebe 1919, Pritchard 1989); French Guiana (Métrailler and Le Gratiet 1996), Brasil (Cabrera and Colantonio 1997; Cunha 1970; Cunha et al. 1985; Fróes 1957; Lima-Verde 1991; Luederwaldt 1926; Magnusson et al. 1998a, 1998b; Medem 1960; Schmidt and Inger 1951; Vanzolini et al. 1980), Bolivia (Müller and Hellmich 1936), Surinam (Lampe 1901), Argentina (Cabrera and Colantonio 1997; Cei 1993; Freiberg 1936, 1967, 1977; Hellmich 1958; Richard 1990; Richard et al. 1990; Richard and de la Fuente 1992), Paraguay (Aquino et al. 1996; Norman 1994), and South America (Cabrera 1995, 1998; Freiberg 1981).

• **FOSSIL RECORD.** Fossil material apparently attributable to *Kinosternon scorpioides* is known from the Pleistocene of Yucatán, México (Kuhn 1964, Langebartel 1953, Mlynarski 1976, the latter apparently referring to Langebartel 1953). Langebartel (1953) indicated that these fossils might be *K. creaseri* (see also Iverson 1983).

• **PERTINENT LITERATURE. General reviews** are in Acuña-Mesén (1993, 1998), Berry (1978), Ernst and Barbour (1989), Pritchard (1979a), Pritchard and Trebbau (1984), Rogner (1996), and Smith and Smith (1979 [1980]). Other important references are **habitat** (Alvarez del Toro 1960, 1973, 1982; Cunha 1970; Casas Andreu 1965, 1967; Duellman 1965, 1978; Dundee et al. 1986; Himmelstein 1981; Iverson 1988b; Kearney 1972; Lacépède 1788; Legler 1990; Métrailler and Le Ministério do Interior Instituto Brasileiro1989; Gratiet 1996; Norman 1994; Pritchard and Trebbau 1984; Sumichrast 1880, 1882a, 1882b), **presence in markets** (Mittermeier 1970), **use in Mayan medicine** (Carr 1991), **epizoophytic algae** (Dixon 1960), **longevity** (Biegler 1966; Bowler 1977; Conant and Hudson 1949; Flower 1925, 1937; Jarvis 1966; Mariani 1935; Mertens 1970; Slavens and Slavens 1994), **size and growth** (Pritchard and Trebbau 1984), **zoo holdings** (Lucas and Biegler 1971, Pawley 1971, Slavens 1976, Slavens and Slavens 1994), **ecology** (Acuña-Mesen 1990, 1993, 1994; Acuña-Mesén et al. 1983; Cabrera 1995), **feeding** (Himmelstein 1981, Monge-Nájera and Morera-Brenes 1987, Vanzolini et al. 1980), **diet** (Fiasson 1945, Fretey 1977, Himmelstein 1981, Moll 1990, Vanzolini et al. 1980), **biomass** (Iverson 1982), **activity** (Fretey 1977, Kearney 1972), **terrestrial movement** (Larrea 1948, Mudde and Van Dijk 1984, Teska 1976), **arboreality** (Sanderson 1941), **predators** (Pritchard and Trebbau 1984), **sexual dimorphism** (Acuña-Mesén and Márquez 1993, Berry and Shine 1980, Pritchard and Trebbau 1984), **population size and density** (Dean 1980, Moll 1990), **reproduction** (Alvarez del Toro 1973, 1982; Castillo-Centeno 1986; Cei 1993; Ewert 1979; Fretey 1976, 1977; Goeldi 1897, 1906; Goode 1991, 1994; Iverson 1999; Lardie 1983; Lucas et al. 1972; May 1985; Métrailler and Le Gratiet 1996; Moll 1979; Norman 1994; Rocha and Molina 1990; Sachsse 1976; Sexton 1960), **egg shape** (Iverson and Ewert 1991), **temperature-dependent sex ratio** (Ewert and Nelson 1991), **developmental arrest** (Ewert 1991), **captive intergrades** (Mertens 1972), **parasites** (Alho 1965; Caballero y Caballero and Branes 1958; Caballero y Caballero and Zerecero y D. 1954; Cabellero y Caballero et al. 1957, 1959; Hughes et al. 1941, 1942; Mane-Garzon and Holcman-Spector 1968; Plimmer 1913; Yamaguti 1958; Zerecero y D. 1948), **zoogeography** (Berry 1978, Gallardo 1979, Lee 1980, Pritchard 1979b, Pritchard and Trebbau 1984, Rivero-Blanco and Dixon 1979), **phylogeny** (Bramble et al. 1984; Iverson 1988a, 1991, 1998; Seidel et al. 1986), **skeletal mass** (Iverson 1984), **chromosomes and karyotypes** (Barros et al. 1972; Bickham and Baker 1976; Bickham and Carr 1983; Bull et al. 1974; Gilboa 1975; Killebrew 1975; Sites et al. 1979; Moon 1972, 1974), **retina** (Heinemann 1877), **blood and blood proteins** (Crenshaw 1962; Frair 1972, 1977; Sullivan and Riggs 1967a-c), and **vernacular names** (Campbell 1998, Casas Andreu 1967, Fróes 1957, Iverson 1985, Liner 1994, Medem 1957, Mittermeier 1970, Mittermeier et al. 1980, Pritchard and Trebbau 1984, Rust 1938, Vanzolini 1958).

• **ETYMOLOGY.** The specific name *scorpioides* is derived from the Latin *scorpio*, a noun of masculine gender, meaning "scorpion" (and probably derived from the Greek words transliterated as *skorpion* and *scorpios*). Linnaeus presumably applied the name with reference to the horny spine at the tip of the tail, such that *scorpioides* means "like" or "similar to" a scorpion (Smith and Smith 1979 [1980]). The name *abaxillare* is a descriptive adjective derived from the Latin *axillares*, referring to the axilla (axillary scute, in this case), and preceded by the prefix *ab* meaning "without;" hence, "without an axillary scute." The name *albogulare* is derived from the Latin *gulares* meaning "of the throat," and preceded by the prefix *albo* from the Latin "*albus*" meaning "white," presumably pertaining to the immaculate chin and throat in many specimens. The name *cruentatum* is a Latin adjective meaning "besmirched with blood," with reference to the bright red or orange coloration on the heads of many individuals, especially adult males.

**1. *Kinosternon scorpioides scorpioides* (Linnaeus)**

*Testudo scorpioides* Linnaeus 1766:352. See species synonymy.
*Kinosternon longicaudatum* Spix 1824:17. See species synonymy.
*Kinosternon brevicaudatum* Spix 1824:17. See species synonymy.

*Cinosternon brevicaudatum*: Wagler 1830:137.
*Kinosternum longicaudatum*: LeConte 1854:181.
*Cinosternum scorpioides scorpioides*: Siebenrock 1907:576.
*Cinosternum scorpioides integrum* forma *brasiliana* Siebenrock 1907:579 (*nomen illegitimum*). Type locality, "Brasilien und Bolivian." Type locality and holotype unknown.
*Kinosternon scorpioides seriei* Freiberg 1936:169. Type locality, "El Tabacal ( Salta)," Argentina. Holotype, Museu Argentino de Ciencias Naturales, Buenos Aires (MACN) 1247, an adult female collected by Dr. S, Mazza (not examined by authors); placed into the synonymy of *K. s. scorpioides* by Cabrera and Colantonio (1997).
*Kinosternon scorpioides pachyurum* Müller and Hellmich 1936: 100. Type locality "Villa Montes," Bolivia. Syntypes, Zoologisches Sammlung der Bayerischen Staaten in München (ZSM) 129/1928a, a male, and 129/1928b, a female, collected in 1926 by Dr. Lindner or M. Kiefer (not examined by authors); placed into the synonymy of *K. s. serei* (*sic*) by Berry (1978, 1979). Two additional syntypes (ZSM 128/1928a and 128/1928b), mentioned in the original description, were apparently lost during World War II. Data accompanying ZSM 129/1928a refer to it as the lectotype (U. Gruber, pers. comm.), although this designation has apparently not been published.
*Kinosternon panamensis* Schmidt 1946:5. See species synonymy.
*Kinosternon scorpioides scorpioides*: Mertens and Wermuth 1955:337. First use of combination.
*Kinosternon scorpioides panamense*: Mertens and Wermuth 1955:338.
*Kinosternon scorpioides integrum*: Fróes 1957:7 (part, Brasil).
*Kinosternon scorpioides carajasensis* Cunha 1970:4. Type locality, "compartimento da serra dos Carajás (serra Norte) Pará," Brasil. Holotype, Museu Paraense Emílio Goeldi (MPEG) 15, adult male collected by O. Cunha in May 1969 (not examined by authors); placed into the synonymy of *K. s. scorpioides* by Cunha et al. (1985).

