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A review of the flightless genus *Nanotermitodius* Howden, 2003 (Coleoptera: Scarabaeidae: Aphodiinae: Rhyparini)

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Abstract

The genus *Nanotermitodius* Howden, 2003 (Coleoptera: Scarabaeidae: Aphodiinae: Rhyparini) is reviewed and a new species described. Only two species are presently known in the genus, *Nanotermitodius andersoni* Skelley, Smith, & Mora-Aguilar, **new species**, and *Nanotermitodius peckorum* Howden, 2003, which both occur in Oaxaca, Mexico. A key and distribution map for the species are presented.

Key words: endemic, Oaxaca, Mexico, leaf litter

Introduction

Research in the past decade on New World Rhyparini (Coleoptera: Scarabaeidae: Aphodiinae) has discovered new species in most genera, including fossil taxa, with a present total of 26 species in six genera (Mencl & Rakovič 2013; Mora-Aguilar & Delgado 2019a; Minkina 2020; Skelley 2021a, 2021b; Skelley *et al*. 2022). Additional manuscripts describing new taxa are currently in preparation.

Nanotermitodius Howden, 2003 was erected for a single unusual flightless species from Oaxaca, Mexico, that was collected directly from leaf litter. Being flightless and with reduced eyes, it is highly likely that more localized, high elevation rhyparines exist in Mexican leaf litter that remain to be discovered. Recent leaf-litter extractions produced a large series of another unusual flightless species that superficially looks very different from the type species, but tibial characters (see Skelley 2007) place it in *Nanotermitodius*. This paper describes this unusual new species to make the name available for further studies.

Materials and methods

All Rhyparini are covered with dirt or encrustations that need to be cleaned in order to properly see external characters. This was done by relaxing specimens overnight in a light detergent water, then gently brushing off with a fine paint brush. Sometimes, encrustations were broken up with a pin, then brushed. Photographs of specimens in the FSCA were taken using a Syncroscopy Auto-Montage system with a JVC 3-CCD, KY-F75U digital camera through a Leica Z16 APO lens. Terminology for dorsal carinae follows Krikken & Huijbregts (1987) and Howden (2003). Label data for the holotypes are presented verbatim, where a backslash "/" separates lines on a label. Paratype and other specimen data are shortened and standardized for consistently in presentation. Distribution maps were made in Quantum Gis 3.2 software (QGIS Development Team 2018). Digital Elevation Model Layers have been taken from EOSDIS Earthdata (National Aeronautics and Space Administration 2022).

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Nanotermitodius Howden, 2003

Nanotermitodius Howden, 2003: 393. Type species: *Nanotermitodius peckorum* Howden, 2003: 396, by original designation.

Diagnosis. *Nanotermitodius* is unique among the rhyparines by having the male sexual dimorphism of a *Rhyparus*-type mesotibia and *Termitodiellus*-type metatibia (Skelley 2007). The females have simple, unmodified tibial apices. Other useful characters to diagnose *Nanotermitodius* include elytral carinae sinuate in dorsal and lateral views, caudal apex of discomedian costa on elytra with an erect tuft of setae, mesoventrite with shallow longitudinal median groove, metaventrite with distinct discolateral fovea on either side of midline, and male protibia distinctly tridentate at apex, female protibia weakly tridentate. The genus also has fused elytra with flight wings reduced to vestigial buds, reduced eyes, and is presently known only from the state of Oaxaca, Mexico.

Comments. Howden (2003) provided a generic description, which also acted as the species description for *N. peckorum*. Thus, a brief diagnosis of the genus listing important delimiting characters was needed. Other traditional characters like body shape, costal development, etc. vary between these two *Nanotermitodius* enough to overlap with other genera, making these characters less useful for generic delimitation. Skelley (2007) noted that male *N. peckorum* have *Rhyparus*-type mesotibia but *Termitodiellus*-type metatibia. The new species shows this character combination more prominently than *N. peckorum*. This tibial combination in the males will readily distinguish *Nanotermitodius*.

