Euscorpius

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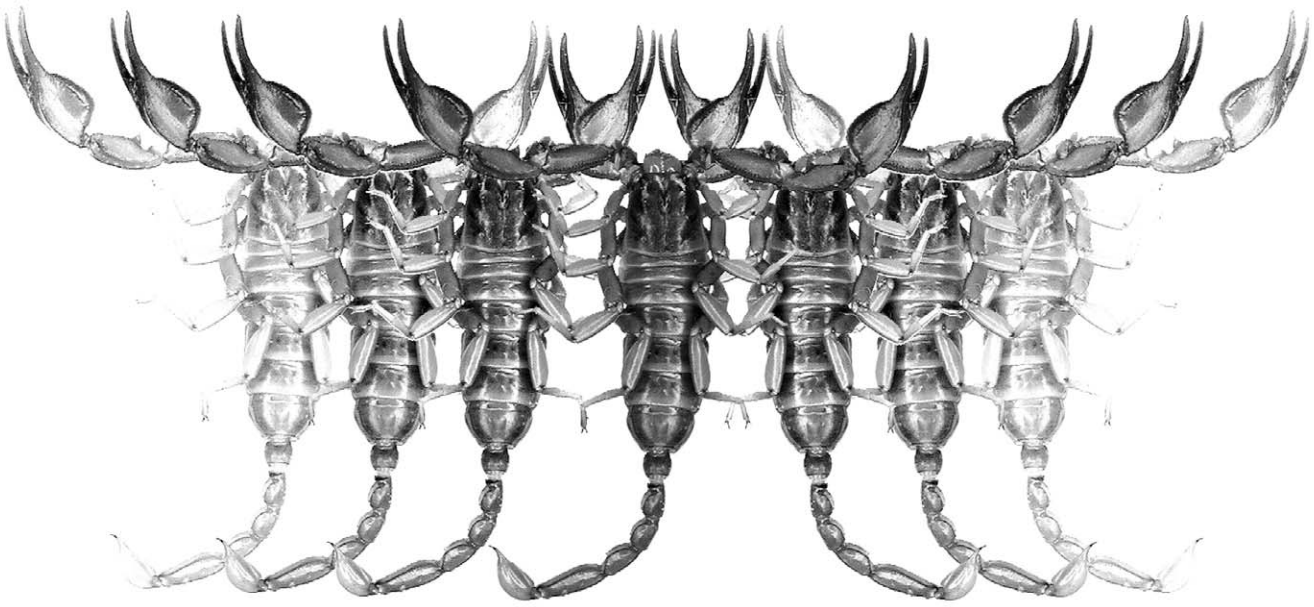

A New Semidesert *Microtityus* Kjellesvig-Waering, 1966 (Scorpiones: Buthidae) from Southeast Cuba, Greater Antilles

Rolando Teruel

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Euscorpius — Occasional Publications in Scorpiology. 2019, No. 273

A new semidesert *Microtityus* Kjellesvig-Waering, 1966 (Scorpiones: Buthidae) from southeast Cuba, Greater Antilles

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Summary

A new species of the buthid scorpion genus *Microtityus* Kjellesvig-Waering, 1966, is herein described from specimens of both sexes collected at three nearby localities in the western part of the Guantánamo Bay Area, southeast Cuba. It belongs in the "jaumei" species-group of the subgenus *Microtityus* (*Parvabsonus*) Armas, 1974 and is very peculiar not only by its external morphology (very distinct from its other Cuban congeners), but also by the unusual habitat where it occurs in and seems to be restricted to (dry and hot cactus scrub on volcanic sandy plain). The present contribution reinforces the position of this genus as the second most diverse in Cuba, with 10 nominal species.

Introduction

The genus *Microtityus* Kjellesvig-Waering, 1966 is noteworthy by two peculiarities. First, the tiny size of its representatives (adults less than 30 mm long but usually not longer than 17 mm), which places them firmly amongst the smallest scorpions worldwide. And second, the high speciation it has undergone both in the continent and the Antillean islands (13 and 27 nominal species, respectively), due to their highly constrained ecological preferences that reflect into extremely restricted geographical occurrences. For details on the above-referred data see Armas & Teruel (2012), Teruel et al. (2015), Santos et al. (2016), and Armas (2018).

Its presence in Cuba was first recorded by Armas (1974), who described three species and also the subgenus *Microtityus* (*Parvabsonus*) to place them all. Thereafter, additional members of this genus were sporadically described from the country (Armas, 1984; Teruel, 2000, 2001; Teruel & Armas, 2006; Teruel & Infante, 2007; Teruel & Kovařík, 2012), all of them assigned to this same subgenus either explicitly or implicitly. In one of these papers, Teruel (2000) divided the members of the subgenus into two groups, based upon the presence of the femoral trichobothrium d_2 ("waeringi" species-group) or its absence ("jaumei" species-group). At this moment, nine nominal species of this genus are known from Cuba.

In the present paper, a remarkable new species of *Microtityus* (*Parvabsonus*) is described from three nearby localities, all enclaved in the southwestern quadrant of the Guantánamo Bay Area. This tiny scorpion seems to be restricted to a very peculiar type of landscape: coastal to subcoastal cactus scrub on volcanic sandy soil, in one of the hottest and driest zones of the Cuban archipelago.

Methods & Material

Specimens were studied under a Zeiss Stemi 2000-C stereomicroscope, equipped with a line scale and a Canon PowerShot A620 digital camera. A variable series of consecutive-plane shots was taken depending on the field depth (i.e., the bulkiest the structure, the largest number of photographs needed) and afterwards, all images of the same structure were assembled into a single fully-focused image using the free software CombineZP. Habitus photographs were taken with a Nikon Coolpix S8100 digital camera. All images were processed with Adobe Photoshop CS5 only slightly, i.e., bright/contrast optimization, removal of artifacts and unnecessary details from background and assemblage of plates.

Nomenclature and measurements follow Stahnke (1971), except for trichobothriotaxy (Vachon, 1974), metasomal carinae (Francke, 1977), pedipalp chela

carinae (Acosta et al., 2008, as interpreted by Armas et al., 2011), and sternum (Soleglad & Fet, 2003). Unless otherwise noted, all morphologically diagnostic characters mentioned in the diagnoses and comparisons refer to adults of both sexes. Counts are given as fractions meaning left/right sides.

