



**A quarter millenium of uses and misuses of the turtle name *Testudo scabra*:
Identification of the type specimens of *T. scabra* Linnaeus 1758
(= *Rhinoclemmys punctularia*) and *T. scripta* Thunberg in Schoepff 1792
(= *Trachemys scripta scripta*)**

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Abstract

The turtle name *Testudo scabra* Linnaeus 1758 has variously and confusingly been used in association with nine different currently recognized nominal species in four separate families in both suborders of turtles. The name has not been recognized as valid since the early 1800s and has recently been synonymized as a *nomen dubium* under primarily two species: *Emys trijuga* Schweigger 1812 (= *Melanochelys trijuga*) and *Testudo punctularia* Daudin 1801 (= *Rhinoclemmys punctularia*) (both Geoemydidae). Other earlier attributions of the name, *T. scabra* L. sensu Statius Müller 1774, Schneider 1783, Retzius in Schoepff 1792, Thunberg in Schoepff 1792, Say 1824, or Agassiz 1857, have variously been referred to seven other currently recognized nominal species: two species of Leguat's tortoises (= both *Testudo vosmaeri* Suckow 1798 = *Cylindraspis vosmaeri*, and/or *Testudo peltastes* Duméril and Bibron 1835 = *Cylindraspis peltastes*) (Testudinidae), Perrault's tortoise (= *Testudo indica* Schneider 1783 = *Cylindraspis indica*) (Testudinidae), *Testudo europaea* Schneider 1783 (= *Testudo orbicularis* L. 1758 = *Emys orbicularis*) (Emydidae), *Testudo galeata* Schoepff 1792 (= *Testudo subrufa* Lacépède 1788 = *Pelomedusa subrufa*) (Pelomedusidae), *Testudo scripta* Schoepff 1792 (= *Trachemys scripta*) (Emydidae), and *Testudo insculpta* LeConte 1830 (= *Glyptemys insculpta*) (Emydidae). The previously unidentified type specimens of both *T. scabra* L. 1758 and *Testudo scripta* Schoepff 1792 have been located in the Linnaean and Thunbergian collections in Uppsala, Sweden. The latter species was described by Schoepff both as *Testudo scabra* sensu Thunberg and *Testudo scripta* Thunberg. Based on our examination, the holotype of *Testudo scabra* Linnaeus 1758 is *Rhinoclemmys punctularia*. To promote nomenclatural stability, we designate *Testudo scabra* Linnaeus 1758 as a *nomen oblitum* and *nomen rejectum* synonymized under *Testudo punctularia* Daudin 1801, already a *nomen protectum*. The type specimen of *Testudo scripta* Schoepff 1792 has not previously been identified, but is also present in the collection and represents *Trachemys scripta scripta*. Based on the circumstances of the description, the proper authorship of the name should be given as *Testudo scripta* Thunberg in Schoepff 1792, rather than *T. scripta* Schoepff 1792, as currently done.

Key words: Testudines, Geoemydidae, Emydidae, type specimens, taxonomy, nomenclature, Linnaeus, Thunberg, *Testudo scabra*, *Testudo scripta*, *Rhinoclemmys punctularia*, *Trachemys scripta scripta*

Introduction

The name *Testudo scabra* Linnaeus 1758 has had one of the longest and most confusing nomenclatural histories in turtle taxonomy, and has remained in dispute ever since its description a quarter of a millennium ago. Despite having been described in the seminal 10th Edition of *Systema Naturae* no definitive identification of *T. scabra* L. has ever been published, and most authors for the last ca. 150 years have either ignored the name or considered it a *nomen dubium*. Contributing to the confusion has also been the

intermittent early use of other attributions of the same name: *Testudo scabra* L. sensu Stadius Müller 1774, Schneider 1783, Retzius in Schoepff 1792, Thunberg in Schoepff 1792, Say 1824, and Agassiz 1857. Various subsequent authors have placed these different versions of the taxon *scabra* in the synonymies of nine currently recognized species in four separate families: (1) *Melanochelys trijuga* (Schweigger 1812) and (2) *Rhinoclemmys punctularia* (Daudin 1801) in the Geoemydidae; (3) *Emys orbicularis* (L. 1758), (4) *Trachemys scripta* (Schoepff 1792) and (5) *Glyptemys insculpta* (LeConte 1830) in the Emydidae; (6) *Pelomedusa subrufa* (Lacépède 1788) in the Pelomedusidae; and (7) *Cylindraspis vosmaeri* (Suckow 1798), (8) *C. peltastes* (Duméril and Bibron 1835), and (9) *C. indica* (Schneider 1783) in the Testudinidae. Taxonomic confusion regarding the allocation of the name *scabra* has clearly reigned for most of its 250 years of existence and is at least partly due to a lack of examination of the pertinent original type specimens.

We have recently located and examined the extant holotypes of *Testudo scabra* Linnaeus 1758 and *Testudo scripta* Schoepff 1792 (based on *T. scabra* sensu Thunberg in Schoepff and *T. scripta* Thunberg in Schoepff) in the Linnaean and Thunbergian collections of Uppsala University Zoological Museum (UUZM), Uppsala, Sweden. We redescribe and identify the holotype of *T. scabra* Linnaeus 1758 as *Rhinoclemmys punctularia* (Daudin 1801), and provide a history of the usage of the name. We also document the previously unknown presence in the UUZM collection of the holotype of *T. scripta* Thunberg in Schoepff 1792 (presently *Trachemys scripta scripta*).

Nomenclatural history

Linnaeus (1758:198) described *Testudo scabra* in his 10th Edition of *Systema Naturae*, but provided only a minimal description and little information on the species, giving the type locality as “Indiis” and providing no measurements. Linnaeus’ use of “Indiis” referred to the West Indies in the Caribbean (not “India”, as some recent synonymies have suggested), but most of the species he cited as coming from the “Indiis” actually came from South America (Kitchell and Dundee 1994).

Later, in the 12th Edition of *Systema Naturae*, Linnaeus (1766:351) expanded the description of *T. scabra* slightly, modified the type locality to “India orientali, Carolina,” and added two synonyms traceable to a pre-Linnaean reference: (1) “Seb. mus. t. 69 [sic], f. 1,2” (Seba 1734:126, pl. 79, f. 1,2) (Fig. 1), named *Testudo terrestris amboinensis minor* by Seba; and (2) “Gron. zooph. 74” (Gronovius 1763:17, no. 74), named *Testudo pedibus palmatis* by Gronovius and including *T. terrestris amboinensis minor* Seba in its synonymy. The specimen figured and described by Seba (1734) (Fig. 1) appears fairly certainly to have been a *Melanochelys trijuga*. Seba’s figure was subsequently re-named *Emys sebae* by Gray (1831:75), and later synonymized with *Nicoria trijuga thermalis* (Lesson 1830:86) (presently *Melanochelys trijuga thermalis*) by Boulenger (1889:122).

Stadius Müller (1774), in his translation of Linnaeus’ 12th Edition of *Systema Naturae*, provided extensive annotations of his own and was the first post-Linnaean author to be confused by what *T. scabra* L. actually represented. He interpreted the species as being a terrestrial tortoise, and in its synonymy included giant tortoises from the Mascarene Islands in the Indian Ocean, notably Leguat’s tortoises from Rodrigues (Leguat 1708), and Perrault’s tortoise from Réunion (Perrault 1676); subsequently these were named *Testudo vosmaeri* by Suckow (1798), *Testudo peltastes* by Duméril and Bibron (1835), and *Testudo indica* by Schneider (1783). These tortoise species are now extinct and included in the endemic genus *Cylindraspis* Fitzinger 1835 (Austin *et al.* 2002).

Subsequently, Walbaum (1782:116) described *Testudo verrucosa* and placed *T. scabra* L., *T. terrestris amboinensis minor* Seba, and *T. pedibus palmatis* Gronovius in its synonymy. Because *T. scabra* L. 1758 predates *T. verrucosa* Walbaum 1782, and because Walbaum specifically referred to *T. scabra* L. in his synonymy, the name *T. verrucosa* is an unjustified *nomen novum* for *T. scabra* and has no validity as a new species name. In addition, Walbaum’s work was not consistently binominal and has been rejected for nomenclatural purposes (Wermuth 1956; Wermuth and Mertens 1977; Smith *et al.* 1980), and *T. verrucosa* is

therefore also a *nomen illegitimum*. However, Walbaum's *T. verrucosa* was later replaced by the available name *Testudo verrucosa* Suckow 1798 (subjective senior synonym of *Testudo punctularia* Daudin 1801, presently *Rhinoclemmys punctularia*); but this name is a junior primary homonym of *Testudo (ferox?) verrucosa* Schoepff 1795 (subjective synonym of *Testudo ferox* Schneider 1783, presently *Apalone ferox*) and therefore not valid either as a species name (Wermuth 1956).

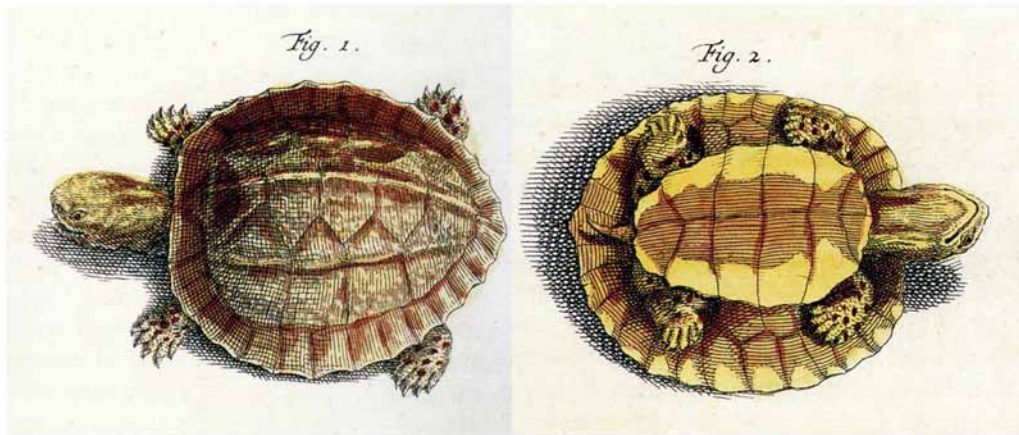


FIGURE 1. Illustrations from Seba (1734: pl. 79, figs. 1 and 2), showing his *Testudo terrestris amboinensis major*, later synonymized by Linnaeus (1766) under his concept of *Testudo scabra*. This appears to show a very young specimen of *Melanochelys trijuga trijuga* or *Melanochelys trijuga thermalis*.

