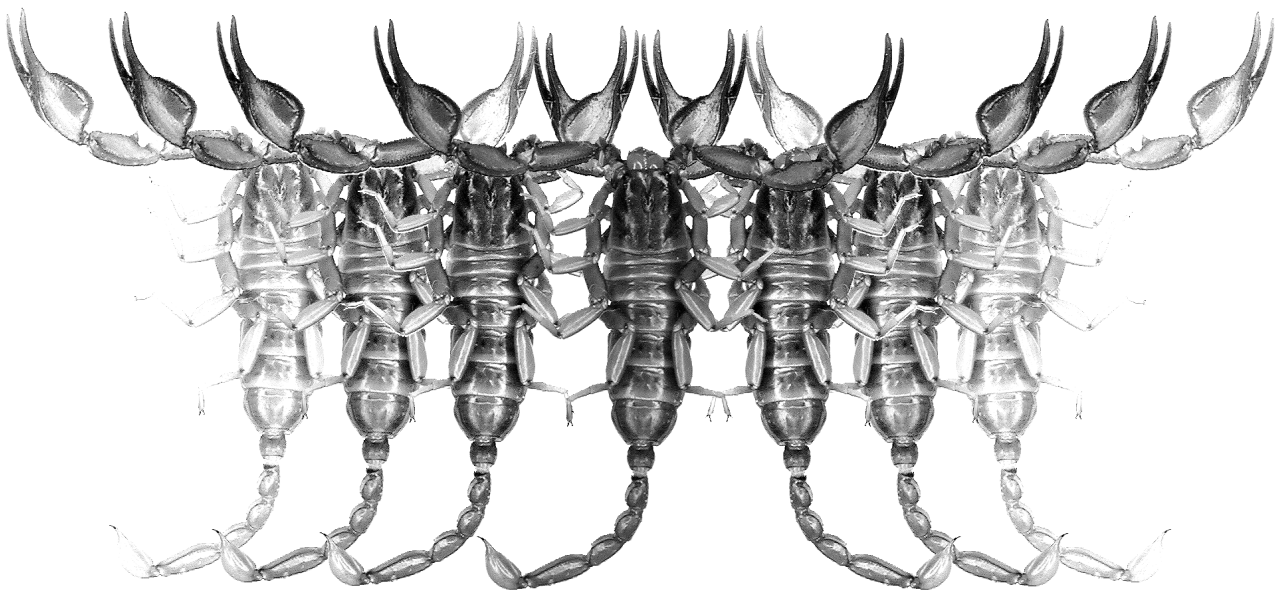


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Brachistosternus Pocock
(Scorpiones: Bothriuridae)**

J. A. Ochoa and L. E. Acosta

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**Two New Andean Species of *Brachistosternus* Pocock
(Scorpiones: Bothriuridae)**

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Summary

Two new Andean species of the genus *Brachistosternus* Pocock from southern Peru and northern Chile are described: *B. titicaca* sp. n. from the Titicaca basin (Departamento Puno, Peru), at 3850-3900 m, and *B. quiscapata* sp. n. from Departamento Tacna (Peru) and Provincia Arica (Chile), at 3100-3400 m. Both species belong to the subgenus *Brachistosternus* (*Leptosternus*) Maury. They are related to the Argentinean species *B. (L.) intermedius* Lönnberg and *B. (L.) montanus* Roig Alsina. Comparisons between these four species are provided, including a combination of characters: length/width ratio of metasomal segment V, number of setae of metasomal segment V and tarsus III, ventral pigment of metasomal segments, and some details of the hemispermatothore morphology (distal lamina and cylindric apophysis). The presence of the subgenus *Brachistosternus* (*Leptosternus*) in Peru is therefore confirmed.

Resumen

Se describen dos nuevas especies andinas del género *Brachistosternus* Pocock, del sur del Perú y norte de Chile: *B. titicaca* sp. n. de la cuenca del Titicaca (Departamento Puno, Perú, 3850-3900 m) y *B. quiscapata* sp. n. (3100-3400 m) del Departamento Tacna (Perú) y la Provincia Arica (Chile). Ambas especies pertenecen al subgénero *Brachistosternus* (*Leptosternus*) Maury, y están relacionadas con las especies argentinas *B. (L.) intermedius* Lönnberg and *B. (L.) montanus* Roig Alsina. Se proporcionan comparaciones entre estas cuatro especies, incluyendo una combinación de caracteres: proporción largo/ancho del segmento caudal V, frecuencia en el número de setas del mismo segmento y del tarso III, patrón de pigmento ventral en los segmentos caudales y algunos detalles en la morfología del hemiespermatóforo (forma de la lámina distal y apófisis cilíndrica). Se confirma así la presencia del subgénero *Brachistosternus* (*Leptosternus*) en el Perú.

