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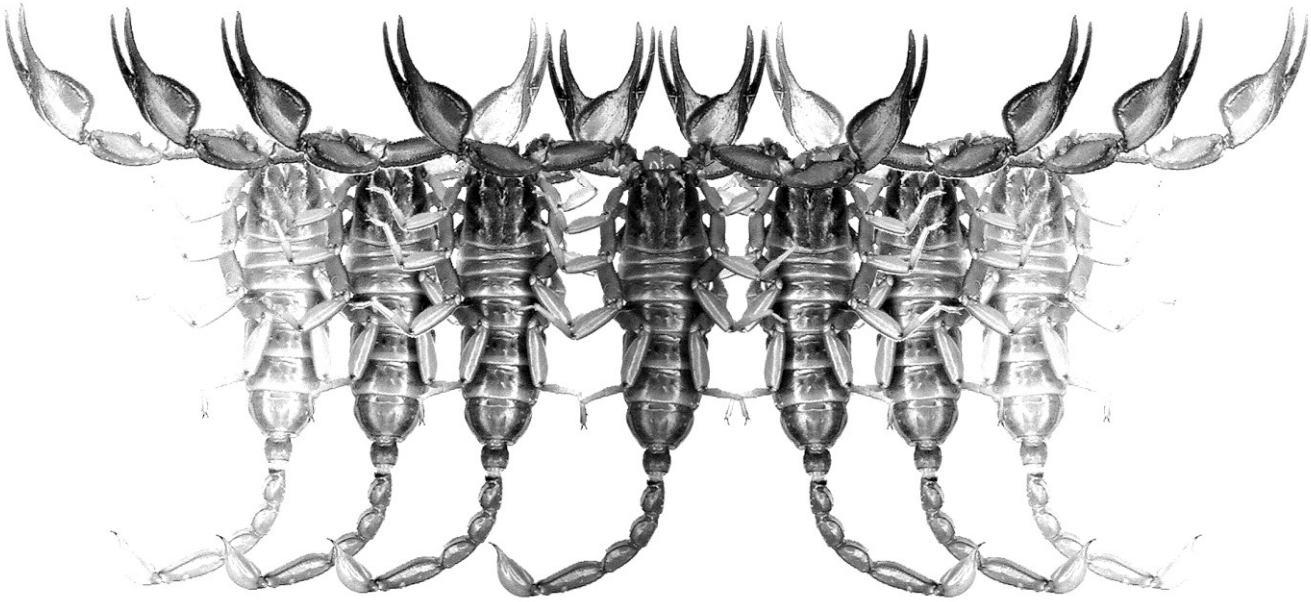

Three New Scorpion Species from the Dominican Republic, Greater Antilles (Scorpiones: Buthidae, Scorpionidae)

František Kovařík & Rolando Teruel

June 2014 — No. 187

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Three new scorpion species from the Dominican Republic, Greater Antilles (Scorpiones: Buthidae, Scorpionidae)

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Summary

We describe herein three new species of scorpions from the Dominican Republic, in the Greater Antillean Island of Hispaniola: *Microtityus minimus* **sp. n.** (probably the smallest scorpion in the world from the southernmost foothills of the Cordillera Central Mountains), *Tityus kindli* **sp. n.** (from the high peaks of eastern Cordillera Central Mountains), and *Cazierius neibae* **sp. n.** (from the southern slope of the Sierra de Neiba Mountains). Additional information is given on their taxonomy, distribution, ecology, and reproductive biology, fully complemented with color photos of live and preserved specimens, as well as their habitat. Figure 20 shows the smallest scorpion female (total length 11.4 mm) photographed with the newborn.

Introduction

Among the Greater Antilles territories, the scorpion fauna of Hispaniola is the second most diverse after that of Cuba: the most recent taxonomic contributions have greatly improved its knowledge to reach a total of three families, eight genera, and 40 nominal species recognized as valid (Armas & Marcano, 1987, 1992; Armas, 1988, 1999, 2001; Armas & Abud, 2004; Teruel, 2005; Teruel & Armas, 2006; Armas & Teruel, 2012). However, this number is not definitive, because even in the case that all of the synonymies suggested by Teruel (2005) become eventually confirmed, yet more new species are currently under description (R. Teruel & L. F. de Armas, in preparation) or have already been identified but remain undescribed because only inadequate samples are available (Armas & Teruel, 2012). As a conservative estimate, the real diversity of scorpions of Hispaniola can be safely hypothesized to be equivalent to that of Cuba.

As part of this studies in progress, the present authors conducted a short but highly successful field trip to this country in early 2014, which even produced several more new species. Three of them (two buthids and one scorpionid) are described in the present paper, and for all of them a detailed photographic complement is included, as well as additional data on their ecology and geographical distribution. The others will be subject of subsequent papers.

Methods & Material

Nomenclature and measurements follow Stahnke (1970), Kovařík (2009), and Kovařík & Ojanguren Affilastro (2013), 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 text refer to adults of both sexes.

Specimens studied herein are preserved in ethanol 80% and deposited in the personal collections of the authors, to which the following name-based abbreviations have been applied: FKCP, the first author collection, and RTOC, the second author collection (followed by catalogue number, with collecting and identification labels originally written in Spanish). Additional samples were examined from the collection of Instituto de Ecología y Sistemática, Havana, Cuba (IESC).

Systematics

Family Buthidae C. L. Koch, 1837

Microtityus* (*Parvabsonus*) *minimus Kovařík et Teruel, **sp. n.**
(Figures 1–26; Table 1)
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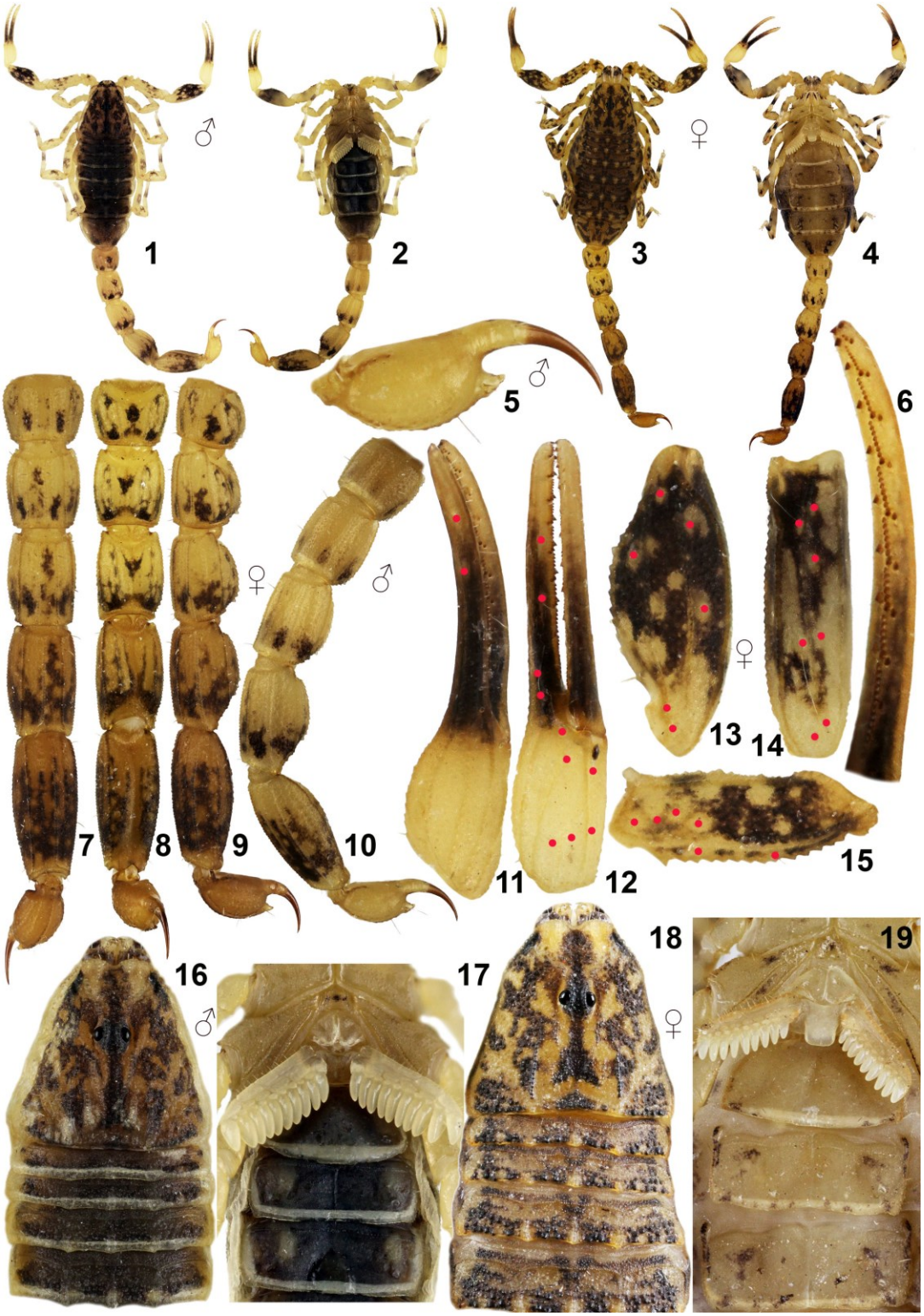


Figures 1–19: ***Microtityus minimus*** **sp. n. Figures 1–2, 5, 10, 16–17**. Dorsal (1) and ventral (2) views, telson (5), metasoma and telson lateral (10), carapace with chelicerae and tergites I–IV (16) and pectinal area with sternites III–V (17), ♂ paratype (FKCP). **Figures 3–4, 6–9, 11–15, 18–19**. Dorsal (3) and ventral (4) views, right movable finger internal (6), metasoma and telson ventral (7), dorsal (8), and lateral (9), right pedipalp chela dorsal (11) and external (12), pedipalp patella dorsal (13) and external (14) and pedipalp femur dorsal (15), carapace with chelicerae and tergites I–IV (18) and pectinal area with sternites III–V (19), ♀ paratype (FKCP).

TYPE LOCALITY AND HOLOTYPE DEPOSITORY. Dominican Republic, Azua Province, Las Charcas Municipality, El Número, 18°21'16.8"N 70°30'55.3"W, 167 m a. s. l., RTOC.

