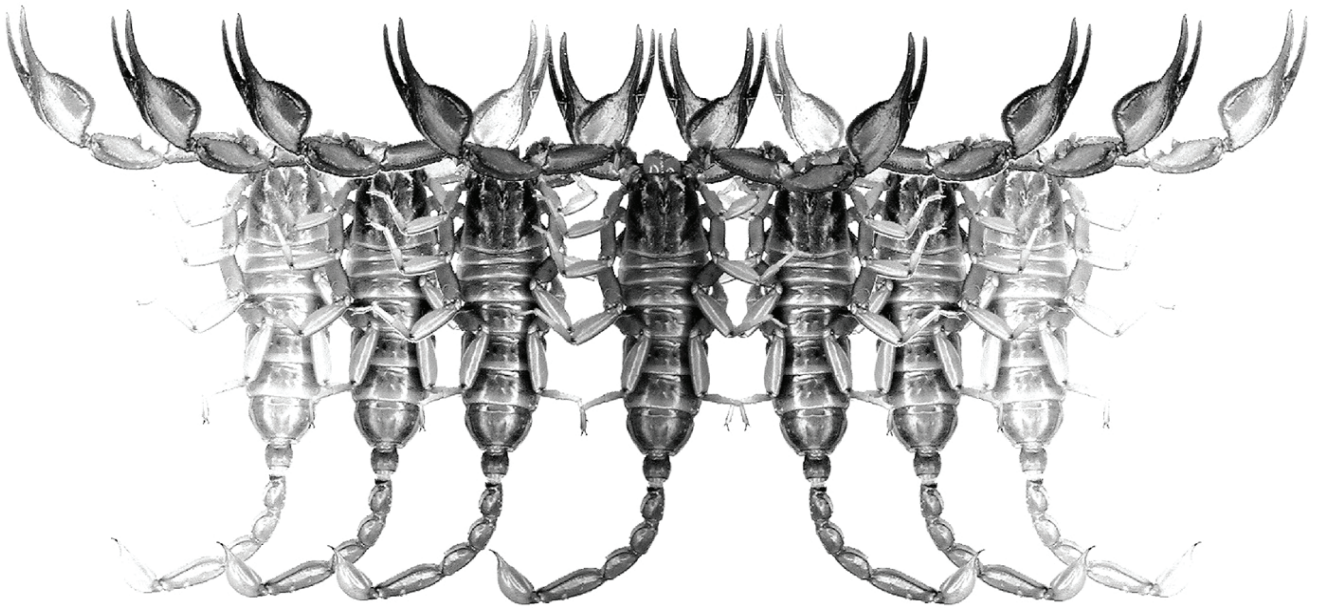


# ***Euscorpius***

**Occasional Publications in Scorpiology**



**Scorpions of Puerto Rico and its satellite islands  
(Scorpiones: Buthidae, Diplocentridae):  
an annotated list, key for genera, and bibliography**

**Luis F. de Armas**

**May 2020 — No. 311**

# *Euscorpius*

## *Occasional Publications in Scorpiology*

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# Scorpions of Puerto Rico and its satellite islands (Scorpiones: Buthidae, Diplocentridae): an annotated list, key for genera, and bibliography

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## Summary

An annotated list of the scorpions of Puerto Rico and its satellite islands (mainly Vieques, Culebra, Caja de Muertos, Magueyes, Desecheo, and Mona), a key for the seven genera present in those insular territories, a key for the three species of *Microtityus*, and the basic bibliography on taxonomy and natural history are provided. Of the 16 confirmed species described from these Greater Antillean islands, four are known only from a single sex and only one or two adult specimens. Seven species (six of them from the genus *Tityus*), are endemic to the Puerto Rico Island; Vieques has two species, whereas Mona Island and Culebrita Island have one species each. At least two species are shared with Hispaniola, whereas one is also found in the Virgin Islands. The only introduced species is *Isometrus maculatus* (De Geer, 1778). The buthid *Tityus dasyurus* Pocock, 1897, described from “Porto Rico”, likely is not a Puerto Rican taxon.