Introduction

The Neotropical genus *Brachistosternus* Pocock, 1893 is the second most diverse in the family Bothriuridae. It contains currently 21 nominal species, what include several new taxa described in recent years (Lourenço, 2000; Ojanguren Affilastro, 2000; Ojanguren Affilastro & Roig Alsina, 2001). This genus has a dilated range, comprising Ecuador, Peru, Chile, Bolivia, Argentina, Paraguay and SW Brazil, with most species linked to the Andean-Patagonian distributional pattern (Maury, 1973, 1979; Acosta & Maury, 1998; Lowe & Fet, 2000).

In this paper, we describe two new *Brachistosternus* species from high Andean localities in southern Peru and northern Chile. Both belong to the subgenus *Brachistosternus* (*Leptosternus*) Maury, 1973, and are close to the Argentinean species *Brachistosternus* (L.) *intermedius* Lönnberg, 1902 and *B.* (L.) *montanus* Roig Alsina, 1977, also inhabitant of high altitude sites (Roig Alsina, 1977; A. Ojanguren Affilastro, pers. comm). All four species may probably form a separate species group within the subgenus. *Brachistosternus* (L.) *titicaca* sp. n. was collected around Lake Titicaca in Departamento Puno; it represents the hitherto only scorpion species adequately documented from the “Meseta del Collao”, i.e. the large basin containing Lake Titicaca. The other species, *B.* (L.) *quiscapata* sp. n. was found on the western Andean slopes in the Peruvian Departamento Tacna and an adjacent locality in the north-Chilean Provincia Arica.

These new species confirm the presence of the subgenus *Brachistosternus* (*Leptosternus*) in southern Peru, which was not mentioned by Maury (1973), but just implied by the single record of *B. castroi* Mello-Leitão, 1940 from “Desaguadero, Lago Titicaca” (Bücherl, 1959), much probably a misidentification for *B. titicaca* sp. n. There is also an imprecise citation of *B. weijenberghii* (Thorell, 1876), from Peru by Cekalovic (1983), but the presence of this Ar-

gentinean species is very unlikely. A total of six *Brachistosternus* species have been hitherto reported from Peru, only two occurring there with certainty (all remaining citations are either doubtful or wrong): *B. ehrenbergii* (Gervais, 1841), spread along the coastal desert from Departamento Tumbes to Departamento Tacna (Aguilar, 1968; Aguilar & Meneses, 1970; Francke, 1977; J. A. Ochoa, unpubl. data), and *B. andinus* Chamberlin, 1916, inhabitant of inter-Andean valleys in the Departamentos Ayacucho, Apurímac and Cusco (Maury, 1978; Ochoa, 1996). The taxonomic status of *B. peruvianus* Piza, 1974, described from Departamento Apurímac, must be investigated, since according to Maury (1978) it is a possible junior synonym of *B. andinus*. Finally, *B. holmbergi* Carbonell, 1923 (a species described originally from Argentina), was reported by Aguilar & Meneses (1970) from an island near Lima, but this is probably a misidentification.

Abbreviations

AMNH: American Museum of Natural History, New York, USA.

CDA: Cátedra de Diversidad Animal I, Facultad de Ciencias Exactas, Físicas y Naturales, Universidad Nacional de Córdoba, Argentina.

MHNC: Museo de Historia Natural, Facultad de Ciencias Biológicas, Universidad Nacional de San Antonio Abad del Cusco, Peru.

MNHN: Muséum National d'Histoire Naturelle, Paris, France.

MUSM: Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru.

Carinae of metasomal segments I-V:

DL : Dorsal lateral

LSM: Lateral supramedian

LM: Lateral median

LIM: Lateral inframedian

VL: Ventral lateral

VSM: Ventral submedian

VM: Ventral median

***Brachistosternus (Leptosternus) titicaca* sp. n.**
(Figs. 1-14)

Etymology. The specific name is a noun in apposition, based on the Lake Titicaca. All specimens examined were collected in localities within the lake's basin.