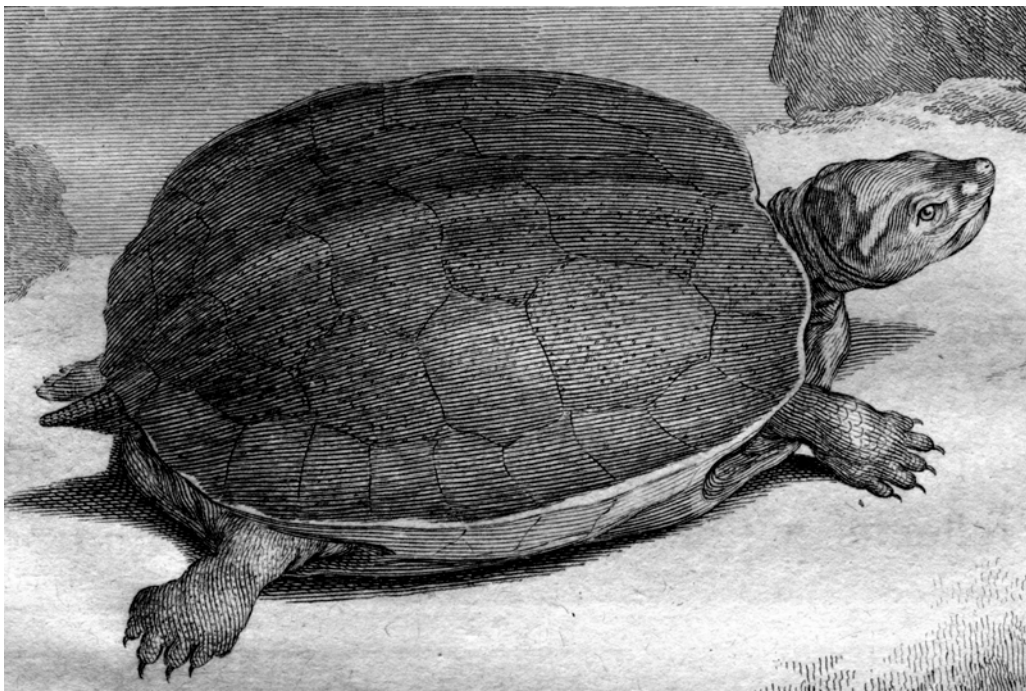


FIGURE 2. Illustration from Lacépède (1788:161, pl. 10), showing his specimen of “La Raboteuse” referred to *Testudo scabra* L. This appears to show a specimen of *Rhinoclemmys punctularia*.

Despite these nomenclatural shortcomings, Walbaum provided an important and detailed description of a small specimen (in alcohol) of what he called *T. verrucosa*, that had a carapace length (CL) of 22 lineas (1 linea or ligne = ca. 2.26 mm; Zupko 1978) or ca. 49.7 mm CL, and a carapace width of 15 lineas (= 33.9 mm) (not stated whether curved or straight measurements). This specimen may have been the same one that Linnaeus used for his brief original description of *T. scabra*, as discussed below.

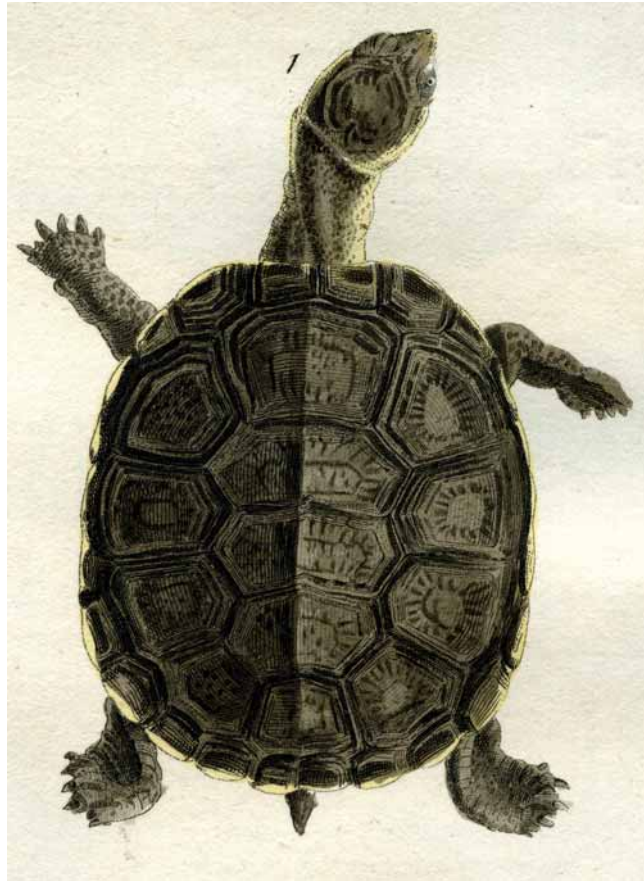


FIGURE 3. Illustration from Schoepff (1792: pl. 3, f. 1), showing the specimen of *Testudo scabra* L. sensu Retzius that he re-named as the new species *Testudo galeata* (later *Pelomedusa galeata*, currently a subjective synonym of *Pelomedusa subrufa*). The specimen in this drawing is the holotype of *Testudo galeata* Schoepff 1792.

Gmelin (1789:1040), in his 13th Revised Edition of Linnaeus' *Systema Naturae*, substituted Walbaum's more extensive description of *T. verrucosa* for the original limited description by Linnaeus of *T. scabra* L., and listed *T. verrucosa* Walbaum in its synonymy, repeating the same carapace measurements for the specimen as reported by Walbaum. Daudin (1801) and Latreille (1801) interpreted this substitution as an error, and instead recognized both *T. verrucosa* and *T. scabra* L. as distinct (Daudin 1801:129, 134; Latreille 1801:148, 156).

However, the fact that Walbaum (1782) provided measurements and a very detailed description of the specimen of *T. verrucosa* identified by him as being synonymous with *T. scabra* L., and that Gmelin (1789) repeated Walbaum's description and measurements of the specimen in Linnaeus' *Systema Naturae* as being representative of *Testudo scabra* L. (and synonymized *T. verrucosa* under *T. scabra*), suggests that Walbaum may have actually examined Linnaeus' original specimen of *T. scabra*, though re-naming it *T. verrucosa* (a not-so-unusual practice in the early days of taxonomy). Walbaum provided a measurement of ca. 50 mm CL of the original wet specimen of his *T. verrucosa*, and the extant holotype of *T. scabra* L., now dried and somewhat shriveled, measures ca. 44 mm—a close match given the drying and likelihood that the measurements were made in different ways, i.e., straight-line measurement with calipers vs. curved carapace length.

Schneider (1783:327) synonymized Walbaum's *T. verrucosa* under his new species *Testudo europaea* (a subjective synonym of *Testudo orbicularis* L. 1758, presently *Emys orbicularis*) and indicated that Walbaum had apparently examined Linnaeus' specimen of *T. scabra* in alcohol. In addition, he placed the erroneous concept of *T. scabra* sensu Statius Müller 1774 as a terrestrial tortoise in the synonymy of his freshwater turtle, *T. europaea*. Later, Wermuth (1956:403) investigated the status of *T. verrucosa* Walbaum and

concluded, based on the detailed original description of the specimen provided by Walbaum, that it represented *Geoemyda punctularia* Daudin (presently *Rhinoclemmys punctularia*).

Lacépède (1788:161) accepted the validity of *T. scabra* L., describing it in the French vernacular as “La Raboteuse” [= rough, rugged, or uneven, a translation of the Latin *scabra*], and noted that its synonymy included Seba’s *T. terrestris amboinensis minor*. He illustrated the specimen for which he provides a description (Fig. 2), and measured it as being 3 pouces (1 pouce = 27.06 mm; Zupko 1978) from snout to tail, or ca. 81 mm overall length. The figure appears to show a juvenile specimen of what we now consider to be *Rhinoclemmys punctularia*.

Schoepff (1792:12, 16) introduced two new *T. scabra* L. concepts into the literature: *Testudo scabra* L. sensu Retzius and *Testudo scabra* L. sensu Thunberg. Neither of these names were published apart from their appearance in Schoepff (1792). The new names that Schoepff (1792:12, 16) proposed for these names, *Testudo galeata* and *Testudo scripta*, were based on specimens that Retzius and Thunberg each had attributed to the nominal species *T. scabra* L. The names should more correctly be listed as “*Testudo scabra* L. sensu Retzius in Schoepff 1792” and “*Testudo scabra* L. sensu Thunberg in Schoepff 1792.”

The only known herpetological publication of Anders J. Retzius [1742–1821], a Swedish naturalist and contemporary of Linnaeus concerned crocodiles (Retzius 1797). However, he did use the name *Testudo scabra* for his description and drawing of a living animal in his possession in Lund in 1790 that he sent as a letter to Schoepff. Schoepff (1792:12) featured “*Testudo scabra* Retzii” prominently as the title for one of his descriptions, in which he repeated the original description by Retzius in quotes (pp. 13–14). He renamed the species *Testudo galeata* [later *Pelomedusa galeata*, a subjective synonym of *Pelomedusa subrufa* (Lacépède 1788)], since Retzius’ concept of *T. scabra* did not match that of Linnaeus’ original description. The illustration by Schoepff of the specimen, labeled “*Test. scabra* Retz.” (pl. 3, f. 1) (Fig. 3), shows what appears to be a *Pelomedusa subrufa*. These details were partially translated into French by Latreille (1801:152). Retzius also provided Schoepff (1792:9–12) with a lengthy description and figure of a specimen from the Lund Museum that was named *Testudo tricarinata* Retzius in Schoepff 1792, currently considered a subjective synonym of *Kinosternon scorpioides* (Linnaeus 1766).

