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Lectotype designations, new synonymies, and new species in the genera *Trichillum* Harold and *Pedaridium* Harold (Coleoptera: Scarabaeidae: Scarabaeinae)

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Abstract

Three new synonymies are proposed in the genera *Trichillum* and *Pedaridium* (the second epithet is valid): *T. pereirai* Martínez, 1959 = *T. heydeni* Harold, 1868; *T. boucomonti* Saylor, 1935 = *T. hirsutum* Boucomont, 1928; and *P. brasiliense* Ferreira & Galileo, 1993 = *P. bidens* Balthasar, 1938. One previous synonym (*T. elongatum* Balthasar, 1939 = *P. argentinum* Arrow, 1913) is confirmed. Lectotypes are designated for three species names (including one synonym): *T. heydeni*, *P. bidens*, and *T. elongatum*. Species previously misidentified as *T. heydeni*; *T. arrowi* Saylor, 1935; and *T. depilatum* Balthasar, 1942 are described as new, respectively *T. tishechkini* sp. nov., *T. pseudoarrowi* sp. nov., and *T. cordobense* sp. nov. Brief diagnosis and illustrations are given for treated species.

Resumo

Três nova sinonímias são propostas nos gêneros *Trichillum* e *Pedaridium* (o segundo epíteto sendo válido): *T. pereirai* Martínez, 1959 = *T. heydeni* Harold, 1868; *T. boucomonti* Saylor, 1935 = *T. hirsutum* Boucomont, 1928; and *P. brasiliense* Ferreira & Galileo, 1993 = *P. bidens* Balthasar, 1938. Uma sinonímia anterior (*T. elongatum* Balthasar, 1939 = *P. argentinum* Arrow, 1913) é confirmada. Se designam lectótipos para três espécies (incluindo um sinônimo): *T. heydeni*, *P. Bidens*, e *T. elongatum*. Novas espécies previamente erroneamente identificadas como *T. heydeni*; *T. arrowi* Saylor, 1935; e *T. depilatum* Balthasar, 1942 são descritas, respectivamente *T. tishechkini* sp. nov., *T. pseudoarrowi* sp. nov., e *T. cordobense* sp. nov. Se apresentam diagnoses e ilustrações de cada espécie tratada.

Key words:

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Introduction

The Neotropical genera *Trichillum* Harold, 1868 and *Pedaridium* Harold, 1868 are closely related genera forming a distinct group within the tribe Ateuchini (*sensu* Montreuil 1998). Reviewing the primary types of previously described species allowed us to discover new synonymies and subsequent misidentifications of some species. It was also necessary, for reasons of nomenclatural stability to designate lectotypes for a number of species.

Material and Methods

Species are cited in the genera of their original description because differences between the genera *Trichillum* and *Pedaridium* in their current usage are inconsistent.

Collections studied were (acronyms and curators in brackets): The Natural History Museum, London (BMNH — M. Kerley); Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, Buenos Aires (BRBA — A. Bachmann); Canadian Museum of Nature, Ottawa (CMNC — F. Génier); Canadian National Insect Collection, Ottawa (CNIC — A. Davies); Fernando Vaz-de-Mello personal collection, Lavras, Brazil (FVMC); Gonzalo and Violeta Halffter personal collection, Coatepec, Mexico (GHC); Muséum National díHistoire Naturelle, Paris (MNHN — Y. Cambefort); Museum für Naturkunde der Humboldt-Universität zu Berlin (MNHU — H. Wendt); Museu de Zoologia da Universidade de São Paulo (MZSP — U. R. Martins, S. Ide and C. Campaner); Naturhistorisches Museum, Basel, Switzerland (NHMB — E. Sprecher); E. Wasmann's Collection, Natuurhistorisch Museum Maastricht, Maastricht (NMM — F. Dingemans-Backels); Narodní Muzeum, Prague (NMP — J. Jelínek), United States National Museum, Washington (USNM — N. Adams) .

Roman type indicates printed and italics indicate handwritten information for type specimens label data.