Type series. Peru, Departamento Puno: Holotype male (MUSM), 1 male, 1 juv. male paratypes (CDA 000.125), 1 male paratype (MHNC), Juli (3875 m, 16°13'S 69°27'W), 02 September 1997 (J. A. Ochoa) — Allotype female (MUSM), 1 male paratype (MHNC), Desaguadero (16°34'S 69°03'W), 05 December 1997 (O. Ochoa M. & J. A. Ochoa) — 1 juv. female paratype (CDA 000.126), 1 juv. female paratype (MHNC), Azángaro (3900 m, 14°55'S 70°13'W), March 2000 (E. Santi) — 3 juv. male paratypes (MNHN), Muñani (3900 m, 14°46'S 69°57'W), 12 January 1961 (J. Dorst).

Other materials examined (no types). PERU: DEPARTAMENTO PUNO: Juli, 02 September 1997 (J.A. Ochoa), 2 males, 1 juv. (MHNC); same data, 04 December 1997 (O. Ochoa M. & J.A. Ochoa),

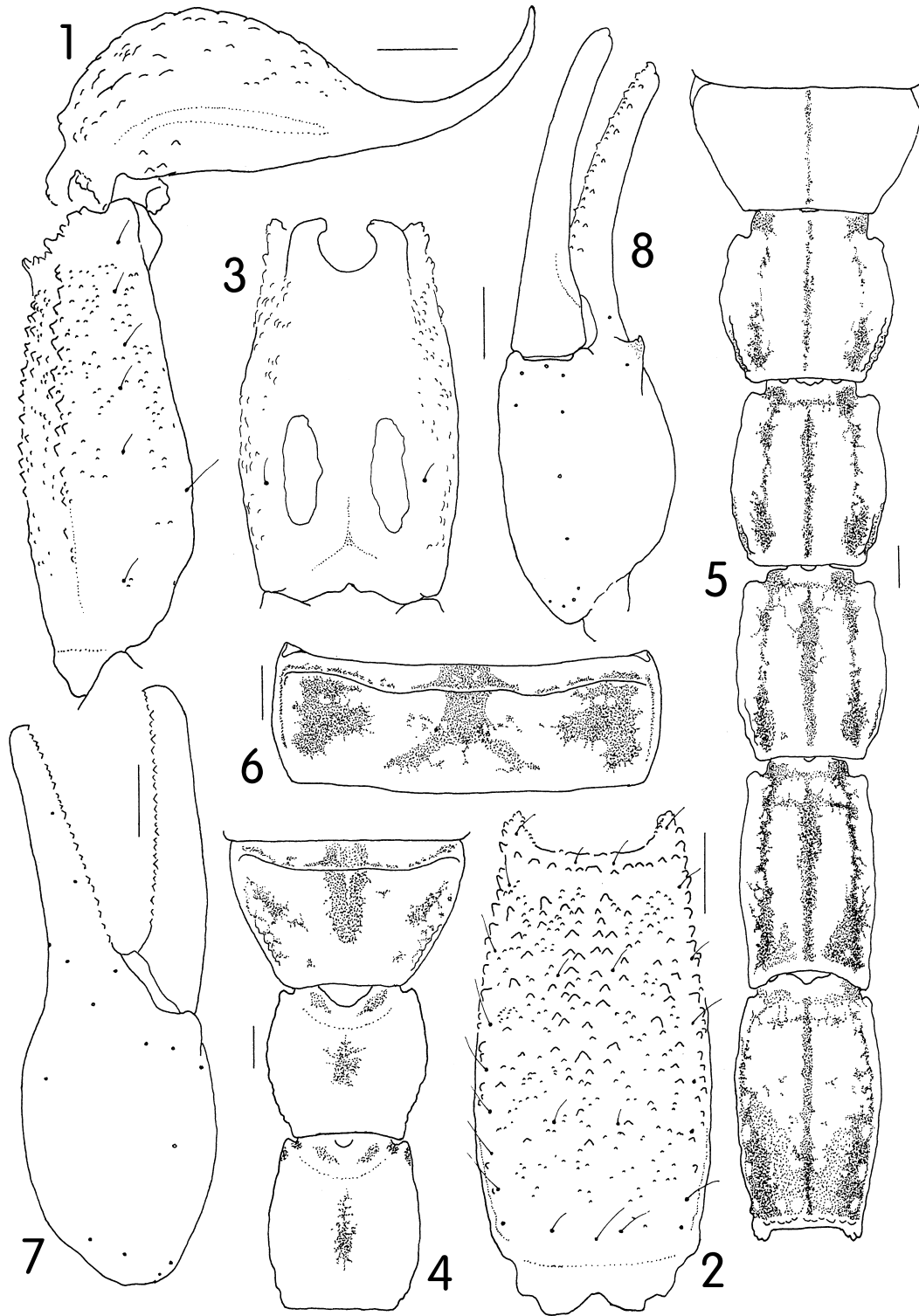
3 juv. (MHNC); Desaguadero, 05 December 1997 (O. Ochoa M. & J.A. Ochoa), 1 male, 1 juv. (MHNC); Huancané (3870 m, 15°12'S 69°46'W), 11 December 1997 (O. Ochoa M. & J.A. Ochoa), 1 juv. (MHNC).