TYPE MATERIAL. Dominican Republic, Azua Province, Las Charcas Municipality, El Número, 18°21'16.8"N 70°30'55.3"W, 167 m a. s. l., 6.III.2014, leg. R. Teruel, F. Kovařík et P. Kindl, 1♂ holotype (Fig. 23, RTOC) 1♂ paratype (Figs. 1–2, 5, 10, 16–17, FKCP) 1♀ paratype (RTOC); same data except 15.III.2014, 3♂ 7♀ paratypes (RTOC) 5♀ paratypes (Figs. 3–4, 6–9, 11–15, 18–22, FKCP).

ETYMOLOGY. The selected name is a Latin adjective that alludes to the extremely small adult size of this species, see remarks below.

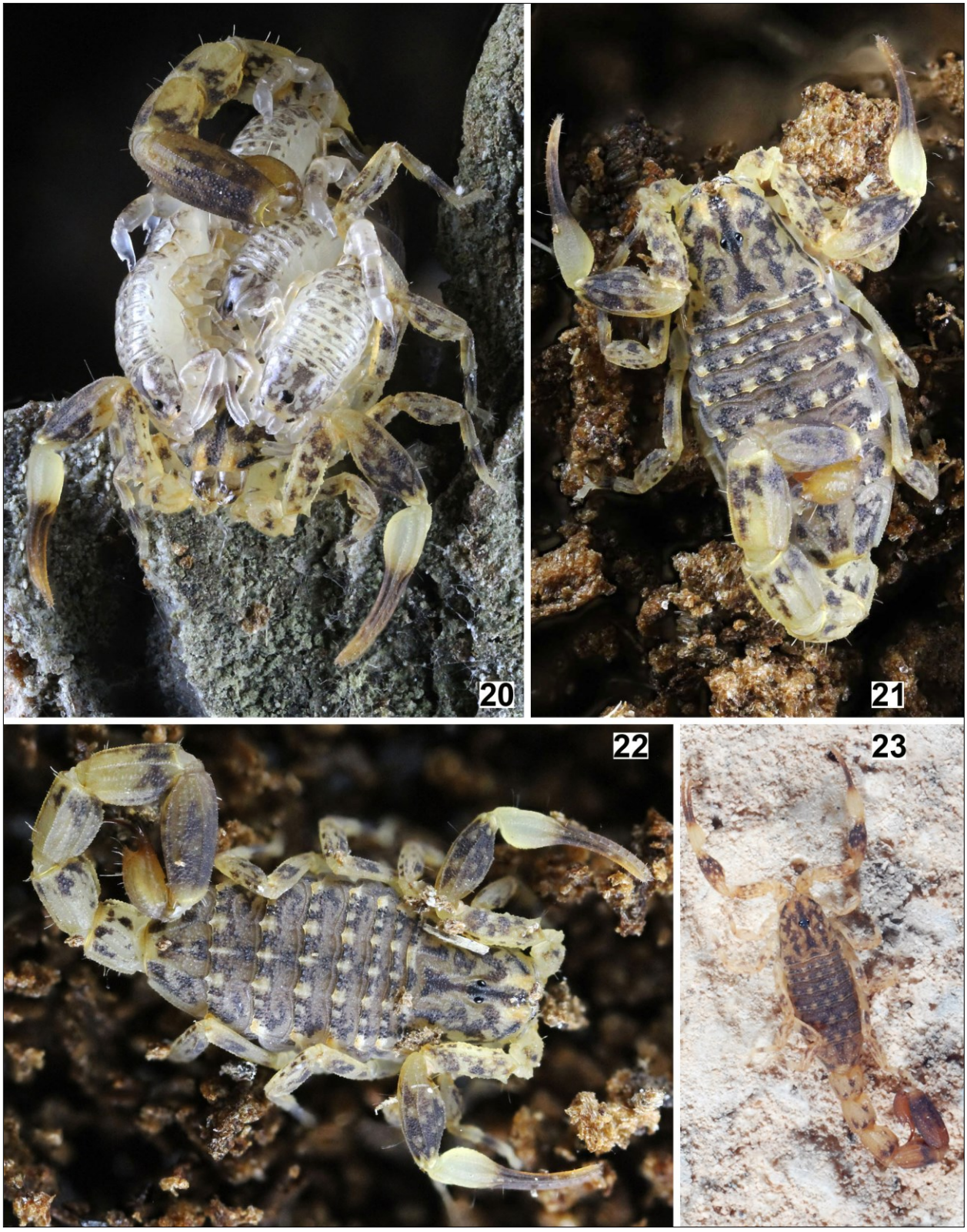
DIAGNOSIS. Adult size very small (males 9–10 mm, females 11–12 mm) for the genus. Coloration pale yellow to yellowish brown, moderately spotted with blackish brown all over the body and appendages, tergites without clearly defined longitudinal dark bands, pedipalp hand immaculate (males) to vestigially spotted (females), fingers blackish with yellowish tips, metasomal segment V and telson only slightly more reddish; in general, coloration in males is paler and less densely spotted. Pedipalps neobothriotaxic (femoral trichobothrium d_2 absent), fixed and movable fingers with 8–9 principal rows of denticles. Sternites IV–V with two carinae, VI–VII with four; posterior margin of III widely convex, with the smooth patch large, subtriangular, flat, and not protruding beyond margin; V with the smooth patch moderately large, cordiform and bulky (males) or very small, fusiform, and flat (females). Metasoma moderately short, with 10-10-8-8-5 complete carinae, most of which are sharply serrate to denticulate, segments II–IV dorsolateral carinae with 2–3 terminal denticles unevenly enlarged, all intercarinal spaces finely and densely granulose; segment V prismatic in cross-section, with ordinary carination and tegumentary sculpture. Telson short oval, vesicle minutely (males) to coarsely (females) granulose, subaculear tubercle moderate and irregular, aculeus as long as vesicle (males) or slightly shorter (females). Pectines with 10–11 teeth (mode 10) in males, 8–9 (mode 9) in females; basal plate in females slightly longer than wide, spatulate, and with posterior margin straight.

DESCRIPTION (adult male holotype unless otherwise noted). Coloration (Fig. 23) base pale yellowish to yellow, densely spotted with blackish brown all over the body and appendages except on the ventral region, which is essentially immaculate. Chelicerae pale yellowish; manus reticulate with blackish brown all over, but with pattern becoming denser and darker distally: fingers with basal half deeply infuscate. Pedipalp femur yellow, sparsely spotted with blackish brown on all surfaces except ventral, which is essentially immaculate; patella yellowish, very densely spotted with blackish brown on all surfaces except ventral, which possesses spots only in the distal half; chela pale yellow, with hand immaculate, fingers blackish with distal one-third yellowish. Carapace symmetrically and very densely spotted with blackish brown (most spots are interconnected), with frontal lobes essentially immaculate but separated by a large blackish spot; tergites densely spotted with blackish brown, but without clearly defined pattern of longitudinal bands; venter essentially immaculate, sternum with a wide, discontinuous transverse blackish stripe. Legs yellowish, becoming progressively paler distally, and with internal surface immaculate except on basitarsi; coxa and trochanter essentially immaculate yellow; femur and patella yellowish, with a single large, irregular blackish spot than surrounds dorsal, external, and ventral surfaces; basitarsi each conspicuously annulated: basal half blackish brown, distal half pale yellowish; telotarsi immaculate whitish. Metasoma pale yellowish, sparsely spotted with blackish brown on distal half of every segment, giving an irregularly annulated appearance; spots become progressively larger and denser towards segment V, which has distal half densely spotted; dorsal surface on I–IV with a large, arrowhead-shaped blackish spot medially; telson vesicle essentially immaculate yellowish, aculeus immaculate, with the distal two-thirds dark reddish brown.

CHELICERAE (Fig. 16, male paratype). With dentition typical for the genus. Tegument smooth and shiny, weakly granulose distally on manus.

CARAPACE (Fig. 16, male paratype). Slightly wider than long, markedly triangular. Anterior margin very narrow, deeply bilobed. Carinae: anterior median, lateral ocular, central median and posterior median granulose, superciliary subgranulose, other carinae obsolete to absent. Tegument very finely and densely granulose, with many coarse granules scattered. Median eyes separated by slightly more than one ocular diameter; three pairs of lateral eyes, which are all much smaller than median eyes.

MESOSOMA (Figs. 16–17, male paratype). Tergites with the same sculpture as on carapace; I–VI with three longitudinal carinae, which are granulose sharply projected beyond the posterior margin, VII with five serrate longitudinal carinae. Sternum type 1, pentagonal, wider than long. Pectines reaching coxa-trochanter joint of leg IV; tooth count 10/10, fulcra very well developed; basal middle lamella slightly enlarged, angulose; basal plate unmodified, about as long as wide, and with posterior margin essentially straight. Sternites III–VI with round to very short-oval spiracles and a narrow, smooth to subgranulose longitudinal carina along midline of IV–



Figures 20–23: ***Microtityus minimus*** **sp. n. Figure 20.** ♀ paratype (FKCP) with newborn. **Figures 21–22.** ♀ paratype (FKCP). **Figure 23.** ♂ holotype at the type locality.

Figures 24–25: ***Microtityus minimus*** **sp. n.**, type locality (subcoastal desert scrub on gypsum-sandy soil).