Results and Discussion

***Trichillum heydeni* Harold**

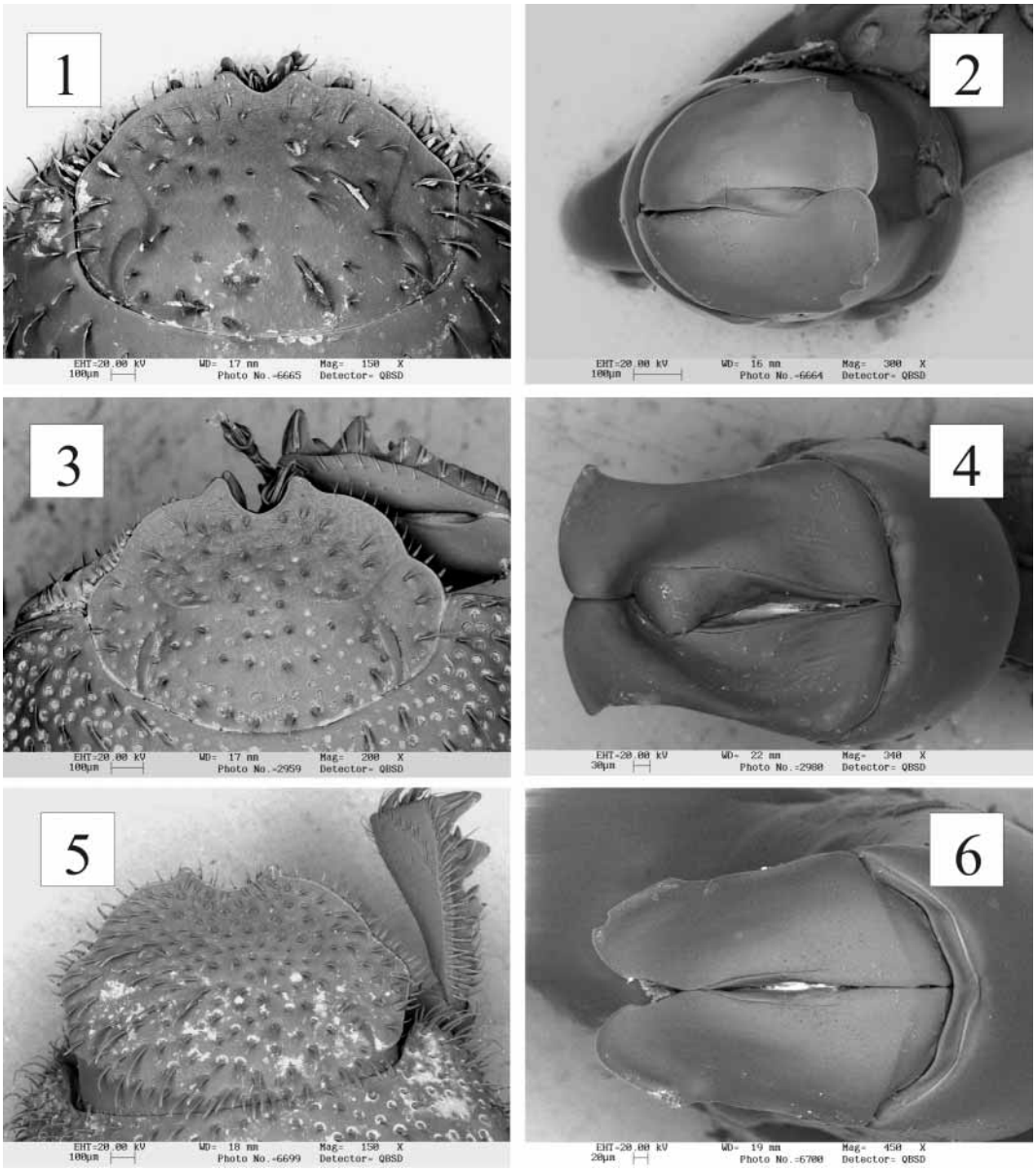
(Figs. 1–2)

Trichillum heydeni Harold, 1868: 53.
Trichillum (Trichillum) pereirai Martínez, 1968: 133, **syn. nov.**

Trichillum heydeni Harold:

LECTOTYPE **here designated**: ♂, pinned, MNHN. Labels: [1. Harold handwritten] *Heydeni T. Harold* / [2.] Ex. Museo E. Harold / [3. green label] Muséum Paris ex. coll. R.