Key to species of *Nanotermitodius*

1 Pronotum as wide as long, lateral margins only sinuate and parallel sided; elytra interval between discomedial and discolateral costae with two rows of punctures (Fig. 1) . . . . ***N. andersoni*** **Skelley, Smith, & Mora-Aguilar, new species**

\- Pronotum wider than long, laterally margins lobed and converging posteriorly; elytra interval between discomedial and discolateral costae with one row of punctures (Fig. 4) . . . . ***N. peckorum*** **Howden, 2003**

Nanotermitodius andersoni Skelley, Smith, & Mora-Aguilar, new species

Figures 1–3, 7–9, 11–16

Type material (total 243)**.** Holotype male and allotype female (CMNC) label data: "**MEXICO: Oaxaca /** Plan de Guadalupe, 2548m / 18.13214 -96.96790 / 10 Jun 2016, / R.S. Anderson **2016-123** / cloud forest litter". Holotype with identification label: "[red paper] **HOLOTYPE** ♂ / *Nanotermitodius* / *andersoni* Skelley, / Smith & Mora-

Aguilar”. Allotype with identification label: “[blue paper] **ALLOTYPE** ♀ / *Nanotermitodius* / *andersoni* Skelley, / Smith & Mora-Aguilar”.

Additional paratypes (244) with yellow identification labels lacking sex symbols, label data: **MEXICO: Oaxaca: Agua de Hueso**, 1915m, 18.14653, -96.79340, 15-VI-2016, R.S. Anderson, 2016-153, scrubby cloud forest litter (3♂♂ CMNC); **Agua de Tierra**, 1886m, 18.14458, -96.79798, 15-VI-2016, R.S. Anderson, 2016-154, liquidambar forest litter (23♂♂, 10♀♀ CMNC; 2♂♂, 2♀♀ FSCA); **3 km NW Ayautla**, 1460m, 18.05369, -96.69192 ±20m, 14-VI-2016, Longino et al. cols, secondary wet forest, ex sifted leaf litter (1♀ CEMT; 3♂♂, 2♀♀ EMAC); Same locality, 1320m, 18.05175, -96.69096 ±20m, 14-VI-2016, Longino et al cols., secondary wet forest, ex sifted leaf litter (1♀ EMAC); **above Café Carlota**, 1459m, 18.05367, -96.69183, 14-VI-2016, R.S. Anderson, 2016-149, mixed hardwood forest litter (1♂, 1♀ CMNC); Same locality, 1508m, 18.05419, -96.69207, 14-VI-2016, R.S. Anderson, 2016-150, mixed hardwood forest litter (2♂♂ CMNC); Same locality, 1604m, 18.05532, -96.69239, 14-VI-2016, R.S. Anderson, 2016-151, mixed hardwood forest litter (1♀ CMNC); **5 km ENE Huautla**, 1890m, 18.14453, -96.79799, 15-VI-2016, Project ADMAC, Wm-F-04-2-02, ex sifted liquidambar litter (24♂♂, 7♀♀: CMNC; 2♂♂ 2♀♀ FSCA); **Plan de Guadalupe**, 2548m, 18.13214, -96.96790, 10-VI-2016, R.S. Anderson, 2016-123, cloud forest litter (HT♂, AT♀, 1 disarticulated ♂, 1♂, 3♀♀ CMNC; 2♂♂, 2♀♀ FSCA; 1♂, 1♀ IEXA); Same locality, 2502m, 18.13369, -96.96642, 10-VI-2016, R.S. Anderson, 2016-124, oak forest