

The Proper Name of the Neotropical Tree Boa Often Referred to as *Corallus enydris* (Serpentes: Boidae)

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ABSTRACT.—Confusion regarding the application of the proper scientific name for the common Neotropical tree boa has existed since Linnaeus described *Boa enydris* and *Boa hortulana* in 1758. We review the nomenclatural history of the species and point out the misapplication of scientific names that have characterized this form. Our review indicates that the proper scientific name for this highly variable, wide-ranging arboreal boid is *Corallus hortulanus*, not *Corallus enydris*, as has been used so frequently in recent years.

The snake genus *Corallus*, as presently understood (Kluge, 1991), includes four species of relatively slender, arboreal, nocturnally active, tropical American boids (Henderson, 1993a). The annulated tree boa, *Corallus annulatus*, has been collected at scattered localities in lowland evergreen forests from Honduras in Central America to northwestern Ecuador west of the Andes (Henderson, 1993b). The emerald tree boa, *Corallus caninus*, occurs in lowland tropical rain forests of Amazonian and Guayanan South America; although widespread, it is infrequently encountered (Henderson, 1993c). Cropani's tree boa, *Corallus cropanii*, is known from only three localities, all in the state of São Paulo, Brazil (Henderson and Puerto, 1993). The common tree boa (also called garden tree boa and Cook's tree boa), often referred to as *Corallus enydris* but also called *Corallus hortulanus* and *Corallus cookii* (see below), is one of the most geographically widespread and frequently encountered species of Neotropical snakes. Its mainland distribution stretches from southwestern Costa Rica, Panama, and northern South America east of the Andes through most of Venezuela and the Guayanan region, and south and westward through Amazonian Colombia, Ecuador, Peru, Bolivia, and Brazil, and into the wet forests of southeastern Brazil to a point south of the Tropic of Capricorn. This species also is known from small islets off the Atlantic and Pacific shores of Panama, Isla Margarita (Venezuela), Ilha Grande (southern Brazil), Trinidad, Tobago, St. Vincent, Grenada, and at least nine of the Grenadine Islands in the Lesser Antilles. The common tree boa has a striking array of color patterns and is ecologically widespread; it has been reported from evergreen wet and

rain forests, banana plantations, mangroves, fruit orchards, cactus and thorn scrub habitats and can be locally abundant. It is eurytrophic, but its diet varies both ontogenetically and geographically (Henderson, 1993d, e).

In reviewing the taxonomic history of names used for snake species (Campbell et al., in prep.), McDiarmid and Touré encountered an inconsistency in the current application of the scientific name of the common tree boa; Savage and McDiarmid had discussed this nomenclatural problem in the late 1980s. Below we review the history of the use of these names and conclude that the appropriate scientific name of the snakes often referred to as *Corallus enydris* should be *Corallus hortulanus*.

In the 10th edition of *Systema Naturae*, Linnaeus described nine snake species in the genus *Boa*; among these were *B. enydris* (1758:215) and *B. hortulana* (1758:215–216). Linnaeus' *Boa enydris* was based on a specimen from "America" in the collection of "Mus. De Geer" (=collection of Carl de Geer, a Swedish entomologist). *Boa hortulana*, also from "America," was based on a specimen reported in "Mus. Ad. Fr." (Linnaeus, 1754) and two plates from "Seb. mus. 2" (Seba, 1735). In plate 74, figure 1, Seba (1735) depicted a single specimen he called "Vipera, Paraguajana, formosa" or "Vipere du Paraguay" listed from "Amerique Méridionale." In plate 84, figure 1, Seba illustrated a snake he called "Coluber, [de] Tlehua, seu Igneus, perpulcher" or "Couleuvre Tlehua, ou Ignée, belle de Nouvelle Espagne." Interestingly, Linnaeus (1758:216) described the head pattern of *Boa hortulana* as having golden-yellow splotches and resembling a garden! This reference to a garden led Shaw (1802) to coin the English name "garden

boa" for the species. Linnaeus also listed *Boa enydris* and *Boa hortulana* in the 12th edition of *Systema Naturae* (1766:374) with no change in the text. Examination of a copy of the 12th edition in the Smithsonian Library shows that the three pages following page 373 are actually numbered "274", "275" and "376". The second set of pages "274" and "275" were numbered incorrectly, apparently the result of printer's errors (not an uncommon happening, see Dundee, 1994); the pages should have been numbered "374" and "375", respectively.