Oberthür 1952 / [4. red label] LECTOTYPE / [5.] *Trichillum heydeni Harold LECTOTYPE* Vaz-de-Mello det. 2000. Lectotype is designated in order to warrant the application of the name to a single species in the case that more specimens of the original series could represent other species.



FIGURES 1–6. Head (1, 3, and 5) and parameres (2, 4, and 6) in dorsal view. 1–2. *Trichillum heydeni*.3–4. *T. hirsutum*. 5–6. *Pedaridium bidens.*

PARALECTOTYPES: ♂, pinned, MNHU. Labels: [1.] 26487 / [2. green] *Brasil v. Olf. nr. 26487* / [3. green] *Heydeni Harold* / [4.] Zool Mus Berlin / [4. yellow label]

PARALECTOTYPE / [5.] *Trichillum heydeni Harold PARALECTOTYPE* Vaz-de-Mello des. 2001; ♀, pinned, MNHU, same data but without third label.

Trichillum pereirai Martínez:

HOLOTYPE ♂ and ALLOTYPE ♀, in BRBA, examined.

HOLOTYPE: ♂, on a rectangular card, with aedeagus attached to a triangular card. Labels: [1., Martínez handwritten] *BRASIL, Eo. Sao Paulo, Sao Paulo, Aclimação, Coll. Martínez, Dic. 962* / [2. orange label] HOLOTYPUS / [3. red label, Martínez handwritten] *Trichillum heydeni n. sp.* ♂, A. MARTÍNEZ DET 19*67*

ALLOTYPE: ♀ on a triangular card. Labels: [1.] Vicosa, MinasGeraes, Brazil 1931 / [2.] Van Dyke, Collection / [3.] Mrs. Y. Mexia, Collector / [4. orange label] ALLOTYPUS / [5. red label, Martínez handwritten] *Trichillum heydeni n. sp.* ♀, A. MARTÍNEZ DET 19*67*

Diagnosis: Differs from the other species of the genus by its large size (3.9–5.0 mm), combined with the characteristic head punctation (Fig. 1) and the unique externally dentate parameres (Fig. 2).

Remarks: In the original description, Harold (1868) does not specify the number of examined specimens. The designated lectotype and the two paralectotypes are the only specimens known to have been seen by Harold at the time of the description. The species diagnosed and figured by Martínez (1968) as *T. heydeni* is described below as *T. tishechkini* **sp. nov**., because it is actually a different species. Martínez (1968) apparently described *T. pereirai* after misidentifying *T. heydeni* and therefore not realizing that they were the same species.

Trichillum hirsutum **Boucomont**
(Figs. 3–4)

Trichillum hirsutum Boucomont, 1928: 187
Trichillum boucomonti Saylor, 1935: 208, **syn. nov.**

Trichillum hirsutum Boucomont:

HOLOTYPE: ♀, on a triangular card, in MNHN. Labels: [1.] Brésil Sao Paulo / [2.] Ex Museo N. VAN DE POLL / [3. red label] TYPUS / [4. Boucomont handwritten] *Trichillum hirsutum n. sp.* / [5.] Muséum Paris *Boucomont* / [6. red label] HOLOTYPE *Trichillum hirsutum BOUC*. HOLOTYPE.

Trichillum boucomonti Saylor:

HOLOTYPE: ♀, on a triangular card, in USNM. Labels: [1.] Horqueta Paraguay / [2. red label] HOLOTYPE *Trichillum boucomonti* L.W. Saylor / [3.] TYPE No. *54102* USNM

/ [4.] *TYPE Trichillum boucomonti Saylor* / [5.] = *Trichillum hirsutum Boucomont compared w. TYPE* Vaz-de-Mello det. 200*0*. Examined.

Diagnosis: 3.2–4.0 mm. Externally similar to *T. hystrix*. However, differing in the shape of the posterior border of the eye (Fig. 3), the shape of the larger sclerite of the internal sac (with two dentiform projections instead of one in *T. hystrix*), and the apicoventral portion of the phallobase that bear a broad triangular tubercle that is divided medially.