Carl Petter Thunberg [1743–1828] was the curator of the Linnaean collection in Uppsala where Linnaeus had worked earlier, but no description of *Testudo scabra* by Thunberg exists. He did, however, describe three other species of turtles: *Testudo japonica* (a subjective synonym of *Chelonia mydas*), *Testudo rostrata* (a subjective synonym of *Pelodiscus sinensis*), and *Testudo areolata* (presently *Homopus areolatus*) (Thunberg 1787b; Webb 1985). His use of the name *T. scabra* was primarily as labels on various specimens in the Uppsala collection, and perhaps also in a letter to Schoepff (1792). Thunberg also provided Schoepff with a drawing and a short description of a new species of turtle labeled with his unpublished catalogue name, *Testudo scripta* (Thunberg 1785–1817), an epithet that Schoepff then published as the new species *Testudo scripta* Schoepff 1792.

In his original description of *Testudo scripta* (presently *Trachemys scripta*), Schoepff (1792:16) recorded two names upon which it was based, *Testudo scabra* Thunberg and *Testudo scripta* Thunberg. Schoepff provided details of a specimen description and set of figures he received from Thunberg (labeled pl. 3, fig. 2 in the text, but figs. 4 and 5 [labeled “*Test. scripta* Thunb.”] on the actual pl. 3) (reproduced here as Fig. 4). Schoepff does not appear to have examined the specimen personally, but relied on the description and set of figures presented by Thunberg for his concept and description of *Testudo scripta*. Importantly, the figure is labeled “*Test. scripta* Thunb.,” but in the text Schoepff refers to “*Testudo scabra* Thunberg.” Given these circumstances, the authorship of the name *T. scripta* should properly be attributed to Thunberg in Schoepff rather than directly to Schoepff (see discussion below). It is probable that Thunberg had identified the specimen with his unpublished catalogue name (*T. scripta*) that he communicated to Schoepff via his labeled drawing, but that Schoepff then used the name *T. scabra* erroneously in the text. Thunberg clearly separated his own concept of *T. scripta* from *T. scabra* in his entries in the catalogues of the Linnaean and Thunbergian collections in Uppsala (Thunberg 1785–1817, 1808–1815) and did not label the specimen whose figure he sent to Schoepff as a *T. scabra* L.

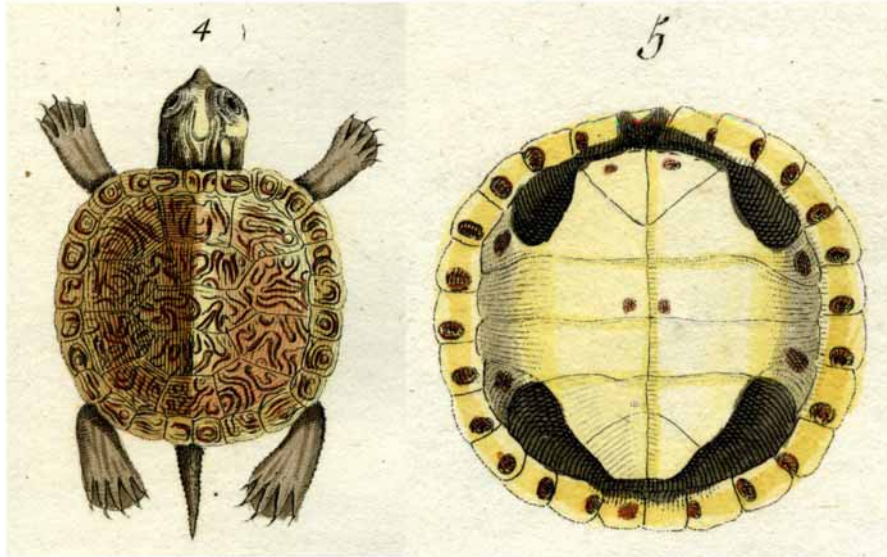


FIGURE 4. Illustration from Schoepff (1792: pl. 3, figs. 4–5), showing the holotype of *Testudo scripta* Thunberg in Schoepff 1792 (also *Testudo scabra* L. sensu Thunberg in Schoepff) (presently *Trachemys scripta scripta*). On the plate these figures are labeled “*Test. scripta* Thunb.” and the specimen is clearly a hatchling. The specimen itself was originally catalogued as *Testudo scripta* by Thunberg sometime between 1785 and 1792 and donated by him to the Uppsala University Museum of Zoology, and it is still there as a badly dried and misshaped specimen now catalogued as UUZM Types 7455 (see Fig. 7).

Later, Schoepff (1801:136) placed *T. scabra* L. (but not *T. scabra* Thunberg) together with *T. verrucosa* Walbaum 1782 in the synonymy of his new species *Testudo dorsata* (a subjective synonym of *Testudo punctularia* Daudin 1801, presently *Rhinoclemmys punctularia*). The description of *T. dorsata* was incomplete in the regular Latin edition, but complete in the translated German edition (Schoepff 1792–1801:158), though the accompanying planned plate illustrating the species was never published in either edition.

Daudin (1801:129) recognized *T. scabra* L. as a distinct turtle species, but was doubtful of its identity. In addition, he recognized three other related species as distinct: 1) *T. verrucosa* Walbaum (Daudin 1801:134), disagreeing with Gmelin’s (1789) synonymy of this species under *T. scabra* L.; 2) *T. galeata* Schoepff (based on *T. scabra* L. sensu Retzius in Schoepff) (Daudin 1801:134); and 3) *T. scripta* Schoepff (based on *T. scabra* L. sensu Thunberg in Schoepff) (Daudin 1801:134). In addition, Daudin (1801:249) described the new species *T. punctularia*, but did not ascribe it to any other previous descriptions, though it was later determined to be a subjective synonym of *T. dorsata* Schoepff 1801 and *T. verrucosa* Walbaum 1792. The name *Testudo punctularia* Daudin 1801 was later conserved for nomenclatural purposes by placing it on the Official List of Specific Names in Zoology (ICZN 1963), and its senior subjective synonym *Testudo dorsata* Schoepff 1801, was suppressed for the purposes of the Principle of Priority (see Mertens and Wermuth 1961 for the background discussion). See Bour (2007) for a current description and illustration of the holotype of *Testudo punctularia* Daudin 1801.

Latreille (1801:152) repeated most of Schoepff’s (1792) arrangements of these taxa, as did Shaw (1802:57), both placing *T. scabra* L. sensu Retzius in Schoepff in the synonymy of *T. galeata*. However, these authors differed from Schoepff (1792) by accepting *T. scabra* L. as valid, albeit with doubts (Latreille 1801:148; Shaw 1802:55). In addition, Shaw (1802:56) also listed *Testudo scabra* L. sensu Thunberg in Schoepff in the synonymy of *Testudo scripta* Schoepff (presently *Trachemys scripta*) following Schoepff (1792), whereas Latreille (1801:151) placed *T. scripta* Schoepff in the synonymy of *T. scabra* L. Latreille (1801:164) caused further confusion surrounding the name *scabra* when he created a *nomen novum* and junior homonym, *Testudo scabra*, for the softshell turtle, “La Chagrinée”, an objective synonym of *Testudo punctata* Lacépède 1788, presently *Lissemys punctata* (Trionychidae).

Schweigger (1812:423) also placed *T. scabra* sensu Thunberg in Schoepff in the synonymy of *T. scripta* Schoepff, following Shaw. In addition, under the synonymy of *Emys dorsata* (Schoepff 1801), he listed three nominal species (1812:423–424): *T. scabra* L., *T. scabra* L. sensu Lacépède, *T. terrestris amboinensis minor* Seba, and *Testudo pedibus palmatis* Gronovius. Schweigger visited Uppsala between 1810 and 1812 (R. Bour, *pers. comm.*; Rookmaaker 1989:146), where he was evidently shown specimens of *T. scabra* by Thunberg, stating (Schweigger 1812:423) that Thunberg ‘communicated’ [gave or showed?] him a specimen of *T. scabra* L., now correctly identified as *T. dorsata* Schoepff (“*Veram scabram L. i.e. dorsatam Schoepf. mecum communicavit ill. Thunberg*”). However, it is not known whether Thunberg showed Schweigger the type specimen of *T. scabra* L. or simply a *T. scabra* L. sensu Thunberg; by 1812 there were four specimens of “*T. scabra*” in the Linnaean and Thunbergian collections (Thunberg 1808–1815, 1785–1817), and all four remain there, none apparently having been donated to Schweigger. Interestingly, Schweigger (1812:310, 353) did not place *T. scabra* L. in the synonymy of his new species, *Emys trijuga* (presently *Melanochelys trijuga*), after having seen the specimens of *T. scabra* in Uppsala.

The type species for Fitzinger’s (1835) subgenus *Rhinoclemmys* was established as *Emys dorsata* Schweigger 1812 (= *Testudo dorsata* Schoepff 1801, a subjective synonym of *Testudo punctularia* Daudin 1801) by subsequent designation of Lindholm (1929:283). In spite of the fact that *Emys dorsata* Schweigger 1812 refers back to Schoepff’s *T. dorsata*, a *nomen oblitum* that was suppressed by the ICZN (1963), there is no prohibition against using a rejected name as the type species of a genus (in this case *Testudo dorsata* Schoepff 1801, a senior synonym of *Testudo punctularia* Daudin 1801). The ICZN (1985) conserved *Rhinoclemmys* Fitzinger 1835 for nomenclatural purposes by placing it on the Official List of Generic Names in Zoology. Although Fitzinger (1835:124) followed Schweigger (1812) by including *Testudo scabra* L. in the synonymy of *Rhinoclemmys dorsata*, there is no indication that he used the name as anything other than a synonym for *Emys dorsata* (Schoepff 1801) (= *Rhinoclemmys punctularia*), and the type species designation for *Rhinoclemmys* by Lindholm (1929) stands.