• **DEFINITION.** This subspecies has a moderately to strongly tricarinate carapace that is somewhat depressed (shell height is 35% of carapace length in males, 38% in females). Head markings consist of yellow, pale gray, or pale brown dots or reticulations on a darker brown, gray, or olive background. The plastron is intermediate to small in size, and does not completely close the ventral openings of the shell (width of posterior plastral lobe averages 38% of carapace length in males, 41% in females; bridge length averages 24% of CL in males, 27% in females; and interabdominal seam length averages 26% of CL in males, 29% in females). Axillary scutes are in contact with the inguinal scutes. The posterior plastral lobe bears a shallow posterior notch that is more emarginate in males than in females.

### 2. *Kinosternon scorpioides abaxillare*

*Kinosternon abaxillare* Baur, *in* Stejneger 1925:462. Type locality, "Tuxtla [Gutiérrez], Chiapas, Mexico." Holotype, National Museum of Natural History (USNM) 7518, shell of an adult male, collected by Dr. C.H. Berendt, apparently in 1863 or 1864 (see Smith and Smith 1979 [1980])(the holotype is lost, but the authors have examined USNM 7519–29, the paratypes; Cochran 1961).
*Kinosternun abaxillare*: Alvarez del Toro 1973:20. *Ex errore*.
*Kinosternon scorpioides abaxillare*: Berry 1979:3186 (also Ernst and Barbour 1989). First use of combination.

• **DEFINITION.** This subspecies has a strongly tricarinate carapace in all but the oldest, largest individuals. The shell is somewhat depressed (shell height averages 38% of carapace length in males, 39% in females). Head markings consist of yellow, cream, or pale gray dots or reticulations on a gray or olive background. The plastron is extensive, and usually completely closes the ventral openings of the shell (width of posterior plastral lobe averages 48% of carapace length in males, 48% in females; bridge length averages 28% of CL in males, 30% in females; and interabdominal seam length averages 31% of CL in males, 33% in females). Axillary scutes are absent, or the axillary-abdominal scute seam is incomplete in most individuals. The posterior plastral lobe bears only a tiny posterior notch, or more typically none at all.

### 3. *Kinosternon scorpioides albogulare*

*Cinosternon albogulare* Duméril and Bocourt 1870:24. Type locality, "S. [San] Jose (Costa Rica)." Holotype, Museum Natural d'Histoire Naturelle, Paris (MNHN) 1760, a juvenile in alcohol, collector and date unknown (examined by JBI).
*Cinosternum albogulare*: Cope 1875:153.
*Kinosternon cruentatum*: Dunn and Emlen 1932:25.
*Kinosternon cruentatum albogulare*: Wettstein 1934:14.
*Kinosternon scorpioides albogulare*: Dunn and Saxe 1950:145. First use of combination.

• **DEFINITION.** This subspecies has a moderately to strongly tricarinate carapace, with a relatively high shell (shell height is 41% of carapace length in males, 46% in females). Head markings consist of yellow, cream pink, or orange dots or reticulations on a brown or gray background. The plastron is extensive, and usually completely closes the ventral openings of the shell (width of posterior plastral lobe averages 47% of carapace length in males, 50% in females; bridge length averages 25% of CL in males, 28% in females; and interabdominal seam length averages 28% of CL in males, 30% in females). Axillary and inguinal scutes are usually (86% of individuals) in contact. The posterior plastral lobe bears only a tiny posterior notch, or more typically none at all.

### 4. *Kinosternon scorpioides cruentatum*

*Cinosternon cruentatum* Duméril and Bibron, *in* Duméril and Duméril 1851:16. Type locality, "Amér. septentr.," restricted by Smith and Taylor (1950b) to "San Mateo del Mar, Oaxaca," México. Holotype, Museum National d'Histoire Naturelle, Paris (MNHN) 1759, a subadult female in alcohol, collector and date of collection not known (examined by JBI).
*Kinosternum Mexicanum* LeConte 1854:182. See species synonymy.
*Kinosternum cruentatum*: LeConte 1854:186.
*Kinosternon cruentatum*: Gray 1855:44.
*Kinosternum triliratum* LeConte 1859:6. See species synonymy.
*Cinosternon mexicanum*: Strauch 1862:41.
*Cinosternon triliratum*: Strauch 1862:41.
*Kinosternon mexicanum*: Müller 1865:598.
*Swanka mexicana*: Gray 1870:69.
*Swanka cruentata*: Gray 1870:69.
*Swanka trilirata*: Gray 1870:69.
*Thyrosternum cruentatum*: Garman 1884:8.
*Cinosternum leucostomum*: Cope 1885:389 (part, "Cozumel Island").
*Cinosternum integrum*: Cope 1887:23 (part, "Vera Cruz").
*Cinosternum shawanianum*: Velasco 1892:80.
*Kinosternon cruentatum*: Dunn and Emlen 1932:25.
*Kinosternon cruentatum cruentatum*: Wettstein 1934:14–15 (by implication); see also Schmidt (1941).
*Kinosternon cruentatum consors* Stejneger 1941:458. Type locality, "Cozumel Island, Yucatan, Mexico." Holotype, Na-

tional Museum of Natural History (USNM) 13912, a female (not a male, as stated in original description), collected in 1885 by U.S. Fisheries Commission personnel (examined by the authors). Duellman (1965) rejected the validity of *K. s. consors*.

*Kinosternon crenulatum*: Pearse 1945:222. *Ex errore*.

*Kinosternun cruentatum*: Alvarez del Toro 1973:18. *Ex errore*.

*Kinosternon scorpioides cruentatum*: Berry 1979:3186 (also Berry and Legler 1980). First use of combination.

• **DEFINITION**. This subspecies has a strongly tricarinate carapace in all but the oldest, largest individuals. The shell is relatively high (shell height averages 43% of carapace length in males, 46% in females). Head markings consist of yellow, orange, or red dots or reticulations on a darker brown, gray, or olive background. The plastron is extensive, and usually completely closes the ventral openings of the shell (width of posterior plastral lobe averages 47% of carapace length in males, 48% in females; bridge length averages 29% of CL in males, 31% in females; and interabdominal seam length averages 26% of CL in males, 28% in females). Axillary scutes are rarely in contact with inguinal scutes. The posterior plastral lobe bears only a tiny posterior notch, or more typically none at all.

## LITERATURE CITED


Acuña-Mesén, R.A. 1990. El impacto del fuego y la sequia sobre la estructura de la población de *Kinosternon scorpioides* (Testudines: Kinosternidae) en Palo Verde, Guanacaste, Costa Rica. Brenesia 33: 85–97.

—. 1993. Las Tortugas Continentales de Costa Rica. Editorial ICER, San Jose, Costa Rica.

—. 1994. Variación morfométrica y características ecológicas del habitat de la tortuga candado *Kinosternon scorpioides* en Costa Rica (Chelonia, Kinosternidae). Rev. Brasil. Biol. 54:537–547.

—. 1998. Las Tortugas Continentales de Costa Rica. 2nd ed. Edit. Univ. de Costa Rica, San Jose.

—, A. Castaing, and F. Flores. 1983. Aspectos ecológicos de la distribución de las tortugas terrestres y semiacuáticas en el Valle Central de Costa Rica. Rev. Biol. Trop. 31:181–192.

— and C. Márquez B. 1993. El dimorfismo sexual de *Kinosternon scorpioides* (Testudines: Kinosternidae) en Palo Verde, Costa Rica. Rev. Biol. Trop. 41:261–265.

—, C.E. Acuña Montero, and M.T. Rodriguez. 1993. Los componentes óseos del carazón y del plastrón de dos tortugas costarricenses: *Kinosternon scorpioides* y *K. leucostomum* (Testudines: Kinosternidae). Brenesia 39–40:81–92.

Agassiz, L. 1857. Contributions to the Natural History of the United States of America. First Monograph. Volume I. Part I. Essay on Classification. Part II. North American Testudinata. Little, Brown, and Co., Boston.

Alderton, D. 1988. Turtles & Tortoises of the World. Facts on File, Inc., New York.

Alho, C.J.R. 1965. A contribution to the knowledge of the helminth fauna of the turtles of the state of Para, Brazil: new host record *Telorchis hagmani, Halltrema avitelina, Kinosternon scorpioides, Podocnemis expansa, Testudo denticulata*. Bol. Mus. Paraense Emilio Goeldi Nova Ser. Zool.58:1–8.

Allen, E.R. and W.T. Neill. 1959. Doubtful locality records in British Honduras. Herpetologica 15:227–233.

Alvarez del Toro, M. 1960. Reptiles de Chiapas. E.C.L.A.L., México, D.F.

—. 1973. Los reptiles de Chiapas. 2nd ed. Gobierno del Estado de Chiapas, Tuxtla Gutierrez, México.

—. 1982. Los Reptiles de Chiapas. 3rd ed. Publ. Inst. Hist. Nat., Tuxtla Gutierrez, Chiapas, México.