Distribution maps were constructed in Mapinfo Professional ver.10, using precise coordinates either taken in situ with a portable GPS device (Datum WGS84) or extracted from 1: 25,000 military-reference maps.

The literature cited here is not an exhaustive compendium for each taxon, but a selection of those more relevant to the subject of the present paper: original descriptions, redescriptions, taxonomic revisions, and those contributing relevant information on ecology and geographical distribution.

All specimens are preserved in 80% ethanol, with labels laser-printed in Spanish (transcribed into English here for text coherence), and deposited in the personal collection of the author (RTO) and Instituto de Ecología y Sistemática, Havana (IES).

Systematics

Family Buthidae C. L. Koch, 1837
Genus *Microtityus* Kjellesvig-Waering, 1966

Microtityus* (*Parvabsonus*) *vulcanicus Teruel, **sp. n.**
(Figures 1–16; Table I)
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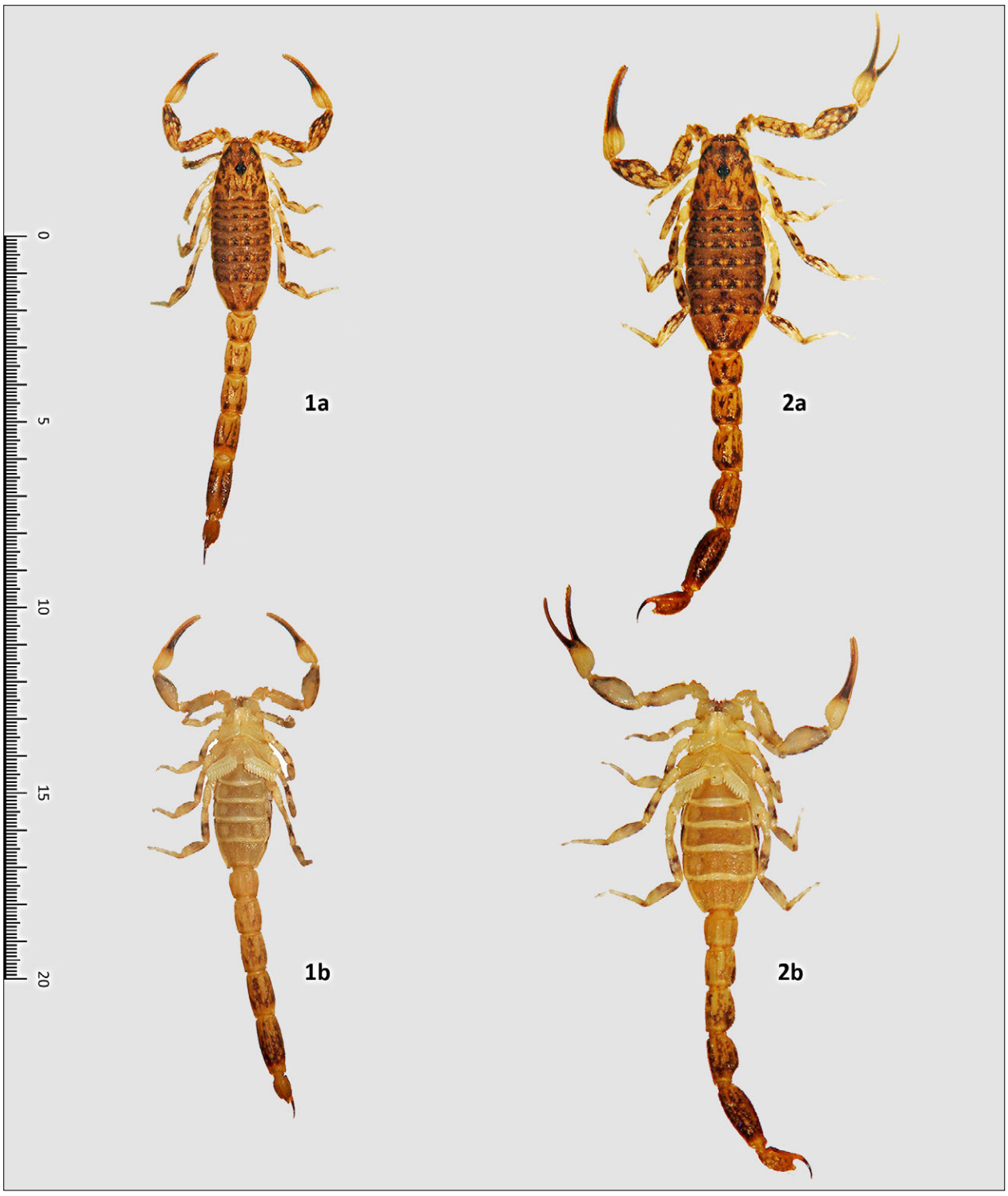
HOLOTYPE. ♂ (RTO). CUBA, GUANTÁNAMO PROVINCE, Caimanera Municipality, Guantánamo Bay Area, 4 km northwest of Tres Piedras Military Post, in trail to Los Monitongos (19°56'12"N - 75°16'28"W), 95 m a.s.l., under rock, cactus scrub on volcanic sandy plain, 24/October/2015; R. Teruel.

PARATYPES (13 specimens: 3♂♂, 6♀♀, 4 juveniles). CUBA, GUANTÁNAMO PROVINCE, Caimanera Municipality, Hatibonico, Los Monitongos (19°56'25"N - 75° 18'49"W), 110 m a.s.l., under rocks, dry forest on volcanic sandy foothill, 8/June/2001, J. A. Genaro, L. M. Díaz, 2♀♀, 2 juvenile ♀♀ (IES). Guantánamo Bay Area, 4 km northwest of Tres Piedras Military Post, in trail to Los Monitongos (19°56'12"N - 75°16'28"W), 95 m a.s.l., under rocks, cactus scrub on volcanic sandy plain, 24/October/2015; R. Teruel, 3♂♂, 2♀♀ (RTO). Tres Piedras Military Post (19°54'49"N - 75°14'40"W), 105 m a.s.l., under rocks, cactus scrub on volcanic hilltop, 23/October/2015, R. Teruel, 2♀♀, 2 juvenile ♂♂ (RTO).