Remarks: Both holotypes are females. Nevertheless, we feel confident in making this synonymy because all evidence based on the available morphological characteristic support it. Primary type specimens differ in size (*T. boucomonti* is smaller) and in the shape of tibial teeth (abraded in *T. hirsutum*), but all other characters coincide. These differences are variable amongst a large series of examined material of this species, from a wide distribution range that includes both type localities. Male genitalia (parameres and internal sac) of several specimens have also been compared and no differences were observed.

***Pedaridium bidens* Balthasar**
(Figs. 5–6)

Pedaridium bidens Balthasar, 1938: 218
Pedaridium brasiliense Ferreira & Galileo, 1993: 21, **syn. nov.**

Pedaridium bidens Balthasar:

LECTOTYPE **here designated**: ♂, on a rectangular card, in NMP. Labels: [1. green label] Paraguay / [2. green label] coll. C. Felsche Kauf 20, 1918 / [3. red label] TYPUS / [4.] *Pedaridium bidens n. sp.* / [5. red label] LECTOTYPE / [6.] *Pedaridium bidens Balth. LECTOTYPE* Vaz-de-Mello des. 200*0*. The lectotype is designated in order to fix the name to a single specimen in case more than one species is represented in the type series (there are nine specimens in the type series, of which, only three were found and examined).

PARALECTOTYPES: ♀, on a rectangular card, in NMP. Labels: [1. green label] Jatahy Goyaz / [2. green label] coll. C. Felsche Kauf 20, 1918 / [3. red label] TYPUS / [4.] *Pedaridium bidens m.* / [5. yellow label] PARALECTOTYPE / [6.] *Pedaridium bidens Balth. PARALECTOTYPE* Vaz-de-Mello det. 200*0*; ♀ pinned, in NHMB, same as before except [4. bordered label] *Pedaridium bidens BALTH.* / [5.] Staatl. Museum für Tierkunde, Dresden / [6. yellow label] PARALECTOTYPE / [7.] *Pedaridium bidens Balth. PARALECTOTYPE* Vaz-de-Mello des. 200*2*.

Pedaridium brasiliense Ferreira & Galileo:

HOLOTYPE: ♀, pinned, in MZSP. Labels: [1. white label] Coleção M. Alvarenga / [2. white label] Encruzilhada 980 m Bahia, Brasil, XI. 1972 M. Alvarenga / [3. red label] HOLOTYPUS / [4. white label] *Pedaridium brasiliensis F. & G.*, M.M.Ferreira det. 1991.

Diagnosis: 3.9–5.3 mm. Distinguished by the small eyes (Fig. 5) combined with equilateral clypeal teeth and impunctate elytral striae. This species is adequately described by Ferreira & Galileo (1993).

Remarks: The species described by Ferreira & Galileo (1993) as *P. bidens* was misidentified and is actually *P. cryptops* Arrow, 1913 (Génier & Vaz-de-Mello 2002).

***Trichillum elongatum* Balthasar**

Pedaridium argentinum Arrow, 1913: 459 (valid name)
Pedaridium rugiceps Arrow, 1913: 458 synonymy by Ferreira & Galileo (1993: 24–25) (see comments in Génier & Vaz-de-Mello 2002)
Trichillum elongatum Balthasar, 1939: 24 synonymy by Martínez (1987: 60), here confirmed.

Trichillum elongatum Balthasar:

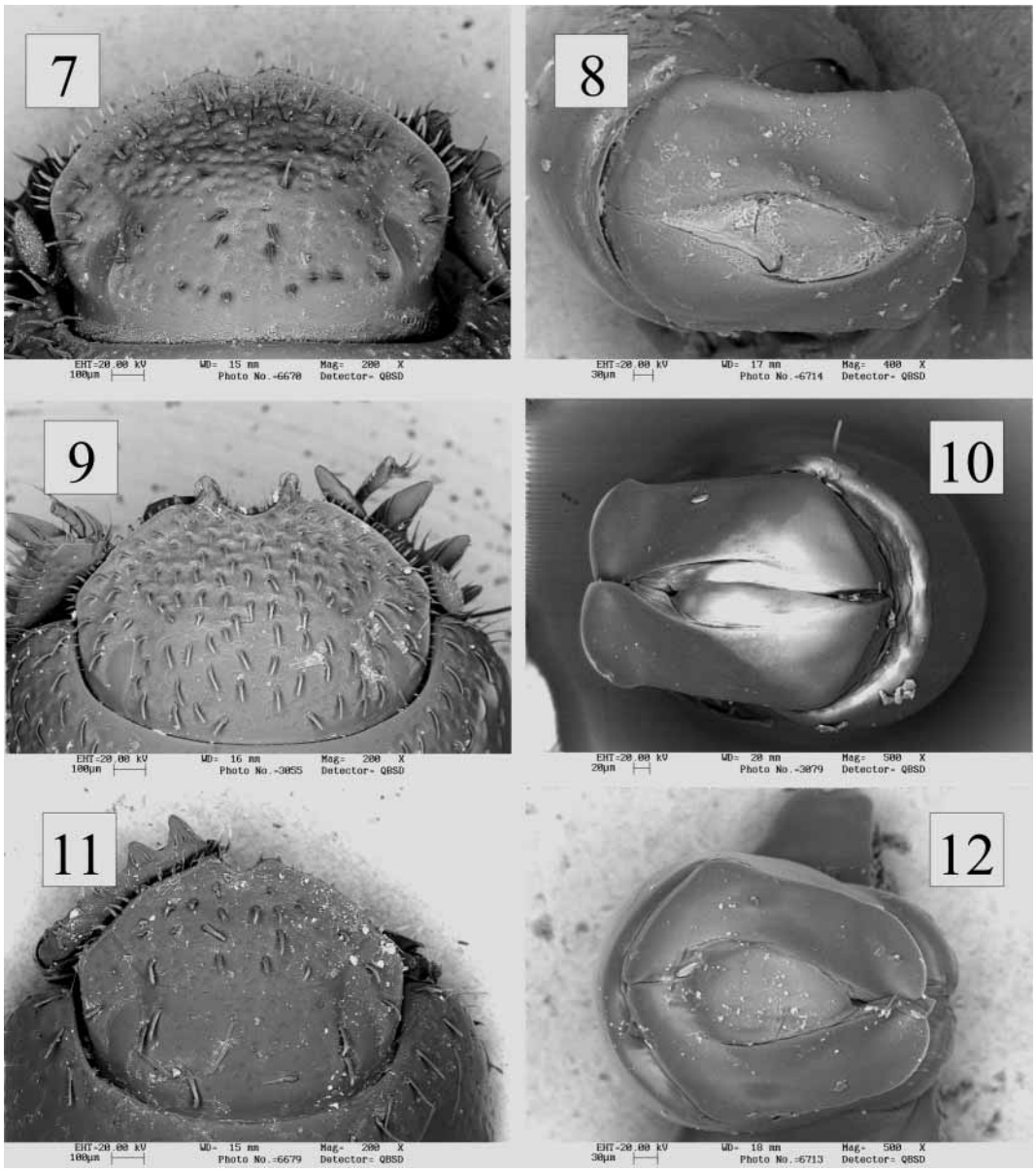
LECTOTYPE **here designated**: ♂, on a rectangular card, in NMP. Labels: [1.] ARGENTINA, Cordoba, Stempelmann / [2. red label] TYPUS / [3.] *Tr. elongatum m.* Dr. V. Balthasar det. / [4. red label] LECTOTYPE / [5.] *Trichillum elongatum Balth. LECTOTYPE*, Vaz-de-Mello det. 200*0* / [6.] *Pedaridium argentinum Arrow*, Vaz-de-Mello det. 200*0*. The lectotype is designated in order to fix the name to a single specimen in case more than one species is represented in the type series (the author does not state the total number of specimens in the type series).

PARALECTOTYPES: 2 ♀♀, pinned, in NMP. Labels: [1.] ARGENTINA, Cordoba, Stempelmann / [2. red label] TYPUS / [3. green label, only with one specimen] *elongatum m.* / [4. yellow label] PARALECTOTYPE / [5.] *Trichillum elongatum Balth. PARALECTOTYPE*, Vaz-de-Mello det. 200*0* / [6.] *Pedaridium argentinum Arrow*, Vaz-de-Mello det. 200*0*

Diagnosis and remarks: See Génier & Vaz-de-Mello (2002).