Over the next 80 years, most authors who included boas in their publications recognized the two Linnean species as distinct. Shaw (1802) referred to *Boa enydris* as the water boa and commented that its compressed body and similar pattern closely allied it to *Boa hortulana*. Shaw also included an illustration of *Boa hortulana* and provided a moderately detailed description of the color pattern of that species. Daudin (1803a) discussed both *Boa enydris* and *Boa hortulana* and commented that perhaps the two plates (Seba, 1735) that Linnaeus used in describing *Boa hortulana* represented more than one species. Wagler (1824, 1833) also indicated that several specimens of *Boa hortulana* were illustrated under different names by Seba (1734, 1735).

During this same period, several other taxa that later proved to be synonyms of *hortulana* were described. Some of these new names apparently were the result of authors applying scientific names to taxa previously described and referenced only with vernacular names (e.g., *Boa ambleocephala* Donndorff, 1798 and *Boa merremi* Schneider, 1801 for "Stumpfköpfiger Schlinger" Merrem, 1790). Other authors (e.g., Bechstein, 1802; Daudin, 1803a) inexplicably proposed new names for taxa that had been described originally with vernacular names and later with scientific ones. In describing *Corallus obtusirostris*, Daudin (1803a) referenced both "Stumpfköpfiger Schlinger" Merrem (1790) and *Boa merremi* Schneider (1801); the name, however, was clearly based on data taken from Merrem (1790). Other taxa (*Boa elegans* Daudin, 1803a; *Xiphosoma dorsuale* and *Xiphosoma ornatum* Wagler, 1824) presumably were described because the authors questioned the taxonomic limits of *Boa hortulana*. The relatively large number of new descriptions undoubtedly reflected the scarcity of specimens in collections and the considerable color and pattern variation characteristic of this snake.

In the latter part of the 18th and early part of the 19th centuries, authors frequently described new species with minimal characterization and inadequate material. Because no formal rules governing taxonomic procedures existed, authors often proposed new names for taxa for

which they knew binomial names and adequate descriptions previously existed. Such practices produced more than the usual number of synonyms expected for a variable species like *Boa hortulana*, and resulted in some taxonomic confusion. The most obvious and troublesome of these was the name *Boa merremii* (not *Boa merremi* Schneider). In a rarely cited paper, Sentzen (1796) listed 39 species of snakes, one lizard, and one caecilian. *Boa merremii* was one of ten snake species described as new. Sentzen (apparently a misspelling for Ulrich Jasper Seetzen [1767-1811], K. Adler, pers. comm.) ostensibly wrote his paper to present information on scale counts (ventral and subcaudal scales or annuli number) and sizes (total and tail lengths) of snakes, amphisbaenians, and a caecilian. The only pertinent reference to the status of *Boa merremii* Sentzen that we have been able to locate is one by Forcart (1951) who unfortunately assumed that the snake Sentzen described was a specimen of *Corallus enydris* and perhaps embodied the same indication to "Stumpfköpfiger Schlinger" Merrem (1790) as did Schneider's (1801) description of *Boa merremi* and Daudin's (1803a) of *Corallus obtusirostris*. In Sentzen's paper, which leaves much to be desired, we found no reference to Merrem's "Stumpfköpfiger Schlinger." Also, the scale counts, "Scut. 217-45 = 262" listed by Sentzen (1796:53), differ significantly from those (284 + 109 = 393) presented by Merrem (1790:13) and subsequently used by both Schneider and Daudin in their descriptions. The counts also are markedly below the range of ventrals (250-294), subcaudals (94-133), and ventrals plus subcaudals (351-436) reported for *Corallus enydris* by Henderson (1993d). Merrem also was aware of the differences. In a footnote under "Stumpfköpfiger Schlinger" Merrem (1821:42) cautioned that because of low scale counts and the relatively small size of Sentzen's specimen, Schneider's *Boa merremi* was not based on the same species that Sentzen described as *Boa merremii*. Thus, *Boa merremii* Sentzen apparently was not based on a specimen of *Corallus hortulanus*, or for that matter on a specimen of *Corallus* (because of the low scale counts reported, we suspect that *Boa merremii* may have been based on a species of viper). In any event, *Boa merremi* Schneider (1801) is a junior primary homonym of *Boa merremii* Sentzen (1796) and a junior subjective synonym of *Corallus hortulanus* (Linnaeus, 1758). Perhaps a concern about homonymy influenced Bechstein (1802) and Daudin (1803a) to propose replacement names for *Boa merremi* Schneider. Until the type is traced, *Boa merremii*, like several other taxa described by Sentzen (1796), is best considered a *nomen dubium*.