ETYMOLOGY. The selected epithet is the Latin adjective that alludes to the kind of soil where this species lives and seems to be endemic from.

DIAGNOSIS. A member of the "jaumei" species-group (pedipalps neobothriotaxic: femoral trichobothrium d_2 absent). Adult size medium for the group (males 11 mm, females 13–14 mm). Coloration light yellowish to orange brown, densely and complexly patterned with dark to blackish brown spots and reticulations superimposed on fainter, larger, dark orange-brown spots all over the body and appendages except ventrally; tergites with irregularly defined longitudinal dark stripes; pedipalp hand faintly (males) to moderately (females) spotted with dark orange-brown, fingers dark brown with yellowish tips; metasomal segments IV–V and telson slightly more reddish. Pedipalp fixed and movable fingers with nine principal rows of denticles. Pectines with 11–12 teeth (mode 11) in males and 9–11 (mode 10) in females; basal middle lamella slightly enlarged in both sexes; basal plate wider than long and unmodified in males, longer than wide, spatulate and with posterior margin straight in females. Sternites IV–V with two carinae, VI–VII with four; posterior margin of III very convex, with the smooth patch large, subtriangular, bulky, and not protruding beyond margin; V with the smooth patch very large, subtriangular and bulky (males) or medium-sized, teardrop-shaped and almost flat (females). Metasoma moderately short and slender, with 10-10-8-8-5 complete, strong, sharply serrate carinae, dorsolateral carinae with terminal denticle sharply enlarged on segments II–IV, all intercarinal spaces densely and irregularly granulose; segment V prismatic in cross-section, with intercarinal granulation very dense, strong and sharp. Telson vesicle short oval and coarsely granulose, subaculear tubercle large and irregular, without dorsal granules; aculeus shorter than vesicle.

DESCRIPTION (adult male holotype). **Coloration** (Figs. 1, 13a) base light orange-brown, slightly paler on legs and venter and with a subtle reddish shade on metasomal segments IV–V and telson; body and appendages (except on the ventral surface of prosoma and mesosoma) with a complex pattern of dark to blackish brown spots and reticulations superimposed on fainter, larger, dark orange-brown spots all over. Chelicerae with manus yellowish, faintly reticulated with blackish brown and densely infuscate distally; fingers yellowish, with a large median blackish spot. Pedipalp femur and patella very densely reticulated with dark to blackish brown on all surfaces except ventral, which is only faintly infuscate distally; chela with manus faintly but densely spotted with dark orange-brown, fingers dark brown with yellowish tips. Carapace symmetrically reticulated



Figures 1–2: *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.**, adult male holotype and adult female paratopotype, full-body views: **a)** dorsal; **b)** ventral. Scale bar in millimeters.

and spotted with blackish brown, interocular triangle with a pair of large, teardrop-shaped pale spots on anterior portion; eyes and ocular tubercles black. Tergites symmetrically reticulated and spotted with dark to blackish brown (fainter and sparser on VII), irregularly arranged into parallel longitudinal stripes. Pectines immaculate whitish, with basal portion and basal plate progressively darker due to heavier sclerotization. Ster-

Figure 3–4: *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.,** adult male holotype and adult female paratopotype, dorsal close-ups: **a)** pedipalp; **b)** chela.

nites essentially immaculate (only with faint symmetrical infuscation on VII); V with the smooth patch translucent. Legs irregularly annulated with large, dark to blackish spots on alternated on pale background on all surfaces except internally and distally, where pattern gradually becomes much fainter. Metasoma with base color progressively darker and redder distally; all surfaces densely and symmetrically reticulated and spotted with dark to blackish brown, with pattern becoming denser and darker distally and ventrally and along carinae; dorsal surface of all segments with a conspicuous median spot, which is arrowhead-shaped on