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## Introduction

The island of Puerto Rico (Fig. 1) is situated in the Caribbean Sea and is part of the Greater Antilles, being the smaller among those insular territories (the others are Cuba, Hispaniola, and Jamaica). Until the present century, the scorpion fauna of Puerto Rico and its satellite islands remained poorly known; for example, Armas (2001a) listed six species belonging to four genera of the families Buthidae and Diplocentridae. Fortunately, during the last two decades this situation has favourably changed and now the list has increased to about 20 species (Teruel et al., 2015).

In 1984, Jorge A. Santiago-Blay concluded his six-year studies on the scorpions of the Greater Puerto Rico Region, which includes the islands of Puerto Rico, Mona, Desecheo, Caja de Muertos, Culebra, Vieques, and also the Virgin Islands (Santiago-Blay, 1984). A list of the species was published (Santiago-Blay, 1983), but the new species discovered during that project waited for 25 years for a formal description (Santiago-Blay, 2009). Unfortunately, these descriptions were very brief, and the promised details are yet unpublished. Of the eight new species described by Santiago-Blay (2009), three have been relegated as junior synonyms (Armas, 2009; Esposito et al., 2017; Teruel et al., 2017), and perhaps other two species might be suffering the same fate. Recently, Teruel et al. (2018) redescribed *Tityus estherae* Santiago-Blay, 2009 and provided additional information on its taxonomy, distribution, and natural history.

The genera *Cazierius* Francke, 1978 and *Rhopalurus* Thorell, 1876 [the Greater Antillean species of the latter were transferred by Esposito et al. (2017) to *Heteroctenus* Pocock, 1893] were recorded from Mona Island by Armas (2005) and Santiago-Blay (2009), respectively. The presence in Puerto Rico of the genus *Microtityus* Kjellesvig-Waering, 1966, predicted by Armas (1984: 5), was recently confirmed by Teruel et al. (2014, 2015), increasing to seven the number of scorpion genera present in Puerto Rico and its satellite islands. In the present contribution, we provide an annotated list of the scorpions described or recorded from Puerto Rico and its satellite islands, a key for the identification of the seven genera present in those insular territories, another key for members of the genus *Microtityus* in these islands, and the basic bibliography on taxonomy and natural history of the involved taxa. Solid keys for species of *Centruroides* Marx, 1890 and *Tityus* C. L. Koch, 1836 are not possible due to the insufficient taxonomical information for some of their species, mainly those described by Santiago-Blay (2009).

## Methods & Material

The taxonomical information and bibliography are actual until April 30, 2020. The bibliography is mainly devoted to those papers containing relevant data on taxonomy and natural history, although other matters are not excluded. Taxa are alphabetically arranged. Terminology follows Stahnke (1971). The map (Fig. 1) has been adapted from Microsoft Encarta 2009.



Figure 1. Geographical position of Puerto Rico and its most relevant satellite islands.

## Systematics

### Annotated List

#### Family Buthidae

*Centruroides bani* Armas & Marcano Fondeur, 1987.

DISTRIBUTION. Hispaniola and Mona Island (Puerto Rico). This species was recorded from Mona Island by Esposito et al. (2017: 27), but without mentioning the material examined. Teruel et al. (2017) synonymizes *Centruroides mariaorum* Santiago-Blay, 2009, described from Mona Island, to *C. bani*, and added new localities from this small insular territory, as well as notes on its habitat.

*Centruroides griseus* (C. L. Koch, 1844).