***Trichillum (Trichillum) tishechkini* sp. nov.**
(Figs. 7–8)

Holotype ♂: BRASIL: **Rio Grande do Sul:** Glória, 7-IX-1925, P. Buck, #109a (IBSP, ex-FVMC).



FIGURES 9–12. Head (7, 9, and 11) and parameres (8, 10, and 12), dorsal view. 7–8. *Trichillum tishechkini* **n. sp.** 9–10. *Trichillum pseudoarrowi* **n. sp.** 11–12. *Trichillum cordobense* **n. sp.**

Paratypes: **ARGENTINA**: **Chaco:** Río Bermejo, Pcia. Roca, II-1945, Martínez (1 CMNC); **Córdoba:** Do. Calamuchita, El Sauce, XII-1938, MJ Viana (2 CMNC); Do. Cruz del Eje, Los Leones, II-1967, Chichero (1 CMNC); Do. Santa María, Diquecito, XII-1965, Martínez (4 CMNC, 1 CNIC, 2 FVMC, 2 GHC); La Falda, I-1945, Martínez (1 CMNC); San Javier, I-1943, Martínez (1 CMNC); **Formosa:** Ciudad, Puerto, II-1949, Martínez (1 CMNC); **Misiones:** Loreto, Est. Experim., X-1966, Martínez (2 CMNC); **Santa Fe:** Rosario, Ciudad, I-1941, Martínez (1 CMNC); **BRAZIL**: **Rio Grande do Sul:** locality unreadable, 20-IX-1926, P. Buck, Ex.: Acromyrmex sp. nest. #168 (1 FVMC, 6 NMM); Glória, 7-IX-1925, P. Buck, #109a (4 FVMC, 1 BDGC); 26-VIII-1925: P. Buck, #98 (1 FVMC, 2 NMM); 3-IV-1925, #50 (1 NMM); Teresópolis, 6-IX-1925, P. Buck, coletado Ex.: Acromyrmex sp. nest. #103 (1 FVMC); Floresta, 20-IX-1925, P. Buck, Ex.: Acromyrmex sp. nest. #115 (1 NMM). All the specimens from Rio Grande do Sul from E.Wasmann's Coll'n Alcohol, mounted by A. Tishechkin, 2000.

Etymology: A patronym honoring Alexey Tishechkin, histeridologist, who diligently prepared Wasmannís material stored in alcohol at the NMM.

Diagnosis: 3.8–5.3 mm. The short triangular head and characteristic confluent large clypeal punctures (Fig. 9), combined with size, shape of posterior tarsi (basitarsomere more than twice as long as the following tarsomere), and distribution (southern Brazil and Argentina) will be sufficient to separate this species from other *Trichillum* species.

Description: Holotype male. *Head*: (Fig. 7) wider than long, clypeus rounded, with a wide v-shaped emargination that originates on each side of a rounded, feebly conspicuous tooth. Clypeal surface with large irregular and coalescent punctures, with the larger ones bearing a seta. Punctures on the clypeo-frontal region feebly coalescent and of two sizes. On front and vertex, punctures feebly impressed and well separated. Clypeogenal suture straight from the border to near the eye tip and then curved inwards. Eye approximately twice as long as wide. *Pronotum*: covered with conspicuous punctures (when viewed with 10x magnification); punctures regularly spaced, smaller on disc, larger and more strongly impressed laterally. Lateral punctures often elongated and deeper with occasional lateral setae in both anterior and posterior angles. Pronotum with a transverse row of setae parallel to anterior margin, posteriorly deviated and interrupted medially. *Elytra*: elytral striae with feeble elongate punctures on the disc, discal interstriae with sparse, small punctures. Lateral and apical striae much deeper and with conspicuous punctures. Apical interstriae with one row of setae each, externally positioned on interstriae 1 and 2, internally on interstriae 3 to 7. *Sterna*: meso-metasternal sulcus in rounded straight angle, terminated by punctures at each side, just below the middle of the trocanter. Metasternum with large ocelated punctures laterally; with simple, small punctures in the disc. Discal concavity elongated, covering most of the disc except the anterior half of the anterior projection. *Legs*: anterior tibia with three external teeth in the apical two thirds, and one internal apical tooth; calcar spathuliform, somewhat larger than the first tarsomere. First tarsomere of median tarsi one and a half times longer than second. First tarsomere of hind