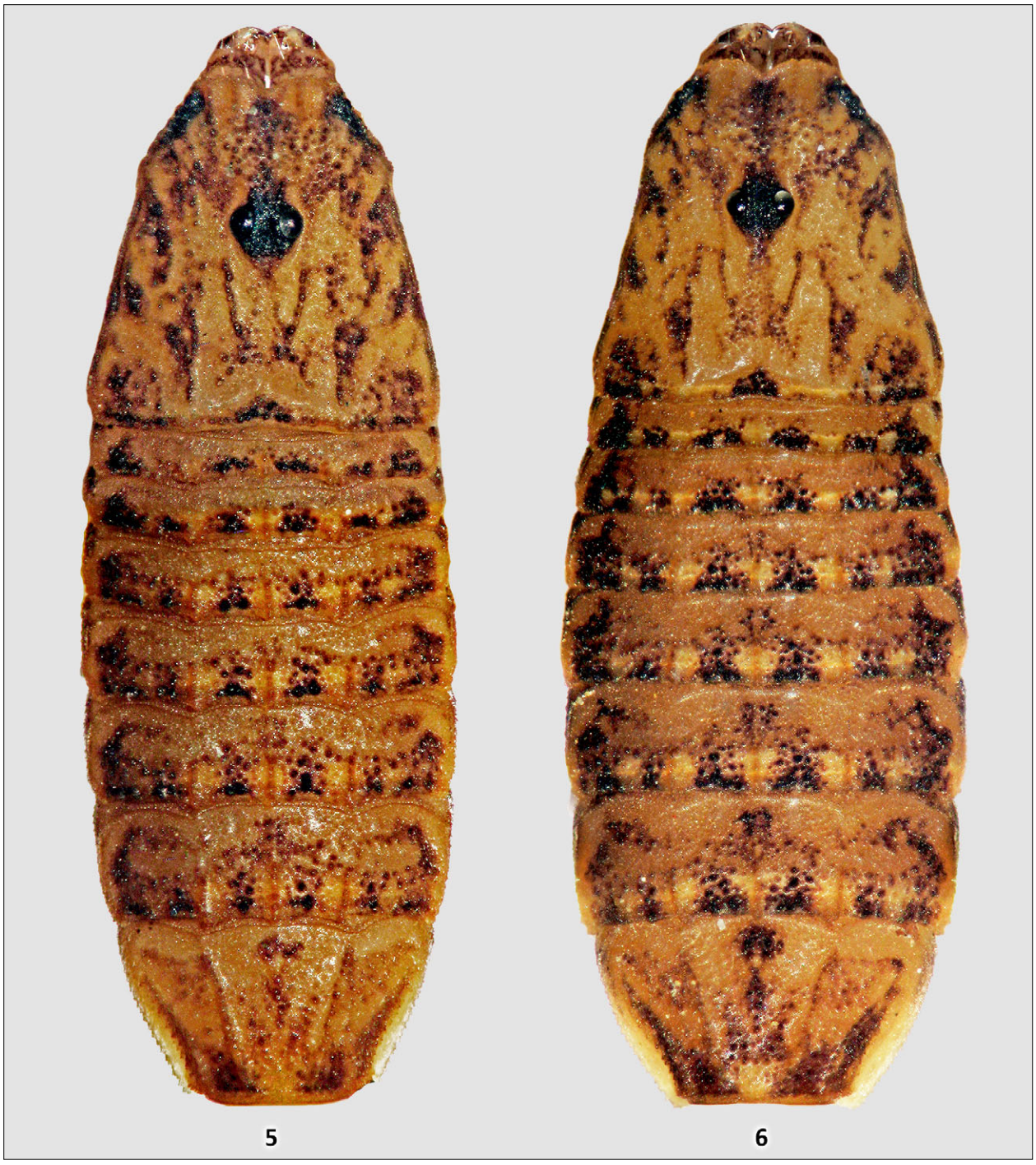


Figure 5–6: *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.**, adult male holotype and adult female paratopotype, dorsal close-ups of carapace and tergites.

I–III, V-shaped on IV and split into two parallel stripes on V. Telson vesicle pale reddish to orange-brown, almost immaculate, only faintly infuscate along ventromedian carina; aculeus with distal two-thirds dark reddish brown.

Chelicerae (Fig. 5). Dentition typical of the genus. Tegument glossy, dorsodistal portion of manus with coarse, glossy granules irregularly arranged transversally, defining a depressed area. Setation very dense ventrally, but essentially lacking dorsally, except for a few rigid macrosetae around depressed area of manus.

Pedipalps (Fig. 3). Of standard size and shape for the genus, sparsely setose. Neobothriotaxic A-α (femur lacking d_2). Femur straight, with five strongly serrate to

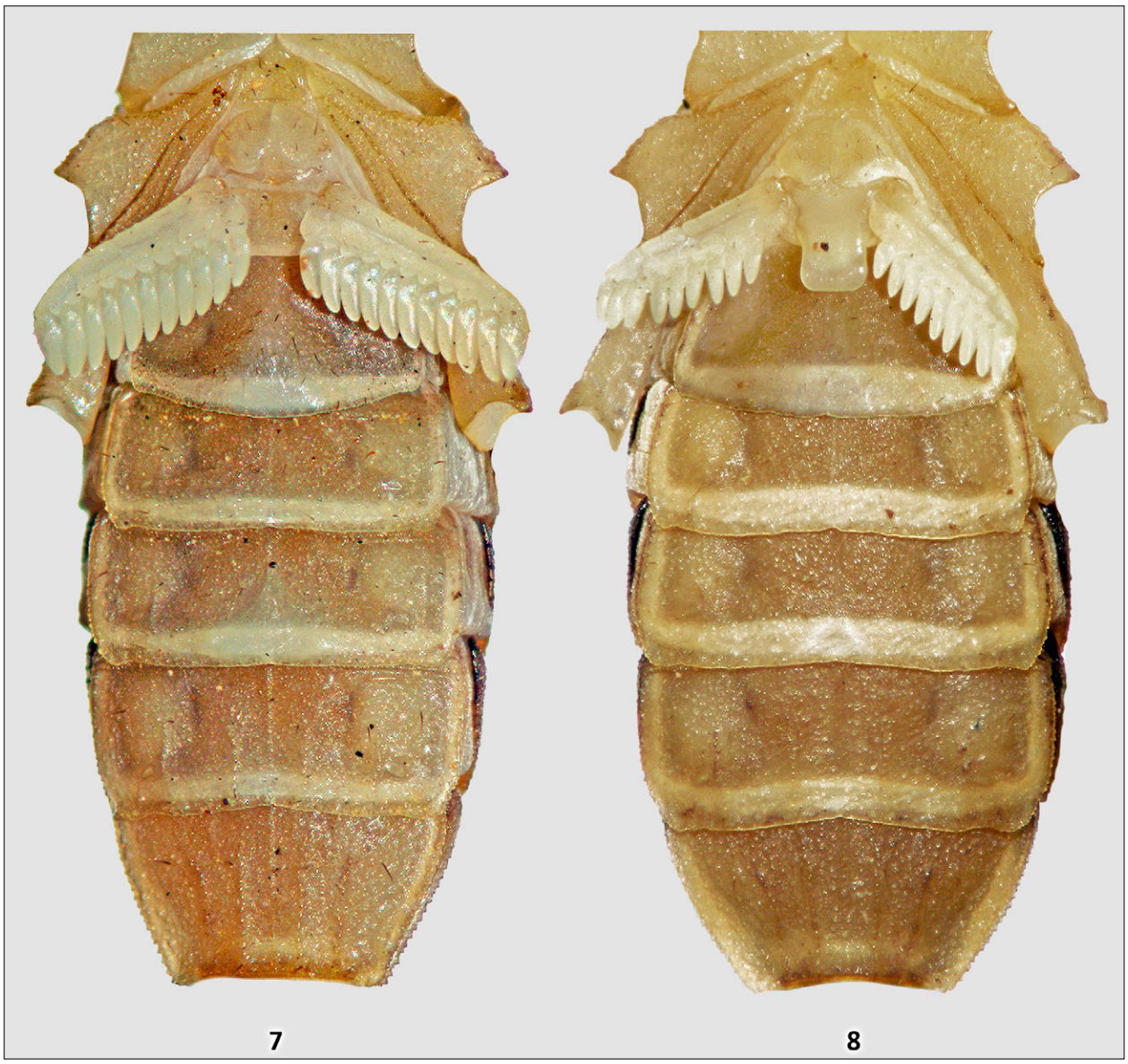


Figure 7–8: *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.**, adult male holotype and adult female paratopotype, ventral close-ups of sternopectinal region and sternites.