Dimensions (mm)		♂ paratype	♂ holotype	♀ paratype	♀ paratype
Carapace	L / Wp	1.32 / 1.40	1.45 / 1.47	1.55 / 1.65	1.60 / 1.94
Mesosoma	L	2.00	2.55	3.25	3.50
Tergite VII	L / W	0.65 / 1.25	0.75 / 1.30	0.80 / 1.50	0.84 / 1.52
Metasoma	L	5.91	6.31	6.64	6.75
Segment I	L / W	0.65 / 0.73	0.67 / 0.80	0.74 / 0.84	0.69 / 0.84
Segment II	L / W	0.75 / 0.68	0.82 / 0.73	0.84 / 0.74	0.86 / 0.75
Segment III	L / W	0.87 / 0.63	0.95 / 0.68	0.97 / 0.68	0.99 / 0.69
Segment IV	L / W	1.03 / 0.61	1.12 / 0.65	1.20 / 0.67	1.22 / 0.67
Segment V	L / W	1.37 / 0.58	1.45 / 0.63	1.50 / 0.65	1.54 / 0.65
Telson	L	1.24	1.30	1.39	1.45
Vesicle	L / W / H	0.62 / 0.41 / 0.41	0.65 / 0.42 / 0.42	0.70 / 0.47 / 0.46	0.75 / 0.47 / 0.46
Aculeus	L	0.62	0.65	0.69	0.70
Pedipalp	L	3.86	4.07	4.59	4.61
Femur	L / W	0.97 / 0.34	1.00 / 0.38	1.15 / 0.40	1.15 / 0.41
Patella	L / W	1.13 / 0.44	1.22 / 0.47	1.36 / 0.54	1.36 / 0.54
Chela	L	1.76	1.85	2.08	2.10
Hand	L / W / H	0.59 / 0.34 / 0.34	0.60 / 0.35 / 0.35	0.69 / 0.44 / 0.44	0.70 / 0.45 / 0.45
Movable finger	L	1.17	1.25	1.39	1.40
Total	**L**	**9.23**	**10.31**	**11.44**	**11.85**

Table 1: Measurements of four types of *Microtityus minimus* **sp. n.** (RTOC). Abbreviations: length (L), width (W), posterior width (Wp), depth (H), left (L), right (R).

VII; III with posterior margin strongly convex, lateral areas very shallowly depressed and essentially smooth, and with the smooth patch large, subtriangular, flat, and not protruding beyond posterior margin; IV–VI coriaceous to finely granulose, with coarser granules scattered; VII finely and densely granulose; V with posterior margin essentially straight and the smooth patch moderately large, cordiform, slightly longer than wide, translucent, and bulky, essentially not protruding from margin of sternite; IV–V without carinae, VI with two, VII with four, all granulose.

METASOMA AND TELSON (Figs. 5 and 10, male paratype). Metasoma with intercarinal tegument finely and densely granulose, with many coarser granules scattered; segments I–II with ten complete carinae, II–IV with eight (even though lateral supramedian carinae are indicated by irregular granulation), V with five, all sharply serrate to denticulate, dorsolateral carinae on I–IV with 2–3 terminal denticles unevenly enlarged and very sharp. Telson vesicle short-oval, coriaceous with small granules scattered, and with a granulose ventromedian carina that abruptly rises into the subaculear tubercle, which points towards the basal third of the aculeus and is moderately-sized, irregularly conical, essentially smooth, and possesses two vestigial dorsal granules; aculeus as long as vesicle, sharp, and evenly curved.

LEGS. Legs with all carinae finely serrate; intercarinal tegument very finely and densely granulose.

PEDIPALPS (Figs. 1–2, male paratype). Neobothriotaxic A-α (femoral d_2 absent). Femur with five serrate carinae; intercarinal tegument coriaceous to finely granulose, with coarser granules scattered; internal surface with the four *i* trichobothria surrounding a large, truncate spur. Patella with seven serrate carinae; intercarinal tegument with the same granular sculpture as on femur, but finer; internal surface with granules becoming progressively larger distally. Chela oval and much narrower than patella; hand with nine finely serrate carinae, intercarinal tegument very finely and densely granulose; fingers without basal lobe/notch combination, fixed finger with 9/9 principal rows of denticles, movable finger with 8/8 plus apical subrow composed by four granules aligned similar to principal rows.

FEMALE (Figs. 3–4, 6–9, 11–15, 18–22; Tab. 1). Similar to the male, but sexual dimorphism is evident by: **1)** size larger; **2)** color pattern somewhat darker and more densely spotted; **3)** genital papillae absent; **4)** mesosoma remarkably wider, with sides convex; **5)** pectines smaller, narrower, with lower tooth counts, and with basal plate longer than wide, spatulate; **6)** pedipalps and metasoma with segments slightly shorter and wider; **7)** sternite V with the smooth patch much smaller, fusiform, flat, and with a median suture.

VARIATION. The size differences among adults are so small (directly correlated to the minuteness of this scorpion), that a clear-cut recognition of size classes is not reliable. Nevertheless, there are probably two size classes in each sex; inside each class, males are consistently smaller than females (Tab. 1).

Figure 26: Geographical distribution of ***Microtityus minimus* sp. n.** (black square) and its closest relatives ***M. paucidentatus*** (grey square) and ***M. reini*** (white squares).

Count of teeth per pecten was also little variable: 10 (n=8) and 11 (n=2) in males, 8 (n=4) and 9 (n=22) in females. The number of principal rows of denticles was almost constant too: nine and eight in fixed and movable fingers, respectively; a few specimens had eight and seven due to poorly defined basalmost rows.

AFFINITIES. Only two other Hispaniolan species lack femoral trichobothrium d_2: *Microtityus paucidentatus* Armas et Marcano, 1992, and *M. reini* Armas et Teruel, 2012. The former is known only from a single locality in the southern slope of the Sierra de Neiba (Independencia Province, roughly 100 km to the west of El Número), and is easy to distinguish from *M. minimus* **sp. n.** by: **1)** size larger (male 13 mm, female 16 mm); **2)** color pattern darker and much more densely spotted; **3)** pectinal tooth count higher (male 11/11, female 9/10); **4)** metasoma slightly longer and less robust; **5)** male sternite V with the smooth patch much wider and shorter.

The most similar morphologically is actually *M. reini*, which occurs in the southern foothills of Cordillera Central (Peravia Province, about 25 km east of El Número), and can be unequivocally separated on the basis of the following characters (females only, as males are unknown): **1)** size 13–14% larger (13–15 mm); **2)** coloration basically darker, but with the spots lighter (body and appendages brownish orange, patterned with medium brown); **3)** basal pectinal plate shorter, trapezoidal, and posteriorly narrower; **4)** sternite III with posterior margin widely bilobed, with a median notch.

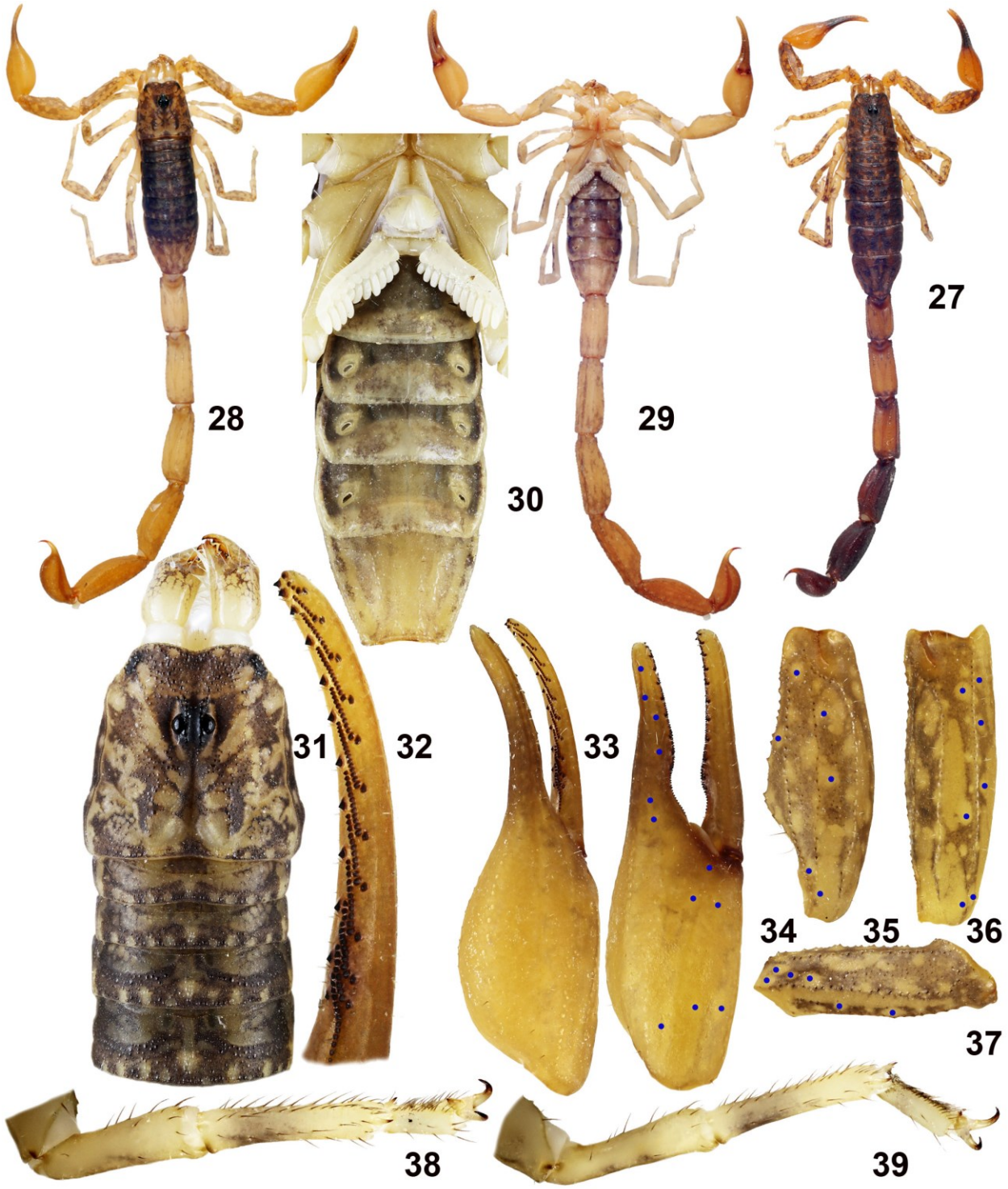
DISTRIBUTION (Fig. 26). Known only from the type locality, in the southernmost foothills of the Cordillera Central mountain range, in southern Dominican Republic.

ECOLOGICAL NOTES. This species lives in subcoastal desert scrub on gypsum-sandy soil, at an elevation of 160–170 m a. s. l. (Fig. 24). All specimens were collected during diurnal searches, hanging to the underside of small limestone rocks half-buried in the dry leaf litter of thorny shrubs and cacti, at the base of hills (Fig. 25). As observed previously in a few members of the genus, when the rocks were turned the individuals remained still but started to run very quickly after 10–20 seconds or at the slightest touch.

