Revista Ibérica de Aracnología, nº **29** (31/12/2016): 91–93.
Grupo Ibérico de Aracnología (S.E.A.). ISSN: 1576 - 9518.

The true taxonomic identity of *Centruroides tenuis* (Thorell, 1876) and *Centruroides zayasi* Armas, 1976 (Scorpiones: Buthidae)

Rolando Teruel

Centro Oriental de Ecosistemas y Biodiversidad (BIOECO), Museo de Historia Natural "Tomás Romay"
José A. Saco # 601, esquina a Barnada; Santiago de Cuba 90100. Cuba. rteruel@bioeco.cu

Abstract: The precise taxonomic identity of two taxa, *Centruroides tenuis* (Thorell, 1876) and *Centruroides zayasi* Armas, 1976, which has been the subject of prolonged controversy, is finally clarified. The study of three syntypes of the first taxon and the holotype of the second taxon has revealed that the syntypes correspond to two species which are the second taxon's potential junior synonyms, *Centruroides marcanoi* Armas, 1981 and *C. zayasi*. One of the syntypes, the best preserved female adult, is here designated as the lectotype of *C. tenuis*. Consequently, the following nomenclatural change is proposed: *Centrurus tenuis* Thorell, 1876 = *Centruroides zayasi* Armas, 1976, **syn. nov.**
Key words: Scorpiones, Buthidae, *Centruroides*, taxonomy, Hispaniola, Greater Antilles.

La verdadera identidad taxonómica de *Centruroides tenuis* (Thorell, 1876) y *Centruroides zayasi* Armas, 1976 (Scorpiones: Buthidae)
Resumen: Se esclarece finalmente la identidad taxonómica precisa de dos taxones largamente controvertidos, *Centruroides tenuis* (Thorell, 1876) y *Centruroides zayasi* Armas, 1976. El examen de tres sintipos del primer taxón y el holotipo del segundo reveló que dichos sintipos corresponden a dos especies, *Centruroides marcanoi* Armas, 1981 y *C. zayasi*, que son sinónimos posteriores potenciales del segundo taxón. Se designa aquí como lectotipo de *C. tenuis* la hembra adulta en mejor estado de preservación. Consiguientemente, se propone el siguiente cambio nomenclatural: *Centrurus tenuis* Thorell, 1876 = *Centruroides zayasi* Armas, 1976, **syn. nov.**
Palabras clave: Scorpiones, Buthidae, *Centruroides*, taxonomía, La Española, Antillas Mayores.

Taxonomía/Taxonomy: *Centrurus tenuis* Thorell, 1876 = *Centruroides zayasi* Armas, 1976, **nuevo sinónimo**.

Exactly 140 years ago, the well-known Swedish arachnologist Tord Tamerlan Teodor Thorell (1876) described the buthid scorpion *Centrurus tenuis* on the basis of five syntypes from three vague American localities: two females from "Antillis" (Latinized form of Antilles or West Indies), one male and one female from "S. Domingo" (common abbreviation for Santo Domingo, the prevailing toponym then for both the island of Hispaniola and its included country Dominican Republic), and one female from "New York" (USA). Nevertheless, in the original description Thorell (1876: 155) regarded the later specimen as an accidental introduction by ship and fixed the type locality of *C. tenuis* as "America (India Occidentalis)", i.e., West Indies.

Only 15 years later, Kraepelin (1891) placed it as a junior synonym of *Centruroides nitidus* (Thorell, 1876), and this was just the beginning of a complicate and controversial taxonomical history for the taxon. From then on, it has sometimes been regarded either as a valid species (Armas & Marcano Fondeur, 1987; Santiago-Blay, 1990; Armas *et al.*, 1999; Armas, 2006), as a junior synonym of more than one species (Armas, 1981, 1988; Fet *et al.*, 2000), or simply referred to as undefined status (Armas, 2001, 2002).

Its nomenclatural history is also curiously linked to that of *Centruroides zayasi* Armas, 1976, which was described from a single female collected in southwestern Haiti (Armas, 1976): both taxa have been cited as subjective synonyms once and again by Armas (1981, 2001, 2002, 2006), mostly because the types of *C. tenuis* were never examined by him. Nevertheless, the situation became even more complicate when it was discovered that all specimens from Dominican Republic that had been referred to the latter in these four papers were actually cases of misidentification: first, Armas & Marcano Fondeur (1987) described part of them as *Centruroides bani* Armas & Marcano Fondeur, 1987, then, Armas (2001) and Teruel (2005) both declared the others as misidentifications and last, Teruel *et al.* (2015) finally described them as *Centruroides lucidus* Teruel, Armas & Kovařík, 2015. Moreover, the taxonomic status of both *C. tenuis* and *C. zayasi* was declared as definition-pending in the most recent catalogue of Hispaniolan scorpions (Santos *et al.*, 2016).