Diagnosis. Species belongs to the subgenus *Brachistosternus (Leptosternus)*; it is most closely related to *Brachistosternus (L.) intermedius*. The new species has lower count of setae on the metasomal segment V (lateral and ventrolateral) and tarsus III than *B. intermedius* (Table 2). In addition, the ventral median pigment stripe on metasomal segment V is always independent from the ventrolateral stripes in *B. intermedius*, whilst in *B. titicaca* sp. n. these stripes join on the distal third of segment V (Fig. 5). The pigmentation pattern makes it easy to separate *B. titicaca* sp. n. from *B. quiscapata* sp. n. (see comparisons under the latter species below). Other differences with *B. montanus* and *B. quiscapata* sp. n. see Table 2.

Description. General color straw-yellowish, with dark-brown spots. Pigment of carapace well developed, especially on the central area; ocular mound darker; two oblique stripes extend from

Table 1. Measurements (mm) of the holotype male and the allotype female of *Brachistosternus titicaca* sp. n. and *B. quiscapata* sp. n.

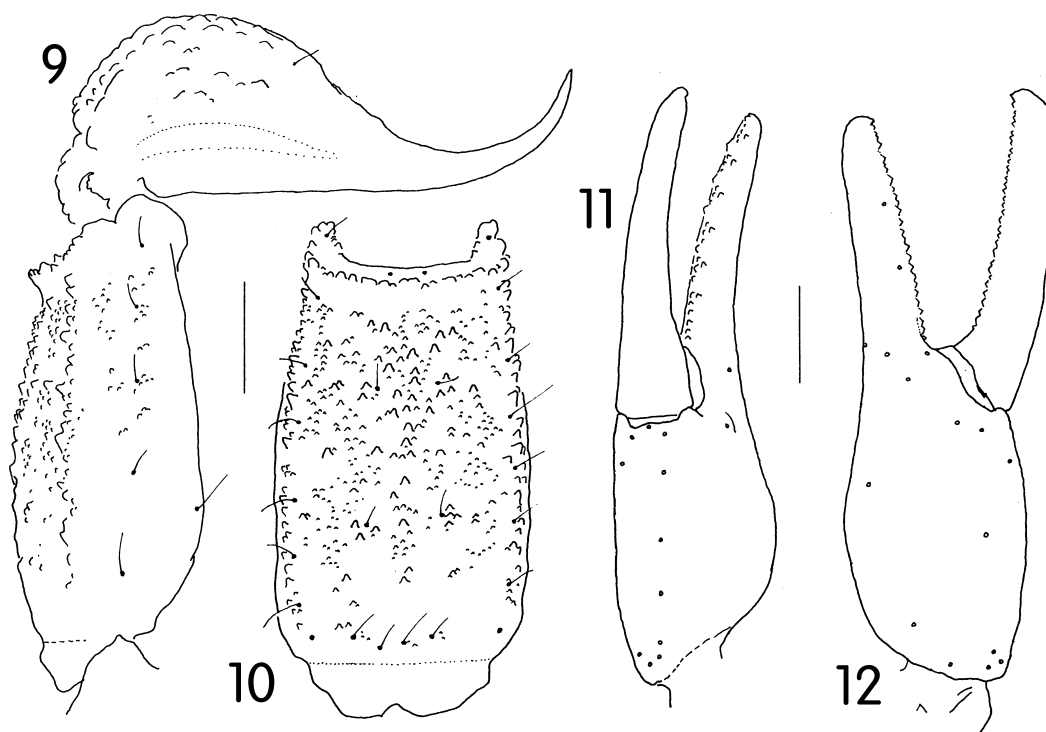
| | <i>Brachistosternus titicaca</i> | | <i>Brachistosternus quiscapata</i> | |
|--|----------------------------------|-----------------|------------------------------------|-----------------|
| | HOLOTYPE | ALLOTYPE | HOLOTYPE | ALLOTYPE |
| Total length | 39.2 | 30.3 | 38.8 | 40.5 |
| Carapace: length | 4.9 | 4.3 | 4.6 | 5.7 |
| anterior / posterior width | 3.5 / 5.4 | 3.2 / 4.5 | 3.5 / 5.0 | 4.1 / 5.8 |