Aquino, A.L., N.J. Scott, and M. Motte. 1996. Lista de anfibios y reptiles del Museo Nacional de Historia Natural del Paraguay (Marzo 1980–Setiembre [*sic*] 1995), p. 331–400. *In* O.R. Martinez (ed.), Colecciones de Flora y Fauna del Museo Nacional de Historia Natural del Paraguay. Museo Nac. Hist. Nat. del Paraguay, Asunción.

Aria, K. 1998. Aqua Magazine Bible III; Collections Series 4, Turtle Collection. Fair Wind Co., Ojidai Sakura Chiba, Japan.

Barrera, A. 1963. La península de Yucatán como provincia biótica. Rev. Soc. Mex. Hist. Nat. 24:71–105.

Barros, R.M., M. Ayres, M.M. Sampaio, O. Cunha, and F. Assis. 1972. Karyotypes of two subspecies of turtles from the Amazon region of Brazil. Caryologia 25:463–469.

Beebe, W. 1919. The higher vertebrates of British Guiana with special reference to the fauna of Bartica District. Zoologica 2:205–238.

Bell, T. 1825. A monograph of the tortoises having a moveable sternum. Zool. J., London 2:299–310.

Berry, J.F. 1978. Variation and systematics in the *Kinosternon scorpioides* and *K. leucostomum* complexes (Reptilia: Testudines: Kinosternidae) of Mexico and Central America. Unpubl. Ph.D. diss., Univ. Utah, Salt Lake City.

—. 1979. Variation and systematics in the *Kinosternon scorpioides* and *K. leucostomum* complexes (Reptilia: Testudines: Kinosternidae) of Mexico and Central America. Diss. Abst. Int. 39(07B):3186.

— and J.B. Iverson. 1980. A new species of mud turtle, genus *Kinosternon*, from Oaxaca, Mexico. J. Herpetol. 14:313–320.

— and J.M. Legler. 1980. A new turtle (genus *Kinosternon*) from Sonora, Mexico. Contr. Sci. Los Angeles Co. Mus. (325):1–12.

— and R. Shine. 1980. Sexual dimorphism and sexual selection in turtles (Order Testudines). Oecologia 44:185–191.

—, M.E. Seidel, and J.B. Iverson. 1997. A new species of mud turtle (genus *Kinosternon*) from Jalisco and Colima, Mexico, with notes on its natural history. Chel. Conserv. Biol. 2:329–337.

Bickham, J.H. and R.J. Baker. 1976. Karyotypes of some Neotropical turtles. Copeia 1976:703–708.

— and J.L. Carr. 1983. Taxonomy and phylogeny of the higher categories of cryptodiran turtles based on a cladistic analysis of chromosomal data. Copeia 1983:918–932.

Biegler, R. 1966. A survey of recent longevity records for reptiles and amphibians in zoos. Intl. Zoo Yb. 6:487–493.

Bocourt, M.-F. 1876. Note sur quelques reptiles de l'Isthme de Tehuantepec (Mexique) donnés par M. Sumichrast au Muséum. J. Zool., Paris 5:386–411.

Bonin, F., B. Devaux, and A. Dupré. 1996. Toutes les Tortues du Monde. Delachaux et Niestlé, Laussamme, Switzerland.

Boulenger, G.A. 1889. Catalogue of the Chelonians, Rhynchocephalians, and Crocodiles in the British Museum (Natural History). Trustees (Brit. Mus.), London.

—. 1914. Reptiles and Batrachians. E.P. Dutton and Co., New York.

Bowler, J.K. 1977. Longevity of reptiles and amphibians in North American collections as of November, 1975. SSAR Herpetol. Circ. (6):1–32.

Bramble, D.M., J.H. Hutchison, and J.M. Legler. 1984. Kinosternid shell kinesis: structure, function and evolution. Copeia 1984:456–475.

Bull, J.J., R.G. Moon, and J.M. Legler. 1974. Male heterogamety in kinosternid turtles (genus *Staurotypus*). Cytogen. Cell Genetics 13: 419–425.

Busack, S.D. 1966. Notes on a herpetological collection from the Azuero Peninsula, Panama. Copeia 1996:371.

Caballero y Caballero, E., and R.R. Branes M. 1958. Helmintos de la República de Costa Rica, VI. Algunos tremátodos de peces, reptiles, y mamiferos. An. Inst. Biol. México 28:217– 240.

— and Zerecero y D. 1954. Helmintos de la República de Panamá, XI. Descripción de una nueva espécie del genero *Telorchis* (Trematoda: Digenea). An. Inst. Biol. México 25:253–258.

—, —, and R.G. Grocott. 1957. Helmintos de la República de Panamá, XIX. Algunos tremátodos de quelonios de aqua dulce. An. Inst. Biol. Univ. México 27:416–430.

—, —, and —. 1959. Helmintos de la República de Panamá, XXI. Algunos tremátodos de quelonios de aqua dulce 2a parte. An. Inst. Biol. Univ. México 29:181–202.

Cabrera, M.R. 1995. Comparative composition of turtle species in four natural regions of the Chacoan Domain, South America. An. Mus. Hist. Nat. Valparaíso 23:41–52.

—. 1998. Las tortugas continentales de Sudamérica Austral. Priv. printed, Córdoba, Argentina.

— and S.E. Colantonio. 1997. Taxonomic revision of the South American subspecies of the turtle *Kinosternon scorpioides*. J. Herpetol. 31: 507–513.

Campbell, J.A. 1998. Amphibians and Reptiles of Northern Guatemala, the Yucatán, and Belize. Univ. Oklahoma Press, Norman.