serratocrenulate carinae; intercarinal tegument very finely and densely granulose, with abundant coarser, rough granules scattered; internal surface with the four internal (*i*) trichobothria surrounding a very large, irregular, sharp spur. Patella straight, with seven strongly crenulate to subcrenulate carinae; with the same granular sculpture as on femur but finer, internal surface with 4–5 slightly larger denticles. Chela slender and sparsely setose; manus elongate-oval (1.72 times longer than wide) and much narrower than patella (ratio 1.21), with basal half slightly wider and with nine finely granulose to subcrenulate carinae, intercarinal tegument very finely and densely granulose, with slightly larger, rough granules scattered and many sharp conical granules on internal surface; fingers long (movable finger 1.76 times longer than underhand), evenly curved, sparsely setose, and with the same granular sculpture as on manus; fixed finger with 9/9 principal rows of denticles, movable finger with 9/9 plus an apical subrow of 3/2 denticles and a large internal accessory denticle (large terminal denticle not included), basal lobe/notch combination absent, terminal denticle of both fixed and movable finger enlarged sharp, moderately overlapping each other when fingers closed.

Carapace (Fig. 5). Subtriangular and slightly longer than wide; anterior margin rough and narrowly bilobed,

Figure 9–10: *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.**, adult male holotype and adult female paratopotype, close-ups: **a)** sternite V, ventral; **b–d)** metasoma and telson, dorsal, lateral and ventral.

with scattered setation. Carination largely obscured by strong intercarinal granulation, the only definable carinae are all coarsely granulose: the lateral medians and anterior medians (short, straight and essentially parallel), the superciliaries (short and converging medially as inverted parentheses), the central medians (short, straight and converging posteriorly), and the posterior medians (short, straight and essentially parallel). Furrows: anterior median, median ocular, central median, posterior median and posterior marginal fused, narrow and moderately deep, other furrows indistinct. Tegument very finely and densely granulose, with abundant coarser, rough granulation scattered, coarser and denser in ocular triangle and posterolateral areas. Median eyes large and separated by about one ocular diameter; lateral eyes much smaller.

Sternum (Fig. 7). Standard for the genus: type 1, small, slightly wider than long and pentagonal, with two pairs of dark macrosetae. Tegument finely and densely granulose.

Genital operculum (Fig. 7). Large, halves separated along posterior half and roundly subtriangular in shape, with three pairs of dark macrosetae; tegument very finely and densely granulose. Genital papillae thick and slightly protruding. Pre-pectinal plate very wide and heavily sclerotized, with anterior margin straight and posterior margin shallowly convex.

Pectines (Fig. 7). Size and shape standard for the group: short but wide, not reaching leg IV trochanter, subrectangular and sparsely setose. Tooth count 11/11, teeth long, straight and swollen. Basal middle lamella oval and slightly enlarged. Basal plate highly sclerotized, wider than long; anterior margin with a wide and moderately deep V-shaped anteromedian notch, posterior margin essentially straight; tegument finely and densely granulose.

Figure 11–12: *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.**, adult male holotype and adult female paratopotype, close-ups: **a)** metasomal segment V, dorsal; **b)** metasomal segment V and telson, lateral.

Legs. Relatively short but slender, with all carinae strongly serrate; intercarinal tegument very finely and densely granulose, with abundant coarser, rough granulation scattered on all surfaces except internally, where it is smooth. Prolateral and retrolateral pedal spurs short, thick and sharp. Ventral surface of telotarsi round and with many thin, translucent setae irregularly scattered. Claws short and strongly curved.

Mesosoma (Figs. 5, 7). Tergites very finely and densely granulose, with abundant coarser, rough granulation scattered; I–II with five longitudinal carinae, III–VI with three, VII with five, all strong, coarsely granulose, straight, essentially parallel, and developed as follows: median carina on I–VII long but not projected beyond posterior margin, submedian carinae on I–VII long and sharply projected beyond posterior margin except on VII, lateral carinae on I–II short, on III–VI indistinct to absent and on VII long, not projected beyond posterior margin in any segment. Sternites with some dark macrosetae scattered; spiracles oblique, short and slit-like; tegument very finely and densely granulose; III without carinae and with lateral areas depressed to partially fit pectines at rest, IV–VII with four finely granulose, essentially parallel carinae (paired submedians and laterals); posterior margin of III very convex, of IV–V almost straight but medially notched, of VI very widely and shallowly indented, and of VII widely concave; smooth patch of V very large, subtriangular, about as long as wide, bulky, translucent-whitish and glossy.

Metasoma (Fig. 9b–d, 11a–b). Moderately short, slender and progressively narrower and shallower distally. Segments I–II with ten complete carinae, III–IV with eight, V with five, all strong, finely serrate and developed as follows: dorsal laterals well defined and with terminal denticle moderately enlarged on I–IV, absent on V; lateral supramedians well defined on I–V; lateral inframedians well defined on I–II, indicated by isolate, irregularly aligned granules on III–V (not defined as a true, raised carina); ventral laterals well defined on I–V; ventral submedians well defined on I–IV and basal third of V only; ventral median absent on I–IV, well defined on V. Intercarinal tegument very finely and densely granulose, with abundant coarse, rough granules scattered all over, especially on segment V where granulation is very dense, strong and sharp; dorsal furrow complete, moderately narrow and deep on all segments; setation sparse, with two pairs of dark macrosetae over almost all carinae.

Telson (Fig. 11b). Vesicle elongate-oval and slightly compressed (1.71 times longer than wide and 1.04 times deeper than wide) and with some setae of different sizes scattered, some dark and large; tegument coarsely granulose on all surfaces except dorsally; ventral median carina strong, formed by coarse granules that become progressively larger distally into the subaculear tubercle, which is large, sharp, irregularly triangular, apically bifurcate (due to the coalescence of the sharp tip of the subaculear tubercle with the very large terminal granule of the ventral median carina), and lacking dorsal granules. Aculeus long (but shorter than vesicle length), very sharp and evenly curved.

FEMALE (paratopotype: Figs. 2, 4, 6, 8, 10, 12, 13b–d, 14; Table I). Very similar to described male, sexual dimorphism moderately expressed as follows: **1)** size larger; **2)** pedipalps with femur, patella and chela slightly shorter and more robust; **3)** mesosoma wider, with sides more convex; **4)** genital operculum lacking papillae; **5)** pectines with teeth shorter, not swollen and fewer in number, basal middle lamella wider and almost horizontal so the basal portion of pecten lacks teeth, basal plate longer than wide, spatulate and with posterior margin straight; **6)** smooth patch of sternite V medium-sized, teardrop-shaped and almost flat; **7)** metasomal segments and telson slightly shorter and more strongly sculptured.