Other scorpions that occur at this locality are the scorpionid *Cazierius politus* (Pocock, 1898), and the buthids *Centruroides bani* Armas et Marcano, 1987, and *Rhopalurus princeps* (Karsch, 1879). All of them occur syntopically under rocks with *Microtityus minimus* **sp. n.**, but *Centruroides bani* is also found under dead barks of shrubs and trees, both standing and fallen.

All females were late pregnant when collected, with embryos clearly visible through sternites and pleural membranes. Seven were kept alive and gave birth during the first month in captivity (Fig. 20); the litters consisted of 1, 2, 2, 3, 3, 4, and 5 newborn, and the first instar lasted for 4–6 days. Also, five of the 15 individuals collected on March 15, 2014 (two males and three females) were subadults and showed obvious signs of being about to carry out their final ecdysis; all of them were kept alive and molted successfully into perfect adults within 5–12 days, without need of being fed.

REMARKS. Despite the tiny size, maturity of the specimens herein declared as adults was clearly demon-



Figures 27–39: Figure 27. ***Tityus quisqueyanus***, dorsal view, ♂ topotype (FKCP). **Figures 28–39. *T. kindli* sp. n.**, ♂ holotype, dorsal (28) and ventral (29) views, pectinal area and sternites (30), carapace with chelicerae and tergites I–IV (31), right movable finger internal (32), pedipalp chela dorsal (33) and external (34), pedipalp patella dorsal (35) and external (36), pedipalp femur dorsal (37), tibia and tarsomeres of third (38) and fourth (39) right legs.

strated: captive males mated and produced spermatophores, and females gave birth. Thus, *M. minimus* **sp. n.** is the smallest confirmed scorpion; a few other similarly sized (10 mm or less) specimens of the genera *Microcharmus* Lourenço, 1995 and *Typhlochactas* Mitchell, 1968 have been alleged to be adults (e. g., Sissom, 1988;

Figures 40–45: **Figures 40–42.** ***Tityus kindli*** **sp. n.**, ♂ holotype, metasoma and telson dorsal (40), ventral (41) and lateral (42) views. **Figures 43–45.** ***T. quisqueyanus***, ♂ topotype (FKCP), metasoma and telson dorsal (43), ventral (44) and lateral (45) views.

Lourenço et al., 2006; Vignoli & Prendini, 2009) but their maturity, although apparent and probably real, has been never demonstrated. Figure 20 shows the smallest scorpion female (total length 11.4 mm) photographed with the newborn.

COMPARATIVE MATERIAL EXAMINED.

Microtityus paucidentatus Armas et Marcano, 1992
Dominican Republic, Bahoruco Province, Neiba Municipality, Sierra de Neiba, Apolinar Perdomo, Segundo Paso, 150 m a. s. l., 3.X.1987, leg. L. F. de Armas, A. Abud et P. Rivera, 1♀ holotype (IESC-3.2815) 1♂ paratype (IESC).

Microtityus reini Armas et Teruel, 2012
Dominican Republic, Peravia Province, Baní Municipality, Montería, La Laguna, km 6 on road to Manaclar, 200 m a. s. l., 22.IX.1987, leg. L. F. de Armas et P. Rivera, 1♀ holotype (IESC-3.2815), 5♀ paratypes (IESC-3.2830) 2 juvenile paratypes (IESC-3.2831); km 4 on road to Manaclar, 100 m a. s. l., 4.III.1999, leg. L. F. de Armas, 2♀ paratypes (RTOC: Sco-0467).

Tityus kindli Kovařík et Teruel, **sp. n.**

(Figures 28–42, 46–48, 50; Tables 2–3)

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Tityus quisqueyanus: Teruel, 2005: 175 (misidentification).

TYPE LOCALITY AND HOLOTYPE DEPOSITORY. Dominican Republic, La Vega Province, Constanza Municipality, Cordillera Central, Valle Nuevo, approx. 2 km southeast of La Nevera, 18°41'33.9"N 70°35'36.1"W, 2,239 m a. s. l., FKCP.

TYPE MATERIAL. Dominican Republic, La Vega Province, Constanza Municipality, Cordillera Central, Valle Nuevo, approx. 2 km southeast of La Nevera, 18° 41'33.9"N 70°35'36.1"W, 2,239 m a. s. l., 5.III.2014, leg. F. Kovařík, R. Teruel et P. Kindl, 1♂ holotype (Figs. 28–42, 48, FKCP); Valle Nuevo, 2,220 m a. s. l., 8.XI.2004, leg. A. Marmolejo et G. E. de los Santos, 1♂ paratype (RTOC: Sco-0276).

ETYMOLOGY. We are pleased to name this species after our good friend Pavel Kindl (Prague, Czech Republic), who accompanied and enthusiastically assisted us during all the field work of our 2014 expedition to the Dominican Republic.

DIAGNOSIS (males only, female unknown). Adult size moderately large (40–45 mm) for the "*quisqueyanus*" group. Coloration basically pale yellowish brown, moderately spotted with light to medium brown all over the body and appendages; tergites without clearly defined longitudinal dark bands; pedipalp hand essentially immaculate, fingers light brown with yellowish tips, metasomal segment V and telson only slightly more reddish. Pedipalps chelae with hand very robust and weakly carinate; fixed and movable fingers with 10 and 11 principal rows of denticles, respectively, basal lobe/notch combination moderate. Sternite V with the smooth patch very large, much wider than long; III–VI without carinae and with spiracles elongate oval. Metasoma long, slender, and slightly swollen distally, with 10-8-8-8-5 complete to essentially complete, weakly serrate to granulose carinae; segments II–IV dorsolateral carinae without enlarged terminal denticles; all intercarinal spaces coriaceous. Telson elongate oval, vesicle essentially smooth, with vestigial subaculear tubercle, and much longer than aculeus. Pectines with 9–11 teeth, basal middle lamella round and moderately enlarged.

DESCRIPTION (adult male holotype). Coloration (Figs. 28–29) base pale yellowish brown, moderately spotted with pale to medium brown all over the body and appendages except on the ventral region of prosoma, which is immaculate. Chelicerae pale yellow, manus reticulate with dark brown all over except basally, but with pattern becoming denser and darker distally, fingers irregularly infuscate. Pedipalp femur and patella densely spotted with light brown on all surfaces except ventral, which it is essentially immaculate; chela with hand essentially immaculate (only a few very faint traces of pale brown spots are traceable externally), fingers irregularly infuscate with light brown, somewhat denser and darker on basal half. Carapace symmetrically marbled with medium brown (most spots are interconnected), with the interocular triangle more densely spotted; eyes and ocular tubercles black. Tergites densely spotted with medium brown, but without clearly defined pattern of longitudinal bands; I–VI with lateral margins pale immaculate and posterior margin with nine pale, round to oval spots (one over the median longitudinal carina and four on each side). Appendicular coxae, sternum, and genital opercula yellowish brown, immaculate. Pectines immaculate whitish, with basal portion and basal plate somewhat darker due to heavier sclerotization. Sternites very sparsely spotted with medium brown, V with the smooth patch conspicuously lighter, immaculate whitish to translucent. Legs sparsely spotted with medium to light brown on all surfaces except ventral, which it is essentially immaculate. Metasomal segments IV–I and telson with base color slightly darker, orange; dorsal surface very sparsely spotted with medium to light brown, lateral surfaces moderately spotted medium to light brown (denser on distal third of I–III and all over IV–V), ventral surface with the same pattern as preceding, but also with a thin dark stripe all along

Figures 46–47: ***Tityus kindli*** **sp. n.**, type locality (montane pine forest on volcanic soil), and same fallen logs where the holotype was found under bark (47).

Dimensions (mm)		*Tityus kindli* sp. n.		*Tityus quisqueyanus*	
		♂ **paratype**	♂ **holotype**	♂	♂
Carapace	L / Wp	3.50 / 3.60	3.80 / 3.95	3.40 / 3.40	4.20 / 4.20
Mesosoma	L	11.02	9.90	10.00	13.00
Tergite VII	L / W	2.72 / 3.39	2.50 / 3.50	2.30 / 3.30	3.40 / 4.11
Metasoma	L	25.91	31.45	22.61	31.17
Segment I	L / W / H	3.15 / 1.82 / 1.75	4.05 / 2.10 / 2.10	2.85 / 1.89 / 1.80	4.02 / 2.22 / 2.25
Segment II	L / W / H	4.09 / 1.78 / 1.78	5.00 / 2.05 / 2.05	3.50 / 1.80 / 1.85	5.00 / 2.20 / 2.12
Segment III	L / W / H	4.44 / 1.81 / 1.74	5.45 / 2.10 / 2.05	3.80 / 1.80 / 1.83	5.35 / 2.23 / 2.12
Segment IV	L / W / H	4.70 / 1.84 / 1.70	5.70 / 2.15 / 1.95	4.10 / 1.89 / 1.81	5.62 / 2.33 / 2.22
Segment V	L / W / H	4.95 / 1.86 / 1.69	5.95 / 2.10 / 2.00	4.20 / 1.90 / 1.75	5.92 / 2.35 / 2.28
Telson	L	4.58	5.30	4.16	5.26
Vesicle	L / W / H	3.00 / 1.70 / 1.60	3.60 / 1.85 / 1.80	2.76 / 1.68 / 1.57	3.65 / 2.10 / 1.96
Aculeus	L	1.58	1.70	1.40	1.61
Pedipalp	L	13.78	16.30	12.24	16.21
Femur	L / W	3.22 / 1.00	3.90 / 1.10	2.91 / 0.99	3.80 / 1.28
Patella	L / W	3.86 / 1.40	4.50 / 1.65	3.41 / 1.30	4.58 / 1.72
Chela	L	6.70	7.90	5.92	7.83
Hand	L / W / H	3.00 / 1.60 / 1.60	3.90 / 2.20 / 2.10	2.52 / 1.49 / 1.50	3.70 / 2.30 / 2.23
Movable finger	L	3.70	4.00	3.40	4.13
Total	**L**	**40.43**	**45.15**	**36.01**	**48.37**

Table 2: Measurements of the types of *Tityus kindli* **sp. n.** and two same-instar adult topotypes of *T. quisqueyanus* (RTOC), for direct comparison. Abbreviations: length (L), width (W), posterior width (Wp), depth (H), left (L), right (R).