Carr, H.S. 1991. The Maya medicinal turtle, *Xkokak*, and a suggested

alternate reading of Yucatec ethnomedical texts. J. Ethnobiol. 11:187–192.
Casas Andreu, G. 1965. Estudio preliminar sobre las tortugas de agua dulce en México. An. Inst. Nac. Inves. Biol.-Pesq. 1:365–401.
—. 1967. Contribución al Conocimiento de las Tortugas Dulceacuicolas de México. Univ. Nac. Autón. México, Fac. Ciencias, Dept. Biol., México, D.F.
Castillo-Centeno, O. 1986. Factores ecológicos y de mercado de la reproduccíon de *Rhinoclemmys pulcherrima* y *Kinosternon scorpioides* (Testudines: Emydidae y Kinosternidae) en Costa Rica. Unpubl. thesis, Ciudad Univ. "Rodrigo Facio." San Jose, Costa Rica.
Cei, J.M. 1993. Reptiles del noroeste, nordeste y este de la Argentina: herpetofauna de las selvas subtropicales, puna y pampas. Mus. Reg. Sci. Natur. Torino Monogr. 14:1–952.
Church, R.J. 1963. Turtles. T.F.H. Publ., Neptune City, New Jersey.
Cochran, D.M. 1961. Type specimens of reptiles and amphibians in the United States National Museum. Bull. U.S. Natl. Mus. (220):1–29.
Conant, R. and R.G. Hudson. 1949. Longevity records for reptiles and amphibians in the Philadelphia Zoological Gardens. Herpetologica 5:1–8.
Cope, E.D. 1866. Fourth contribution to the herpetology of tropical America. Proc. Acad. Nat. Sci. Philadelphia 18:123–132.
—. 1875. Check-list of North American Batrachia and Reptilia with a systematic list of the higher groups and an essay on geographic distribution based on the specimens contained in the United States National Museum. Bull. U.S. Natl. Mus. 1:1–104.
—. 1885. A contribution to the herpetology of Mexico. Proc. Amer. Phil. Soc. 22:379–404.
—. 1887. Catalogue of batrachians and reptiles of Central America and Mexico. Bull. U.S. Natl. Mus. 32:1–98.
Crenshaw, J.W., Jr. 1962. Variation in the serum albumins and other blood proteins of turtles of the Kinosternidae. Physiol. Zool. 35:157–165.
Cunha, O.R. da 1970. Una nova subspecie de quêlonio, *Kinosternon scorpioides carajasensis* da Serra dos Carajás, Pará. Bol. Mus. Paraense Emilio Goeldi 73:1–12.
—, F.P. do Nascimento, and T.C.S. de Avila-Pires. 1985. Os répteis da área de Carajás, Pará, Brasil (Testudines e Squamata). I. Publ. Avulsas Mus. Paraense Emílio Goeldi 40:9–92.
Dahl, G. and F. Medem. 1964. Informe sobre la fauna acuática del río Sinu. Parte II. Los reptiles acuáticos de la hoya del Sinu. Corporación Autónoma Regional de los Valles del Magdalena y del Sinu-CVM, Dept. Invest. Ictiol. Faunist., Bogotá:110–152.
Daudin, F.M. 1802. Histoire Naturelle, Généra et Particulière des Reptiles, Pour Faire Suite L'histoire Naturelle de Buffon, Rédigée par Sonnini. 8 vols. F. Dufart, Paris.
Davis, W.B. 1953. The turtle *Kinosternon cruentatum cruentatum* in Tamaulipas. Copeia 1953:65.
Dean, R.H. 1980. Selected aspects of the ecology of the Central American mud turtle *Staurotypus salvinii*. M.S. thesis, Texas A& M Univ., College Station.
Dixon, J.R. 1960. Epizoophytic algae on some turtles of Texas and Mexico. Texas J. Sci. 12:36–38.
—, C.A. Ketchersid, and C.S. Lieb. 1972. The herpetofauna of Querétaro, Mexico, with remarks on taxonomic problems. Southwest. Nat. 16: 225–237.
— and P. Soini. 1977. The reptiles of the upper Amazon Basin, Iquitos region, Peru. II. Crocodilians, turtles and snakes. Milwaukee Pub. Mus. Contr. Biol. Geol. (12):1–91.
Duellman, W.E. 1965. Amphibians and reptiles of the Yucatan Peninsula, México. Univ. Kansas Publ. Mus. Nat. Hist. 15:577–614.
—. 1978. The biology of an equatorial herpetofauna in Amazonian Ecuador. Univ. Kansas Mus. Nat. Hist., Misc. Publ. (65):1–352.
— and A.W. Salas. 1991. Annotated checklist of the amphibians and reptiles of Cuzco Amazonica, Peru. Occ. Pap. Mus. Nat. Hist., Univ. Kansas (143):1–13.
Dugés, A.A.D. 1894. Liste de algunas reptiles y batracios de Tabasco y Chiapas. Naturaleza (2):375–377.
—. 1896. Reptiles y batracios de los E.U. Mexicanos. Naturaleza (2): 479–485.
Duméril, A.M.C. and G. Bibron. 1835. Erpétologie Générale ou Histoire Naturelle Complète des Reptiles. Vol. 3. Libr. Encyclopédique de Roret, Paris.
— and A.H.A. Duméril. 1851. Catalogue Méthodique de la Collection des Reptiles du Muséum d'Histoire Naturelle. Gide & Boudry, Paris.
— and M.-F. Bocourt. 1870. Observations sur les reptiles et les batraciens de la région central de l'Amerique, etudes sur les reptiles. Mission scientifique au Mexique et dans l'Amerique Centrale (3rd part):1–32.
Duméril, A.H.A. 1852. Description des reptiles nouveaux ou imparfaitement connus de la collection du Muséum d'Histoire Naturelle et remarques sur la classification et les caractères des reptiles. Archs. Mus. Natn. Hist. Nat., Paris 6:109–264, pls. 14–22.
Dundee, H.A., D.A. White, and V. Rico-Gray. 1986. Observations on the distribution and biology of some Yucatán amphibians and reptiles. Bull. Maryland. Herpetol. Soc. 22:37–50.
Dunn, E.R. 1933. Amphibians and reptiles from El Valle de Auton, Panama. Occ. Pap. Boston Soc. Nat. Hist. 8:65–79.
—. 1945a. Los generos de amfibios y reptiles de Columbia. IV. Reptiles, ordenes testudineos y crocodilinos. Caldasia 3:307–335.
—. 1945b. The amphibians and reptiles of the Colombian Carribean Islands San Andrés and Providencia. Caldasia 3:363–365.
— and J.T. Emlen. 1932. Reptiles and amphibians from Honduras. Proc. Acad. Nat. Sci. Philadelphia 84:21–32.
— and L.H. Saxe. 1950. Results of the Catherwood-Chaplin West Indies expedition, 1948. Part V. Amphibians and reptiles of San Andrés and Providencia. Proc. Acad. Nat. Sci. Philadelphia 52:141–165.
Ernst, C.H. and R.W. Barbour. 1989. Turtles of the World. Smithsonian Inst. Press, Washington, D.C.
Ewert, M.A. 1979. The embryo and its egg: Development and natural history, p. 333-413. *In* M. Harless and H. Morlock (eds.), Turtles. Perspectives and Research. John Wiley & Sons, New York.
—. 1991. Cold torpor, diapause, delayed hatching, and aestivation in reptiles and birds, p. 173–191. *In* D.C. Deeming and M.W.J. Ferguson (eds.), Egg Incubation: Its Effects on Embryonic Development in Birds and Reptiles. Cambridge Univ. Press, Cambridge, England.
— and C.E. Nelson. 1991. Sex determination in turtles: diverse patterns and some possible adaptive values. Copeia 1991:50–69.
Fiasson, R. 1945. Cinq chéloniens et deux saureins du Haut Apure (Venezuela). Cahiers l'Inst. Franc. D'Amer. Lat. (México, D.F.) 3:33–45.
Fitzinger, L.J. 1826. Neue Classification der Reptilien nach ihren Natürlichen Verwandtschaften nebst einer Verwandtschafts-Tafel und einem Verzeichnisse der Reptilien-Sammlung des k. k. Zoologischen Museum zu Wien. J.G. Hübner Verlagen, Wien.
—. 1835. Entwurf einer systematischen Anordnung der Schildkröten nach den Grudnsätzen der natürlichen Methoden. Ann. Naturh. Mus. Wien. 1:103–128.
—. 1843. Systema Reptilium. Fasciculus Primus: Amblyglossae. Braumüller und Seidel, Vindobonae.
Flower, S.S. 1925. Contributions to our knowledge of the duration of life in vertebrate animals. III. Reptiles. Proc. Zool. Soc. London 1925:911–981.
—. 1937. Further notes on the duration of life in animals. III. Reptiles. Proc. Zool. Soc. London 1937:1–39.
Frair, W. 1972. Taxonomic relationships among chelydrid and kinosternid turtles elucidated by serological tests. Copeia 1972:97–108.
—. 1977. Turtle red blood cell packed volumes, sizes, and numbers. Herpetologica 33:167–190.
Freiberg, M. 1936. Una nueva tortuga del norte Argentino. Physis (Buenos Aires)12:169–171.
—. 1967. Tortugas de la Argentina. Cienc. y Invest. 23:351–363.
—. 1972. Los Reptiles. Orden 3. Las Tortugas (Testudines), p. 583–620. *In* L. Candero (ed.), Zoologia Hispanoamericana. Vertebrados. Porrua, México, D.F.
—. 1977. Reptilia. Testudines o Chelonia, p. 7–55. *In* R. A. Ringuelet (ed), Fauna de agua dulce de la República Argentina. FECIC, Buenos Aires 42:1–55.
—. 1981. Turtles of South America. T.F.H. Publ., Neptune, New Jersey.
Fretey, J. 1976. Reproduction de *Kinosternon scorpioides scorpioides* (Linn.). Bull. Soc. Zool. France 101:732–733.
—. 1977. Les cheloniens de Guyane francaise. I. Etude preliminaire. Thesis, Univ. Paris.
Fróes, O.M. 1957. Notas quelonológicas. I. Atualização da nomenclatura dos quelônios Brasileiros. Iheringia Zool. 2:1–24.
Gadow, H.F. 1905. The distribution of Mexican amphibians and reptiles. Proc. Zool. Soc. London 1905:191–245.
Gaige, H.T. 1936. Some reptiles and amphibians from Yucatan and Campeche, Mexico. Publs. Carnegie Inst., Washington (457):289–304.
Gallardo, J. 1979. Composición, distribución y origen de la herpetofauna