The first indication of doubt about the dis-

tinctiveness of the two species described by Linnaeus appeared in a major work by Schlegel (1837:392) who suggested that *Boa enydris* was a color variety of *Boa hortulana*. A few years later, Duméril and Bibron (1844:506) listed all names in the genus *Boa* in a table in Volume 6 of the *Erpétologie Générale*; [*Boa*] *hortulana* Linné was listed in the genus *Xiphosoma*, and [*Boa*] *enydris* Linné, together with three other taxa, [*Xiphosoma*] *dorsuale* Spix, [*Boa*] *elegans* Daudin, and [*Boa*] *merremii* Schneider, were considered synonymous with *Xiphosoma hortulanum*. In the table, Duméril and Bibron attributed *Xiphosoma dorsuale* to Spix, but Wagler (1824) actually wrote the snake volume in Spix's series on the Herpetology of Brazil (see Vanzolini, 1977, 1981). Also, Duméril and Bibron (1844) listed Schneider (1801) as the author of [*Boa*] *merremii*. Schneider (1801), however, spelled *merremii* with one "i"; whether the "ii" ending used by Duméril and Bibron and most other authors was an effort to correct what they thought was an inappropriate spelling or the result of confusion with the spelling of *merremii* by Sentzen, is unknown. In the account of *Xiphosoma hortulanum*, Duméril and Bibron (1844:545-549) listed *Boa enydris* Linné (Sys. Nat., 10th edition, page 215) in the synonymy of *Xiphosoma hortulanum*, without comment. Clearly this constituted a nomenclatural action following the Principle of First Reviser (ICZN, 1985), and the name *Boa hortulana* Linnaeus has precedence over the name *Boa enydris* Linnaeus.

During the next 90 years, most influential authors followed the action of Duméril and Bibron and listed *Boa enydris* in the synonymy of *Corallus hortulanus* (Gray, 1849:97; Boulenger, 1893:101) or used only the name *Boa hortulana* to refer to the species they discussed (Ihering, 1911; Griffin, 1916; Amaral, 1925, 1930a, b). During the first half of the 20th century, many authors followed Stejneger's (1901) recommendation and used the generic name *Boa*, rather than *Corallus*, as advocated by Boulenger (1893). This treatment held until Forcart (1951) clarified the application and use of the name *Corallus*. In his review of Linnean type-specimens of snakes, Andersson (1899:32) commented under the account of *Boa enydris* that "most authors regard this Linnean snake as a form of Linnaeus's *Boa hortulana*." On page 33, Andersson (1899) explained that he was "much inclined" to list *Corallus cookii* Gray as a synonym of Linnaeus' *Boa enydris* and *B. enydris* as a variety of *Corallus hortulanus* (L.). Thus, our research reveals that most (all?) authors through the first quarter of the 20th century followed Duméril and Bibron's (1844) action and treated *hortulanus* as the senior synonym.

In 1935, Stull resurrected the name *enydris*

from the synonymy of *hortulanus* and used *enydris* as the senior synonym to refer to the snakes called *hortulanus* by authors since Duméril and Bibron (1844). In the introduction to her checklist of the family Boidae, Stull (1935) stated that her studies indicated the need for many changes in the nomenclature of the family. Under a heading of species synonymized, she (Stull 1935:388) specifically listed the following: "*Boa hortulana* (Linné, 1758, p. 215, line 36) = *Boa enydris enydris* (Linné 1758, p. 215, line 32)." Later in the same publication, Stull (1935:398) recognized *Boa enydris enydris* (Linné) and *Boa enydris cookii* (Gray). She listed *Corallus hortulanus* Gray, 1849 and *Corallus hortulanus* Boulenger, 1893 in the synonymy of the former, and *Boa hortulana cookii* Amaral, 1930a [listed as 1929 but actually published in 1930] under the latter name. Unfortunately, we are left to guess the rationale behind Stull's action. Earlier in the article she stated that detailed reasons for the changes made, complete synonymies, and bibliography would be given in a monograph that was in preparation; this monograph was never published. Possibly, Stull was influenced by the appearance of Linnaeus' listing of *enydris* on a line above *hortulana* in the *Systema Naturae* (1758), an interpretation that has no influence on nomenclatural precedence. Whatever the case, Stull's act has no nomenclatural validity because it directly contradicts the Principle of First Reviser, Article 24 (a-b), International Code of Zoological Nomenclature (ICZN, 1985:53).