litter (2♂♂, 2♀♀ CMNC); Same locality, 2442m, 18.13551, -96.96453, 10-VI-2016, M Barrios-Izás, MBI-666, hojarasca, bosque nuboso (5♂♂, 4♀♀ CMNC; 1♂, 1♀ CNIN; 1♂, 1♀ CZUG; 2♂♂, 2♀♀ NHML; 3♂♂, 3♀♀ UNSM) [1♂ with additional orange paper label: “DNA VOUCHER / P585 2018 / MJ Paulsen-UNSM”]; Same locality, 2494m, 18.13401, -96.96612, 10-VI-2016, M Barrios-Izás, MBI-667, hojarasca, bosque nuboso (3♂♂, 2♀♀ CMNC; 2♂♂, 2♀♀ FSCA); Same locality, 2468m, 18.13559, -96.96377, 10-VI-2016, M Barrios-Izás, MBI-668, hojarasca, bosque encino (5♂♂, 4♀♀: CMNC; 1♂, 1♀ CASC; 1♂, 1♀ MCZC); Same locality, 2392m, 18.13672, -96.96228, 10-VI-2016, M Barrios-Izás, MBI-669, hojarasca, bosque nuboso (2♂♂, 2♀♀ CMNC); Same locality, Hwy 182, Km 38-39, 2516m, 18.13688, -96.96202 ±20m, 9-VI-2016, L. R. Benavides, #LRB-MX021, oak forest, ex sifted leaf litter (1♂, 1♀ CMNC); **Puerto de la Soledad**, Hwy 182, km 28, 2366m, 18.16280, -96.99669, 10-VI-2016, R.S. Anderson, 2016-125, cloud forest litter (1♀ CMNC); Same locality, Hwy 182, km 28, 2370m, 18.16306, -96.99693, 10-VI-2016, R.S. Anderson, 2016-126, cloud forest litter (3♂♂, 5♀♀ CMNC); Same locality, Hwy 182, km 24, 2241m, 18.17548, -97.00745, 11-VI-2016, R.S. Anderson, 2016-127, oak-pine forest litter (4♂♂, 1♀ CMNC); Same locality, Hwy 182, km 26, 2320m, 18.17470, -97.00205, 11-VI-2016, R.S. Anderson, 2016-130, cloud forest litter (1♀ CMNC); Same locality, Hwy 182, km 27, 2319m, 18.16911, -97.00181, 11-VI-2016, R.S. Anderson, 2016-131, open oak forest litter (11♂♂, 16♀♀ CMNC; 2♂♂, 2♀♀ EMAC; 1♂, 1♀ FSCA; 1♂, 1♀ IEXA; 1♂, 1♀ USNM); Same locality, 2381m, 18.16364, -96.99763, 11-VI-2016, R.S. Anderson, 2016-132, cloud forest litter (2♀♀ CMNC); Same locality, 2388m, 18.16275, -96.99771, 11-VI-2016, R.S. Anderson, 2016-133, cloud forest litter (2♂♂ CMNC); Same locality, 2396m, 18.16181, -96.99776, 13-VI-2016, R.S. Anderson, 2016-139, cloud/oak/podocarpus forest litter (1♂ CEMT; 4♂♂, 2♀♀ CMNC; 3♂♂, 1♀ FSCA); Same locality, Hwy 182, km 30, 2369m, “18.16307003, -96.996851” [correct coordinates 18.15307003, -96.986851], 9-VI-2016, L.R. Benavides, LRB-MX-022, oak forest litter sample (1♂ CMNC); Same locality, Hwy 182, km24, 2198m, 18.17487, -97.00661, 11-VI-2016, M Barrios-Izás, MBI-674, hojarasca, bosque encino (6♂♂, 2♀♀ CMNC); Same locality, Hwy 182, km26, 2343m, 18.17465, -97.00138, 11-VI-2016, M Barrios-Izás, MBI-675, hojarasca, bosque encino (2♂♂, 3♀♀ CMNC; 2♂♂, 2♀♀ FSCA); Same locality, Hwy 182, km27, 2299m, 18.16893, -97.0024, 11-VI-2016, M Barrios-Izás, MBI-677, hojarasca, bosque encino (3♂♂, 3♀♀ CMNC).