Chaqueña, p. 299–307. *In* W.E. Duellman (ed.), The South American Herpetofauna: Its Origin, Evolution, and Dispersal. Mus. Nat. Hist. Univ. Kansas Monograph (7):1–485.
Garman, S. 1884. The North American reptiles and batrachians. A list of the species occuring north of the Isthmus of Tehuantepec, with references. Bull. Essex Inst. 16:1–46.
Garrison, R. 1971. *Kinosternon cruentatum*. Intl. Turtle Tortoise Soc. J. 5(1):ii (2 figures).
Gijzen, A. and H. Wermuth. 1958. Schildkröten-Pflege in öffentlichen Schau-Aquarien nach biologischen Gesichtspunkten. Bull. Soc. R. Zool. Anvers. 6:1–65.
Gilboa, I. 1975. Karyotypes of amphibians and reptiles: a bibliographic review, p. 91–156. *In* H.G. Dowling (ed.), Yearbook of Herpetology. Herpetol. Info. Search Syst., New York.
Goeldi, E.A. 1897. Die Eier von 13 brasilianischen Reptilien, nebst Bemerkungen über Lebens- und Fortpflanzungs-weise letzterer. Zool. Jahrb. (Syst.) 10:640–669.
—. 1906. Chelonios do Brazil (Jabotys-Kagados-Tartarugas). Bol. Mus. Goeldi 1906:699–756.
Goode, J.M. 1991. Breeding semi-aquatic and aquatic turtles at the Columbus Zoo, p. 66–76. *In* K.R. Beaman, F. Caporaso, S. McKeown, and M.D. Graff (eds.), Proceedings of the First International Symposium on Turtles and Tortoises: Conservation and Captive Husbandry, 1990. Circle Printing Co., Los Angeles.
—. 1994. Reproduction in captive Neotropical musk and mud turtles (*Staurotypus triporcatus*, *S. salvinii*, and *Kinosternon scorpioides*), p. 275–295. *In* J.B. Murphy and K. Adler (eds.), Captive Management and Conservation of Amphibians and Reptiles. SSAR, Lawrence, Kansas.
Gravenhorst, J.L.C. 1829. Reptilia Musei Zoologici Vratislaviensis recensita et descripta... Part I. Chelonios et Batrachia. Del Musei Zool., Vratislavensis 1:1–106.
Gray, J.E. 1831. Synopsis Reptilium. Part 1. Cataphracta, Tortoises, Crocodiles, and Enaliosaurians. Treüttel, Würtz and Co., London.
—. 1844. Catalogue of the Tortoises, Crocodiles, and Amphisbaenians, in the Collection of the British Museum. Trustees (Brit. Mus.), London.
—. 1855. Catalogue of the Shield Reptiles in the Collection of the British Museum. Part I. Testudinata (Tortoises). Trustees (Brit. Mus.), London.
—. 1869. Notes on the families and genera of tortoises (Testudinata), and on the characters afforded by the study of their skulls. Proc. Zool. Soc. London 1869:165–225.
—. 1870. Supplement to the catalog of shield reptiles in the collection of the British Museum. Part I. Testudinata (tortoises). With figures of the skulls of 36 genera. Trustees (Brit. Mus.), London.
—. 1873. Observations on chelonians, with descriptions of new genera and species. Ann. Mag. Nat. Hist. (4)11:289–308.
Greene, H.W. 1972. Mexican reptiles in the Senckenberg Museum. Carnegie Mus., Pittsburgh.
Günther, A.C.J.G. 1885. Reptilia and Batrachia. *In* O. Salvin and F.O. Godman (eds.), Biologia Centrali-Americana. Vol. 20. R.H. Porter and Dalau & Co., London.
Hartweg, N. and J.A. Oliver. 1940. A contribution to the herpetology of the Isthmus of Tehuantepec. IV. An annotated list of the amphibians and reptiles collected on the Pacific slope during the Summer of 1936. Misc. Publs. Mus. Zool., Univ. Michigan (47):1–31.
Heinemann, C. 1877. Beiträge zur Anatomie der Retina. Arch. Mikrosk. Anat., Bonn 14:409–441.
Hellmich, W. 1958. Zur Kenntnis von *Kinosternon scorpioides seriei* Freiberg. Opuscula Zool. (16):1–7.
Henderson, R.W. and L.G. Hoevers. 1975. A checklist and key to the amphibians and reptiles of Belize, Central America. Milwaukee Pub. Mus., Contr. Biol. Geol. (5):1–63.
Heyer, W.R. 1967. A herpetofaunal study of an ecological transect through the Cordillera de Tilaran, Costa Rica. Copeia 1967:259–271.
Himmelstein, J. 1981. Observations and distributions of amphibians and reptiles in the State of Quintana Roo, Mexico. HERP-Bull. N.Y. Herpetol. Soc. 16(2):18–34.
Hoogmoed, M.S. and U. Gruber. 1983. Spix and Wagler type specimens of reptiles and amphibians in the Natural History Musea in Munich (Germany) and Leiden (The Netherlands). Spixiana Suppl. 9:319–415.
Hughes, R.C., J.W. Higginbotham, and J.W. Clary. 1941. The trematodes of reptiles. Part II. Host catalogue. Proc. Oklahoma Acad. Sci. 21:35–43.
—, —, and —. 1942. The trematodes of reptiles. Part I. Systematics section. Amer. Midl. Nat. 27:109–134.
Iverson, J.B. 1976. The genus *Kinosternon* in Belize (Testudines: Kinosternidae). Herpetologica 32:258–262.
—. 1982. Biomass in turtle populations: a neglected subject. Oecologia 55:69–76.
—. 1983. *Kinosternon creaseri*. Cat. Amer. Amphib. Rept. (312):1.
—. 1984. Proportional skeletal mass in turtles. Florida Sci. 47:1–11.
—. 1985. Checklist of the turtles of the world with English common names. SSAR Herpetol. Circ. (14):1–14.
—. 1986. A Checklist with Distribution Maps of the Turtles of the World. Priv. printed, Richmond, Indiana.
—. 1988a. Neural bone patterns and the phylogeny of the turtles of the subfamily Kinosterninae. Milwaukee Pub. Mus. Contr. Biol. Geol. (75):1–12.
—. 1988b. Distribution and status of Creaser's mud turtle, *Kinosternon creaseri*. Herpetol. J. 1:285–291.
—. 1991. Phylogenetic hypotheses for the evolution of modern kinosternine turtles. Herpetol. Monogr. 5:1–27.
—. 1992. A Revised Checklist with Distribution Maps of the Turtles of the World. Priv. printed, Richmond, Indiana.
—. 1998. Molecules, morphology, and mud turtle phylogenetics (family Kinosternidae). Chel. Conserv. Biol. 3:113–117.
—. 1999. Reproduction in the Mexican mud turtle *Kinosternon integrum*. J. Herpetol. 33:144–148.
— and J.F. Berry. 1979. The mud turtle genus *Kinosternon* in northeastern Mexico. Herpetologica 35:318–324.
— and M.A. Ewert. 1991. Physical characteristics of reptilian eggs and a comparison with avian eggs, p. 87–100. *In* D.C. Deeming and M.W.J. Ferguson (eds.), Egg Incubation: Its Effect on Embryonic Development in Birds and Reptiles. Cambridge Univ. Press, Cambridge, England.
Jarvis, C. 1966. A survey of recent longevity records for reptiles and amphibians in zoos. Intl. Zoo Yb. 6:487–493.
Kearney, P. 1972. Nocturtles of Trinidad. Intl. Turtle Tortoise Soc. J. 6:10–11, 32–33.
Kilias, R. 1957. Die Funktionell-Anatomische und Systematische Bedeutung der Schlafenreduktionen bei Schildkröten. Mitt. A.D. Zool. Mus. Berlin 33:307–354.
Killebrew, F.C. 1975. Mitotic chromosomes of turtles. III. The Kinosternidae. Herpetologica 31:398–403.
Köhler, G. 1999. The amphibians and reptiles of Nicaragua: a distributional checklist with keys. Cour. Forsch.-Inst. Senckenburg 213:1–121.
Koshikawa, A. 1996. Reptiles: turtles, p.160–216. *In* S. Sengoku (ed.), Picture book of 800 Reptiles and Amphibians. Pisces Publ., Tokyo.
Kuhn, O. 1964. Testudines. Fossilium Catalogues I: Animalia, Pars 107:1–299.
Lacépède, B.G.E. 1788. Histoire Naturelle des Quadrupèdes Ovipares et des Serpens. Vol. 1. Hôtel de Thou, Paris.
Lampe, E. 1901. Catalog der Reptilien-Sammlung (Schildkröten, Crocodile, Eideschen, und Chamaeleons) der Naturhistorischen Museums zu Wiesbaden. Jahrb. Nassau. Ver. Naturk. 54:177–222.
Langebartel, D.A. 1953. Faunal and archeological researches in Yucatán caves. Part 4. The reptiles and amphibians. Bull. Cranbrook Inst. Sci. (33):91–108.
Lardie, R.L. 1983. Notes on eggs and young of *Kinosternon scorpioides cruentatum*. Bull. Oklahoma Herpetol. Soc. 8(2):60–62.
Larrea, J. 1948. Quelonios venezolanos. Mem. Soc. Ceinc. Nat. La Salle 8:133–141.
LeConte, J. 1854. Description of four new species of *Kinosternum*. Proc. Acad. Nat. Sci. Philadelphia 7:180–190.
—. 1859. Description of two new species of tortoises. Proc. Acad. Nat. Sci. Philadelphia 11:4–7.
Lee, J.C. 1980. An ecogeographic analysis of the herpetofauna of the Yucatan Peninsula. Misc. Publ. Univ. Kansas Mus. Nat. Hist. (67):1–75.
—. 1996. The Amphibians and Reptiles of the Yucatan Peninsula. Cornell Univ Press, Ithaca, New York.
—. 2000. A Field Guide to the Amphibians and Reptiles of the Maya World: The Lowlands of Mexico, Northern Guatemala, and Belize. Comstock Publ. Assoc., Ithaca, New York.
Legler, J.M. 1965. A new species of turtle, Genus *Kinosternon*, from Central America. Univ. Kansas Publ. Mus. Nat. Hist. 15:615–625.