DISTRIBUTION. Virgin Islands and Puerto Rico, including some satellite islands of the last (Vieques, Culebra, Caja de Muertos, Magueyes). The presence of *C. griseus* in Desecheo Island (Torres-González, 1965, cited by Santiago-Blay, 2009: 112) was considered by Teruel et al. (2015: 13) as needed of verification and probably erroneous. The Puerto Rican population was described by Armas (1982) as *Centruroides griseus borinquensis*, but later downgraded by him to subspecies (Armas, 1988: 50). Nevertheless, Santiago-Blay (2009: 112) mentioned it as a subspecies of *C. griseus* (C. L. Koch, 1844), whereas Esposito & Prendini (2019) removed it

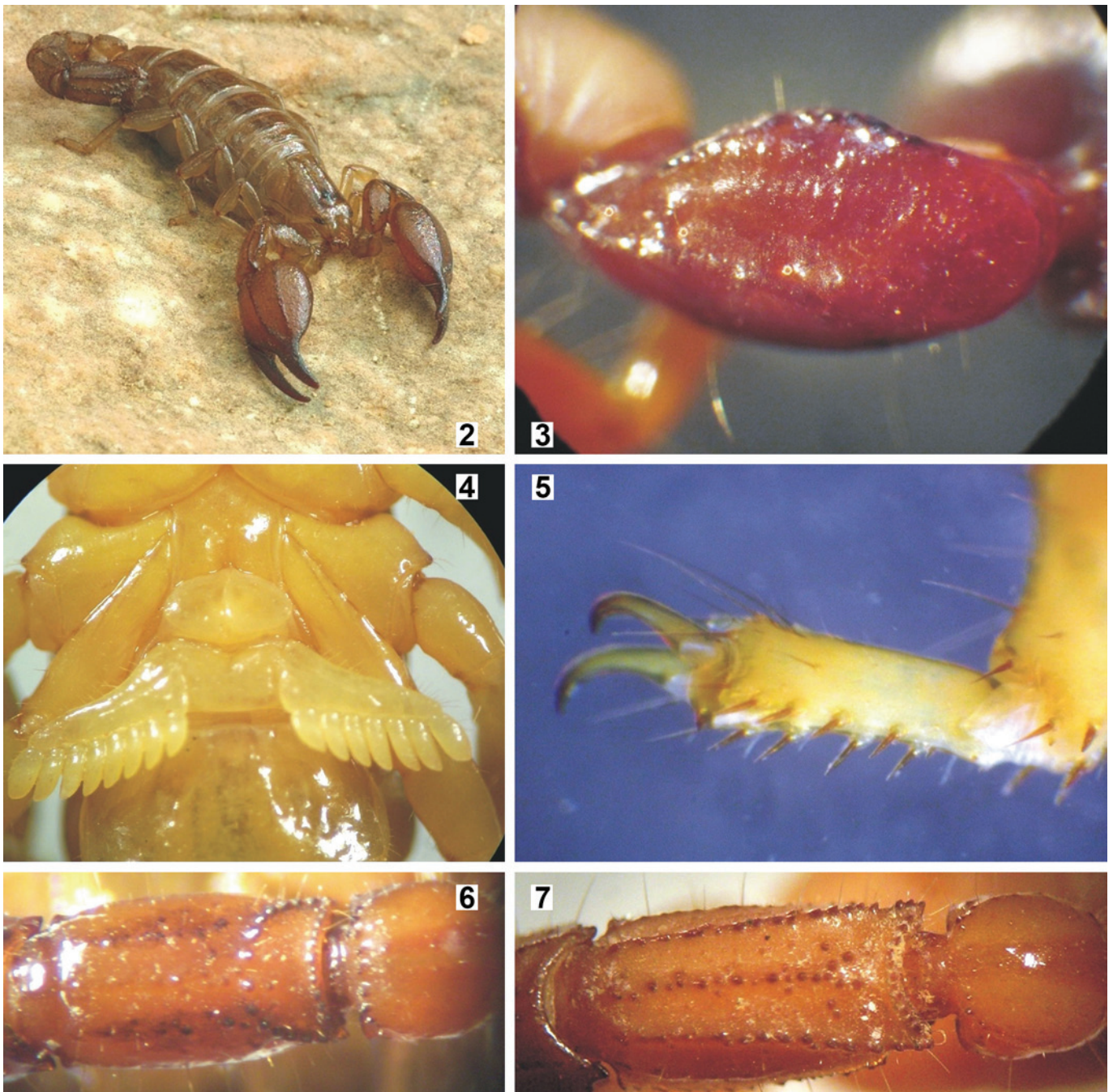
from the synonymy with *C. griseus*, and raised it to the species level, a nomenclatural action overlooked by Crew & Esposito (2020: fig. 11), who again mentioned it as a subspecies of *C. griseus*. If *C. griseus borinquensis* is a good species, then it would be most strongly demonstrated. Consequently, at this moment caution seems preferable. This is the most common scorpion in Puerto Rico and Virgin Islands, also being synanthropic (Santiago-Blay, 2009).