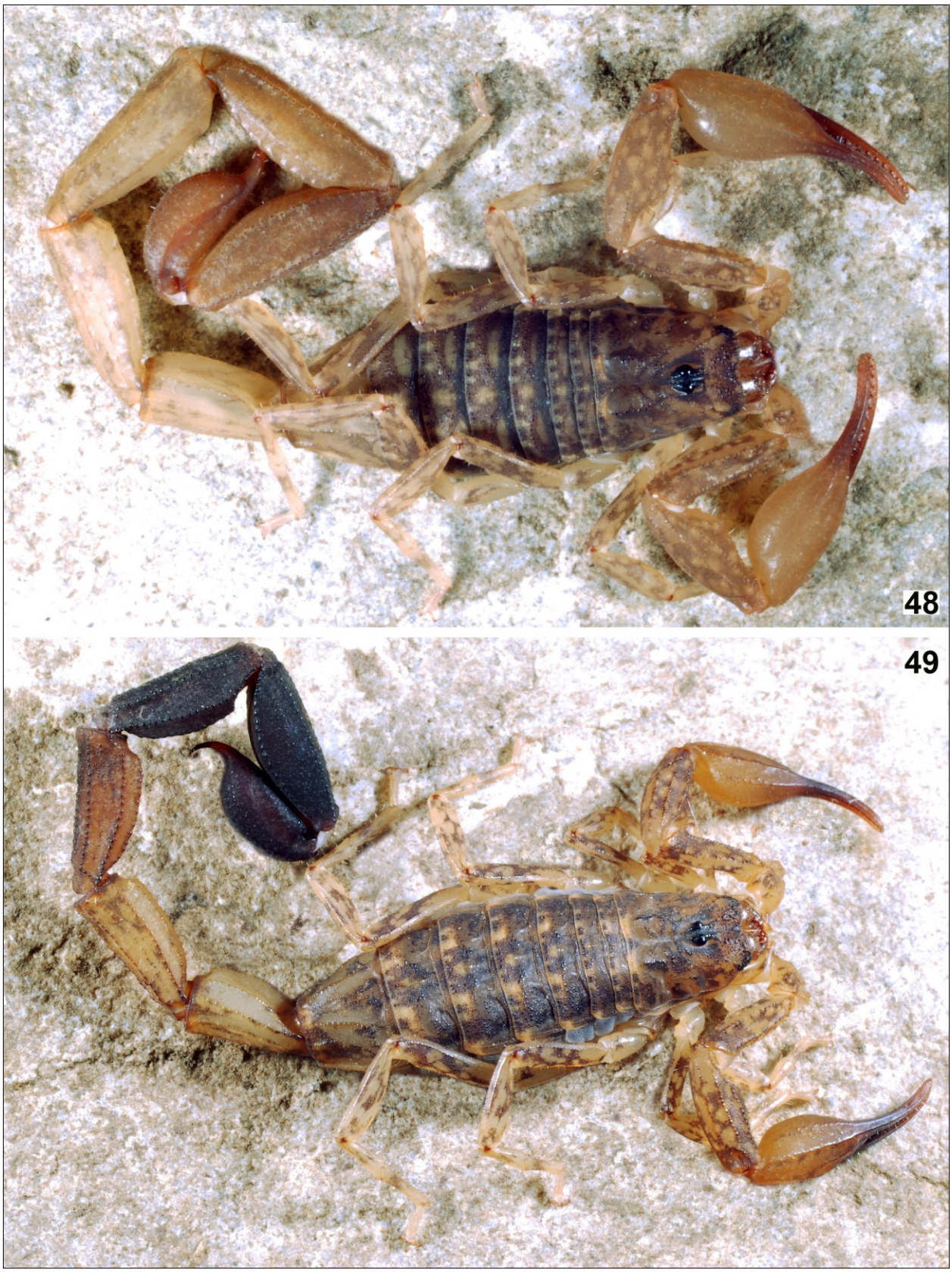
midline (more sharply defined on II–III); telson immaculate orange, aculeus light yellow basally and reddish brown distally.

CHELICERAE (Fig. 31). With dentition typical for the genus; teeth short and wide but sharp. Tegument polished and smooth except on extreme dorsodistal portion of manus, which possesses a few granules aligned transversally. Setation very scarce on dorsal surface (only with five pale macrosetae around manus/finger juncture), but very dense ventrally.

CARAPACE (Fig. 31). Trapezoidal and slightly wider than long; anterior margin widely bilobed, with some pairs of short setae. Carination essentially absent: the on-ly definable carinae are the superciliary (strongly granulose to subgranulose), and the irregularly fused central medians and posterior medians (moderately granulose). Furrows: anterior median, median ocular, central median, posterior median and posterior marginal fused, wide and moderately to very deep, posterior laterals long, narrow and shallow, other furrows indistinct. Tegument coriaceous, densely covered by glossy granules of medium to small size, especially on each side of the median furrows. Median eyes large and separate by about one ocular diameter, lateral eyes much smaller but all same-sized.

MESOSOMA (Figs. 30–31). Tergites with the same sculpture as on carapace; I–VI with only one longitudinal carina, which is moderately strong, granulose, and not projected beyond posterior margin; VII with five carinae (median, submedians and laterals) which are strong and granulose to subserrate. Sternum standard for the genus: type 1, moderately large, longer than wide, and triangular in shape. Pectines somewhat short (not reaching leg IV trochanter), rectangular and moderately setose; tooth count 11/11; basal plate heavily sclerotized, much wider than long, and with a deep median furrow; anterior and posterior margins straight. Sternites III–VI smooth to coriaceous, glossy and sparsely setose, spiracles elongate oval but not slit-like; V with smooth patch very large, arrowhead-shaped, much wider than long and bulky, translucent whitish and conspicuously paler than the rest of the plate; VII very finely and densely granulose, with two pairs of long, moderately subserrate to subcrenulate carinae.

METASOMA AND TELSON (Figs. 40–42). Metasoma long, slender and slightly swollen distally; I with ten complete carinae, II–IV with eight, and V with five: dorsolaterals (I–IV), lateral supramedians (I–V), lateral inframedians (I only), and ventrolaterals (I–V) vestigial, weakly serrate to granulose and without any enlarged terminal denticles; ventrosubmedians vestigial and weakly serrate to granulose, well defined on I–III and basal third of V, but irregular on IV. Intercarinal tegument coriaceous and with a few minute granules scattered on all surfaces; dorsal furrow moderately shallow and narrow on all segments, deeper on IV–V; setation sparse, with 3–5 pairs of short, dark ventrolateral macrosetae. Telson sparsely setose; vesicle elongate oval (1.95 times longer than wide, 1.03 times wider than deep), tegument coriaceous and essentially smooth, only with subtle



Figures 48–49: **Figure 48**. ***Tityus kindli* sp. n.**, ♂ holotype. **Figure 49**. ***T. quisqueyanus***, ♂ topotype (FKCP).

Ratios	*T. kindli* sp. n. (paratype–holotype)	*T. abudi* (holotype)
Total (L) / Pedipalp (L)	2.93–2.77	3.21
Pedipalp patella (L/W)	2.76–2.73	2.88
Pedipalp chela (L/W)	4.19–3.59	3.56
Pedipalp chela (L) / movable finger (L)	1.81–1.97	2.05
Pedipalp hand (L) / movable finger (L)	0.81–0.97	1.05
Metasoma (L) / Carapace (L)	7.40–8.28	9.13
Metasomal segment III (L/W)	2.45–2.60	3.67
Metasomal segment IV (L/W)	2.55–2.65	4.19
Metasomal segment V (L/W)	2.66–2.83	3.77
Metasomal segment V (L/H)	2.93–2.97	3.97
Telson vesicle (L/W)	1.76–1.95	2.30
Telson vesicle (L/H)	1.87–2.00	2.36
Total (L)	**40.43–45.15**	**55.00**

Table 3: Comparison between *Tityus kindli* **sp. n.** and its closest relative *T. abudi*, based upon selected morphometric ratios of adult males (adult females of the former are known). Abbreviations: length (L), width (W), depth (H).

traces of granules and a coarse but very poorly defined ventromedian carinae; subaculear tubercle insinuated by a coarse granule; aculeus very short but sharp, much shorter than vesicle and evenly curved.

LEGS (Figs. 38–39). Legs very long and slender, sparsely setose. All carinae smooth to subcrenulate; intercarinal tegument coriaceous to minutely granulose; tibial spurs absent, prolateral and retrolateral pedal spurs well developed in all legs; ventral surface of all tarsomere II obtusely edged and with many setae irregularly arranged into two ventrosubmedian rows, without median row of spinules; claws long and strongly curved.

PEDIPALPS (Figs. 32–37). Pedipalps moderately long, very sparsely setose and orthobothriotaxic A-α. Femur moderately slender and straight; all carinae moderately granulose; intercarinal tegument coriaceous, with many small granules scattered. Patella moderately long, slender and slightly curved inwards; all carinae moderately granulose; intercarinal tegument coriaceous, with many small granules scattered. Chela very robust, with hand markedly wider than patella, broadly oval (1.77 times longer than wide) and with all carinae obsolete to weak, granulose to costate, intercarinal tegument coriaceous, with traces of minute granules internally; fingers short and thick (movable finger essentially as long as underhand, just 1.03 times longer), evenly curved and with basal lobe/notch combination moderate, fixed fingers with 10/10 principal rows of granules, movable fingers with 11/11 plus an apical subrow formed by four denticles and a large internal accessory denticle (large terminal denticle not included).

VARIATION. The single paratype available is one size-class smaller than the holotype and thus, it exhibits a minor expression of most secondary sexually dimorphic characters such as morphometric ratios of pedipalps and metasoma (Tabs. 2–3), and a slightly lower pectinal tooth count of 10/9. This same size-related variation has already been demonstrated to be a rule amongst members of this genus (Lourenço, 1983; Teruel, 2000, 2011a–b; Armas et al., 2002; Montoya & Armas, 2002; Teruel & Armas, 2006; Kovařík, 2007; Rojas-Runjaic & Armas, 2007; Teruel & García, 2008a–b; Teruel & Sánchez, 2009, 2010; Teruel & Kovařík, 2011).