—. 1990. The genus *Pseudemys* in Mesoamerica: taxonomy, distribution, and origins, p. 82–105. *In* J.W. Gibbons (ed.), Life History and Ecology of the Slider Turtle. Smithsonian Inst. Press, Washington, D.C.

Lima-Verde, J. 1991. Estado atual do conhecimento sobre a fauna reptiliana do Ceara. M.S. thesis, Fortaleza, Ceara, Brasil.

Liner, E.A. 1994. Scientific and common names for the amphibians and reptiles of Mexico in English and Spanish. Nombres científicos y comunes en Ingles y Español de los amphibios y los reptiles de México. SSAR Herpetol. Circ. (23):1–113.

Linnaeus, C. 1766. Systema Naturae per Regna Tria Naturae, Secundum Classes, Ordines, Genera, Species cum Characteribus, Differentiis, Synonymis, Locis. Vol. 1. 12th ed. L. Salvius, Stockholm.

Lucas, J. and R. Biegler. 1971. Species of wild animals bred in captivity during 1969. Intl. Zoo Yb. 11:259–320.

—, N. Duplaix-Hall, and R. Biegler. 1972. Species of wild animals bred in captivity in 1970. Intl. Zoo Yb. 12:311–375.

Luederwaldt, H. 1926. Os chelonios brasileiros, com a lista das espécies do Museu Paulista. Rev. Mus. Paulista 14:405–470.

Magnan, P. and J. Maran. 1999, L'encyclopédie Terrariophile. Tortues-Volume 1. JEH Publ., Mommenheim, France

Magnusson, W.E., A.P. Lima, and M.C. d. Araújo. 1998a. Geographic distribution. *Kinosternon scorpioides*. Herpetol. Rev. 29:173.

—, —, and —. 1998b. Geographic distribution. *Kinosternon scorpioides*. Herpetol. Rev. 29:247.

Mane-Garzon, F. and B. Holcman-Spector. 1968. Trematodos de las tortugas del Uruguay, VIII. Una nueva especie de genero *Telorchis* (Luhe, 1900) del intestino de *Pseudemys dorbigni* (Dum. and Bib.). Com. Zool. Mus. Hist. Nat. Montevideo 9(121):1–4.

Mariani, A. 1935. Rundbesuch bei Wiener Vivarienern. Bl. Aquar.-u. Terrareink. 46:37–41.

Martin, P.S. 1955. Herpetological records from the Gómez Farías region of southwestern Tamaulipas, Mexico. Copeia 1955:173–180.

—. 1958. A biogeography of reptiles and amphibians in the Gómez Farías region, Tamaulipas, Mexico. Misc. Publ. Mus. Zool. Univ. Michigan (101):1–102.

May, C. 1985. Some notes on *Kinosternon scorpioides cruentatum*. Notes from NOAH 12(5):11–13.

Medem, F. 1957–1958. Informe sobre reptiles Colombianos. II. El conocimiento actual sobre la distribución geográfica de las Testudinata en Colombia. Bol. Mus. Cien. Nat. 2–3:13–45.

—. 1960. Datos zoo-geográficos y ecologícos sobre los crocodylia y testudinata de los rios Amazonas, Putumayo y Caqueta. Caldasia 8:341–351.

—. 1962. La distribución geográfica y ecología de los Crocodylia y Testudinata en el Departamento del Choco. Rev. Acad. Colomb. Cienc. Ex. Fis. Nat. 11:279–303.

—. 1965. Lista de reptiles acuáticos coleccionados durante la expedición, p. 103–110. *In* G. Dahl, F. Medem, and A.R. Henao (eds.), El "Bocachico." Contribución al Estudio de su Biología y de su Ambiente. Depto. Pesca Corp. Autón. Reg. Valles Magdalena, Sinu (C.V.M.), Bogotá..

Merrem, B. 1820. Versuch eines Systems der Amphibien. Tentamen Systematis Amphibiorum. Marburg.

Mertens, R. 1952a. Die Amphibien und Reptilien von El Salvador, auf Grund der Reisen von R. Mertens und A. Zilch. Abh. Senckenb. Naturforsch. Ges. (487):1–120.

—. 1952b. Neues über die Reptilienfauna von El Salvador. Zool. Anz. 148:87–94.

—. 1970. Ueber die Lebensdauer einiger Amphibien und Reptilien in Gefangeschaft. Zool. Gart., Leipzig 39:193–209.

—. 1972. Über Reptilienbastards. VI. Senckenberg. Biol. 53:1–19.

— and H. Wermuth. 1955. Die rezenten Schildkröten, Krokodile und Brückenechsen. Eine kritische Liste der heute lebenden Arten und Rassen. Zool. Jb. Abt. Atlg. Zool. 83:323–440.

Métrailler, S. and G. Le Gratiet. 1996. Tortues Continentales de Guyane Française. Pillet SA, Martigny, Switzerland.

Methner, K. 1989. Die Schildkröten des unteren Rio Magdalena (Kolumben). Sauria 11(4):9–11.

Meyer, J.R. 1966. Records and observations on some amphibians and reptiles from Honduras. Herpetologica 22:172–181.

—. 1969. A biogeographic study of the amphibians and reptiles of Honduras. Unpubl. Ph.D. diss., Univ. S. California, Los Angeles.

— and L.D. Wilson. 1973. A distributional checklist of the turtles, crocodilians, and lizards of Honduras. Contr. Sci., Los Angeles Co. Mus. Nat. Hist. (244):1–39.

Mijares-Urrutia, A. and A. Arends R. 1992. Geographic distribution. *Kinosternon scorpioides scorpioides* (Scorpion Mud Turtle). Herpetol. Rev. 23:122–123.

— and —. 2000. Herpetofauna of Estado Falcón, northwestern Venezuela: a checklist with geographical and ecological data. Smithsonian Herpetol. Info. Serv. 123:1–30.

Ministério do Interior Instituto Brasileiro. 1989. Projeto Quelônios da Amazônia. 10 Anos. Ministério do Interior Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis, Ibama.

Mittermeier, R.A. 1970. Turtles in Central American markets. Intl. Turtle Tortoise Soc. J. 4:20–26.

—, F. Medem, and A.G.J. Rhodin. 1980. Vernacular names of South American turtles. SSAR Herpetol. Circ. (10):1–44.

Mlynarski, M. 1976. Handbuch der Paläoherpetology. Part 7. Testudines. Gustav Fischer Verlag, Stuttgart.

Moll, D. 1990. Population sizes and foraging ecology in a tropical freshwater stream turtle community. J. Herpetol. 24:48–53.

Moll, E.O. 1979. Reproductive cycles and adaptations, p. 305–331. *In* M. Harless and H. Morlock (eds.), Turtles. Perspectives and Research. John Wiley & Sons, New York.

— and J.M. Legler. 1971. The life history of a Neotropical slider turtle, *Pseudemys scripta* (Schoepff), in Panama. Bull. Los Angeles Co. Mus. Nat. Hist., Sci. 11:1–102.

Monge-Nájera, J. and B. Moreva-Brenes 1987. Notes on the feeding behavior of a juvenile mud turtle, *Kinosternon scorpioides*. Herpetol. Rev. 18:7–9

Moon, R.G. 1972. Chromosomes in the turtles of the family Kinosternidae. M.S. thesis, Univ. Utah., Salt Lake City.

—. 1974. Heteromorphism in a kinosternid turtle. Mammal. Chrom. Newsl. 15:10–11.

Mudde, P. and M. Van Dijk. 1984. Herpetologische waarnemingen in Costa Rica (VI) Schildpadden en Krokodillen. Lacerta 42(10–11): 221–223.

Mueller, G. 1998. Turtles in the Terrarium. T.F.H. Publ., Neptune City, New Jersey.

Müller, F. and W. Hellmich. 1936. Amphibien und Reptilien. I.Teil-Amphibia, Chelonia, Loricata, p. 1–120. *In* H. Krieg (ed.), Wissenschaftliche Ergebnisse der Deutsche Gran Chaco-Expedition. Strecker and Schröder, Stuttgart.

Müller, J.W. 1865. Reisen in den Vereinigten Staaten, Canada und Mexiko. III. Beiträge zur Geschichte, Statistik und Zoologie von Mexiko. Dritte Abtheilung. Die Wirbelthiere Mexikos. Brockhaus, Leipzig.

Murphy, J.C. 1997. Amphibians and Reptiles of Trinidad and Tobago. Krieger Publ., Malabar, Florida.

Neill, W.T. 1965. New and noteworthy reptiles and amphibians from British Honduras. Bull. Florida St. Mus., Biol. Sci. 9:77–130.

Nelson, C.E. and M.A. Nickerson. 1966. Notes on some Mexican and Central American amphibians and reptiles. Southwest. Nat. 11:128–131.

Nemuras, K.T. 1967. Turtles of Pan America. Intl. Turtle Tortoise Soc. J. 1(6):22–23, 38–39, 42–43.

—. 1968. Notes on herpetology of Panama. Part 4. Bull. Maryland Herpetol. Soc. 4:31–40.