| Mesosoma, length | 10.1 | 8.7 | 9.3 | 10.5 |
| Metasoma, length | 24.2 | 17.3 | 24.9 | 24.3 |
| Metasomal segment I, length / width | 3.0 / 3.4 | 2.0 / 2.6 | 2.8 / 3.4 | 2.8 / 3.3 |
| Metasomal segment II, length / width | 3.3 / 3.0 | 2.3 / 2.4 | 3.3 / 3.1 | 3.2 / 3.0 |
| Metasomal segment III, length / width | 3.4 / 3.0 | 2.5 / 2.2 | 3.6 / 3.0 | 3.5 / 2.8 |
| Metasomal segment IV, length / width | 3.9 / 2.8 | 2.8 / 2.1 | 4.1 / 2.8 | 3.9 / 2.6 |
| Metasomal segment V, length / width / height | 4.6 / 3.0 / 2.2 | 3.2 / 2.1 / 1.6 | 5.0 / 2.8 / 2.3 | 4.8 / 2.7 / 2.2 |
| Telson, length | 6.0 | 4.5 | 6.1 | 6.1 |
| Vesicle, length / width / height | 3.9 / 2.4 / 2.1 | 3.0 / 1.8 / 1.5 | 3.8 / 2.4 / 2.1 | 3.5 / 2.5 / 2.1 |
| Sting, length | 2.1 | 1.5 | 2.3 | 2.6 |
| Pedipalp, total length | 15.3 | 10.6 | 15.5 | 14.4 |
| Femur, length / width | 3.9 / 1.2 | 2.6 / 1.0 | 3.8 / 1.2 | 3.7 / 1.2 |
| Patella, length / width | 3.7 / 1.4 | 2.6 / 1.2 | 3.6 / 1.5 | 3.5 / 1.5 |
| Chela, length / width / height | 7.7 / 2.1 / 2.6 | 5.4 / 1.4 / 1.7 | 8.1 / 2.1 / 2.4 | 7.2 / 1.8 / 2.1 |
| Movable finger, length | 4.3 | 3.2 | 4.5 | 4.2 |



Figs. 1-8.— *Brachistosternus titicaca* sp. n., holotype male (MUSM), 1, metasomal segment V and telson, lateral view; 2-3, metasomal segment V, 2, ventral view, 3, dorsal view; 4-6, pigmentary pattern, 4, mesosomal tergite VII and metasomal segments I-II, dorsal view, 5, sternite V and metasomal segments I-V, ventral view, 6, mesosomal tergite V; 7-8, right pedipalp chela, 7, lateral view, 8, ventromedial view. Scale bars = 1 mm.