*Centruroides jorgeorum* Santiago-Blay, 2009.

DISTRIBUTION. Only known from the type locality: Puerto Rico: Patillas: Barrio Guardarraya, close to Barrio Pollo. This species was barely described on the basis of a single adult female, which is the only known specimen. On July 28, 2010, personal effort for rediscovering it in the type locality was fruitless. It remains as a species pendant of confirmation (Teruel et al., 2015: 12).

*Centruroides sasae* Santiago-Blay, 2009.

DISTRIBUTION. Only known from the type locality: Caja de Muertos Island. This species was described on the basis of a single adult male, which is the only known specimen. Its description is very inadequate and efforts for rediscovering it have been unproductive, because all the collected specimens were *C. griseus* (Armas, 2010; Teruel et al., 2015). In a very



**Figures 2–7:** Diplocentrid characters. **Figures 2, 4, 7.** *Heteronebo portoricensis*, female in vivo habitus (2), coxosternal area (4); metasoma V, ventral aspect (7). **Figures 3, 5.** *Oiclus* sp., pedipalp patella, ventral aspect (3); leg IV tarsomere II (5). **Figure 6.** *Cazierius garridoi*, metasoma V, ventral aspect.

recent paper on Caribbean arthropod biogeography, Crew & Esposito (2020: fig. 11) included this dubious species in their analyses, but likely they were in error. Its taxonomical status is pendant of confirmation (Teruel et al., 2015: 12; but also see Armas, 2010: 62).

*Isometrus maculatus* (De Geer, 1778).