Say (1824:204,210) used the name *Emys scabra* (Linn.) to describe a freshwater turtle from the eastern United States, specifically attributing it to *Testudo scabra* Linnaeus, rather than the *T. scabra* L. concept of some other authors. The name was changed to *Terrapene scabra* (L.) by Bonaparte (1830:371), who placed three nominal species in its synonymy: *Testudo scabra* L., *E. scabra* (L.) sensu Say, and *Testudo insculpta* LeConte (1830) (presently *Glyptemys insculpta*); however, he specifically excluded *T. scabra* L. sensu Gmelin and other authors from this synonymy. Gray (1831:26) placed *E. scabra* (L.) sensu Say in the synonymy of his species *Emys speciosa* 1830 (a subjective synonym of *Glyptemys insculpta*). At the same time Gray (1831:24) considered *E. scabra* (L.) sensu Lacépède to be a separate and valid species very closely allied to *E. punctularia* (Daudin). Subsequent authors (e.g., Ernst 1972) have continued to place *Emys scabra* (L.) sensu Say 1824 in the synonymy of *Glyptemys insculpta* (LeConte).

By the time Duméril and Bibron (1835) wrote their definitive work on turtles, *T. scabra* L. was no longer considered valid. They (1835:243) synonymized the following *scabra*-related taxa under *Emys punctularia* (= *Rhinoclemmys punctularia*): *T. scabra* L. sensu Lacépède, *T. dorsata* Schoepff, *T. scabra* L. sensu Latreille, *T. scabra* L. sensu Daudin, and *E. dorsata* Schweigger. In addition, they (1835:310) synonymized *T. scabra* L. sensu Shaw and *T. terrestris amboinensis minor* Seba under *Emys trijuga* (presently *Melanochelys trijuga*). Gray (1844, 1856) generally followed this same arrangement of synonyms in his catalogues, except he used *Emys scabra* as the taxon name and placed *T. punctularia* Daudin 1801 in its synonymy. However, he consistently referred his use of the name *scabra* to Lacépède (1788), not to Linnaeus (1758).

Agassiz (1857:434) revived brief usage of *Testudo scabra* L. as the explicit basis for his description of *Trachemys scabra*, but his description was of the species now known as *Trachemys scripta*. Nonetheless, subsequent authors did not continue to use *Trachemys scabra* (L.) sensu Agassiz. However, Brown (1908:114) designated *Trachemys scabra* Agassiz (based on *Testudo scabra* L.) as the type species for the genus *Trachemys* Agassiz 1857, which in view of the confused taxonomic history of the name *scabra* would cause nomenclatural instability if accepted, as pointed out by Smith and Smith (1980). However, Lindholm (1929:280) subsequently designated *Emys troostii* Holbrook 1836 (presently *Trachemys scripta troostii*) as the

type species for *Trachemys*, and this unambiguous designation is now generally accepted (Wermuth and Mertens 1977; Fritz and Havaš 2007).

Boulenger (1889:121) synonymized *T. scabra* L. with a question mark under *Nicoria trijuga* (= *Melanochelys trijuga*), and no one has used the name for a turtle taxon since Agassiz did so erroneously in 1857. Recent works on turtle synonymy have listed *T. scabra* L. as a *nomen dubium* under either just *Geoemyda trijuga* (Wermuth and Mertens 1977:35), or under both *Melanochelys trijuga* and *Rhinoclemmys punctularia* (Fritz and Havaš 2007:235, 245). Most recent taxonomic works focused on *Rhinoclemmys* have contained no references to *T. scabra* L. (Fretey *et al.* 1977; Ernst 1978, 1981; Carr 1991). One notable exception was Pritchard and Trebbau (1984:175), where it was listed as a *nomen dubium* in the synonymy of *R. punctularia*.

Interestingly, all these earlier decisions regarding synonymy of the names *T. scabra* L. and *T. scabra* L. sensu Thunberg in Schoepff (= *T. scripta* Schoepff) appear to have been made without actually examining the type specimens of either *T. scabra* or *T. scripta* (with the possible exceptions of Walbaum 1782 and Schweigger 1812). Therefore, one of us (AGJR) visited the Uppsala University Zoological Museum's Linnaean and Thunbergian collections and located the extant types of *T. scabra* and *T. scripta*. Examination of the holotype of *T. scabra* L. indicates that it is most probably a *Rhinoclemmys punctularia*, one of the nine species with which the name *scabra* has previously been synonymized. The holotype of *T. scripta* Schoepff had not previously been located or identified, but fortunately appears to be a *Trachemys scripta scripta*.

Type specimens

Testudo scabra Linnaeus 1758

The original type specimen (holotype) of *T. scabra* L. 1758 was donated to Carl Linnaeus for his personal collection by Jonas Alströmer in 1749 [Alströmer was a Swedish industrialist and co-founder with Linnaeus of the Swedish Academy of Sciences] and became part of the combined Alströmer/Linnaeus collections later donated by Linnaeus to the Museum in Uppsala (Linné and Thunberg 1780; Thunberg 1785–1817, 1787a, 1808–1815; Lönnberg 1896; Holm 1957; Wallin 1992). After Linnaeus died in 1778, the specimen was catalogued in 1780 by his son and curatorial successor, Carl von Linné, Jr., as being in the Linnaean collection as their single specimen of "*Testudo scabra*" (Linné and Thunberg 1780), and that it was at that time stored in alcohol. After Linné died in 1784, this specimen was catalogued as "*T. scabra* α AL." by his curatorial successor, Carl Petter Thunberg (Thunberg 1808–1815) indicating that the specimen had been donated by Alströmer, and distinguishing it from two specimens, "*T. scabra* β Th." and "*T. scabra* γ Th.," donated to the collection in 1785 by Thunberg himself (Thunberg 1785–1817). Later, the original Alströmer specimen was labeled "*Testudo scabra* α Linn. Mus." by Thunberg, reaffirming that it had come specifically from the Alströmer/Linnaeus donation (Wallin 1992). Thunberg labeled the two subsequent specimens of what he considered to be *T. scabra* as "*T. scabra* β Mus. Thunb." and "*T. scabra* γ Mus. Thunb." Sometime later, but prior to 1817, Thunberg donated another specimen that he catalogued as "*T. scabra* δ Mus. Thunb." (Thunberg 1785–1817). The same catalogues (Thunberg 1785–1817, 1808–1815) also list the donation by Thunberg of a single specimen of "*T. scripta* Th.", the type of *Testudo scripta* Schoepff 1792 (see below).

Sometime during the 1800s the holotype was removed from alcohol storage and dried out. Lönnberg (1896:34) examined the type specimen of *T. scabra* L. and noted that it was "quite young, dried and in a very bad condition." He noted further that Boulenger (1889:121) had synonymized *T. scabra* L. with a question mark under *Nicoria trijuga* (presently *Melanochelys trijuga*), but disagreed with this, noting that "it is possible that [the type] is a *Nicoria*, but it is **not** *Nicoria trijuga*." However, most subsequent authors followed Boulenger's lead (without examining the specimen) and continued to place *T. scabra* L. in the synonymy of *trijuga*.