the center to the fronto-lateral angles, leaving a median anterior depigmented area (it contains two submedian spots close to the front border, and a faint projection over the anterior longitudinal furrow); posterior third of carapace with reticulate pigment. Mesosomal tergites I-VI (Fig. 6) with three spots each, two lateral (irregular), and a median spot, with the shape of a inverted Y; tergite VII (Fig. 4) with an elongated median spot on the anterior two thirds, and 2-4 lateral spots. Sternites depigmented, except sternite V, which may (in some specimens) present a thin median line of pigment. Metasomal segments I-IV (Fig. 4) with a dorsal median spot (three specimens have in addition two small faint postero-lateral spots), telescopic portion with two lateral spots; pigment of the lateral side restricted to the posterior third in segments I-III; ventral side with three dark longitudinal stripes (Fig. 5), the two ventrolateral stripes

thickening caudally; the median stripe is thin, and it is almost always independent of the lateral pigment (only in some specimens this stripe slightly joins distally the lateral pigment on segment IV, always remaining the median band darker); some paramedian spots may exist on the basal portion. Metasomal segment V with light dorsal spots on the distal portion, lateral side without pigment; ventral side (Fig. 5) with two expanded lateral stripes that converge on distal third with a conspicuous, slender medial line (in some specimens there are paramedian lines of pigment). Telson faintly spotted. Chelicera with reticulated pigment close to the base of fingers. Pedipalps: femur with pigment on the distal third, dorsal borders of patella pigmented, leaving a clear area on the median portion; chela with reticulated lines (in some cases, joining at the base of fingers). Legs with some spots on the prolateral side.



Figs. 9-12.— *Brachistosternus titicaca* sp. n., allotype female (MUSM), 9, metasomal segment V and telson, lateral view; 10, metasomal segment V, ventral view; 11-12, right pedipalp chela, 11, ventromedial view, 12, lateral view. Scale bars = 1 mm.

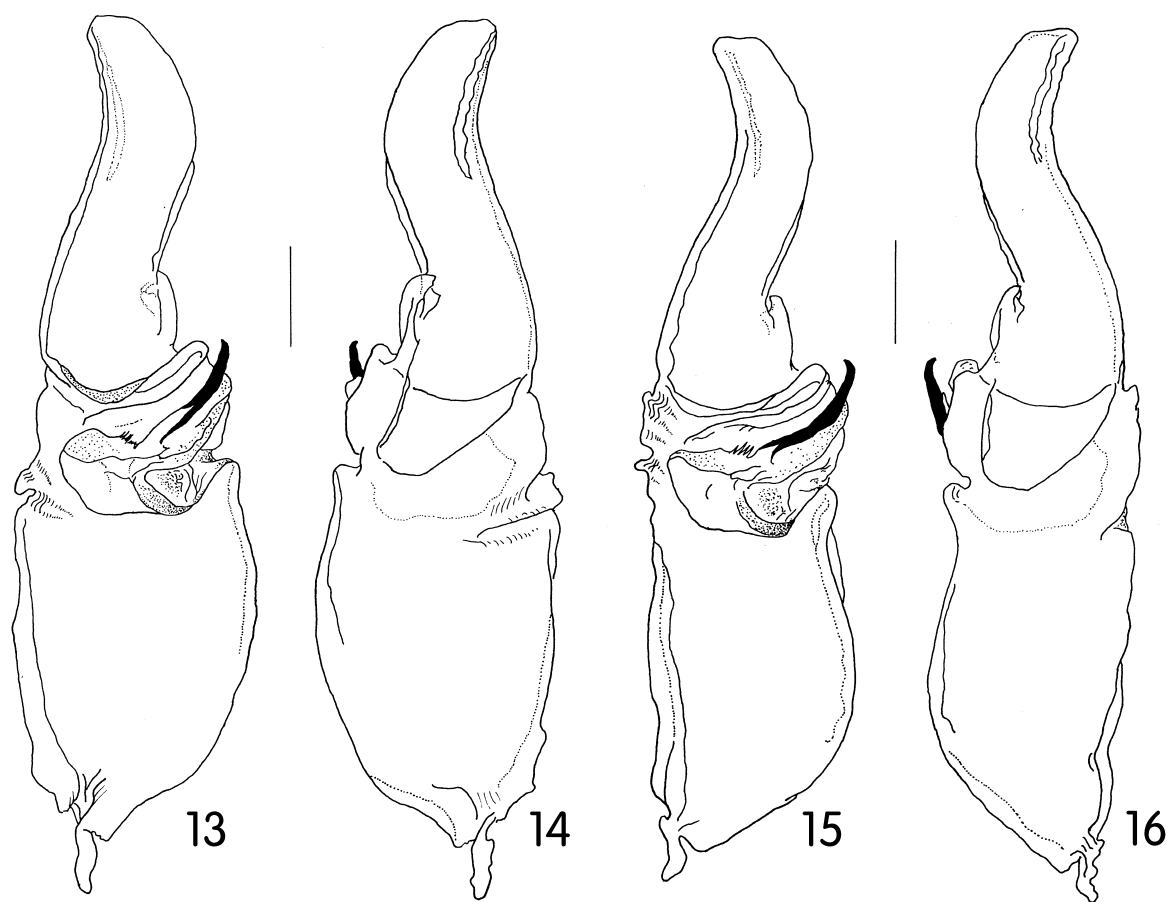
Measurements. Total length: adult males 30.3–39.2 mm (mean= 35.5), n=6 (measurements of holotype and allotype: Table 1).