This smaller male also shows a somewhat darker and more contrasting coloration, which is due to the fact that it is a much older than the holotype (as evidenced by the wear out of the leg ungues, cheliceral teeth, and pedipalp finger denticles). Apart from this, both specimens are identical in all other important characters such as setation, carination and intercarinal sculpture of the body and appendages, and number of principal rows of denticles on pedipalp fingers.

AFFINITIES. *T. kindli* **sp. n.** differs from almost all other members of the "*quisqueyanus*" group in the following combination of characters: moderately large to large size (40–45 mm), very long and slender metasoma combined with very large pedipalp chelae, pale coloration (especially the posterior metasomal segments and telson only very faintly darkened), weak development of most carinae of pedipalps and metasoma, exaggerate development of smooth patch of sternite V, and low counts of pectinal teeth. All other members of this group have a conspicuously less attenuate metasoma but more slender pedipalp chelae, metasomal segments IV–V and telson markedly darker (usually black), and smooth patch of sternite V moderate to small; further, most of them are small to medium-sized (except *Tityus neibae* Armas, 1999 and *T. quisqueyanus* Armas, 1982), have markedly stronger pedipalpal and metasomal carinae (except *T. altithronus* Armas, 1999), and exhibit higher count of pectinal teeth (except *T. elii* Armas et Marcano, 1992).

Figure 50: Geographical distribution of ***Tityus kindli* sp. n.** (black squares, type locality the southernmost) and its closest relative ***T. abudi*** (white squares); the two high-altitude sections of the Cordillera Central mountain range are clearly depicted.

This same combination of characters is shared only by *T. abudi* Armas, 1999, which indeed is the closest relative of *T. kindli* **sp. n.** But it can be reliably separated by: **1)** metasoma more slender, with all segments narrower and lower (Tab. 3); **2)** pedipalp chelae larger, with movable finger shorter than hand (this proportion is reversed in *T. kindli* **sp. n.**, see Tab. 3); **3)** sternite VI with a smooth patch (absent in *T. kindli* **sp. n.**, see Fig. 30); **4)** metasomal segments IV–V and telson with tegument sparsely granulose (smooth in *T. kindli* **sp. n.**, see Figs. 40–42); **5)** pectinal basal plate larger. Further, their geographical distribution as currently known is allopatric, with each species restricted to its own section of the Cordillera Central mountain range (Fig. 50): *T. abudi* in the northern slopes of the western section and *T. kindli* **sp. n.** on the southern slopes of the eastern section, separated by the Constanza Valley.

As this new species is syntopic with *T. quisqueyanus*, we include here color photos, precise measurements and diagnostic morphometric ratios here for an easy distinction (Figs. 27, 43–45, 49; Tab. 2). To warrant a non-biased comparison between these two species, we selected for the figures and tables freshly collected males belonging to the same size-class and from the same two localities where both are known to occur together. The differences in coloration, slenderness of pedipalps and metasoma, and carination of the same structures are in fact very obvious to unaided eye, but also *T. quisqueyanus* possesses consistently higher pectinal tooth counts: 10–13 (mode 12) in nine males examined by us.

DISTRIBUTION (Fig. 50). This scorpion is known only from the highest part of the eastern section of the Cordillera Central mountain range, in central Dominican Republic. It has been collected in two nearby localities, separated by about 15 km map distance.

ECOLOGICAL NOTES. In the two localities known, *T. kindli* **sp. n.** lives in the same habitat: high montane pine forest on volcanic soil, at 2,220–2,239 m altitude (Figs. 46–47). According to the information kindly supplied by the collectors, the male obtained in 2004 was found under a rock in the remains of an abandoned bonfire; the one captured by us in 2014 was detected under the loose bark of a fallen pine log, in a rocky landslide along the roadside (Fig. 47).

This is undoubtedly a very rare species, which is collected only sporadically: a single specimen has been obtained in each locality, whereas during the last four decades a pooled total of about 100 individuals of the syntopic and much more common *T. quisqueyanus* has been taken (this number includes our own field results and revision of several museum collections). A third syntopic scorpion that occur at the same two localities is *Centruroides nitidus* (Thorell, 1876).

It is interesting to note here that, in both localities, none of these three species shows a marked preference for a given substratum and can be found as commonly on the vegetation as on the ground.

REMARKS. Teruel (2005: 175) identified tentatively as *T. quisqueyanus* the same specimen herein designated as paratype of *T. kindli* **sp. n.**, but highlighted that it showed some obvious differences (e. g., a remarkably weaker development of pedipalp chela carinae) and stated that additional samples were necessary to define whether it represented a case of variation or a separate

taxon. Our finding of the second adult male that matches perfectly that specimen, as well as abundant supplementary material of *T. quisqueyanus*, allowed us to clarify the status of this population and its differential diagnosis against its remaining Hispaniolan congeners.

COMPARATIVE MATERIAL EXAMINED.

Tityus abudi Armas, 1999
Dominican Republic, Santiago Province, Jánico Municipality, Cordillera Central, Juncalito, Loma Alto de la Bandera, 19°07'04"N 70°50"16.8"W, 1,690 m a. s. l., 11.III.1999, leg. L. F. de Armas, 1♂ holotype (IESC-3.2910); Rincón de Piedra Municipality, Cordillera Central, San José de las Matas, Jamamucito, 19° 07'53.3"N 70°57"35.5"W, 1,615 m a. s. l., 10.IV.1999, leg. L. F. de Armas et R. Bastardo, 1♀ (RTOC: Sco-0294).

Tityus quisqueyanus Armas, 1982
Dominican Republic, La Vega Province, Constanza Municipality, Cordillera Central, Pinar Bonito, 18°49' 33.5"N 70°41'29.1"W, 2,144 m a. s. l., 5.III.2014, leg. R. Teruel, F. Kovařík et P. Kindl, 2♂ 2♀ (RTOC), 1♂ 2♀ (FKPC); Valle Nuevo, La Nevera, 18°44'15.5"N 70° 36'17.1"W, 2,465 m a. s. l., 5.III.2014, leg. R. Teruel, F. Kovařík et P. Kindl, 3♂ 23♀ 3 juveniles (topotypes, RTOC) 3♂ 10♀ (Figs. 27, 43–45, 49, topotypes, FKPC); Valle Nuevo, approx. 2 km southeast of La Nevera, 18°41'33.9"N 70°35'36.1"W, 2,239 m a. s. l., 5.III.2014, leg. R. Teruel, F. Kovařík et P. Kindl, 1♂ 1♀ (RTOC).

Family Scorpionidae Latreille, 1802

Subfamily Diplocentrinae Karsch, 1880

Cazierius neibae Kovařík et Teruel, **sp. n.**

(Figures 51–86; Table 4)

http://zoobank.org/urn:lsid:zoobank.org:act:943ED407-4086-4D5F-A68A-0E84AB3DCF33

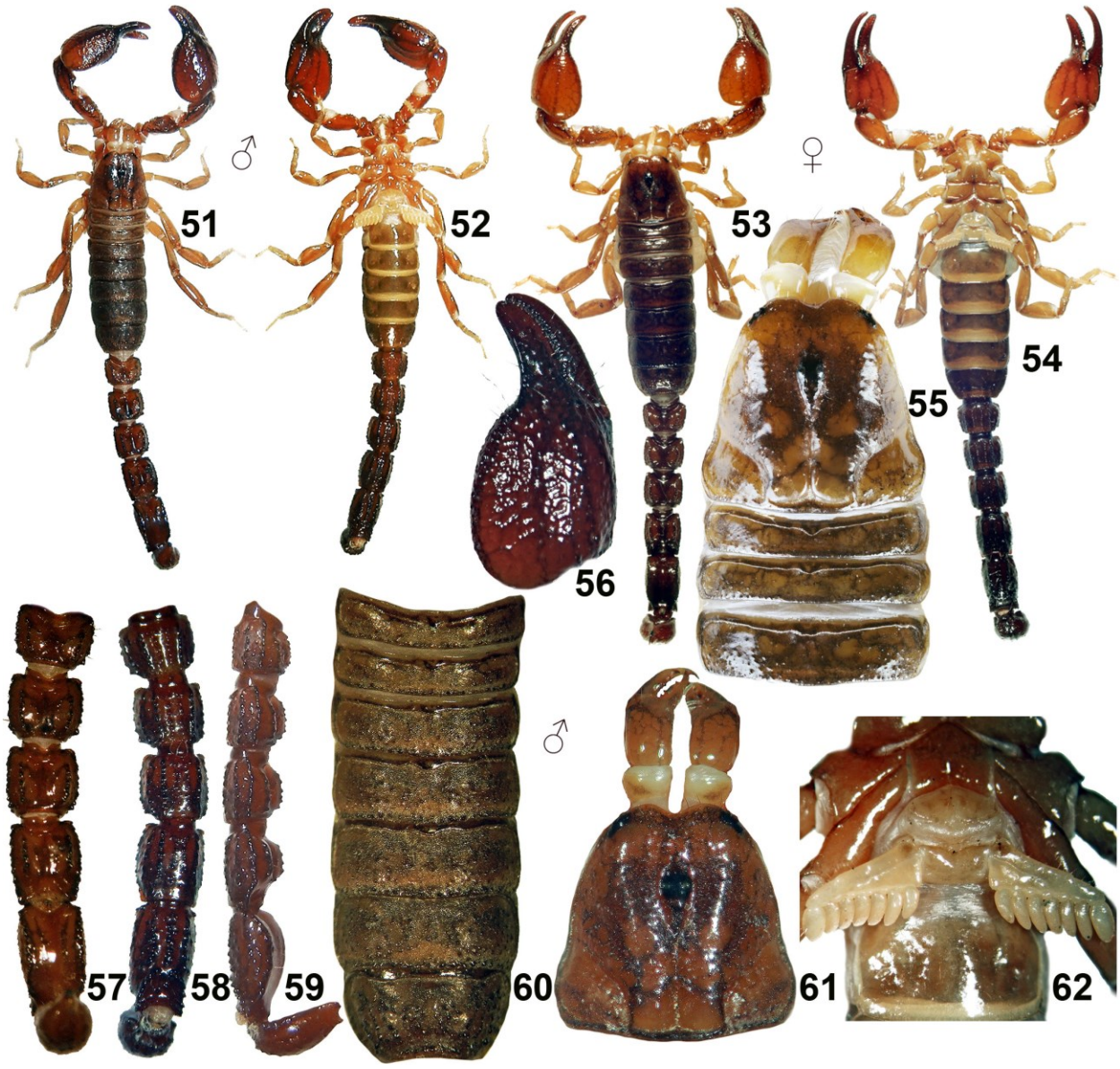
TYPE LOCALITY AND HOLOTYPE DEPOSITORY. Dominican Republic, Bahoruco Province, Neiba Municipality, Sierra de Neiba, Apolinar Perdomo, Segundo Paso, 18°32' 10"N 71°24'20"W, 150 m a. s. l., RTOC.