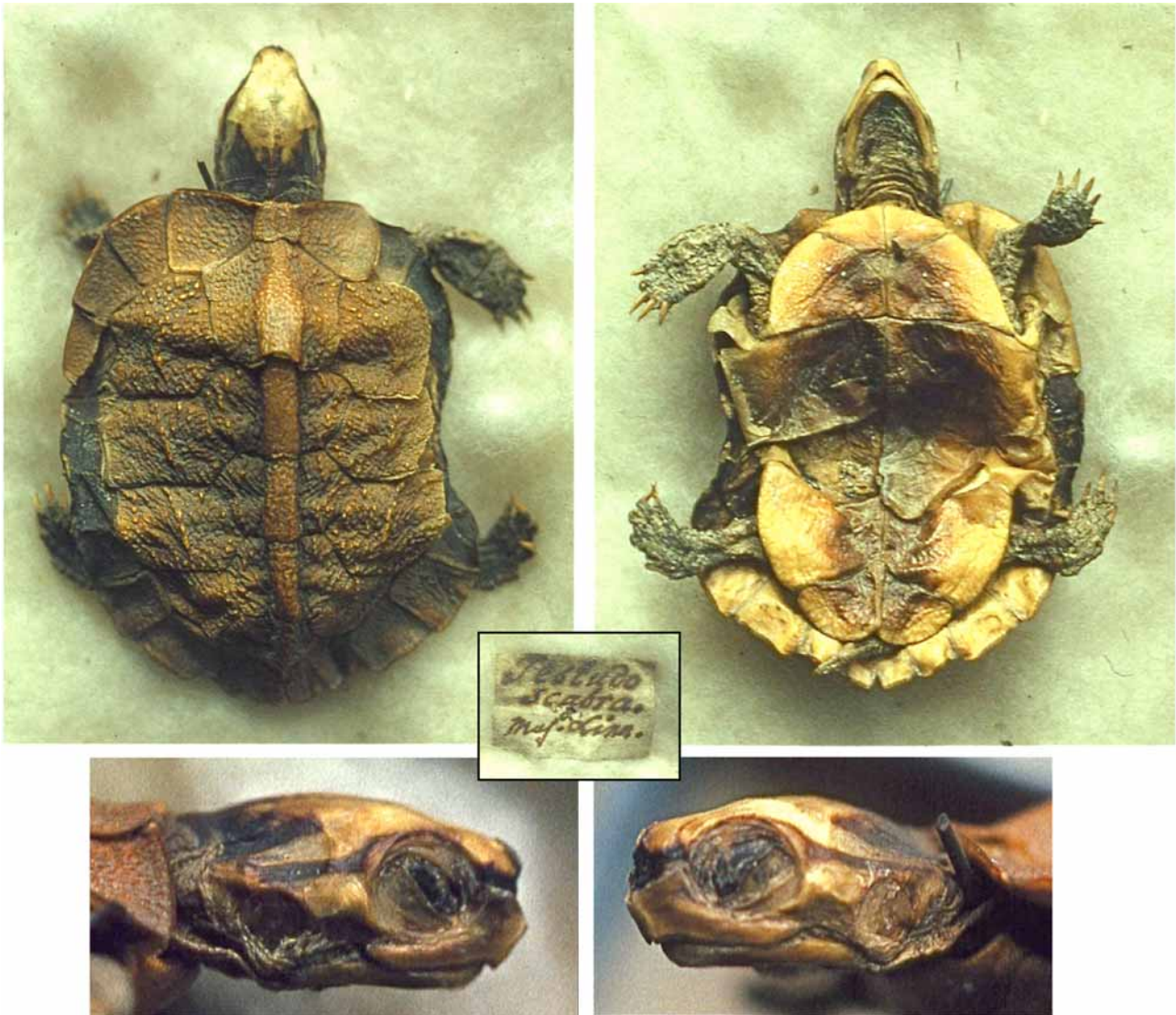


FIGURE 5. Type specimen (holotype) of *Testudo scabra* Linnaeus 1758:198, donated by Jonas Alströmer in 1749 to Carl Linnaeus and then later by Linnaeus to the Uppsala University Museum of Zoology (UUZM Linné Collection 129), dried hatchling, ca. 44 mm straight CL. The original tag by Carl Petter Thunberg from ca. 1785 reads “*Testudo scabra* α *Mus. Linn.*” This specimen represents a *Rhinoclemmys punctularia*.

Holm (1957) noted that the holotype was still present in the Uppsala museum and had by then been catalogued as Linné Collection no. 129. The specimen (with its original Thunberg tag) is still extant in the collection, and is badly preserved as noted by Lönnberg (1896).

Examination of the holotype of *Testudo scabra* Linnaeus 1758 (UUZM Linné Collection no. 129), illustrated here for the first time (Fig. 5), indicates that it is not referable to eight of the nine nominal species with which the name *scabra* has previously been synonymized, i.e., *Melanochelys trijuga*, *Pelomedusa subrufa*, *Emys orbicularis*, *Trachemys scripta*, *Glyptemys insculpta*, *Cylindraspis vosmaeri*, *C. peltastes*, or *C. indica*. We have instead identified the specimen as belonging to the ninth species with which it has previously been synonymized, *Rhinoclemmys punctularia* (Daudin 1801), based on comparison with all nine species of *Rhinoclemmys* and 13 genera of Asian Geoemydidae (Carr 1991; Vetter and van Dijk 2006; Rueda-Almonacid *et al.* 2007).

The specimen itself is a small, dry, somewhat shriveled hatchling currently measuring approximately 44 mm straight CL (Fig. 5). The carapace dorsum is brown, with the undersides of the marginal scutes and plastron periphery a yellow color, with a large black figure in the center of the plastron. Soft parts of the limbs,

head and neck are shriveled and appear nearly black, except that the dorsal and lateral portions of the head exhibit lighter-colored (yellowish) stripes. Diagnostically important parts of the head color pattern and bridge region are somewhat obscured by the poorly-preserved state of the specimen; however, through a careful and thorough examination of many externally visible characteristics of the specimen we were able to restrict the identification to a single species of *Rhinoclemmys*.

The following combination of characters identify the holotype as belonging to the testudinoid family Geoemydidae rather than the Emydidae or Testudinidae: 1) contact between marginal scutes and the pectoral and abdominal scutes on the bridge; 2) hatchling size > 40 mm; 3) presence of a nuchal scute; 4) presence of a vertebral keel; 5) presence of two axillary scutes; 6) plastral coloration a dark, centrally located, longitudinal band that extends from the gular scutes to the posterior end of the plastron; and 7) presence of five separate digits of the manus.

Now restricted to the Geoemydidae, and acknowledging that no single characteristic is diagnostic for the genus, we can further identify the specimen as belonging to *Rhinoclemmys* based on the following combination of characteristics: 1) lateral keel present in the form of a discontinuous, longitudinally oriented keratinous ridge on the costal scute areolae; 2) relatively weak degree of serration of the posterior marginal scutes; 3) presence of an anal notch; 4) dark central plastral coloration not extending across the anterior portion of the gular scutes, but extending around the anal notch; 5) presence of two relatively small axillary scutes; 6) contact between the humeral scute and posterior axillary scute; 7) ventral portions of marginal scutes 4, 5, and 6 contact the plastral scutes (pectoral and/or abdominal) on the bridge (and marginal 7 would apparently contact the abdominal); and 8) presence of a narrow zygomatic arch (“excavated dorsally and ventrally” as described by Feuer 1970).

Features of the specimen that indicate probable identification as *R. punctularia* are [comparison to other nominal species of *Rhinoclemmys* in brackets]: 1) the CL of approximately 44–49 mm is close to the size range known for hatchlings of *R. punctularia*, i.e., smallest = 47 mm and average = 56–58 mm (Ewert 1979; Pritchard and Trebbau 1984) [other known hatchling sizes are: 35–51 mm (*R. pulcherrima*), 46 mm (*R. diademata*), 52 mm (mean for *R. rubida*), 39–59 mm (*R. melanosterna*), 55 mm (mean for *R. areolata*), 63 mm (mean for *R. funerea*), and 64 mm (mean for *R. annulata*) (mostly Ewert 1979)]; 2) the maxillary tomium is notched in the midline with a cusp on each side [characteristic of all but *R. annulata* and *R. rubida*]; 3) the dark central plastron color does not extend across the anterior portion of the gular scutes, but does extend around the anal notch, with a yellow margin laterally and anteriorly [typical of most of the genus, but it is typically narrower in *R. pulcherrima* and *R. rubida*; a different, blotched pattern is found in *R. nasuta*]; 4) the relative lack of dark pigmentation on the ventral surfaces of the marginal scutes [more extensive in *R. annulata*, *R. diademata*, *R. funerea*, *R. nasuta*, *R. rubida*; also dark, or with ocelli in *R. pulcherrima*]; 5) presence of dark blotches on the lateral pectoral and abdominal scutes and adjacent marginals [typical of several species, but *R. annulata*, *R. pulcherrima* and *R. rubida* have the bridge portions of the pectoral and abdominal scutes nearly uniformly dark in coloration; and dark coloration is often absent from the area in *R. areolata* and *R. melanosterna*]; 6) axillary scutes contact marginal scutes 2, 3, and 4 [this is the most common character state only in *R. melanosterna* and *punctularia*; more common in all other species is contact with marginals 3 and 4 only]; 7) interhumeral seam length is less than the intergular seam length [characteristic of all species except *R. annulata*]; 8) interanal seam length is greater than the interfemoral seam length [also characteristic of *R. diademata* and *R. rubida*; all other species are the converse]; 9) seam B contact (intercostal seam between C1 and C2) (Tinkle 1962) on anterior marginal 5 [the dominant character state in all species except *R. annulata* and *R. nasuta*]; and 10) seam C contact (intercostal seam between C2 and C3) (Tinkle 1962) on anterior marginal 7 [the most common character state in all species except *R. funerea*, *R. melanosterna*, and *R. nasuta*].

In addition, the color pattern of the head apparently includes both supratemporal and postorbital stripes, both of which are light-colored stripes on the dark ground color that is typical of all species of *Rhinoclemmys*. The dorsum of the specimen’s head appears to be covered with an extensive, light-colored blotch with the supratemporal stripe extending from the dorsolateral corner. We suspect that the extent of this “blotch” may

be an artifact of drying, and we note the similarity to the “lunata” form of head marking found in some specimens of *R. punctularia* (Fretey *et al.* 1977). Occipital spots that would be diagnostic for *R. punctularia* may be represented by the two, oval, posterior extensions of the “blotch” nearest the midline (Fig. 5).

We can unequivocally exclude *T. scabra* L. from the synonymy of *Melanochelys trijuga* based on the continuous lateral keel present from hatching (as evidenced in the Seba illustration reproduced here as Fig. 1) and the great extent of dark pigmentation on the plastron found in that taxon. Similarly, *T. scabra* L. is obviously not a testudinid, and may be excluded from the synonymy of *Cylindraspis* spp. based on the presence of a nuchal scute and separate 12th marginals, as opposed to a single supracaudal scute as is characteristic of most Testudinidae. Among the features that characterize *Trachemys scripta* that are not present in the holotype of *T. scabra* are: 1) vertebral keel absent or evidenced as a narrow ridge; 2) no trace of lateral keels; 3) dark plastral coloration is not in the form of a broad central figure; 4) a single relatively large axillary scute prevents contact between the 4th marginal and pectoral scutes; and 5) a rather broad zygomatic arch. The other two emydids with which *T. scabra* L. has been synonymized, *Glyptemys insculpta* and *Emys orbicularis*, differ in the absence of humeral-axillary contact, only one axillary scute is present, and the zygomatic arch is relatively broad. Two obvious features of *T. scabra* L. that indicate it is not a specimen of *Pelomedusa subrufa* are its lack of an intergular scute and the presence of a nuchal scute.

Our preliminary impression of the holotype had been that it appeared to possibly represent *R. annulata* (Gray 1860), but we are now convinced that it is referable to *punctularia* rather than *annulata*. However, genetic testing of the specimen with comparison to all *Rhinoclemmys* species would be helpful to absolutely confirm its identity.



FIGURE 6. One of three specimens of “*Testudo scabra*” at the University of Uppsala Museum of Zoology donated by Carl Petter Thunberg between 1785 and 1815 (UUZM s/n, juvenile shell, 86 mm CL). Original Thunberg tag reads “*Testudo scabra* β Mus. Thunb.” and newer tag reads “*Chelopus punctularius* Mus. Thunb.” This specimen represents *Rhinoclemmys punctularia*, but has no status as a type.