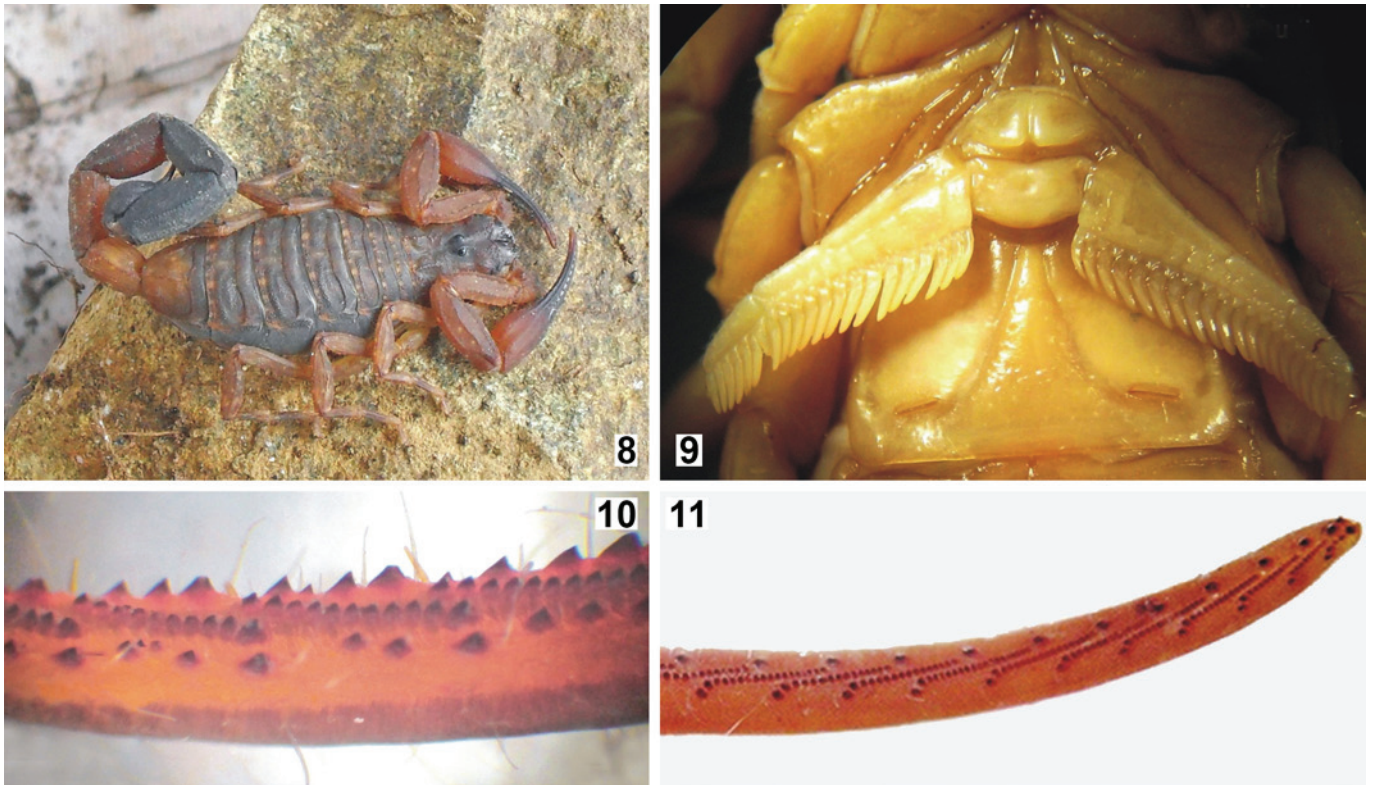
**DISTRIBUTION.** Cosmotropical. This synanthropic species was recorded by Banks (1906) from San Juan, Puerto Rico; Santiago-Blay (2009) mentioned 60 specimens that he alleged were examined, but data on their localities were lacking.

*Microtityus borincanus* Teruel, Rivera & Sánchez, 2014.

**DISTRIBUTION.** Only known from the type locality: Puerto Rico: Sabana Grande Municipality: Barrio Susúa, Susúa State Forest (18°05'34"N 66°54'32"W). This species was described on the basis of a single adult female, which is the only known specimen.

*Microtityus santosi* Teruel, Rivera & Sánchez, 2014.

**DISTRIBUTION.** Only known from the type locality: Culebrita Island (18°05'34"N 66°54'32"W). This species was described on the basis of a single adult female, which is the only known



**Figures 8–11.** Buthid characters. **Figure 8.** *Tityus obtusus*, female in vivo habitus. **Figure 9.** *Heteroctenus abudi*, female, coxosternal region and sternite III. **Figure 10.** *Heteroctenus abudi*, pedipalp movable finger dentition, showing the median rows of denticles and the accessory denticles (10). **Figure 11.** *Tityus* sp., pedipalp movable finger dentition.

specimen. On the apical area of the left comb of the holotype (Fig. 13) there are two egg-like organisms solidly attached, similar to those found on some scorpions and a Colombian schizomid (Armas, 2003: fig. 2; Delgado-Santa & Armas, 2013: fig. 3B), which were overlooked by Teruel et al. (2014). This enigmatic organism resembles an insect or mite egg, but its real origin is yet unknown. It also has been observed on an *Oiclus* sp. (Diplocentridae) from St. Kitts, Lesser Antilles (pers. obs.).

*Microtityus vieques* Teruel, Rivera & Santos, 2015.

**DISTRIBUTION.** Only known from the type locality: Vieques Island (probably from Monte Pirata, western part of the island). The female holotype and a male paratype are the only known specimens.

*Heteroctenus abudi* (Armas & Marcano Fondeur, 1987).