Additional material. One other data point is known for a non-paratype. Galante *et al*. (2003: 305, fig. 17; 309) illustrate a specimen of this species, misidentified as “*Termitodius chaki* Reyes and Martinez” with label data: “**Oaxaca** (new state record): 26 km E Teotitlan del Camino, 2250 m, 26.IX.1990, R. BARANOWSKI”.

Diagnosis. Body of moderate size, length 3.52–4.07 mm, pronotum quadrate, pronotal lateral margin weakly sinuate, longer elytra (almost 2 times length of pronotum), which are parallel-sided having straighter costae, flight wings vestigial.

Description. Male holotype (Figs. 1–3)**.** Body length 4.07 mm, greatest width 1.56 mm. Dorsum dark reddish brown nearly black with head, pronotal lobes, and legs tinged with brown; shape elongate, almost parallel sided. **Head.** Head one-third wider than long, surface dulled, punctures with short setae (Fig. 11); clypeus anteriorly with inflexed, flattened margin bearing short setal fringe, lower edge medially sharply, obtusely angulate, upper edge with weakly inflexed margin smoothly to angulate tooth adjacent to rounded edge of gena; clypeocentral disc defined anteriorly by U-shaped groove (peridiscal impression), and posteriorly by arcuate suture, center of disc with 2 small, longitudinal tubercles. Vertex with 4 short, longitudinal carinae, each with a short tuft of erect setae (best seen in profile), 2 frontodiscal costae slightly closer and with shallow groove between. Gena anteriorly lobed, posteriorly depressed above eye, eye greatly reduced (compare Figs. 9–10), not visible dorsally. Mouthparts not notably different from other recently described rhyparines; epipharynx with anterior margin deeply concave (Fig. 13). **Pronotum.** Pronotum as wide as long, with 6 irregularly longitudinal carinae; paramedian costa complete and slightly convergent in anterior half, discolateral costa interrupted in anterior third by deep irregular pit, parts anterior to pits slightly more elevated and wider than posterior part, which is weakly elevated; submarginal costa outwardly sinuate near middle with adjacent deep, mesad depression; all costae extending to posterior pronotal margin; surface of intervals between paramedian and discolateral costae strongly punctate anteriorly, nearly impunctate and dulled posteriorly; surface of interval between discolateral and submarginal costa coarsely punctate entire length; pronotal punctures bearing short setae; lateral margin of pronotum sinuate with 2 week lobes, equally prominent laterally, anterior lobe elongate forward of equal length to intermediate lobe, which grades smoothly to posterior angle of pronotum; anterior pronotal margin tomentose, lateral posterior margins lacking marginal bead. **Scutellum.** Scutellar shield minute, narrow, apex acute. **Elytra.** Elytron almost 2 times length of pronotum; with 4 elevated carinae; discomedian costa depressed near middle of elytron, highest in apical third anterior to bulbous area; discolateral costa sinuate, more elevated than discomedial costa, highest points just at middle and near apex, near apex costa curves inwardly to trichome; discomedial and discolateral costa ending posteriorly with tuft of setae over trichomes occupying depression just anterior to bulbous apex; posthumeral costa elevated anteriorly, weakly sinuate, gradually reducing in height and width towards apex, indistinct when reaching caudal trichome; submarginal costa dorsally sinuate, sharply turns inward and upward at elytral apex merging with caudal bulb; caudal bulb transverse in dorsal view, narrow and vertical in caudal view (Fig. 12), most pronounced near suture; all costae dorsally with 1 or 2 rows of minute setae; elytral intervals with coarse, deep seta bearing punctures; interval between juxtasutural and discomedian costa and interval between posthumeral and submarginal costa with 1 row of punctures; intervals between discomedian-discolateral-posthumeral costae with 2 rows of punctures. **Flight wings.** Metathoracic wings vestigial, reduced to buds (Fig. 8), species flightless, elytra fused. **Ventral thorax.** Preprosternal apophysis medially broadly lanceolate anterior to coxae; postprosternal apophysis haustate. Mesoventrite short, surface densely punctate; medially with longitudinal, tomentose-ringed groove. Metaventrite with narrow, anterior metasternal projection separating mesocoxae; posterior of process with large, deep, medial impression, with small medial and larger triangular lateral impression just behind mesocoxa, discal area with a large 2-part impression. **Abdomen.** Abdomen with 5 visible sternites, first 4 narrow, slightly wider laterally; first ventrite medially with oval concavity, laterally with large cavity occupying most of metacoxal length; next 3 ventrites with small depression on each side near lateral edge, otherwise, convex; apical ventrite approximately as long as adjacent 3 sternites combined, basal two-thirds with deep transverse depression on each side of median ridge; apical third of last ventrite convex, surface with numerous recumbent setae, bearing a small medial tubercule. Pygidium flattened, apical three-fourths outlined by distinct ridge, basal portion above ridge finely setose with distinct median longitudinal sulcus, below sulcus in flattened area midline carinate, smooth on each side; apex of pygidium rounded. **Legs.** Ventral surfaces of all femora irregularly punctate-setose, profemur robust with tooth medially on anterior margin, meso- and metatibia narrow; meso- and metafemur with a weakly defined area for tibia. Protibia with broad apical margin distinctly tridentate, each tooth sharply angulate, medial tooth projecting inwardly. Mesotibia gradually expanded to truncate apex, sinuate inner margin with dense fringe of setae along apical third, distinct sharp tooth on inner apical edge directed inwardly (Fig. 8); apical fringe of spinules short, complete. Metatibia gradually widening to apex, inner apical angle extended approximately one-third length of basal tarsomere as an acute tooth (Fig. 8); apical fringe of spinules short, complete. Protarsus short, length of basal tarsomere equal to next 2 combined. Mesotarsus narrow, half as long as tibia; basal tarsomere as long as next 3 combined. Metatarsus narrow, half as long as tibia; basal tarsomere as long as rest of tarsus. **Genitalia.** Male genitalia slender, tubular, gradually curved; phallobase 4.8 times longer than parameres; parameres short, triangular, rounded apically (Figs. 14–15).