The type locality for *T. scabra* Linnaeus (1758:198) was originally given as “Indiis” (= West Indies or South America), but emended by Linnaeus (1766:351) to “India orientali, Carolina.” Since the name *T. scabra* represents a specimen of *R. punctularia*, we hereby restrict the type locality of *T. scabra* L. to “Cayenne, French Guiana”, the same type locality as for *Testudo punctularia* Daudin (1801:252) (= *R. punctularia*).

Thunberg's three specimens of "*T. scabra*" donated to the Uppsala collections between 1785 and 1817 (Thunberg 1785–1817) are also still extant. The first, *T. scabra* β (Fig. 6) is a dried shell of *Rhinoclemmys punctularia* measuring 86 mm CL. The second, *T. scabra* γ (not figured), has been re-identified as an *Emys orbicularis*. The third, *T. scabra* δ (not figured), is a juvenile *Rhinoclemmys punctularia* measuring 51 mm CL. None of these specimens have any standing as Linnaean types, nor were they described by Thunberg.

***Testudo scripta* Thunberg in Schoepff 1792**

The specimen of "*Testudo scabra* Thunberg" (labeled "*Testudo scripta* Thunberg" on the plate) that Schoepff (1792) used as the basis for the description of *Testudo scripta* (= *Trachemys scripta scripta*) is present in the Thunbergian collection in Uppsala (Fig. 7). It is the only specimen of *Testudo scripta* in the collection and was accessioned by Thunberg himself, who recorded it in various versions of his museum catalogues. This specimen is the holotype of *Trachemys scripta scripta* and has never previously been located or identified (Iverson 1992; Seidel and Ernst 2006). Interestingly, Schweigger (1812:297) later wrote about *T. scripta* Schoepff: "*Vidi specimen, quo usus Schoepf., in museo Parisiensi*" (I saw the specimen, used by Schoepff, in the Paris Museum), but that was never confirmed, and it is not there (R. Bour, *pers. comm.*). Instead, it was part of the Thunberg donation to the collections in Uppsala. Since Schweigger visited both collections, he may have meant "*Upsaliensi*" rather than "*Parisiensi*."

The specimen is a small, dried, misshapen hatchling labeled "*Testudo scripta* Mus. Thunb." by Thunberg himself (Fig. 7) and is the only *T. scripta* in the entire Linnaean and Thunbergian collections in Uppsala. It measures approximately 31.0 mm straight CL, ca. 30.3 mm PL, and 9.2 mm tympanic head width, and has a trace of its hatchling egg caruncle still visible. It was never given an original accession number, but has now been catalogued as UUZM Types 7455. It was accessioned into the Uppsala collection sometime between 1785 and 1792, but not with the first group of Thunberg specimens in 1785, being added to the catalogue as "*Testudo scripta*" after the initial entries (Thunberg 1785–1817, 1808–1815). Aside from entries for this single specimen of *T. scripta* by Thunberg in various other handwritten museum catalogues, the only actual publication documenting its existence was in Thunberg (1818) where it was listed as being part of the Thunberg donations to the Uppsala collections.

Based on examination of the poorly-preserved holotype and its photos (Fig. 7) and examination of its original figure (Schoepff 1792: pl. 3, f. 4, 5, labeled "*Test. scripta* Thunb.") (Fig. 4), we and other colleagues highly familiar with *T. scripta* (K. Buhmann, W. Gibbons, and B. Thomas, *pers. comm.*) agree that it fortunately appears to represent a *Trachemys scripta scripta*, but genetic analysis would be helpful to be certain.

Discussion

Since its description, the name *Testudo scabra* Linnaeus 1758 has usually been considered a *nomen dubium*, being assigned variously and usually erroneously to the synonymies of nine different currently recognized species (Table 1). Since we have now identified the holotype as belonging to one of these species, the nomenclatural considerations need to be reviewed.

It would appear from our analysis of the nomenclatural history and examination of the type specimen of *T. scabra*, that the following sequence of events occurred: 1) Linnaeus (1758) described a single specimen that he received from Alströmer as his new species *Testudo scabra* (now identified as a synonym of *Testudo punctularia* Daudin 1801, presently *Rhinoclemmys punctularia*); 2) Linnaeus (1766) altered his description slightly and erroneously included *T. terrestris amboinensis minor* by Seba (1734) in the synonymy of *T. scabra*, but that reference is merely an illustration of a *Melanochelys trijuga*; 3) Stadius Müller (1774) erroneously interpreted *T. scabra* L. as a terrestrial tortoise identical to Leguat's and Perrault's giant tortoises from Rodrigues and Réunion; 4) Walbaum (1782) examined, described, and measured the presumed type



FIGURE 7. Type specimen (holotype) of *Testudo scripta* Thunberg in Schoepff 1792, donated by Thunberg between ca. 1785–92 to the Uppsala University Museum of Zoology (now catalogued as UUZM Types 7455), dried hatchling, ca. 31 mm straight CL. The original tag by Thunberg reads “*Testudo scripta*. Mus. Thunb.” This specimen represents *Trachemys scripta scripta*.

specimen of *T. scabra*, but named it *T. verrucosa* as an unjustified *nomen novum* in place of *T. scabra* L.; 5) Schneider (1783) placed Statius Müller’s *T. scabra*, Walbaum’s *T. verrucosa*, and *T. scabra* L. under his new species *Emys europaea* (= *Emys orbicularis*) and indicated that Walbaum had apparently examined Linnaeus’ specimen of *T. scabra*; 6) Gmelin (1789) used Walbaum’s description and measurements of the presumed type as his new basis for *T. scabra* L., placing *T. verrucosa* in its synonymy; 7) Schoepff (1792, 1801) placed both *T. scabra* L. and *T. verrucosa* in the synonymy of his new species *T. dorsata* (also a synonym of *T. punctularia* Daudin, presently *Rhinoclemmys punctularia*), while using two unpublished names, *T. scabra* L. sensu Retzius and *T. scabra* L. sensu Thunberg (though labeled *T. scripta* Thunberg on the plate) as the bases for his new descriptions of *T. galeata* (a synonym of *T. subrufa* Lacépède 1788, presently *Pelomedusa subrufa*) and

T. scripta (presently *Trachemys scripta*); 8) Say (1824) used *T. scabra* L. as the basis for his concept of *Emys scabra*, later noted to be synonymous with *Glyptemys insculpta* (LeConte 1830) by Bonaparte (1830) and Gray (1831); 9) Duméril and Bibron (1835) synonymized *T. dorsata* Schoepff under *Emys punctularia* (= *Rhinoclemmys punctularia*); 10) Agassiz (1857) erroneously used *T. scabra* L. as the basis for his *Trachemys scabra* (= *Trachemys scripta*); 11) various other authors synonymized *T. scabra* L. under *Melanochelys trijuga*, but none of these were correct; 12) Wermuth (1956) re-examined Walbaum's original description of *T. verrucosa* and concluded that it represented a *Rhinoclemmys punctularia*; and 13) our examination of the extant type specimen of *T. scabra* L., also presumably examined by Walbaum (1782) as the basis for his *T. verrucosa*, confirms this identification as *Rhinoclemmys punctularia*.

Since the type of *Testudo scabra* Linnaeus 1758 represents a senior subjective synonym of *Testudo punctularia* Daudin 1801 (= *Rhinoclemmys punctularia*), the Principle of Priority of names could require that what we now call *punctularia* (Daudin) would need to be called *scabra* (Linnaeus) (ICZN 1999). However, the name *Testudo scabra* Linnaeus 1758 has not been used as valid since 1857 (fulfilling the criterion for ICZN Article 23.9.1.1), and the name *Testudo punctularia* Daudin 1801 has been in constant use since its description, and used by essentially all authors since the late 1800s (fulfilling the criterion for ICZN Article 23.9.1.2). In addition, the ICZN (1963) declared *T. punctularia* Daudin 1801 to be a *nomen protectum*, taking precedence over its other senior subjective synonym *Testudo dorsata* Schoepff 1801. Therefore, following the recommendations of the ICZN (1999), since the conditions in Articles 23.9.1.1 and 23.9.1.2 are met in this situation, we hereby declare the senior subjective synonym *Testudo scabra* Linnaeus 1758 to be a *nomen oblitum* and *nomen rejectum*, and reaffirm that the junior synonym *Testudo punctularia* Daudin 1801 remains valid as a *nomen protectum* and *nomen conservandum*. Based on the above criteria, this case does not need to be referred to the International Commission on Zoological Nomenclature for a ruling (ICZN 1999, Article 23.9.2).

The type specimen of *Testudo scripta* Schoepff 1792 (= *Trachemys scripta*) has never previously been identified (Iverson 1992; Seidel and Ernst 2006). Schoepff made his original description based on the description of "*Testudo scabra*" by Thunberg and set of figures of the single specimen provided by Thunberg and labeled "*Testudo scripta*". However, since the published figure was labeled "*Test. scripta* Thunb." it is probable that Thunberg did not provide his description as "*T. scabra*", but instead used his own catalogue name of *T. scripta*. In any case, the actual description of *T. scripta* in Schoepff was clearly provided by Thunberg, and the accompanying figure labeled *Testudo scripta* Thunberg. Therefore, authorship of the name *T. scripta* should instead be attributed to Thunberg and rendered as *Testudo scripta* Thunberg in Schoepff 1792, rather than the current usage, *Testudo scripta* Schoepff 1792. Additionally, genetic analysis may be necessary to determine its exact identification, but based on our observations, it appears to be *Trachemys scripta scripta*.

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TABLE 1. Synopsis of sequential allocation of the different uses and synonymizations of *Testudo scabra*.