tarsi about twice as long as the second. *Abdomen*: aedeagus with parameres slightly asymmetrical, the right paramere larger but similar in form to the left one (Fig. 8), external apical angle straight.

Variation: Paratypes vary in sexual features, size, color (teneral specimens are lighter in color), and in position of individual head punctures, not differing however of the general structure described for the holotype, apart of features related to abrasion of clypeal and fore tibial teeth. Females differ from males by protibial apical internal tooth absent, metasternal disc flat, not concave, and pygidium slightly more transverse.

Remarks: This species was treated as *T. heydeni* by Martínez (1968), who adequately diagnosed it in the key of his paper.

***Trichillum (Trichillum) pseudoarrowi* sp. nov.**
(Figs. 9–10)

Holotype ♂: PARAGUAY: **Boquerón:** Gran Chaco, km 145 de Pto. Casado, 25-XI-1950, A. Martínez (CMNC).

Paratypes: BOLIVIA: **Tarija?:** Boyoiú, IV-1949, Daguerre (1 CMNC); PARAGUAY: **Boquerón:** Gran Chaco, km 145 de Pto. Casado, XI-1950, A Martínez (1 BDGC); 25-XI-1950 (7 CMNC, 2 FVMC, 1 GHC); **Concepción:** Horqueta, IV-1934, Schultze (2 CMNC).

Etymology: In reference to the misidentification of this species as *T. arrowi* Saylor, 1935 in both literature and collections.

Diagnosis: 3.1–3.7 mm. Distinguished by the typical acute clypeal teeth and characteristic head punctation, which is anastomosed instead of well separated and quite ocellate in *T. arrowi*. Also, eyes are smaller and narrowed posteriorly (in *T. arrowi* larger and not narrowed posteriorly).

Description: Holotype male. *Head*: Clypeus with wide and deep U-shaped emargination, with a large and narrow tooth at each side, each tooth parallel-sided, with truncated apex (Fig. 9). Emargination internally and clypeal sides slightly upturned; clypeal sides straight, with a small emargination on the clypeo-genal border. Head covered by large, rugose, setose, transversal punctures, coalescent in the apex and middle of clypeus and distinctly separated on other parts of head, smaller in size on genae. Frons, posterior part of clypeus and genae, with simple small punctures mixed up with the rugose ones. Interocular dorsal space eight times the width of one eye. *Pronotum*: Pronotal disk with scattered small simple conspicuous punctures. Sides with large, rugose, setose, elongated punctures. Anterior transverse row of setose punctures parallel to anterior border laterally, abruptly posteriorly directed at each side from near to each eye, evanescent in the middle. Basal border with elongated row of setose punctures only on the lateral fourths. *Elytra*: Elytral discal striae without punctures; interstriae with irregularly spaced small punctures. First, third, and fifth interstriae with apical longitudinal rows of

setose punctures, each with up to three setae and restricted to the apical third. *Sterna*: Metasternal disk with umbilicate punctures, separated by one to three diameters. Metasternal sides with larger umbilicate punctures. *Abdomen*: Abdominal sternites covered by large umbilicate punctures. Parameres as in figure 10. *Legs*: Hind femora 1½ times longer than wide in the middle, middle femora normal. Middle and hind tibiae strongly expanded at apex, apical width about 2½ times shorter than tibia. Hind tibia with a small median tubercle on the external ventral face. First tarsomere of the middle legs as long as the second. First tarsomere of the hind legs about 1.2 times longer than the second.

Variation: Paratypes vary in sexual features and size, apart of features related to abrasion of clypeal and fore tibial teeth. Females differ from males by protibial apical internal tooth absent, metasternal disc flat, not concave, and pygidium slightly more transverse.