TYPE MATERIAL. Dominican Republic, Bahoruco Province, Neiba Municipality, Sierra de Neiba, Apolinar Perdomo, Segundo Paso, 18°32'10"N 71°24'20"W, 150 m a. s. l., 9.III.2014, leg. R. Teruel, F. Kovařík et P. Kindl, 1♂ holotype (Figs. 51–52, 56–62, 79, RTOC) 1♀ (Fig. 81, FKCP) 1 juvenile ♀ paratype (Fig. 80, RTOC); Independencia Province, Postrer Río Municipality, Sierra de Neiba, Guayabal, Los Bolos, 18°37'17.5"N 71°38'39.4"W, 1,076 m a. s. l., 9.III.2014, leg. P. Kindl, R. Teruel et F. Kovařík, 1♀ paratype (Figs. 53–55, 63–78, 82, FKCP).

ETYMOLOGY. The selected name is a Latinized noun in apposition, taken from the name of the mountain range where this species occur.

DIAGNOSIS. Adult size moderately small (male 22 mm, females 27–33 mm) for the genus. Coloration dark olivaceous brown, very densely spotted with blackish brown all over the body and appendages except ventrally on prosoma and mesosoma. Carapace glossy, with many coarse granules scattered and large, irregular patches of minute and dense granulation laterally (male) or glossy, with several coarse granules scattered (females and juveniles). Tergites minutely and densely granulose, with many coarse granules scattered (males) or glossy, with some coarse granules scattered (females and juveniles). Metasoma robust (segments I–III wider than long) and sparsely hirsute, with 10-10-10-10-5 complete to essentially complete carinae of large and isolated granules (much stronger in male); intercarinal tegument glossy, with coarse granules scattered; segment V with ventral transverse carina perfectly arched. Pedipalp chelae very short, robust and sparsely hirsute; intercarinal tegument strongly reticulate dorsoexternally and with many coarse granules internally (males) or vestigially reticulate dorsoexternally and with a few coarse granules internally (females); fingers short and densely hirsute (male) or somewhat longer and moderately hirsute (females). Pectinal tooth count 7/7 in males, 6–7 (mode 7) in females. Legs smooth and glossy; modal formula of telotarsal spiniform setae 3/3 : 5/5 : 6/6 : 6/6.

DESCRIPTION (adult male holotype). Coloration (Figs. 51–52, 79) base dark olivaceous brown, very densely spotted with blackish brown all over the body and appendages except on the ventral region, which is essentially immaculate. Chelicera manus moderately reticulate with blackish brown all over, denser distally; fingers moderately infuscate. Pedipalp femur with all carinae deeply infuscate, dorsal and internal surfaces almost entirely blackish, external surface moderately reticulate with blackish brown, ventral surface bicolor along midline: external half blackish, internal half pale; patella with all carinae deeply infuscate and moderately reticulate with blackish brown on all surfaces except ventral, which possesses only sparse spots; chela with all carinae deeply infuscate, hand densely reticulate with blackish brown on all surfaces, fingers blackish with slightly paler tips. Carapace symmetrically and densely spotted with blackish brown (most spots are interconnected), with anterior margin deeply infuscate; tergites very densely spotted and reticulated with blackish brown; venter essentially immaculate except on sternite VII, which has lateral areas moderately infus-



Figures 51–62: ***Cazierius neibae*** **sp. n. Figures 51–52, 56–62**. ♂ holotype, dorsal (51) and ventral (52) views, chela dorsal (56), metasoma and telson dorsal (57), ventral (58) and lateral (59), tergites (60), carapace and chelicerae (61), sternopectinal area with sternite I (62). **Figures 53–55**. ♀ paratype from Los Bolos (Locality No. 14DN), dorsal (3) and ventral (4) views.

cate. Legs very densely spotted on all surfaces, less so internally; coxa and trochanter essentially immaculate. Metasoma with all carinae deeply infuscate and densely spotted with blackish brown; lateral and ventral surfaces of all segments with spots confluent in an entirely blackish patch that covers the distal half of all segments; dorsal surface with a large arrowhead-shaped blackish spot on I–IV, and with two parallel blackish stripes on V. Telson vesicle almost entirely infuscate, with four pale stripes corresponding to longitudinal furrows.

CHELICERAE (Fig. 61). With dentition typical for the genus, all teeth sharp and slender. Tegument smooth and shiny. Fingers long, slender, evenly curved, and conspicuously unequal (movable much longer).

CARAPACE (Fig. 61). Somewhat wider than long, subtriangular. Anterior margin narrow, bilobed, with 2–3 long macrosetae plus several small microsetae on each frontal lobe; median notch U-shaped, moderately deep. Tegument glossy, with many moderately coarse granules scattered all over; laterally with large, irregular patches of minute and dense granulation. Carinae: indistinct or absent. Furrows: lateral oculars, central median, posterior median and posterior marginal narrow and moderately deep, fused; posterior laterals narrow and moder-

Figures 63–70: ***Cazierius neibae*** **sp. n.**, ♀ paratype from Los Bolos, right pedipalp chela dorsal (63), external (64) and ventral (65), pedipalp patella dorsal (66), external (67) and ventral (68), pedipalp femur dorsal (69) and right movable finger internal (70).

ately deep; other furrows indistinct or absent. Median eyes separated by slightly more than one ocular diameter, ocular tubercle raised and elongate; three pairs of lateral eyes, smaller than median eyes.

MESOSOMA (Figs. 60 and 62). Tergites without distinct carinae; tegument minutely and densely granulose, with many coarse granules scattered all over, denser and coarser posteriorly. Sternum type 2, markedly pentag-

Figures 71–74: ***Cazierius neibae*** **sp. n.**, ♀ paratype from Los Bolos, metasoma and telson dorsal (71), ventral (72), and lateral (73) and sternopectinal area with sternites III–VII (74).

onal, somewhat wider than long. Genital operculum with valves subtriangular and completely divided medially; genital papillae large and acute, largely protruding from posterior margin. Pectines extending beyond coxa-trochanter joint of leg IV, sparsely hirsute; tooth count 7/7, fulcra large; basal plate rectangular and much wider than long, anterior margin deeply notched, posterior margin essentially straight. Sternites III–VI smooth a glossy, with medium-sized, slit-like spiracles; VII finely granulose, with two pairs of subequal, subcrenate to subgranulose carinae.

METASOMA AND TELSON (Figs. 57–59). Metasoma short, robust and sparsely hirsute; segments I–III wider than long, IV–V longer than wide; all segments wider than deep. Intercarinal tegument glossy, with coarse granules scattered on all surfaces except ventrally. Segments I–IV with ten complete carinae, V with five: dorsolaterals strongly serratocrenulate to dentate on I–IV, absent from V; lateral supramedians strongly subcrenate to dentate on I–V; lateral inframedians strongly subcrenate to subgranulose on I–IV, absent from V; ventrolaterals strongly serratocrenulate to dentate, complete on I–III, poorly

Figures 75–78: ***Cazierius neibae*** **sp. n.**, ♀ paratype from Los Bolos, tarsomeres of first (75), second (76), third (77) and fourth (79) left legs.

defined on distal part of IV, irregular, distally divergent and absent from distal third of V, where they are replaced by the perfectly arched, strongly crenate ventral transverse carina which has a median opening; ventral submedians strongly crenulate on I–II, irregularly granulose on III, very poorly defined on IV, and absent from V; ventromedian carina strong and composed of a double row of closely alternate conical granules which traverses the ventral transverse carina and become irregular. Segment V with anal arc strongly crenate; laterodistal lobes straight and bluntly triangular. Telson with vesicle oval and somewhat depressed, tegument glossy and with some weak granules scattered which become stronger and sharper on ventrobasal ridge, and with four smooth, shallow, longitudinal furrows, subaculear tubercle large, conical, weakly granulose and covered by 14 translucent macrosetae only (white microsetae absent); aculeus broken and lost almost its entire length.

LEGS. Tegument acarinate, smooth and glossy. Telotarsi with lateral margins essentially straight; spiniform setae formula 3/3 : 5/5 : 6/6 : 6/6–7.

PEDIPALPS (Fig. 56). Orthobothriotaxic C. Femur short, deeper than wide, and vertically curved (dorsal and internal surfaces very convex, external surface flat, ventral surface concave); all carinae indistinct or absent except irregularly granulose dorsointernal; tegument glossy, smooth on all surfaces except dorsointernal, which is coarsely granulose. Patella short, deeper than wide, and with all surfaces convex; all carinae indistinct or absent except irregularly subcostate dorsointernal and vestigially granulose ventrointernal; tegument glossy and

Figures 79–82: ***Cazierius neibae*** **sp. n.**, **Figures 74–76**. ♂ holotype (79), juvenile (80) and ♀ (81) paratypes from type locality. **Figure 82**. ♀ paratype from Los Bolos.

Figures 83–84: ***Cazierius neibae*** **sp. n.**, two views of the type locality (transition from dry submontane semicaducifolious forest through lowland desert scrub on clay-gypsum soil).

Figure 85: ***Cazierius neibae*** **sp. n.**, locality of ♀ paratype from Los Bolos (edge of coffee plantation with remains of humid montane evergreen forest on clay soil, intensively deforested).

smooth on all surfaces except internal, which is very finely and densely granulose. Chela very short and robust (2.40 times longer than wide), somewhat deeper than wide and sparsely hirsute; hand subquadrate in dorsal view (external and internal surfaces essentially parallel) and rounded in cross-section, with all carinae indistinct to absent except strongly subcostate to subgranulose ventroexternal and moderately to weakly subcostate ventrointernal (which are parallel and define a rectangular, flat ventral surface), tegument glossy but strongly reticulate dorsoexternally and with many coarse granules internally; fingers short and thick (movable 1.29 times longer than underhand), strongly curved, and densely hirsute, without basal lobe/notch combination and with a single principal row of denticles flanked by abundant external and internal accessory denticles partially merged with the principal row, tip of fixed finger internally with 2–3 coarse, weak granules irregularly arranged.