1. *Testudo scabra* Linnaeus 1758:198 (= *Testudo punctularia* Daudin 1801 = *Rhinoclemmys punctularia*) (Geoemydidae). Holotype: UUZM Linné Collection 129, dried hatchling, ca. 44 mm CL. Type locality: “Indiis” (= West Indies or South America), emended erroneously by Linnaeus (1766:351) to “India orientali, Carolina”, and hereby restricted to “Cayenne, French Guiana”, the same type locality as *T. punctularia* Daudin. *Testudo scabra* Linnaeus 1758 is hereby declared a *nomen oblitum* and *nomen rejectum*, and *Testudo punctularia* Daudin 1801 is reaffirmed as a *nomen protectum* and *nomen conservandum*.
2. *Testudo scabra* L. sensu Stadius Müller 1774:34 (= Leguat’s tortoises = *Testudo indica vosmaeri* Suckow 1798 = *Cylindraspis vosmaeri* and *Testudo peltastes* Duméril and Bibron 1835 = *Cylindraspis peltastes*; and Perrault’s tortoise = *Testudo indica* Schneider 1783 = *Cylindraspis indica*) (Testudinidae).
3. *Testudo scabra* L. sensu Walbaum 1782:116 (in synonymy) (= *Testudo verrucosa* Walbaum 1782 = *Testudo verrucosa* Suckow 1798 = *Testudo punctularia* Schoepff 1801 = *Rhinoclemmys punctularia*) (Geoemydidae).
4. *Testudo scabra* L. sensu Schneider 1783:327 (in synonymy) (= *Testudo europaea* Schneider 1783 = *Testudo orbicularis* L. 1758 = *Emys orbicularis*) (Emydidae).
5. *Testudo scabra* L. sensu Lacépède 1788:161 (= *Testudo dorsata* Schoepff 1801 = *Rhinoclemmys punctularia*) (Geoemydidae).
6. *Testudo scabra* L. sensu Retzius in Schoepff 1792:12 (= *Testudo galeata* Schoepff 1792 = *Pelomedusa galeata* = *Pelomedusa subrufa*) (Pelomedusidae). The holotype of *T. galeata* is not presently known, but figured in Schoepff 1792, pl. 3, f. 1. Barring rediscovery of the actual type specimen, the specimen drawn in this figure is hereby designated as the holotype of *Testudo galeata* Schoepff 1792.
7. *Testudo scabra* sensu Thunberg in Schoepff 1792:16 and *Testudo scripta* Thunberg in Schoepff 1792:pl. 3 (= *Testudo scripta* Thunberg in Schoepff 1792 = *Trachemys scripta scripta*) (Emydidae). Holotype: UUZM Types 7455, figured in Schoepff, pl. 3, figs 4–5, dried hatchling, ca. 31 mm. Type locality: none designated, but restricted to “Charleston, South Carolina” by Schmidt (1953:102).
8. *Testudo scabra* L. sensu Schoepff 1801:136 (in synonymy) (= *Testudo dorsata* Schoepff 1801 = *Testudo punctularia* Daudin 1801 = *Rhinoclemmys punctularia*) (Geoemydidae).
9. *Testudo scabra* L. sensu Latreille 1801:148 (= *Testudo scabra* L. sensu Lacépède 1788 = *Testudo dorsata* Schoepff 1801 = *Rhinoclemmys punctularia*) (Geoemydidae).
10. *Testudo scabra* Latreille 1801:164 (= junior homonym of *Testudo scabra* L. 1758), *nomen novum* and objective synonym of *Testudo punctata* Lacépède 1788 (= *Lissemys punctata*) (Trionychidae), apparently based on the same specimen.
11. *Emys scabra* (L.) sensu Say 1824:210 (= *Emys insculpta* LeConte 1830 = *Glyptemys insculpta*) (Emydidae).
12. *Terrapene scabra* (L.) sensu Bonaparte 1830:157 (= *Emys scabra* L. sensu Say 1824 = *Emys insculpta* LeConte 1830 = *Glyptemys insculpta*) (Emydidae).
13. *Trachemys scabra* (Linnaeus) sensu Agassiz 1857:434 (= *Testudo scripta* Thunberg in Schoepff 1792 = *Trachemys scripta*) (Emydidae).

Literature cited

- 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*. Boston, MA: Little, Brown and Co., 1–452 pp.
- Austin, J. J., Arnold, E. N. & Roger, B. (2002) The provenance of type specimens of extinct Mascarene island giant tortoises (*Cylindraspis*) revealed by ancient mitochondrial DNA sequences. *Journal of Herpetology*, 36, 2, 280–285.
- Bonaparte, C. L. (1830) Sulla Seconda Edizione del Regno Animale del Barone Cuvier. Osservazioni. *Annali di Storia Naturale, Bologna*, 4, 1–26; 159–220; 303–389.
- Boulenger, G. A. (1889) *Catalogue of the Chelonians, Rhynchocephalians, and Crocodiles in the British Museum (Natural History)*. London, UK: Trustees of the Museum, 311 pp.
- Bour, R. (2007) The type specimens of *Rhinoclemmys areolata* (Duméril and Bibron, 1851), *R. pulcherrima incisa* (Bocourt, 1868), and *R. punctularia* (Daudin, 1801). *Emys*, 14, 2, 28–34.
- Brown, A. E. (1908) Generic types of Nearctic Reptilia and Amphibia. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 60, 112–127.
- Carr, J. L. 1991. Phylogenetic Analysis of the Neotropical Turtle Genus *Rhinoclemmys* Fitzinger (Testudines: Emydidae). Ph.D. dissertation. Southern Illinois University, Carbondale, IL, xx + 290 pp.
- Daudin, F. M. (1801) *Histoire Naturelle, Generale et Particuliere, des Reptiles. Tome Second*. Paris, France: Dufart, 432 pp.
- Duméril, A. M. C. & Bibron, G. (1835) *Erpétologie Générale ou Histoire Naturelle des Reptiles. Tome Second*. Paris,

- France: Roret, 680 pp.
- Ernst, C. H. (1972) *Clemmys insculpta*. *Catalogue of American Amphibians and Reptiles*, 125, 1–2.
- Ernst, C. H. (1978) A revision of the Neotropical turtle genus *Callopsis* (Testudines: Emydidae: Batagurinae). *Herpetologica*, 34, 113–134.
- Ernst, C. H. (1981) *Rhinoclemmys punctularia*. *Catalogue of American Amphibians and Reptiles*, 276, 1–2.
- Ewert, M. A. (1979) The embryo and its egg: Development and natural history. In: M. Harless & H. Morlock (Eds), *Turtles: Perspectives and Research*. John Wiley and Sons, New York, NY, pp. 333–413.
- Feuer, R. C. (1970) Key to the skulls of Recent adult North and Central American turtles. *Journal of Herpetology*, 4, 69–75.
- Fitzinger, L. J. (1835) Entwurf einer systematischen Anordnung der Schildkröten nach den Grundsätzen der natürlichen Methode. *Annalen des Wiener Museums der Naturgeschichte*, 1, 103–128.
- Fretey, J., Hoogmoed, M. S. & Lescure, J. (1977) Etude taxinomique de *Rhinoclemmys punctularia punctularia* (Daudin) (Testudinata, Emydidae). *Zoologische Mededelingen*, 52, 6, 63–80.
- Fritz, U. & Havaš, P. (2007) Checklist of chelonians of the world. *Vertebrate Zoology*, 57, 149–368.
- Gmelin, J. F. (1789) *Caroli a Linné, Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Editio Decima Tertia, Aucta, Reformata. Tomus I. Pars III* (Vol. 1(3)). Lipsiae [Leipzig]: G.E. Beer, pp. 1033–1516.
- Gray, J. E. (1830) A Synopsis of the Species of the Class Reptilia. In: Griffith E. and Pidgeon, E. *The Class Reptilia arranged by the Baron Cuvier, with specific descriptions. In: Griffith, E. (Ed.). The Animal Kingdom Arranged in Conformity with its Organization, by the Baron Cuvier, with Additional Descriptions of all the Species Hitherto Named, and of Many not Before Noticed. Vol. 9. Reptilia. Supplement*. London, UK: Whittaker, Treacher, and Co., 110 pp.
- Gray, J. E. (1831) *Synopsis Reptilium; or Short Descriptions of the Species of Reptiles. Part I.—Cataphracta. Tortoises, Crocodiles, and Enaliosaurians*. London, UK: Treuttel, Wurz, and Co., 85 pp.
- Gray, J. E. (1844) *Catalogue of the Tortoises, Crocodiles, and Amphisbaenians in the Collection of the British Museum*. London, UK: Museum Trustees, 80 pp.
- Gray, J. E. (1856[1855]) *Catalogue of the Shield Reptiles in the British Museum. Part I. Testudinata (Tortoises)*. London, UK: Museum Trustees, 79 pp.
- Gray, J. E. (1860) Description of a new species of *Geoclemmys* from Ecuador. *Proceedings of the Zoological Society of London*, 1860, 231–232.
- Gronovius, L. T. (1763) *Zoophylacium Gronovianum, exhibens animalia. Fasciculus primus*. Leiden, Batavorum, 136 pp.
- Holbrook, J. E. (1836) *North American Herpetology; or, a Description of the Reptiles Inhabiting the United States. Ed. 1, Vol. 1*. Philadelphia, PA: J. Dobson, 120 pp.
- Holm, Å. (1957) Specimina Linnaeana. I Uppsala bevarade zoologiska samlingar från Linnés tid [In Swedish with English summary]. *Uppsala Universitets Årsskrift*, 1957, 6, 1–68.
- ICZN [International Commission on Zoological Nomenclature] (1963) Opinion 660. Suppression under the plenary powers of seven specific names of turtles (Reptilia, Testudines). *Bulletin of Zoological Nomenclature*, 20, 187–190.
- ICZN (1985) Opinion 1309. *Geoemyda* Gray, 1834, and *Rhinoclemmys* Fitzinger, 1835 (Reptilia, Testudines): conserved. *Bulletin of Zoological Nomenclature*, 42, 152–153.
- ICZN (1999) *International Code of Zoological Nomenclature. Fourth edition*. London, UK: International Trust for Zoological Nomenclature, 306 pp.
- Iverson, J. B. (1992) *A Revised Checklist with Distribution Maps of the Turtles of the World*. Richmond, IN: Privately printed, xiii + 363 pp.
- Kitchell, K., Jr. & Dundee, H. A. (1994) A trilogy on the herpetology of Linnaeus's *Systema Naturae* X. *Smithsonian Herpetological Information Service*, 100, 1–61.
- Lacépède, B. G. E. d. (1788) *Histoire Naturelle des Quadrupèdes Ovipares et des Serpens. Tome Premier. Quarto edition*. Paris: Hôtel de Thou, 651 pp.
- Latreille, P. A. (1801) *Histoire Naturelle des Reptiles. In: Sonnini, C.S. and Latreille, P.A. Histoire Naturelle des Reptiles, avec figures dessinées d'après nature. Tome Premier. Première Partie. Quadrupèdes et Bipèdes Ovipares*. Paris: Deterville, 280 pp.
- LeConte, J. (1830) Description of the species of North American tortoises. *Annals of the Lyceum of Natural History, New York*, 3, 91–131.
- Leguat, F. (1708) *Voyages et aventures de François Leguat, et de ses compagnons, en deux isles désertes des Indes orientales*. London, UK: David Mortier, Vol. 1, 164 pp., Vol. 2, 180 pp.
- Lesson, R.-P. (1830) *Centurie Zoologique*. Paris: F.G. Levrault, 235 pp.
- Lindholm, W. A. (1929) Revidiertes Verzeichnis der Gattungen der rezenten Schildkröten nebst Notizen zur Nomenklatur einiger Arten. *Zoologische Anzeiger*, 81, 275–295.
- Linnaeus, C. (1758) *Systema Naturae, per Regna Tria Naturae, secundum Classes, Ordines, Genera, Species, cum*