VARIABILITY. Orange shades and the dark orange-brown spots fade to brown gradually with preservation, becoming difficult to distinguish.

Specimens from the three known populations are remarkably homogeneous in coloration, morphology and morphometrics, except as follows.

Adult size varies from 11.04–11.50 mm in males and 13.35–14.40 mm in females (Tab. 1); a single size-class can be defined in males and two in females, the latter separated by gaps of 1.00–1.05 mm. As usual for most scorpions, smaller adults have the sexual secondary dimorphism slightly less expressed than larger adults.

Coloration in life is very similar, only slightly more vivid (Fig. 13). As in all other species of *Microtityus*, juveniles exhibit the base color conspicuously paler than adults, but the dark pattern is almost the same, only more grayish than blackish (Figs. 13e–f). A few adults and juveniles from all three populations have a slightly different coloration, with the base more yellowish and the dark pattern slightly lighter and sparser (Figs. 13c, f). Just-molted individuals look conspicuously paler and almost monochromatic (Fig. 13d), i.e., the yellowish, orange and reddish shades appear gradually as days go by and their tegument sclerotization increases.

The apical subrow of fixed finger varies in count from 2–4 denticles (large terminal denticle not included), with frequent asymmetries between both pedipalps of the same specimen and the distalmost denticle being commonly vestigial. The large internal accessory denticle is always present.

Pectinal tooth count of the entire sample (holotype included) varied as follows: in males, 11 teeth (n = 8 pectines) and 12 (n = 3), one pecten missing; in females, 9 (n = 4), 10 (n = 8) and 11 (n = 4). Mode was well de-

Dimensions		♂ **paratopotype**	♂ **holotype**	♀ **paratopotype**	♀ **paratopotype**
Carapace	L / Wp	1.55 / 1.53	1.55 / 1.53	1.85 / 1.85	1.92 / 2.05
Mesosoma	L	2.75	2.95	3.58	3.87
Tergite VII	L / W	0.75 / 1.35	0.82 / 1.40	0.95 / 1.77	1.20 / 1.90
Metasoma	L	5.34	5.55	6.17	6.74
Segment I	L / W / D	0.67 / 0.83 / 0.75	0.75 / 0.85 / 0.75	0.85 / 0.92 / 0.82	0.92 / 1.02 / 0.90
Segment II	L / W / D	0.90 / 0.75 / 0.70	0.92 / 0.75 / 0.70	1.02 / 0.82 / 0.77	1.10 / 0.90 / 0.87
Segment III	L / W / D	1.02 / 0.70 / 0.70	1.05 / 0.72 / 0.70	1.15 / 0.77 / 0.77	1.25 / 0.85 / 0.87
Segment IV	L / W / D	1.20 / 0.68 / 0.68	1.25 / 0.68 / 0.68	1.40 / 0.72 / 0.77	1.52 / 0.82 / 0.82
Segment V	L / W / D	1.55 / 0.65 / 0.65	1.58 / 0.65 / 0.65	1.75 / 0.70 / 0.72	1.95 / 0.80 / 0.80
Telson	L	1.40	1.45	1.75	1.87
Vesicle	L / W / D	0.75 / 0.44 / 0.45	0.77 / 0.45 / 0.47	0.95 / 0.52 / 0.55	1.02 / 0.60 / 0.60
Aculeus	L	0.65	0.68	0.80	0.85
Pedipalp	L	4.40	4.43	5.51	5.83
Femur	L / W	1.12 / 0.38	1.12 / 0.38	1.37 / 0.50	1.47 / 0.55
Patella	L / W	1.27 / 0.52	1.27 / 0.52	1.60 / 0.70	1.72 / 0.74
Chela	L	2.01	2.04	2.54	2.64
Manus	L / W / D	0.74 / 0.43 / 0.41	0.74 / 0.43 / 0.41	0.87 / 0.58 / 0.50	0.92 / 0.62 / 0.55
Movable finger	L	1.27	1.30	1.67	1.72
Total	**L**	**11.04**	**11.50**	**13.35**	**14.40**

Table 1: Measurements (mm) of four types of *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.** Abbreviations: length (L), width (W), posterior width (Wp), depth (D).

fined in each sex: 11 in males (73% of pectines) and 10 in females (50%). No evident differences were detected amongst all three subpopulations, which most likely represent a single continuous population (see below, in Distribution section).

COMPARISONS. The general shape of the body and telson, the possession of a single smooth patch on sternite V and the carapacial carination, all place this species in the subgenus *Microtityus* (*Parvabsonus*). Inside it, the lack of femoral trichobothrium d_2 attests for its membership in the "jaumei" species-group.

As can be seen in Fig 16 herein, other five species of the subgenus occur in the southeastern quadrant of eastern Cuba. Of them, *Microtityus* (*Parvabsonus*) *farleyi* Teruel, 2000 and *Microtityus* (*Parvabsonus*) *guantanamo* Armas, 1984 can be separated very easily at first from *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.** by being members of the "waeringi" species group, i.e., they both possess femoral trichobothrium d_2. Moreover, both are larger (12–17 mm), the coloration is very different (much paler and with dark pattern greatly reduced), both sexes are more robust, pectinal tooth counts are higher (males 11–15, females 10–14), and metasomal segment V and telson have intercarinal granulation weaker; as an illustrative complement, see Teruel (2000) and Teruel & Kovařík (2012).

The other three species belong in the "jaumei" species group and can be reliably distinguished from *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.** as follows. First, *Microtityus* (*Parvabsonus*) *flavescens* Teruel, 2001 and *Microtityus* (*Parvabsonus*) *fundorai* Armas, 1974 both have the smooth patch of sternite V very different in shape and size (oval to teardrop-shaped and much smaller, in females often vestigial), metasoma with intercarinal granulation weaker and distinct coloration (much paler and with dark pattern greatly reduced in the former, darker and more densely patterned in the latter); see Teruel (2001) and Teruel & Kovařík (2012). And last, *Microtityus* (*Parvabsonus*) *jaumei* Armas, 1974 has coloration very different (much paler and with dark pattern greatly reduced), both sexes are more robust, pectinal tooth counts are higher (males 10–13, females 8–12), and metasomal segment V and telson have intercarinal granulation weaker; see Armas (1974) and Teruel & Kovařík (2012).