FEMALE (Figs. 53–55, 63–78, 81–82; Tab. 4). Similar to the male, but sexual dimorphism is evident by: **1)** size larger; **2)** genital operculum with valves paraboloid, completely fused by a medial membrane, and without genital papillae; **3)** carapace without minutely granulose patches and with coarse granules weaker and fewer; **4)** tergites glossy, only with several coarse granules scattered which are weaker and fewer; **5)** pectines smaller and narrower; **6)** pedipalps with femur and patella slightly broader, but with hand narrower and oval in shape, and fingers longer; **7)** pedipalp chelae with reticulate sculpture much weaker; **8)** metasoma more robust and with all carinae conspicuously weaker.

VARIATION. The two adults from the type locality belong to the same size-class and, as usual for a typical *Cazierius*, the male holotype is slightly smaller than the female paratype. Also, both specimens are about 25% smaller than the adult female from Los Bolos (Tab. 4). A positive correlation between size and altitude in vertically widespread scorpions (i. e., size increases with altitude or vice versa) has already been found in other members of this genus (Teruel & Cala, 2006). We suspect this is also the case for *C. neibae* **sp. n.**, but the sample available is too small to gather how many size-classes are represented.

Apart from this and despite the ecological difference between Segundo Paso and Los Bolos, the adult

Dimensions (mm)		♂ holotype (Segundo Paso)	♀ paratype (Segundo Paso)	♀ paratype (Los Bolos)
Carapace	L / Wp	3.20 / 3.30	3.40 / 3.75	4.30 / 4.55
Mesosoma	L	6.61	10.20	11.40
Tergite VII	L / W	1.49 / 2.22	1.90 / 3.50	2.00 / 4.10
Metasoma	L	11.86*	13.00	16.85
Segment I	L / W	1.49 / 2.00 / 1.45	1.50 / 2.15 / 1.65	2.00 / 2.85 / 2.15
Segment II	L / W	1.68 / 1.90 / 1.45	1.60 / 1.90 / 1.60	2.10 / 2.60 / 2.10
Segment III	L / W	1.78 / 1.85 / 1.48	1.70 / 1.90 / 1.60	2.30 / 2.50 / 2.10
Segment IV	L / W	2.10 / 1.80 / 1.48	2.10 / 1.85 / 1.60	2.75 / 2.40 / 2.10
Segment V	L / W	2.71 / 1.75 / 1.40	2.80 / 1.80 / 1.60	3.60 / 2.35 / 2.00
Telson	L	–	3.30	4.10
Vesicle	L / W	2.10 / 1.45 / 1.10	2.40 / 1.80 / 1.75	3.10 / 2.40 / 1.80
Aculeus	L	–	0.90	1.00
Pedipalp	L	9.37	11.25	13.00
Femur	L / W	2.12 / 1.00	2.45 / 1.10	2.90 / 1.40
Patella	L / W	2.20 / 1.16	2.80 / 1.20	3.40 / 1.50
Chela	L	5.05	6.00	6.70
Hand	L / W	2.20 / 2.10 / 2.20	2.50 / 2.60 / 2.30	2.70 / 3.60 / 3.00
Movable finger	L	2.85	3.50	4.00
Total	**L**	**21.67***	**26.60**	**32.55**

Table 4: Measurements of the adult types of *Cazierius neibae* **sp. n.** Abbreviations: length (L), width (W), posterior width (Wp), depth (H), left (L), right (R), incomplete measurements due to aculeus broken are marked with an asterisk (*).

females from both localities are identical in coloration, tegument sculpture and carination, pectinal tooth count (7/7), telotarsal spiniform setae formula (3/3 : 5/5 : 6/6 : 6/6), and diagnostically relevant morphometric proportions (Figs. 81–82; Tab. 4).

The juvenile female from type locality (Fig. 80) differs from the adult in the same characters in common to all Diplocentrinae scorpions: base color much lighter (pale grayish), with the dark pattern more contrasting, as well as pedipalps and metasoma more slender and with weaker carinae; it also has a slightly lower pectinal tooth count of 7/6.

AFFINITIES. After the generic reassignment made by Teruel (2005), only two other Hispaniolan species remained allocated in this genus: *Cazierius cicero* (Armas et Marcano, 1987) and *C. politus* (Pocock, 1898); the former is apparently widespread but disjunct in two main areas isolated by the Cordillera Central mountain range, while the latter is endemic from the southeast coast including Saona Island (Fig. 86). Two characters that are very conspicuous even to unaided eye make very easy to separate *C. neibae* **sp. n.** from both: the very dark, essentially blackish overall coloration, and the coarse granulation scattered over carapace and tergites. Apart from this, a supplementary comparison is detailed as follows:

Regardless that *C. politus* could actually represent a complex of cryptic species, as currently diagnosed it can be distinguished also by the female chelae less robust, with tegument completely devoid of reticulate sculpture. Further, it shows a slight but consistent tendency to be larger (males 24–30 mm, females 26–36 mm) and have higher pectinal tooth count in males (7–9, mode 8).

On the other hand, the only taxonomic information published on *C. cicero* remains its very poor original description (just a six-sentence diagnostic paragraph and a measurements table, without any illustrations), but based upon our examination of the holotype and additional specimens it can be further distinguished by the female carapace and tergites with irregular patches of minute and dense granulation, especially on lateral areas, and female chelae with tegument completely devoid of reticulate sculpture and with dorsoexternal carinae distinct as smooth edges.

DISTRIBUTION (Fig. 86). This scorpion is known only from the southern watershed and slopes of the Sierra de Neiba, in southwestern Dominican Republic. It has been collected in two nearby localities, separated by some 25 km air distance, but at very different altitudes. Taking into account the proximity of the Haitian border, *C. neibae* **sp. n.** is very likely to occur also in this country.

ECOLOGICAL NOTES. This species lives under limestone rocks on clay-gypsum soil, but apart from this common factor, the two known localities are markedly dissimilar in other conditions such as altitude, vegetation, and scor-

Figure 86: Geographical distribution of ***Cazierius neibae* sp. n.** (black squares), ***C. cicero*** (grey squares), and ***C. politus*** (white squares).

pion fauna. At type locality it lives in the transition zone from dry submontane semicaducifolious forest through lowland desert scrub, at an elevation of 150 m a. s. l. (Figs. 83–84). Other scorpions found here are all buthids: *Centruroides bani* (mostly under barks, but also in the ground), *C. nitidus* (only under barks of standing trees, shrubs and fence posts), *Microtityus paucidentatus* and *M. solegladi* Armas & Teruel, 2012 (both exclusively under rocks).

The single specimen from Los Bolos was detected under a large rock surrounded by the tall grass of the roadside, at the edge of a coffee plantation with remains of the original humid montane evergreen forest, at an altitude of 1,076 m a. s. l. (Fig. 85). Other scorpions that coexist here are the buthids *Microtityus virginiae* Armas, 1999 (exclusively under rocks), and *Tityus neibae* Armas, 1999 (mostly in the ground, but also onto the vegetation).

REMARKS. On the basis of color pattern, pectinal tooth count, morphometric proportions, carination and sculpture of carapace, tergites, metasoma and pedipalp chelae, *Cazierius neibae* **sp. n.** is more similar to the eastern Cuban endemics *C. paradoxus* Teruel et Díaz, 2004 and *C. parvus* Armas, 1984, than to its other Hispaniolan congeners. Another case of such similar relationship was highlighted by Teruel (2005) on the southern Hispaniolan endemic *Heteronebo monticola* (Armas, 1999), which is morphologically closer to a northeastern Cuban endemic *H. nibujon* Armas, 1984 than to the remaining Hispaniolan species.

COMPARATIVE MATERIAL EXAMINED.

Cazierius cicero (Armas & Marcano, 1987)
Dominican Republic, San Pedro de Macorís Province, Guayacanes Municipality, Los Conucos, 6.IV.1986, leg. A. Abud et E. J. Marcano, 1♂ holotype (IESC: 3.2913); bridge over Cumayasa River, at border with La Romana Province, 18°27'07.9"N 69°05'49.2"W, 39 m a. s. l., 1.III.2014, leg. R. Teruel, F. Kovařík et P. Kindl, 2 juveniles ♂ (FKCP); La Altagracia Province, San Rafael del Yuma Municipality, approx. 4 km north of Bayahibe, 18°23'18.8"N 68°50'18.6"W, 48 m a. s. l., 1.III.2014, leg. R. Teruel, F. Kovařík et P. Kindl, 1♀ 1 juvenile ♀ (RTOC) 1♀ (FKCP); approx. 1 km south of Bayahibe, 18°21'25.4"N 68°49'44.3"W, 6 m a. s. l., 1.III.2014, leg. R. Teruel, F. Kovařík et P. Kindl, 2♀ 1 juvenile ♀ (RTOC); approx. 4 km southwest of Boca de Yuma, 18°21'47.7"N 68°37'05.8"W, 23 m a. s. l., 2.III.2014, leg. R. Teruel, F. Kovařík et P. Kindl, 1 juvenile ♂ (RTOC).

Cazierius politus (Pocock, 1898)
Dominican Republic, Valverde Province, Mao Municipality, Gurabo, 28. II.1998, leg. M. Schenkel, 1♂ (RTOC: Sco-0286); Azua Province, Las Charcas Municipality, Hatillo, Playa Chiquita, 30.VIII.1988, leg. E. J. Marcano et C. Marcano, 1♂ 1♀ (RTOC: Sco-0019); Las Charcas Municipality, El Número, 18° 21'16.8"N 70°30'55.3"W, 167 m a. s. l., 6 and 15. III.2014, leg. R. Teruel, F. Kovařík et P. Kindl, 1♂ 7♀ 16 juveniles (RTOC) 7♀ 22 juveniles (FKCP).

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