- Characteribus, Differentiis, Synonymis, Locis. Tomus I. Editio Decima, Reformata. [10th Ed.]*. Holmiae [Stockholm]: Laurentii Salvii, 824 pp.
- Linnaeus, C. (1766) *Systema Naturae. Editio Duodecima, Reformata. Tomus I, Pars I, Regnum Animale [12th Ed.]*. Holmiae [Stockholm]: Laurentii Salvii, 532 pp.
- Linné, C. v., Jr. & Thunberg, C. P. (1780) *Inventeringen på Academiska i Horto Botanico varande Museum [In Swedish]. Handwritten Catalogue at Uppsala University Zoological Museum*. Uppsala, Sweden, pp.
- Lönnberg, E. (1896) Linnean type-specimens of birds, reptiles, batrachians and fishes in the Zoological Museum of the R. University in Upsala. *Bihang Svenska Vetenskaps Akademien Handlingar*, 22, 4, 1–45.
- Mertens, R. & Wermuth, H. (1961) Proposed use of the plenary powers to suppress eight specific names of turtles (Reptilia, Testudines). *Bulletin of Zoological Nomenclature*, 18, 211–213.
- Perrault, C. (1676) Description anatomique d'une grande Tortuë des Indes. *Suites des Mémoires pour servir à l'Histoire Naturelle des Animaux*, 2, 192–205.
- Pritchard, P. C. H. & Trebbau, P. (1984) *The Turtles of Venezuela* (Vol. 2). Oxford, OH: SSAR, x + 403 pp.
- Retzius, A. J. (1797) *Animadversiones circa Crocodylum ejusque historiam...resp. Matth.* Lund: Jacobson. Dissertatio.
- Rookmaaker, L. C. (1989) *The Zoological Exploration of Southern Africa, 1650–1790*. Boca Raton, FL: CRC Press, 272 pp.
- Rueda-Almonacid, J. V., Carr, J. L., Mittermeier, R. A., Rodríguez-Mahecha, J. V., Mast, R. B., Vogt, R. C., *et al.* (2007) *Las Tortugas y los Cocodrilianos de los Países Andinos del Trópico*. Bogotá, Colombia: Conservación Internacional, 538 pp.
- Say, T. (1824) On the fresh water and land tortoises of the United States. *Journal of the Academy of Natural Sciences, Philadelphia*, 4, 203–219.
- Schmidt, K. P. (1953) *A check list of North American amphibians and reptiles. Sixth edition*. Chicago, IL: American Society of Ichthyologists and Herpetologists, 280 pp.
- Schneider, J. G. (1783) *Allgemeine Naturgeschichte der Schildkröten, nebst einem systematischen Verzeichnisse der einzelnen Arten und zwei Kupfern*. Leipzig: J.G. Müller, 364 pp.
- Schoepff, J. D. (1792) *Historia Testudinum Iconibus Illustrata*. Erlangae: Ioannis Iacobi Palm, 136 pp. [pp. 1–32].
- Schoepff, J. D. (1795) *Historia Testudinum Iconibus Illustrata*. Erlangae: Ioannis Iacobi Palm, 136 pp. [pp. 81–112].
- Schoepff, J. D. (1801) *Historia Testudinum Iconibus Illustrata*. Erlangae: Ioannis Iacobi Palm, 136 pp. [pp. 113–136].
- Schoepff, J. D. (1792-1801) *Naturgeschichte der Schildkröten, mit Abbildungen erläutert*. Erlangen, Germany: Johann Jacob Palm, xxxi plates + 160 pp.
- Schweigger, A. F. (1812) Prodomus monographiae Cheloniorum. *Königsberger Archiv für Naturwissenschaft und Mathematik*, 1, (3), 271–368; (4), 406–462.
- Seba, A. (1734) *Locupletissimi Rerum Naturalium Thesauri Accurata Descriptio, et Iconibus Artificiosissimis Expressio, per Universam Physices Historiam. Tomus I*. Amstelaedami [Amsterdam]: J. Wetstenium, Gul. Smith, and Janssonio Waesbergios, 178 pp.
- Seidel, M. E. & Ernst, C. H. (2006) *Trachemys scripta*. *Catalogue of American Amphibians and Reptiles*, 831, 1–94.
- Shaw, G. (1802) *General Zoology, or Systematic Natural History. Volume III, Part I, Amphibia*. London: G. Kearsley, 312 pp.
- Smith, H. M., Ernst, C. H. & Smith, R. B. (1980) *Geoemyda* Gray, 1834, and *Rhinoclemmys* Fitzinger, 1835 (Reptilia, Testudines): proposed conservation. *Bulletin of Zoological Nomenclature*, 37, 233–239.
- Smith, H. M. & Smith, R. B. (1980) *Synopsis of the Herpetofauna of Mexico. Volume VI. Guide to Mexican Turtles. Bibliographic Addendum III*. North Bennington, VT: John Johnson, 1044 pp.
- Stadius Müller, P. L. (1774) *Des Ritters Carl von Linne' vollständiges Natursystem nach der zwölften lateinischen Ausgabe und nach Anleitung des holländischen houttunnischen Werks mit einer ausführlichen Erklärung. Dritter Theil. Von den Amphibien*. Nürnberg: G.N. Raspe, 350 pp.
- Suckow, G. A. (1798) *Anfangsgründe der theoretischen und angewandten Naturgeschichte der Thiere. Dritter Theil. Von den Amphibien*. Leipzig: Weidmannischen Buchhandlung, 298 pp.
- Thunberg, C. P. (1785–1817) *Donat. Animal. Thunberg. Animalia. 1. Mammalia, 2. Aves, 3. Amphibia, 4. Pisces, 5. Insecta, 6. Vermes, donata a Car. Pet. Thunberg 1785–1817. 8. Donatio 1785 seqq. Caroli Petri Thunberg*. Uppsala: Handwritten Catalogue at Uppsala University Zoological Museum, 180 pp.
- Thunberg, C. P. (1787a) *Museum Naturalium Academiae Upsaliensis. Partem Secundam ... proponit Laur. Magn. Holmer. 5. Donatio 1748, Magni Lagerstroem. 6 et 7. Donatio 1749 et sequentibus annis, Jonae Alströmer nec non Caroli a Linné. 8. Donatio 1775, Carol. Petr. Thunberg*. Upsaliae: Museum Naturalium Academiae Upsaliensis, Part 2, pp. 16–32.
- Thunberg, C. P. (1787b) Beskrifning på trenne sköld-paddor [Description of three turtles] [In Swedish]. *Kongliga Vetenskaps Academiens Nya Handlingar, Stockholm*, (2), 8, 178–180.
- Thunberg, C. P. (1808–1815) *Animalia Academiae Upsaliensis. General-Cataloge på Upsala Akademies Djur-Samling*. Uppsala: Handwritten Catalogue at Uppsala University Zoological Museum, 258 pp.
- Thunberg, C. P. (1818) *Museum Naturalium Academiae Upsaliensis. Append. XXIV... proponit Olavus Sjöstrand*.

- Donation Thunbergian*. Upsaliae: Museum Naturalium Academiae Upsaliensis, pp. 26–37.
- Tinkle, D. W. (1962) Variation in shell morphology of North American turtles. I. The carapacial seam arrangements. *Tulane Studies in Zoology*, 9, 331–349.
- Vetter, H. & van Dijk, P. P. (2006) *Turtles of the World. Volume 4. East and South Asia*. Frankfurt am Main, Germany: Edition Chimaira, 160 pp.
- Walbaum, J. J. (1782) *Chelonographia oder Beschreibung einiger Schildkröten*. Lubeck: J.F. Gleditsch, 132 pp.
- Wallin, L. (1992) Linnaean specimens in the Zoological Museum of Uppsala University. *Archives of Natural History*, 19, 219–230.
- Webb, R. G. (1985) Taxonomic status of *Testudo rostrata* Thunberg, 1787 (Testudines, Trionychidae). *Herpetologica*, 41, 84–88.
- Wermuth, H. (1956) Versuch der Deutung einiger bisher übersehener Schildkröten-Namen. *Zoologische Beitrag, Berlin*, 2, 399–423.
- Wermuth, H. & Mertens, R. (1977) Liste der rezenten Amphibien und Reptilien: Testudines, Crocodylia, Rhynchocephalia. *Das Tierreich*, 100, 1–174.
- Zupko, R. E. (1978) *French Weights and Measures Before the Revolution: A Dictionary of Provincial and Local Units*. Bloomington, IN: Indiana University Press, 208 pp.