Remarks: This species is adequately and carefully described under the name *T. arrowi* by Pereira & Martínez (1959).

***Trichillum (Trichillum) cordobense* sp. nov.**
(Figs. 11–12)

Holotype ♂: ARGENTINA: **Córdoba:** El Sauce, Diquecito, XII-1964, Martínez (CMNC).

Paratypes: ARGENTINA: **Buenos Aires:** S. de la Ventana, XI-1981, Bolle (5 CMNC); **Córdoba:** Do. Santa María, Diquecito, XII-1965, A Martínez (1 BDGC, 1 CMNC, 1 GHC); Alta Gracia, XI-1920, Bruch (2 CMNC); Cabana, I-1944, Prosen (1 CMNC); 28-XII-1925 (1 CMNC); El Sauce, Diquecito, XII-1964, Martínez (1 FVMC).

Etymology: From Córdoba, Argentinean province where the first specimens seen came from.

Diagnosis: 2.8–3.5 mm. Similar to *T. depilatum*, differing by the presence of discoclypeal setae (lacking in *T. depilatum*), short-triangular shape of head (more rounded in *T. depilatum*), and clypeal teeth not clearly detached from clypeal sides (Fig. 11).

Description: Holotype male. *Head*: Clypeal margin slightly upturned, with two obtuse teeth with rounded apices, separated by a wide V-shaped emargination. Lateral clypeal margins almost straight, in continuation with genae. Clypeal surface covered by large simple punctures, coalescent in the middle, separated by less than ¼ of their diameter, some of them setose. Frons with sparse punctures, smaller than those on clypeus, separated by 1 ½ to 3 times the diameter of one point; laterally with two large simple setose punctures in the internal border of each eye. Dorsal interocular space seven to eight times wider that the width of one eye. Gena with few, scattered, simple, setose punctures. *Pronotum*: Pronotal disk with minute, barely visible (50 x) punctures, separated by more than three times their diameter. Pronotal sides with scattered large, elongated punctures, of larger size on the anterior angles. Pronotal basis not marginated, with a row of elongated punctures, evanescent in the middle, and laterally setose. Apical border not marginated,

lateral margins well defined. Anterior transverse row of setose punctures restricted to the sides, with no more than three setae at each side. Hypomeron with simple punctures, separated by two to three diameters. *Elytra*: Elytral discal striae with small simple punctures, separated by two diameters. Discal interstriae with unorganized, minute, barely visible punctures (size similar to that of the pronotal disk), separated by more than three diameters. First, third, fifth, seventh, and eighth interstriae with a longitudinal row of setose punctures in the apical half, those rows are external in the first interstria (closer to the first elytral stria than to elytral suture) and internal in the remaining ones. *Sterna*: Prosternon with large umbilicate punctures, and two to four central setose punctures. Mesosternum approximately 2.5 times wider than long in the middle, with simple punctures separated by about two diameters. Metasternal anterior lobe slightly wider in the middle than in base; meso-metasternal suture in straight, rounded angle; meso-metasternal sulcus evanescing posteriorly, at each side, just posterior to the base of the middle trochanter. Metasternal disk with punctures as small as in the pronotal disk, laterally with larger, umbilicate, elongated punctures. *Abdomen*: Abdominal sternites covered by large umbilicated punctures. Parameres as in figure 12. *Legs*: First tarsomere of the middle legs as long as the second. First tarsomere of the hind legs about 1.2 times longer than the second.

Variation: Paratypes vary in sexual features, size, color (teneral specimens are less dark in color) and in position of individual head punctures, not differing however of the general structure described for the holotype, apart of features related to abradation of clypeal and fore tibial teeth. Females differ from males by protibial apical internal tooth absent, metasternal disc flat, not concave, and pygidium slightly more transverse.

Remarks: This species was misidentified by Martínez (1968) as *T. depilatum*, but differs (apart from the characters cited above) by having different paramera (much longer and narrower in *T. depilatum*). The new species appears to be closer to *T. externepunctatum* Borre, 1880 than to *T. depilatum*, judging by the form of the paramere (shorter and narrowed apically).

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