Nöllert, A. 1987. Schildkröten. Landbuch-Verlag, Hannover.

Norman, D.R. 1994. Amphibians and Reptiles of the Paraguayan Chaco. Vol. I. Priv. printed, San Jose, Costa Rica.

Oken, L. 1816. Okens Lehrbuch der Naturgeschichte. Dritter Theil. Zoologie. Zweite Abtheilung. Fleischthiere. C.H. Reclam, Leipzig.

Orces V.G. 1949. Los testudinata ecuatorios que se conserven en las colecciones de Quito, Ecuador. Bol. Info. Cient. Nac. Quito 3(20/21):13–22.

Parsons, T.S. 1968. Variation in choanal structure of recent turtles. Canadian J. Zoo. 46:1235–1263 + 5 pls.

— and S.M. Stephens. 1967. The nasal anatomy of *Kinosternon* and *Sternotherus* (Testudines: Kinosternidae). Canadian J. Zool. 46:399–404.

Pawley, R. 1971. Annual inventory, reptile house, 1970. Chicago Zoological Park. Bull. Chic. Herpetol. Soc. 6:37–41.

Pearse, A.S. 1945. La fauna. Enciclopedia Yucatanense 1:109–271.

Pérez-Higareda, G. 1980. Checklist of freshwater turtles of Veracruz, México. II. Central portion of the state (Testudines: Cryptodira). Bull. Maryland Herpetol. Soc. 16:27–34.

Plimmer, H.G. 1913. Report on the details which occurred in the Zoo-

logical Gardens during 1912, together with the blood parasites found during the year. Proc. Zool. Soc. Lond. 1913:141–149.
Poglayen-Neuwall, I. 1953. Untersuchungen der Kiefermuskulatur und deren Innervation bei Schildkröten. Acta Zool. 34:241–292.
Polver, P.d.P. and G.G. Novelli. 1971. Ulterior osservation istomorfologiche ed istochimiche comparate sulla vesica urinasa di chelona (con una tavola nel testo). Archo. Ital. Anat. Embriol. 76:127–138.
Pritchard, P.C.H. 1964. Turtles of British Guiana. J. British Guiana Mus. 39:19–45.
—. 1967. Living Turtles of the world. T.F.H. Publ., Jersey City, New Jersey.
—. 1979a. Encyclopedia of Turtles. T.F.H. Publ., Neptune City, New Jersey.
—. 1979b. Taxonomy, evolution, and zoogeography, p. 1-42. *In* M. Harless and H.Morlock (eds.), Turtles: Perspectives and Research. John Wiley & Sons, New York.
—. 1989. Geographic distribution. *Kinosternon s. scorpioides*. Herpetol. Rev. 20:14.
— and P. Trebbau. 1984. The Turtles of Venezuela. SSAR Contr. Herpetol. (2). Ithaca, New York.
Rafinesque, C.S. 1832. Description of two new genera of soft shell turtles of North America. Atlantic J. Friend Knowl. 1:64–65.
Rand, A.S. 1957. Notes on amphibians and reptiles from El Salvador. Fieldiana Zool. 34:505–534.
Richard, E. 1990. Geographic distribution. *Kinosternon scorpioides seriei*. Herpetol. Rev. 21:26.
—, P.E. Belmonte, and J.C. Chébez. 1990. Nombres vernaculos y distribucíon geográphica de las tortugas argentinas. Univ. Nac. Tucuman Ser. Monogr. Didact. 7:7–30.
— and M.S. de la Fuente. 1992. Lista sistemática y distribución de las tortugas Argentinas (Reptilia: Chelonii). Acta Zool. Lilloana 41:357–364.
Rivero-Blanco, C. and J.R. Dixon. 1979. Origin and distribution of the dry lowland regions of northern South America, p. 281–298. *In* W.E. Duellman (ed.), The South American Herpetofauna: Its Origin, Evolution, and Dispersal. Mus. Nat. Hist. Univ. Kansas Monogr. (7):1–485.
Rocha, M.B. da and F. de B. Molina. 1990. Reproductive biology of *Kinosternon scorpioides* (Testudines: Kinosternidae) in captivity. Tortoises and Turtles (IUCN Tortoise and Freshwater Turtle Specialist Group) 5:8.
Rogner, M. 1996. Schildkröten 2. Heidi Rogner-Verlag, Hürtgenwald, Germany.
Rudloff, H.-W. 1990. Vermehrung von Terrarientieren. Schildkröten. Urania-Verlag, Berlin.
Rust, H.T. 1938. Interessante Schildkröten. V. Wochenschrift Aquar. Terrarienkunde (35):22–40.
Ruthven, A.G. 1922. The amphibians and reptiles of the Sierra Nevada de Santa Marta, Colombia. Misc. Publ. Mus. Zool. Univ. Michigan (8):1–69, pls. I–XII.
Rutimeyer, L. 1873. Bau von Schale und Schaedel lebenden und fossilen Schildkroeten. Verh. Naturf. Ges. Basel 6:1–137.
Sachsse, W. 1976. Our knowledge in regard to breeding of turtles: Re productive behaviour, embryonic development and growth of the young. Bull. Soc. Zool. France 101:739–741.
Sanderson, I. 1941. Living Treasure. Viking Press, New York.
Savage, J.M. 1974. Type localities for species of amphibians and reptiles described from Costa Rica. Rev. Biol. Trop. 22:71–122.
Schinz, H.R. 1833. Naturgeschichte und Abbildung der Reptilien. Brodtmann, Schaffhausen, Germany.
Schmidt, K.P. 1941. The amphibians and reptiles of British Honduras. Zool. Ser. Field Mus. Nat. Hist. 22:475–510.
—. 1946. Turtles collected by the Smithsonian biological survey of the Panama Canal Zone. Smithson. Misc. Coll., Washington 106:1–9.
—. 1947. A new kinosternid turtle from Colombia. Fieldiana Zool. 31: 109–112.
— and R.F. Inger. 1951. Amphibians and reptiles of the Hopkins-Branner Expedition to Brazil. Fieldiana Zool. 31:439–465.
— and F.A. Shannon. 1947. Notes on amphibians and reptiles of Michoacan, Mexico. Fieldiana Zool. 31:63–85.
Schoepff, J.D. 1792. Historia testudinum iconibus illustrata. J.J. Palm, Erlangen.
Schubert-Soldern, R. 1947. Biologische Studie uber Bau und Lebensweise von Süsswasserschildkröten. Öst. Zool. Zeit. 1:275–313.
Schumacher, G.-H. 1973. The head muscles and laryngeal skeleton of turtles and crocodilians, p. 101–109. *In* C. Gans and T.S. Parsons (eds.), Biology of the Reptilia. Vol. 4. Morphology D. Acad. Press, New York.
Schwartz, A. and R.W. Henderson. 1988. West Indian amphibians and reptiles: a checklist. Milwaukee Pub. Mus. Contr. Biol. Geol. (74):1–264.
— and —. 1991. Amphibians and Reptiles of the West Indies: Descriptions, Distributions, and Natural History. Univ. Florida Press, Gainesville.
—, R. Thomas, and L.D. Ober. 1978. First supplement to a check-list of West Indian amphibians and reptiles. Carnegie Mus. Nat. Hist. Spec. Publ. (5):1–35.
Schweigger, A.F. 1812. Monographiae cheloniorum. Königsberg. Arch. Naturw. 1:271–368, 406–458.
Scott, N.J. and S. Limerick. 1983. Reptiles and amphibians, p. 351–367. *In* D.H. Janzen (ed.), Costa Rican Natural History. Univ. Chicago Press, Chicago.
Seidel, M.E. 1976. Geographic distribution. *Kinosternon flavescens flavescens*. Herpetol. Rev. 7:122.
—, J.B. Iverson, and M.D. Adkins. 1986. Biochemical comparisons and phylogenetic relationships in the family Kinosternidae (Testudines). Copeia 1986:285–294.
Sexton, O.J. 1960. Notas sobre la reproducción de una tortuga Venezolana, la *Kinosternon scorpioides*. Mem. Soc. Cienc. Nat. La Salle 20:189–197.
Shaw, G. 1802. General Zoology, or Systematic Natural History. Volume III, Part I, Amphibia. G. Kearsley, London.
Siebenrock, F. 1897. Die Kopfskelete der Schildkröten. Sber. Akad. Wiss. Wien 106:245–328.
—. 1898. Uber den Bau und die Entwicklung des Zungenbien-Apparates der Schildkröten. Ann. K.K. Naturhist. Hofmus 13:423–437.
—. 1904. Schildkröten von Brasilien. Denkschr. Akad. Wiss. Wien 76:1–28.
—. 1906. Schildkröten aus Südmexico. Zool. Anz. 30:94–102.
—. 1907. Die Schildkrötenfamilie Cinosternidae m. Sber. Akad. Wiss. Wien 116:527–599.
—. 1909. Synopsis der rezenten Schildkröten mit Berücksichtigung der in historischer Zeit ausgestorbenen Arten. Zool. Jb., Abt. Allg. Zool. 73:427–618.
Sites, J.W., Jr., J.W. Bickham, M.W. Haiduk, and J.B. Iverson. 1979. Banded karyotypes of six taxa of kinosternid turtles. Copeia 1979: 692–698.
Slavens, F.L. 1976. The Working Guide to Breeding Potential for Reptiles and Amphibians in United States Zoos. Woodland Park Zool. Garden, Seattle, Washington.
— and K. Slavens. 1994. Reptiles and Amphibians in Captivity: Breeding, Longevity, and Inventory. Slaveware, Seattle, Washington.
Smith, H.M. 1938. Notes on reptiles and amphibians from Yucatán and Campeche, Mexico. Occ. Pap. Mus. Zool. Univ. Michigan (388):1–22.
— and L.F. James. 1958. The taxonomic significance of cloacal bursae in turtles. Trans. Kans. Acad. Sci. 61:86–96.
— and R.B. Smith. 1979 (1980). Synopsis of the Herpetofauna of Mexico. Vol. VI. Guide to Mexican Turtles. John Johnson, North Bennington, Vermont.
— and E.H. Taylor. 1950a. Type localities of Mexican reptiles and amphibians. Kansas Univ. Sci. Bull. 33:313–380.
— and —. 1950b. An annotated check list and key to the reptiles of Mexico exclusive of the snakes. Bull. U.S. Natl. Mus. (199):1–253.
Spix, J.B. 1824. Animalia nova, sive species novae testudinum et ranarum, quos in itinere per Brasiliam, annis 1817: Collegit et descripsit. Vol. 3. F.S. Hübschmann, München.
Staton, M.A. and J.R. Dixon. 1977. The herpetofauna of the central llanos of Venezuela: noteworthy records, a tentative checklist and ecological notes. J. Herpetol. 11:17–24.
Stafford, P.J. and J.R. Meyer. 2000. A Guide to the Reptiles of Belize. Acad. Press, San Diego.
Stejneger, L.H. 1925. New species and subspecies of American turtles. J. Washington Acad. Sci. 15:462–463.
—. 1941. Notes on Mexican turtles of the genus *Kinosternon*. Proc. U.S. Natl. Mus. 90:457–459.
Strauch, A. 1862. Chelonische Studien mit besonderer Beziehung auf die Schildkrötensammlung der Kaiserlichen Akademie der Wissenschaften zu St. Petersburg. Mem. Acad. Imp. Sci. St. Petersburg (7)5(7):1–196.