**DISTRIBUTION.** Dominican Republic (Hispaniola Island) and Mona Island (Puerto Rico). This species was described from Mona Island as *Rhopalurus virkkii* Santiago-Blay, 2009, but Esposito et al. (2017) transferred it to *Heteroctenus* and synonymized it with *H. abudi*, as previously suggested by Teruel & Armas (2012: 216-217).

*Tityus alexandroi* Teruel, Rivera & Santos, 2015.

**DISTRIBUTION.** Only known from the type locality: Vieques Island, probably from Monte Pirata (eastern part of the island). The only known specimens are the adult male holotype and two juvenile male paratypes.

*Tityus angelesae* Santiago-Blay, 2009.

**DISTRIBUTION.** Southwestern Puerto Rico. Of this species only two specimens are known: the female holotype from Susúa State Forest, Sabana Grande Municipality, and other female from Juana Diaz, approximately 40 km E of the type locality (Teruel et al., 2015: 10).

*Tityus estherae* Santiago-Blay, 2009.

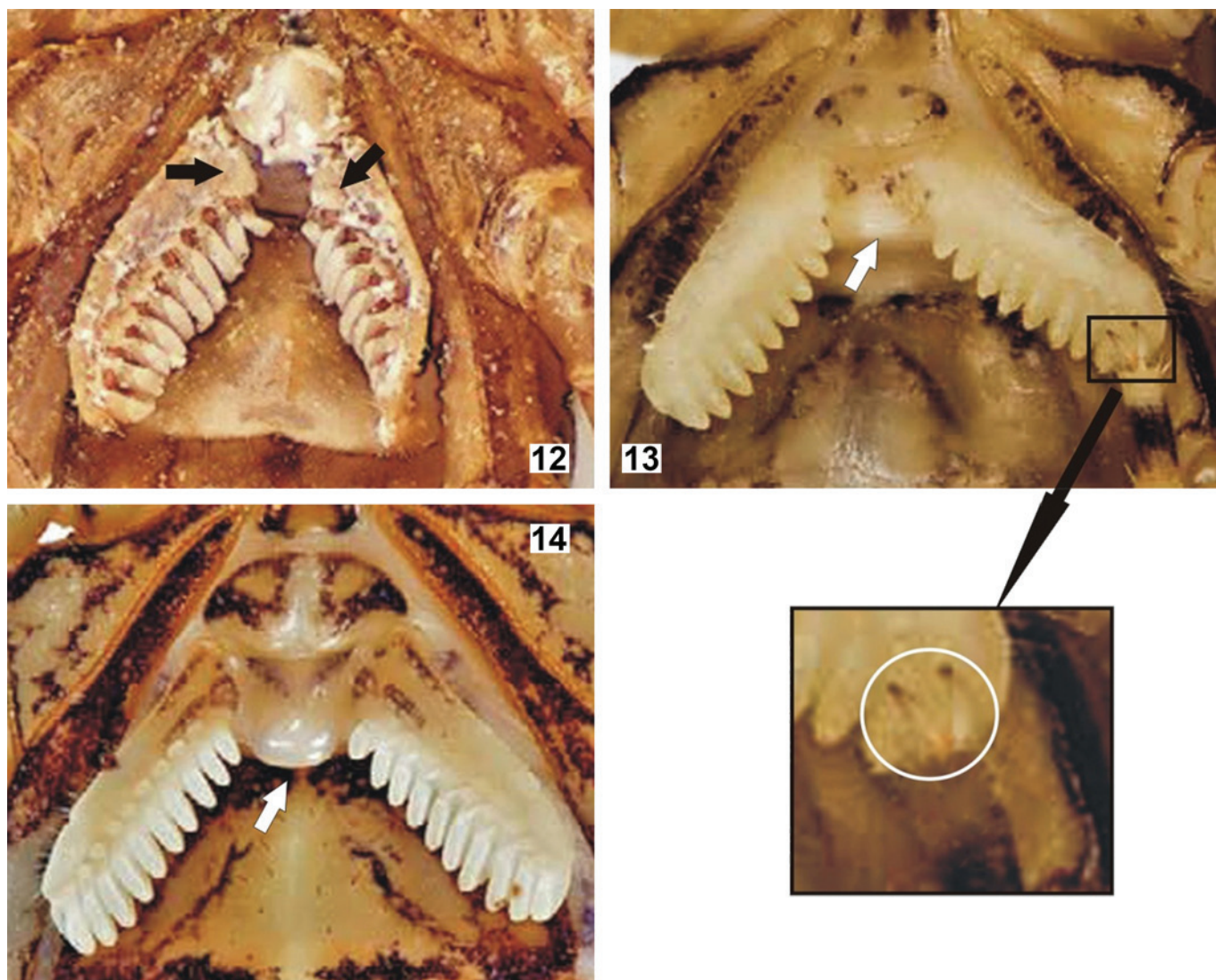
**DISTRIBUTION.** Most parts of Puerto Rico. A redescription of this species and data on its natural history were provided by Teruel et al. (2020).