Female allotype. Body length 3.89 mm, width 1.52 mm. Similar to male, showing dimorphisms in tibiae and abdomen. Profemur lacking tooth medially on anterior margin. Protibia with 2 apical teeth, medial and outer angle, inner tooth of male obsolete. Meso- and metatibia gradually expanded to apex, lacking sinuate inner margin and apical teeth (Fig. 7). Abdomen with last ventrite convex, with small basal depressions and lacking small medial tubercle on apex.

FIGURES 1–6. *Nanotermitodius* species, habitus images. **1–3,** *Nanotermitodius andersoni*, holotype male (CMNC). **4–6,** *Nanotermitodius peckorum*, male, from "22 mi. S. of Valle Nacional" (FSCA), habitus images. **1, 4,** Dorsal. **2, 5,** Ventral. **3, 6,** Lateral. Scale line = 1.0 mm.

Variation. Body length 3.52–4.07 mm, width 1.33–1.56 mm. Much subtle variation was observed, that was not sexually dimorphic, which includes the following. Head with clypeal teeth and minute tuft of setae on frontodiscal costa of head varying from present to absent. This is easily attributed to apparent wear on older specimens, as many have those surfaces abraded. Pronotum with shape quadrate or appearing longer than wide, but measuring quadrate; coarse punctation between paramedian costa always present on anterior half of surface, varying from few to numerous punctures in posterior half; number, size and distinctness of surface punctures variable; lateral margin varied from weakly to distinctly sinuate (never deeply sinuate); posterior lobe of lateral margin varies from small and flatly rounded to somewhat dentate. Elytra with lateral margin varying from nearly parallel sided to distinctly arcuate-sinuate; discomedian costa with median section absent to reduced but distinct; discolateral costa curvature and height being weakly to more strongly sinuate; submarginal costa with angulate or rounded caudal end as curving into caudal bulb; intervals between costa with puncture size varying from distinctly separated to almost coalescing. Metaventrite median fovea varied from sharply or roundly edged, edged arcuate to somewhat sinuate; general shape from wider anteriorly to almost rectangular to evenly oval; discal foveae on each side a series of 2–3 large foveae or a single crescent shaped fovea. Protibial teeth abraded in many, thus more-or-less distinctly dentate based on age and wear.

Etymology. Named for Robert S. Anderson, a weevil expert who works with high elevation, often flightless weevils. His primary collecting technique is use of Berlese or Winkler extractors on sifted leaf litter. He collected the large number of specimens studied here, or helped lead different projects (*e.g.*, Leaf Litter Arthropods of MesoAmerica, LLAMA) that produced these and many other interesting rhyparines.

Natural history. Immature stages and host relations are unknown. Adults are found in litter. The species inhabits cloud forest, scrubby cloud forest, oak forest, oak-pine forest, mixed hardwood forest, secondary vegetation related to this vegetation, some cloud forest locations are dominated by *Liquidambar* L. (Altingiaceae) or *Podocarpus* Labill. (Podocarpaceae).

Distribution. Known only in Sierra Mazateca, Oaxaca, Mexico, at an elevation of 1320–2550 m (Fig. 16).

Comments. Robert S. Anderson (personal communication, 12 October 2021) suggested each of the separate areas where these were collected may have a different species, as he observes in the flightless weevil fauna. Specimens of *Nanotermitodius* were sorted by locality, then males were dissected from each area and many comparisons were made. Some variations were observed in many characters as noted in the Variation section. In the available series, some variations seemed more prevalent within one population compared to another. However, a corollary of our species concept is the ability to identify a species without knowing where it was collected. These variations show much overlap between localities. None of the variations observed could be definitively associated with a single area. Having large series allowed us to avoid over description of populations based on subtle differences. More new data may show otherwise. For now, we deem it best to consider these a single species.

Discussion. Oaxaca is one of the most diverse territories in Mexico, almost 10% of the state's flora and fauna are endemic. Nine monospecific genera and more than 700 species of vascular plants and more than 130 species of vertebrates are restricted to this state, most of them in the cloud forests and oak forests of the Oaxacan Highlands (García-Mendoza 2004; González-Pérez *et al*. 2004). For highly studied insects with stable taxonomy, the information has been compiled. For example, butterflies have 29 endemic Oaxacan taxa (Luis-Martínez *et al*. 2004). However, this pattern shown in plants and vertebrates should be similar or have higher values for various groups of insects as has been recorded in some Oaxacan regions such as Chimalapas (Mora-Aguilar & Delgado 2019b).