Thanks to the kind mediation of Antonio Melic (Sociedad Entomológica Aragonesa), a series of high-resolution, full color digital photographs of three syntypes of *C. tenuis* were finally made available to the present author. This revealed that these three syntypes belong to two different taxa: the adult male and female from "S. Domingo" (labeled as Thorell's types # 68 and 67, respectively) are conspecific with *Centruroides marcanoi* Armas, 1981, while the female from "New York" (Thorell's type # 69) is conspecific with the holotype and single known specimen of *C. zayasi*, as clearly shown in the figure 1 of the present paper.

This leads to a complicate nomenclatural decision: these two taxa were described much later than *C. tenuis* and thus, both names now represent its objective junior synonyms, but have been regarded as valid either always (*C. marcanoi*) or for more than 10 years (*C. zayasi*); then, which one must be selected to enter synonymy by designating a lectotype of the latter? We chose the second because of the following sound reasons:

- The binomen *C. zayasi* has had an unstable and controversial taxonomic history, even with synonymies included. As opposite, *C. marcanoi* has always been acknowledged as valid and has never had any taxonomical problems, thus, nomenclatural stability as first and foremost principle of the Code (ICZN, 1999) is best served by retaining the latter binomen.
- This female syntype conspecific with *C. zayasi* is the only well-preserved syntype, which warrants that its morphological characters can be reliably evaluated for further taxonomic studies (fig. 1).

Thus, the female syntype from New York (Thorell's type # 69) is herein designated as the lectotype of *Centrurus tenuis* Thorell, 1876 and the following subsequent synonymy is proposed: *Centrurus tenuis* Thorell, 1876 [currently *Centruroides tenuis* (Thorell, 1876)] = *Centruroides zayasi* Armas, 1976, **new synonym**. And consequently, the type locality of *C. tenuis* which was originally vaguely fixed as "West Indies" (Thorell, 1876), is herein



Fig. 1. Top: syntypes of *Centrurus tenuis* herein examined, in complete dorsal views with accompanying labels: male and female from "S. Domingo" (left and center, respectively) and female from "New York" (right); note that the specimen herein designated as lectotype is in remarkably better condition than, and evidently not conspecific to, the other two. **Bottom:** included for direct comparison, adult male and female topotypes of *Centruroides marcanoi* (left and center, respectively) and female holotype of *Centruroides zayasi* (right), complete dorsal views; note that each specimen is clearly conspecific with the one placed right above it.



Fig. 2. Known geographical distribution of *Centruroides tenuis*, based upon its junior synonym *C. zayasi*.

estricted to the westernmost part of the Tiburon Peninsula (Département du Sud, Haiti), in the island of Hispaniola (fig. 2).

Last, the list of comparative specimens examined herein is as follows, from the collections of the present author (RTO) and Instituto de Ecología y Sistemática, Havana, Cuba (IES):

● ***Centruroides marcanoi.*** DOMINICAN REPUBLIC: Pedernales Province: Pedernales Municipality: Sierra de Bahoruco: Río Mulito (type locality); 18°09'16"N - 71°45'30"W; 270 m a.s.l.; 12/March/2014; under barks of trees and fence posts; R. Teruel, F. Kovařík, P. Kindl; 6♂♂, 3♀♀ topotypes (RTO). Dark, deep creek on road roughly midway between Mencía and Aguas Negras; 18°09'56"N - 71°43'00"W; 564 m a.s.l.; 12/March/2014; under barks of trees; R. Teruel, F. Kovařík, P. Kindl; 2♀♀ (RTO). Km 24 of road from Cabo Rojo to El Aceitillar; 18°06'45"N - 71°37'02"W; 782 m a.s.l.; 11–12/March/2014; under barks of trees; 2♂♂, 6♀♀, 1 juvenile (RTO). Barahona Province: Cabral Municipality: Sierra de Bahoruco: km 7–9 of road from Cabral to Polo; 18°10'55"N - 71°15'10"W; 221 m a.s.l.; 7–8/March/2014; under rocks; R. Teruel, F. Kovařík, P. Kindl; 1♂, 10♀♀, 2 juveniles (RTO). Barahona Municipality: Playa Azul: La Vuelta de Gabino; 18°08'34"N - 71°03'53"W; 30 m a.s.l.; 7/March/2014; on bush branches at night, UV detection; R. Teruel, F. Kovařík, P. Kindl; 1♀, 1 juvenile (RTO).

● ***Centruroides zayasi.*** HAITI: Département du Sud: Tiburon Peninsula: Les Cayes: stony area in front of Île à Vache; July/1950; F. de Zayas; 1♀ holotype (IES: 3.1685).

Acknowledgments

I am greatly indebted to Antonio Melic (S.E.A.), for his opportune and kind mediation in obtaining the photos of the syntypes of *C. tenuis*. Also, to Jan Ove Rein (Trondheim, Norway) for the literature provided, which usually implied very old and hard-to-find references. And last, but not least, to two anonymous referees for the peer-review of the manuscript.

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