To summarize, *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.** can be easily recognized from all other Cuban congeners by the combination of very small size, the large size of the smooth patch of sternite V, and the exaggerate intercarinal granulation of metasomal segment V. Moreover, the tricolor pattern (i.e., smaller blackish spots superimposed on larger brownish spots, both over a pale background) is also unique to this species amongst the described Cuban species, which all have a bicolor pattern (i.e., a single shade of dark spots over a pale background).

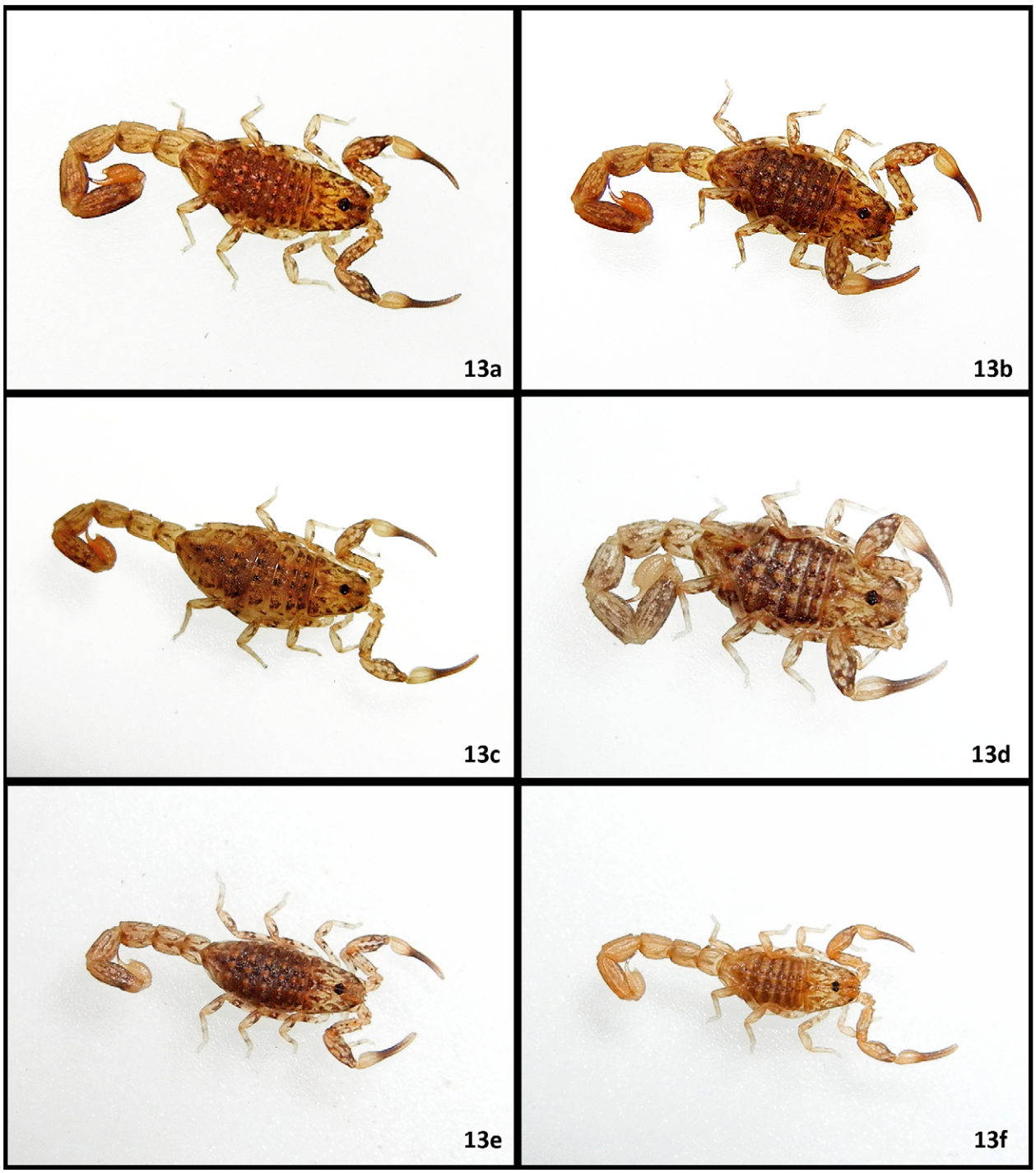


Figure 13: *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.**, adults photographed alive: **a)** male holotype; **b)** female paratopotype; **c)** female paratype; **d)** female paratopotype, three days after last ecdysis; **e–f)** juvenile paratypes. See color differences due to intraspecific variability (a–c, e–f) and incomplete sclerotization (d).

DISTRIBUTION (Fig. 16). This tiny scorpion is known only from three nearby localities separated from each other by roughly 4–5 km air-distance, in the lowland volcanic plain of western Guantánamo Bay Area. *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.** is most likely a local endemic from this peculiar landscape: as seen in the above-referred figure, repeated extensive and intensive samplings all around there have never revealed its occurrence, but only other species of *Microtityus* (*Parvabsonus*), all morphologically quite different.

Figure 14–15: *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.**, adult females photographed alive at natural habitat: **a)** paratopotype; **b)** paratype. See cryptic coloration closely matching substratum. Habitat and microhabitat **a, c)** type locality; **b, d)** Tres Piedras Military Post. See minor differences in vegetation and rocks between both sites.

Similar sampling effort was applied all over the area, but specimens were found only in these three sites. Nevertheless, as the entire zone is quit homogeneous in soil and vegetation, the latter is very well-preserved due to its military isolation and the samplings were conducted in a very short time, these subpopulations most likely form part of a single continuous population.