The Oaxacan Highlands are known as one of the most diverse areas in Mexico (González-Pérez *et al*. 2004), and biogeographically have been considered as part of the Orizaba-Zempoaltépec district in the East Subprovince and Trans-Mexican Volcanic Belt Province (Morrone 2020). Some species of beetles, such as *Cyclocephala mesophylla* Mora-Aguilar & Delgado, 2012 and *Chrysina victorina* (Hope, 1840) (Coleoptera: Scarabaeidae) (Mora-Aguilar & Delgado 2012; Mora-Aguilar *et al*. 2018), support this pattern. Nevertheless, this area is historically and topographically conformed by the Sierra Mazateca, Sierra de Juárez, and Nudo de Zempoaltépetl. The Sierra Mazateca has been more related with the Sierra Madre Oriental than to Sierra de Juárez and Nudo de Zempoaltépetl in separate parsimony analyses using vascular plants and vertebrates (Luna *et al*. 1999; León-Paniagua & Morrone 2009).

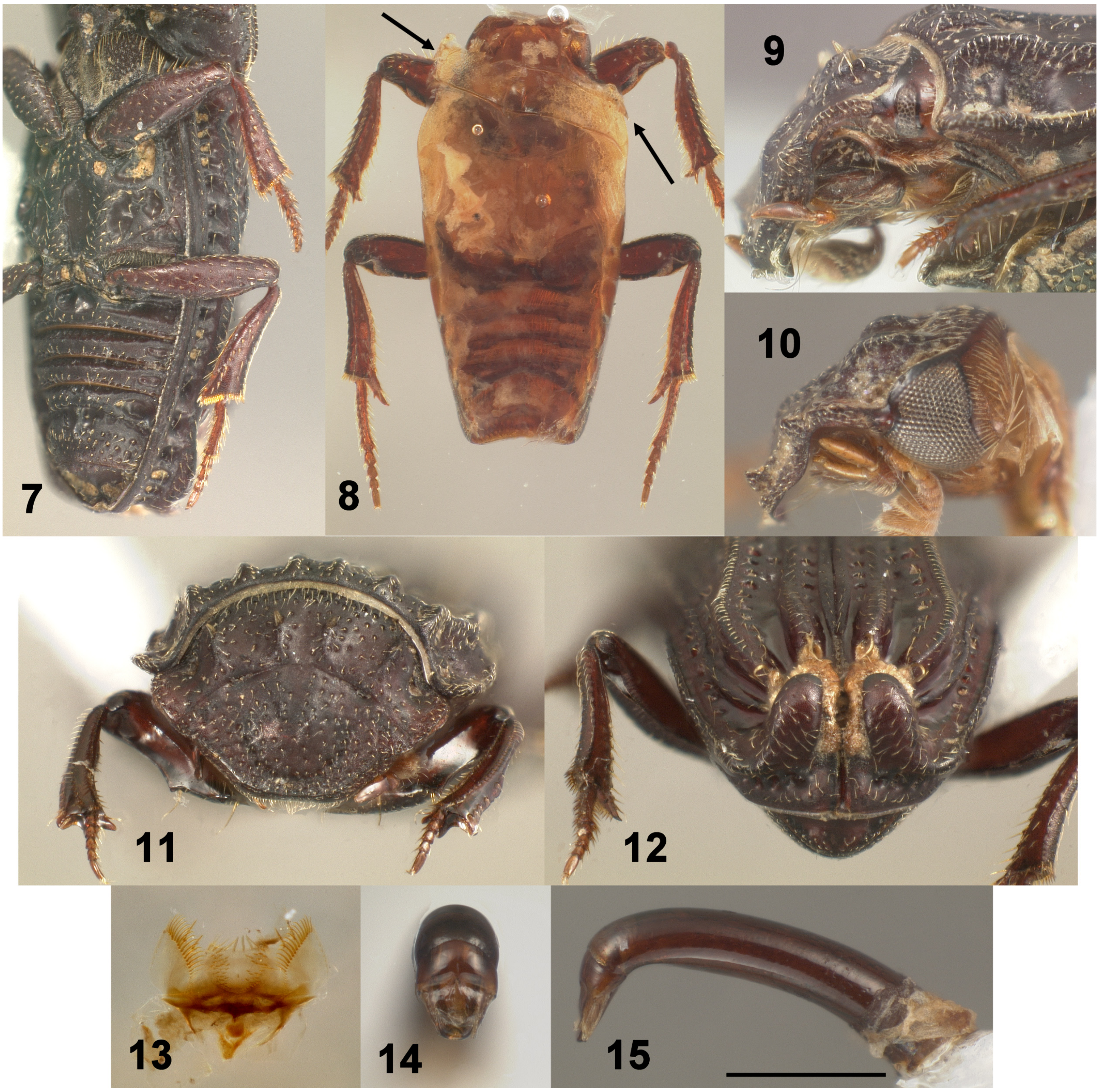
Additional factors such as separation of the two mountain masses (Sierra Mazatec and Sierra de Juárez) by the lowlands of the Cañón de Tecomavaca and Río Santo Domingo, which act as geographic barriers, along with biological, climatical, topographical, geological, and geomorphological differences (Luna *et al*. 1999; Centeno-García 2004; León-Paniagua & Morrone 2009), vagility limitations and the possible association with ant or termites, support this theory and the restricted distribution of this species.