Unfortunately, Stull's treatment (1935) of *Boa enydris* as the senior synonym was followed by many authors. Most influential among the subsequent publications was a paper by Forcart (1951), written to clarify the use of certain generic names in the family Boidae. Among several issues that he discussed was the suitability of the name *Corallus* Daudin for species referred to the genus *Boa* Linnaeus by Stull (1935). Forcart (1951) correctly stated that *Corallus obtusirostris* Daudin (1803a) was the type species of the genus *Corallus* (Daudin 1803b; we follow Zhao and Adler's [1993:199] recommendation about the earliest date of Daudin's publications in 1803). Forcart also asserted that *Corallus obtusirostris* Daudin was based on "Stumpfköpfiger Schlinger" Merrem, 1790 and *Boa merremii* Sentzen, 1796. The reference to Sentzen was in error; Daudin (1803a) clearly stated that he was referring to *Boa merremii* Schneider, 1801; he made no mention of *Boa merremii* Sentzen. If Forcart based his statement on the assumption that Sentzen (1796) based his *Boa merremii* on "Stumpfköpfiger Schlinger" Merrem (1790) (an assumption we questioned earlier), then Sentzen's, Schneider's and Daudin's names would have been based on the same specimen. Even

though this was not true in Sentzen's case, nothing regarding the type species of *Corallus* changes. Forcart (1951) also stated that both *Corallus obtusirostris* Daudin and *Boa merremii* Sentzen were junior synonyms of *Boa enydris* Linnaeus, 1758; this is true for the former but not the latter. Forcart then listed *Corallus enydris enydris* and *Corallus enydris cookii* as currently recognized subspecies; apparently this was the first use of the combination *Corallus enydris*. In recognizing *C. enydris*, Forcart followed Stull's (1935) checklist and either overlooked or ignored the synonymy of Duméril and Bibron (1844) who placed *Boa enydris* Linnaeus, *Boa merremii* Schneider, and *Corallus obtusirostris* Daudin in the synonymy of *Xiphosoma hortulanum*. Forcart's use of *enydris* rather than *hortulanus*, and his assumption regarding the synonymy of *Boa merremii* Sentzen, was followed in turn by Stimson (1969), Peters and Orejas-Miranda (1970), and, most recently, Henderson (1993d).

In the Preface to his checklist, Stimson (1969) stated that he was updating Stull's checklist and following the recommendations of Forcart (1951), regarding the use of the name *Boa*. He listed *Corallus enydris enydris* and *Corallus enydris cookii* as the currently recognized names for the species *Corallus hortulanus*. Peters and Orejas-Miranda (1970) stated (incorrectly) that authors since Boulenger had used *hortulanus* and *enydris* about equally, and they chose to follow Stimson (1969). Their decision subsequently influenced most workers in Neotropical herpetology. In spite of the publications by Stull, Forcart, Stimson, and Peters and Orejas-Miranda, several authors subsequent to 1935 (e.g., Amaral, 1937; Dunn, 1944; Schmidt and Inger, 1957; Smith and Grant, 1958; Sexton and Heatwole, 1965; Roze, 1966, 1970; Pessôa and Cavalheiro, 1970; Savage and Villa, 1986) have used *Corallus hortulanus* as the name for these arboreal boids. In the second list of the snakes of Brazil, Amaral (1937) used *Boa hortulana hortulana* and listed Stull's usage of *Boa enydris enydris* in synonymy.

In conclusion, Duméril and Bibron (1844) were the first revisers and their designation of *Boa hortulana* Linnaeus as the senior synonym stands; *Boa enydris* Linnaeus is a junior synonym of *Corallus hortulanus* (Linnaeus). Therefore, the proper name for the widely distributed and frequently encountered Neotropical tree boa often called *Corallus enydris* is *Corallus hortulanus*.

To facilitate tracing the nomenclatural history of *Corallus hortulanus* (Linnaeus, 1758), we present the following synonymy.