ECOLOGICAL NOTES. *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.** has been found only under a very peculiar

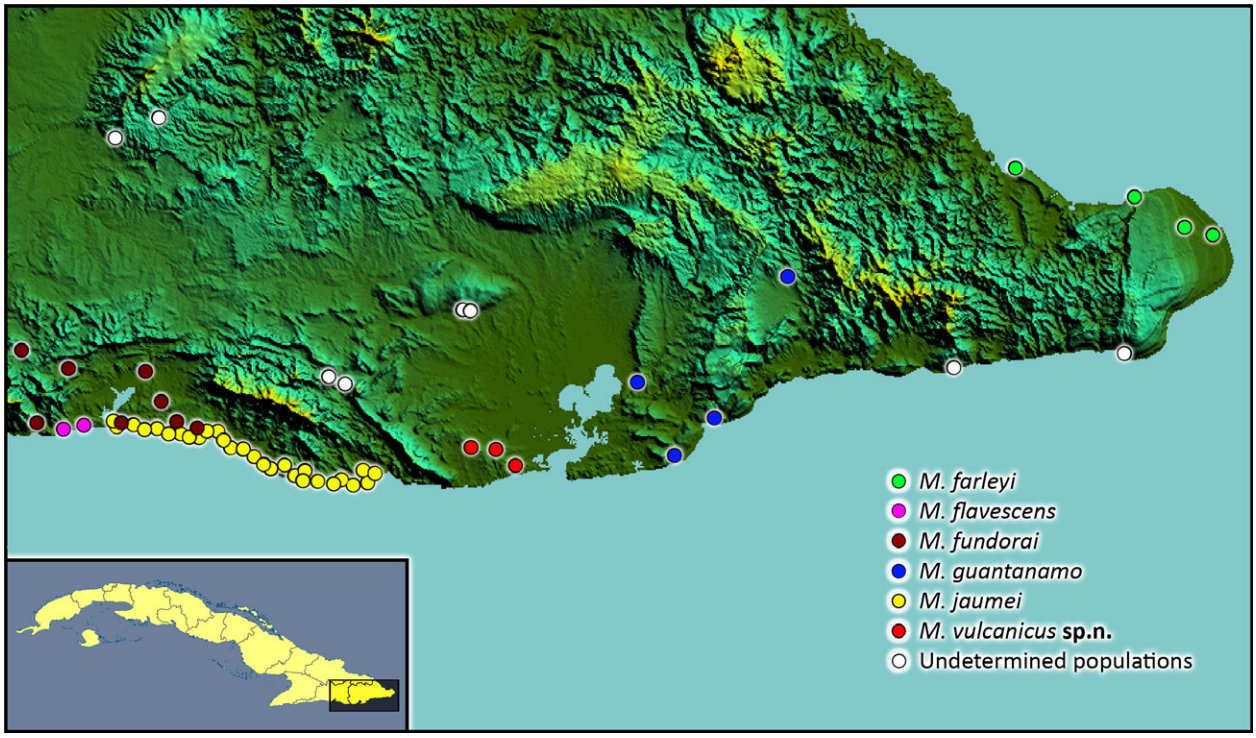


Figure 16: Complete known distribution of the genus *Microtityus* in southeast Cuba, including all literature records and unpublished populations currently under study by the present author. Image frame = 200 x 100 km (inset = 1,200 x 500 km).

combination of ecological conditions. It lives in coastal to subcoastal cactus scrub on very dark, volcanic sandy soil (Figs. 15c–d), in one of the hottest and driest areas of the Cuban archipelago. The collection was made during the day (nocturnal search was not authorized for the sampling) and all specimens were found under black, volcanic sandstone rocks under bushes and small trees (Figs. 15a–b), usually hanging to the underside of the rock (Fig. 14); intensive revision in open, sun-scorched clearings did not yield any specimens of this species.

The Tres Piedras Military Post is a small hill located exactly at the transition from the volcanic interior soil to the alluvial limestone soil of the seashore, thus, the dark volcanic and light limestone rocks are mixed (Fig. 15b) and the individuals of *Microtityus* (*Parvabsonus*) *vulcanicus* **sp. n.** were found under both rock types. At Los Monitongos and the type locality (enclaved roughly midway between the other two sites), the soil is only volcanic.

In the three localities, it is syntopic with the burrowing diplocentrine scorpionid *Cazierius gundlachii* (Karsch, 1880) and the generalist buthids *Centruroides robertoi* Armas, 1976 and *Heteroctenus junceus* (Herbst, 1800). The two buthids also occur in the vegetation under barks and inside dry cacti, hollow branches, epiphytic bromeliads and dead *Agave* plants, together with *Centruroides anchorellus* Armas, 1976, which is strictly arboreal there.

REMARKS. In the most recent paper dealing with this genus, Armas (2018) suggested that the subgenus *Microtityus* (*Parvabsonus*) deserves full generic status. A taxonomic move like this is still premature and not supported by solid morphological evidence, as explained in detail below.

The subgenus *Microtityus* (*Parvabsonus*) was described by Armas (1974) to accommodate three Cuban species, and was compared to the only two species of *Microtityus* sensu stricto then known: one from the continental island of Trinidad (the type-species of the genus) and another from northern Venezuela. Very interestingly, Armas (1974: 24) explicitly split these five members of *Microtityus* into **three** equally-ranked subgroups, but contradictorily he only gave subgenus-rank to **two** of them and implicitly treated the Venezuelan species as a member of the nominal subgenus. From then on, many additional species were gradually described in and/or assigned to both subgenera (including amber-fossil taxa), but the subgeneric diagnoses were never revised and updated.

This problem was first pointed out by Fet & Lowe (2000: 182, 185), who correctly stated that some of these species did not fit strictly into the current diagnoses of the subgenera. Later, Armas & Teruel (2012) attempted a correction, but the emended diagnoses presented by them were ambiguous and based largely in overlapping characters/states. And last, Armas (2018) went one step

further by suggesting the generic separation of *Microtityus* (*Parvabsonus*), but based such statement solely on a single alleged difference in carapacial carination, which was not described nor discussed in detail but only depicted in a sketchy drawing recycled from Armas (1974: fig. 4). The supraspecific arrangement of the members of the *Microtityus* sensu lato is currently being studied by the present author (R. Teruel, in preparation), together with the description of several new Antillean species.

The present contribution increases the Cuban representatives of *Microtityus* (*Parvabsonus*) to 10 nominal species, reinforcing its position as the second most diverse scorpion genus in this country, exceeded only by *Centruroides* Marx, 1890 (15 species). Moreover, the totals for the subgenus and the entire genus are raised to 28 and 41 species, respectively.

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