*Tityus juliorum* Santiago-Blay, 2009.

**DISTRIBUTION.** Mainly northeastern Puerto Rico. According with Teruel et al. (2015: 10-11), an adult female and two immatures collected on south of Sierra de Guardarraya, Patilla, southeastern Puerto Rico, recorded by Armas (2010) as this species, might be *T. alexandroi*.

*Tityus michelii* Armas, 1982.

**DISTRIBUTION.** Only known from the type locality: Puerto Rico: Ponce municipality: Guánica Forest. This is a very rare species of which only limited specimens have been collected (Teruel & Armas, 2006). As pointed out by Teruel & Sánchez (2009: 332), it is probable that some of the 25 adult specimens mentioned by Santiago-Blay (2009: 118) really belong to *Tityus riverai* (unfortunately, data of those specimens are unknown).



**Figures 12–14:** *Microtityus* spp., pectines. **Figure 12.** *M. vieques*, male holotype, basal middle lamella conspicuously enlarged, modified from Teruel et al. (2015: fig. 2b). **Figure 13.** *M. santosi*, female holotype, basal plate and the distal area of the left comb, showing two egg-like organisms firmly attached (outside square), modified from Teruel et al. (2014: fig. 5c). **Figure 14.** *M. borincanus*, female holotype, basal plate, modified from Teruel et al. (2014: fig. 2c).

*Tityus obtusus* (Karsch, 1879).

**DISTRIBUTION.** Puerto Rico. This species is widely distributed in this island and has been studied from several points of view (Torres-González, 1965, 1967; Armas, 1977, 1982, 2010; Santiago-Blay, 2009; Teruel & Sánchez, 2010).

*Tityus riverai* Teruel & Sánchez, 2009.

**DISTRIBUTION.** Only known from the type locality: Puerto Rico: Río Grande: circa 3 km E of Las Coles, end of the road 968.

#### Family Diplocentridae

*Cazierius garridoi* Armas, 2005.

**DISTRIBUTION.** Mona Island. This species was erroneously described from Puerto Rico: Cordillera Central: Cerro de Puntas, but Armas (2006) emended this mistake. It was also described by Santiago-Blay (2009) as *Cazierius tatae*, but synonymized by Armas (2006). In their study on the scorpion fauna of Mona Island, Teruel et al. (2017) provided additional

data on its natural history and also suggested that this species might be a junior synonym of *Cazierius cicero* (Armas & Marcano Fondeur, 1987) from the Dominican Republic.

*Heteronebo portoricensis* Francke, 1978.

**DISTRIBUTION.** Southwestern parts of Puerto Rico, including the adjacent islands of Cueva, Caja de Muertos, Magueyes and Guayacán. The presence of this species in the Desecheo Island (Torres-Gonzalez, 1965, cited by Santiago-Blay, 2009: 111) was considered by Teruel et al. (2015: 13) as needing a verification and probably erroneous. An immature recorded by Armas (2005) from Mona Island was really a mislabeled specimen from Puerto Rico (Teruel et al., 2017).