Corallus hortulanus

Boa Hortulana Linnaeus, 1758, 215.
Boa Enydris Linnaeus, 1758, 215.
Vipera bitis Laurenti, 1768, 102.

Vipera madarensis Laurenti, 1768, 102.
Coluber madarensis—Gmelin, 1788, 1092.
Coluber bitis—Gmelin, 1788, 1092.
 ?*Boa Merremii* Sentzen, 1796, 53. *Nomen dubium*.
Boa Ambleocephala Donndorff, 1798, 149. [Based upon "Stumpfköpfiger Schlinger" Merrem, 1790]
Boa merremii Schneider, 1801, 259. [Based upon "Stumpfköpfiger Schlinger" Merrem, 1790]
Boa obtusiceps Bechstein, 1802, 46, pl. 2., fig. 2. [Based upon "Stumpfköpfiger Schlinger" Merrem, 1790 and *Boa Ambleocephala* Donndorff, 1798]
Boa elegans Daudin, 1803a, 123.
Corallus obtusirostris Daudin, 1803a, 259. [Based upon "Stumpfköpfiger Schlinger" Merrem, 1790 and *Boa merremii* Schneider, 1801]
Draco hortulanum—Oken, 1816, 277. [Rejected for purposes of nomenclature, ICZN, 1956, Opinion 417]
Xiphosoma ornatum Wagler, 1824, 40, pl. 14, fig. 2.
Xiphosoma dorsuale Wagler, 1824, 43, pl. 15.
X[iphosoma]. hortulanum—Fitzinger, 1826a, 54.
Xiphosoma hortulana—Fitzinger, 1826b, 883.
[Xiphosoma] merremii—Wagler, 1830, 167.
Boa modesta Reuss, 1834, 129.
Boa hortulana—Schlegel, 1837, 392, pl. 14, figs. 10 & 11.
Corallus maculatus Gray, 1842, 42.
Corallus hortulanus—Gray, 1842, 42.
Corallus Cookii Gray, 1842, 42.
Xiphosoma hortulanum—Duméril and Bibron, 1844, 545. [First reviser; placed *Boa enydris* Linnaeus, 1758 in synonymy of *X. hortulanum*]
Corallus hortulanus melanea Gray, 1849, 98.
Xiphosoma ruschenbergii Cope, 1875, 129.
Corallus cookii—Boulenger, 1893, 99; pl. 4, fig. 3.
Corallus hortulanus—Boulenger, 1893, 101.
Boa ruschenbergii—Stejneger, 1901, 184. [*Lapsus*]
Boa hortulana—Ihering, 1911, 316.
Boa cookii—Ihering, 1911, 317.
Boa grenadensis Barbour, 1914, 327.
Boa salmonidia Briceño Rossi, 1934, 1141.
Boa enydris enydris—Stull, 1935, 388.
Corallus enydris—Forcart, 1951, 197.
Corallus enydris enydris—Forcart, 1951, 197.
Corallus enydris cookii—Forcart, 1951, 197.

The pertinent rules governing the nomenclature of *Corallus hortulanus* are taken from (ICZN, 1985) and reproduced here.

Article 24 (a): Statement of the Principle of the First Reviser.

If two or more names, different or identical, or two or more nomenclatural acts, are published on the same date, whether in the same or different works, whether by the same or different authors, and in the case of names whether based on the same or different types,

and when they are subsequently considered to be synonyms or found to be homonyms, their relative precedence is determined by the first reviser.

Article 24 (b): Application of the Principle of the First Reviser.

The first author to have subsequently cited together such names or nomenclatural acts published on the same date, or different original spellings of the same name, and to have chosen one of them to have precedence over the other(s), has determined the precedence of the chosen name, nomenclatural act, or spelling, except as provided in Subsection (i) of this Section.

Some systematists might regard an appeal to the International Commission for Zoological Nomenclature for conservation of *enydris* as a long-accepted name desirable and promoting nomenclatural stability, a primary objective of the Code. The nearly universal and frequent use of the name *enydris* since 1935 makes such an idea appealing. In this case, however, that option is not available because Article 79 (c. 1.) requires "... that the senior name has not been used as a valid name during the immediately preceding fifty years..." (ICZN, 1985). We have referenced at least seven usages of the senior name, *hortulanus*, since 1946, and therefore no appeal for conservation of *enydris* is justified under the Code.

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