Nanotermitodius peckorum **Howden, 2003**
Figures 4–6, 16

Nanotermitodius peckorum Howden, 2003: 396.

Type material examined (2**).** Holotype male and allotype female (CMNC): "MEXICO: Oaxaca, 1220m, 26 km E. Valle Nacional, 25.VI.1983, S. & J. Peck, Mont. trop. for. litter Ber. Km 71, 83-50".

Additional material examined (14): **MEXICO: Oaxaca:** Hwy. 175, 22mi. S. Valle Nacional, 5800', 3-VI-1983, CW. & L. O'Brien & GB. Marshall, Berlese sifted cloud forest litter (1♂, 1♀ FSCA); 18.7 mi S Valle Nacional, 5200', 17-VIII-1973, A. Newton, Berlese litter cloud forest (2♂♂, 2♀♀ FSCA; 1♂, 1♀ IEXA; 1♂, 5♀♀ MCZC); 18.7 mi S Valle Nacional, 5200', 11-18-VIII-1973, A. Newton, leaf litter forest floor (1♀ MCZC).



FIGURES 7–15. Body parts of *Nanotermitodius andersoni* (unless noted otherwise). **7,** Allotype female, showing dimorphic tibial apices and ventrolateral thorax and abdomen. **8,** Disarticulated male paratype, showing dimorphic tibial apices and vestigial wing bud (arrow). **9,** Head, lateral view, showing reduced eye. **10,** *Rhyparus costaricensis* Cartwright & Woodruff, 1969, head showing a normally developed eye. **11,** Holotype head, anterior view. **12,** Holotype elytra, in caudal view. **13,** Epipharynx, paratype. **14–15,** Paratype male genitalia, caudal and lateral view. Scale line for Figures 14–15 = 0.5 mm.