#### Dubious species

*Tityus dasyurus* Pocock, 1897. This species was described from “Porto Rico”, but Teruel et al. (2020: 12) suggested that it seems to be a South or Central American taxon.

**Remarks.** Of the 16 confirmed species of scorpions described from these Greater Antillean islands, four (*M. borincanus*, *M. santosi*, *T. alexandroi*, *T. angelesae*) are known for a sex and only one or two adult specimens. Seven species, six of them belonging to the genus *Tityus*, are endemic of Puerto Rico Island; Vieques has two ones (*M. vieques* and *T. alexandroi*), whereas Mona Island and Culebrita Island has one species each (*C. garridoi* and *M. santosi*, respectively). At least two species (*C. bani* and *H. abudi*) are shared with Hispaniola and one (*C. griseus*) is also found in Virgin Islands. The only introduced species is *I. maculatus*.

Two species (*Centruroides jorgeorum* Santiago-Blay, 2009 and *C. sasae* Santiago-Blay, 2009) remain to be confirmed and are not listed among the 16 confirmed ones; and one more species (*Tityus dasyurus* Pocock, 1897) is possibly not a Puerto Rican taxon (Teruel et al., 2020).

#### Key for the genera (mainly adult specimens)

1. Pedipalp chelae very robust (Fig. 2). Ventral surface of the pedipalp patella with three trichobothria (Fig. 3). Sternum clearly pentagonal (Fig. 4). Pectines with six to eight teeth (Fig. 4). Leg tarsomere II (telotarsus) with two rows of spine-like setae (Fig. 5). .....(Diplocentridae) 2
- Pedipalp chelae feeble (Fig. 8). Ventral surface of the pedipalp patella without trichobothria. Sternum subtriangular to subpentagonal (Fig. 9). Pectines with more than eight teeth (Figs. 9, 12-14). Leg tarsomere II (telotarsus) without spine-like setae. ....(Buthidae) 3
2. Ventral surface of the metasomal segment V with a distal semicircular area, anteriorly delimited for well-defined transversal carina (Fig. 6). .....*Cazierius*
- Ventral surface of the metasomal segment V without a distal semicircular area, with the transversal carina poorly defined (Fig. 7). .....*Heteronebo*
3. Pedipalp fixed finger with six rows of denticles, being the basal one very long (it occupies almost the basal one-half of the finger). .....*Isometrus*
- Pedipalp fixed finger with more than six rows of denticles, being the basal one very short (it occupies approximately one-eighth of the total length of the finger). ..... 4
4. Pedipalp fingers with inner accessory denticles and accessory outer denticles (Fig. 10). ..... 5
- Pedipalp fingers without either inner accessory denticles or outer accessory denticles (Fig. 11). ..... 6
5. Sternite III (the first post-pectinal) with a well-developed pair of longitudinal furrows, which converge towards the anterior part of the plate (Fig. 9). .....*Heteroctenus*
- Sternite III (the first post-pectinal) without longitudinal furrows or a feebly submedian pair only. .... *Centruroides*

6. Carapace subtriangular. Tergites with at least three well-developed longitudinal carinae. Pedipalp fingers with the median rows of denticles not imbricate. ....*Microtityus*
- Carapace subrectangular. Tergites with a single longitudinal carina. Pedipalp fingers with the median rows of denticles clearly imbricate (Fig. 11). .....*Tityus*

#### Key for species of the genus *Microtityus* (mainly females)

1. Basal middle lamella of the pectines conspicuously enlarged in both sexes (Fig. 12). ..... *M. vieques*
- Basal middle lamella of the pectines not enlarged neither in female or male. .... 2
2. Female with pectinal basal plate wider than long, not spatulate (Fig. 13). ..... *M. santosi*
- Female with pectinal basal plate longer than wide, distally spatulate (Fig. 14). ..... *M. borincanus*

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