—. 1865. Die Vertheilung der Schildkröten über den Erdball. Ein zoogeographischer Versuch. Mem. Acad. Imp. Sci., St. Petersbourg (7)8: 1–207.

Stuart, L.C. 1935. A contribution to the knowledge of the herpetology of a portion of the savanna region of central El Petén, Guatemala. Misc. Publ. Mus. Zool. Univ. Michigan (29):1–56.

—. 1948. The amphibians and reptiles of Alta Verapaz, Guatemala. Misc. Publ. Mus. Zool. Univ. Michigan (69):1–109.

—. 1954. Herpetofauna of the southeastern highlands of Guatemala. Contrib. Lab. Vert. Bio. Univ. Michigan (68):1–65.

—. 1963. A checklist of the herpetofauna of Guatemala. Misc. Publ. Mus. Zool. Univ. Michigan (122):1–150.

Sullivan, B. and A. Riggs. 1967a. Structure, function, and evolution of turtle hemoglobins. I. Distribution of heavy hemoglobins. Comp. Biochem. Physiol. 23:437–447.

— and —. 1967b. Structure, function, and evolution of turtle hemoglobins. II. Electrophoretic studies. Comp. Biochem. Physiol. 23:449–458.

— and —. 1967c. Structure, function, and evolution of turtle hemoglobins. III. Oxygenation properties. Comp. Biochem. Physiol. 23:459–474.

Sumichrast, F. 1880. Contribution a l'histoire naturelle du Mexique. I. Notes sur une collection de reptiles et de batraciens de la partie occidentale de l'Isthme de Tehuantepec. Bull. Soc. Zool. France 5: 162–190.

—. 1882a. Contribucion á la historia natural de México. I. Notas acerca de una coleccion de reptiles y batracios de la parte occidental del istmo de Tehuantepec. Naturaleza 5:268–293.

—. 1882b. Enumeracion de las especies de reptiles. Observados en la parte meridional de la República Mexicana. Naturaleza 6:31–45.

Swanson, P.L. 1945. Herpetological notes from Panama. Copeia 1945: 210–216.

Tamsitt, J.R. and D. Valdivieso. 1963. The herpetofauna of the Caribbean Islands, San Andres and Providencia. Rev. Biol. Trop. 11:131–139.

Taylor, E.H. 1952. Third contribution to the herpetology of the Mexican state of San Luis Potosi. Kansas Univ. Sci. Bull. 34:793–815.

Teska, W.R. 1976. Terrestrial movements of the mud turtle *Kinosternon scorpioides* in Costa Rica. Copeia 1976:579–580.

Test, F.H., O.J. Sexton, and H. Heatwole. 1966. Reptiles of Rancho Grande and vicinity, Estado Aragua., Venezuela. Misc. Publ. Mus. Zool. Univ. Michigan (128):1–63.

Valdivieso, D. and J.R. Tamsitt. 1963. A check list and key to the amphibians and reptiles of Providencia and San Andres. Carib. J. Sci. 3:77–79.

Vanzolini, P.E. 1958. Notas sobre a zoologica dos indios Canela. Rev. Mus., Paulista (N.S.) 10:155–171.

—, M.M. Ramos-Costa, and L.J. Vitt. 1980. Repteis das Caatingas. Academia Brasileira de Ciencias, Rio de Janeiro.

Velasco, A.F. 1892. Geografía y Estadística del Estado de Tlaxcala. Geografía y Estadística de la República Mexicana. Vol. 12. Secr. Fomento., México, D.F.

Waagen, G.N. 1972. Musk glands in Recent turtles. M.S. thesis, Univ. Utah, Salt Lake City.

Wagler, J.G. 1830. Natürliches System der Amphibien, mit Voranghender Classification der Säugethiere und Vögel. Ein Beitrag zur Vergleichender Zoologie. J.G. Cotta'schen, Buchhandlung, Munich.

Wermuth, H. and R. Mertens. 1961. Schildkröten, Krokodile, Brückenechsen. Gustav Fischer Verlag, Jena.

— and —. 1977. Liste der rezenten Amphibien und Reptilien: Testudines, Crocodylia, Rhynchocephalia. Das Tierreich 100:1–174.

Werner, F. 1896. Beiträge zur Kenntniss der Reptilien und Batrachier von Centralamerika und Chile, sowie eineger seltenerer Schlangenarten. Verh. Zool.-Bot. Ges. Wien 46:344–365.

Wettstein, O. 1934. Ergebnisse der österreichisen biologischen Costa Rica-Expedition 1930. Sber. Akad. Wiss. Wien 143:1–39.

Williams, E.E. 1950. Variation and selection in the cervical central articulations of living reptiles. Bull. Amer. Mus. Nat. Hist. 94:505–561.

Williams, K.L. and L.D. Wilson. 1966. Noteworthy Mexican reptiles in the Louisiana State University Museum of Zoology. Proc. Louisiana Acad. Sci. 28:127–130.

Wilson, L.D., J.R. McCranie, and L. Porras. 1979. New departmental records for reptiles and amphibians from Honduras. Herpetol. Rev. 10:25.

Winokur, R.M. 1982. Integumentary appendages of chelonians. J. Morphol. 172:59–74.

— and J.M. Legler. 1974. Rostral pores in turtles. J. Morphol. 143:107–120.

Yamaguti, S. 1958. Systema Helminthum. Volume I. The Digenetic Trematodes of Vertebrates - Part I. Interscience Publ., New York.

Zerecero y D., M.C. 1948. Un tremátodo de la vejiga urinaria de *Kinosternum leucostomum*. A. Dum., de la cuenca de Papaloapan, Veracruz. An. Inst. Biol. Univ. México 19:163–168.

Zug, G.R. 1966. The penial morphology and the relationships of cryptodiran turtles. Occ. Pap. Mus. Zool. Univ. Michigan (647):1–24.

**JAMES F. BERRY**, Department of Biology, Elmhurst College, Elmhurst, IL 60126, USA (jimb@elmhurst.edu), and **JOHN B. IVERSON**, Department of Biology, Earlham College, Richmond, IN 47374, USA (johni@earlham.edu).

Primary editor for this account, Michael E. Seidel.

Published 30 June 2001 and © 2001 by the Society for the Study of Amphibians and Reptiles.