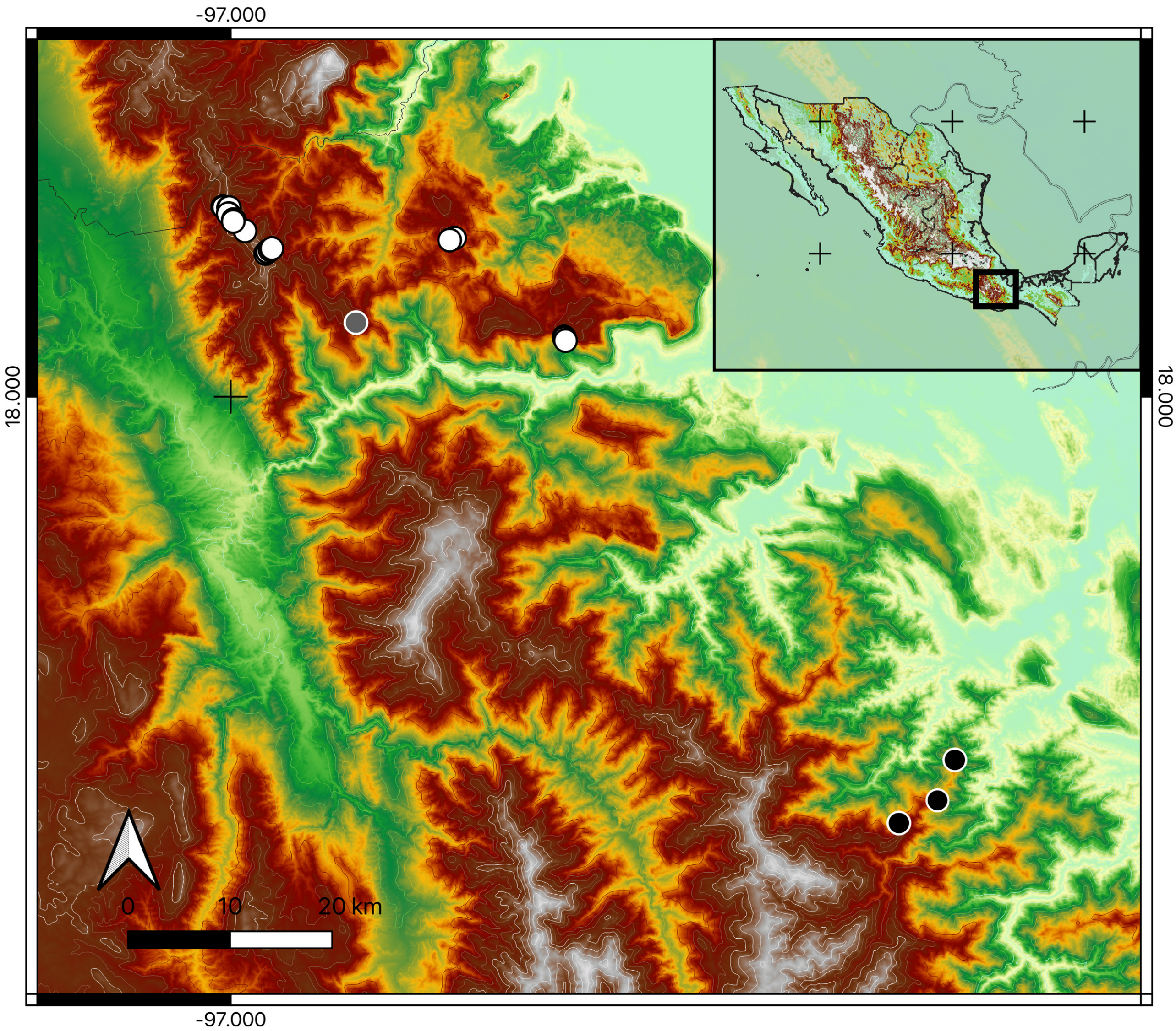


FIGURE 16. Map of collecting sites for *Nanotermitodius andersoni* (white circles), estimated locality of misidentified *N. andersoni* (gray circles) and *N. peckorum* (black circles).

Diagnosis. *Nanotermitodius peckorum* (Figs. 4–6) differs from *N. andersoni* in smaller body size (length 2.5–2.6 mm), pronotal lateral margin deeply sinuate, short elytra (1.5 times length of pronotum), which converge posteriorly having more sinuate costae, flight wings vestigial, and other characters including those in key.

Distribution. Known only in wet slope of Sierra de Juarez, Oaxaca, Mexico, commonly known as "La Chinantla", an elevation of 1220–1750 m (Fig. 16).

Comments. There appears to be an error in the label data of the type series. The marker "km 71" along the highway 157 Tuxtepec-Oaxaca is 26 km south southwest of Valle Nacional, not east. This area matches the elevation (1220 m) and vegetation (montane tropical forest) as stated on the label. To the east of Valle Nacional the territory is below 800 m and has different lower elevation plant communities. The locality Puerto Antonio is located at km 71–72, we suspect this may be the actual type locality. This error in labeling is supported by data associated with additional specimens that have been recently studied.

Discussion. Sierra de Juárez is considered one of the most diverse regions of the state and present one of the two highest number of endemic species of arthropods (González-Pérez *et al*. 2004). In "La Chinantla", cloud forest exhibit three variations, in lower elevations is represented by species of Lauraceae, *Ilex* L. (Aquifoliacee), *Podocarpus*, *Alchornea* Sw. (Euphorbiaceae) and with *Oreomunnea mexicana* (Standley) Leroy (Juglandaceae) (1400–1600 m), *O. mexicana* is the dominant element between 1600–1800 m of elevation, and cloud forests in higher elevations (1800–2050 m), where *O. mexicana* and several species of the genus *Quercus* (Fagaceae) are present as dominant trees (Rzedowski & Palacios-Chávez 1977). Particularly, cloud forests with *O. mexicana* as the dominant element are considered relict and paleoendemic vegetation established in areas that presumably served as Pleistocene refugia of flora and fauna in Mexico (Rzedowski 1991).

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