Morphology. Front edge of carapace with a slight median prominence, anterior and posterior longitudinal furrows fairly developed. Tegument of carapace slightly granulous. Mesosomal tergites in males finely granulous (females smooth), tergite VII with granules on the posterior half forming four carinae. Sternites smooth in females, in males all sternal plates covered with low blunt granules. Carinae of metasomal segments I-IV: DL complete, although with no evident granules (especially in females); LSM complete on segment I, limited to the distal half on segments II-III, just few distal granules on segment IV (females with few distal granules on segments III and IV); LIM present on the distal half on segments I-II, on the distal third on segment III, and represented (only in males) by a slight tegumentary elevation and few distal granules on segment IV; LSM and LIM delimit a smooth concavity on segments I-II (less evident on segment III); VSM absent, and just a tegumentary elevation still represents VL; ventral surface segments I-III in males with similar granulation as sternite V (smooth in females), segment IV always smooth; the areas between DL and LSM, LIM and VL have sparse granules, more evident on segment I. Metasomal segment V wide; DL carinae complete; lateral side of segment with coarse granulation (just on distal third in females); ventral side irregularly granulous (Figs. 2, 10), especially on the distal third; carinae VL and VM complete, VSM absent. Metasomal glands (segment V) small and elliptic, placed on the anterior half (Fig. 3). Number of setae of segment V: dorsal lateral 1-2, lateral 4-7, ventral lateral 6-8, ventral 6-10 (in 11/16 individuals the formula was 4-2-2; see also Variability). Telson (Figs. 1, 9) high, with ventral surface granulous, sting comparatively short. Chelicera robust, movable finger with two small subdistal teeth; ventral face with scarce setae. Pedipalps (Figs. 7-8, 11-12) more robust in males, with a spine-shaped prolateral apophysis on the chela; movable finger with 6 external and 6-7 internal granules. Trichobothriotaxy

typical for the subgenus: chela with 5 *V* and 3 *Eb* trichobothria, patella with 3 *v* and 13 *e* trichobothria (Maury, 1973). Legs: Number of setae in tarsus III: dorsal of telotarsus 7-8, ventrolateral of telotarsus 4-5, dorsal of basitarsus 5-6 (the formula 7-5-5 in 15/31 tarsi; 8-5-5 in 13/31), see Variability. Number of pectinal teeth: males 24-27, females 20-21 (holotype 25-26, allotype 21-21; see Variability). Hemispermaphore (Figs. 13-14; nomenclature according to Maury, 1975): lamina proportionally wide, slightly curved; distal lobe short; cylindric apophysis slightly surpassing the length of the internal lobe; internal lobe without spines; basal triangle sclerotised; spine group and the row of spine-shaped processes of the basal lobe less developed.

Variability

- Number of pectinal teeth: males (n=26 pectines), 24 teeth (3 pectines), 25 (5), 26 (11), 27 (7); females (n=8), 20 (2), 21 (6).
- Metasomal segment V, length/width ratio: adult males, 1.5-1.6 (mean=1.6; n=6), holotype: 1.5 — allotype: 1.5.
- Telson, length/height ratio: adult males, 2.9-3.2 (mean=3.0; n=6), holotype: 2.9 — allotype: 3.0.
- Pedipalp femur, length/width ratio: adult males 3.1-3.4 (mean=3.2; n=6), holotype: 3.2 — allotype: 2.6.
- Pedipalp chela, length/width ratio: adult males 3.5-4.0 (mean=3.7; n=6), holotype: 3.7 — allotype: 3.9.
- Number of setae on metasomal segment V:
 - dorsal lateral (n=32): 1 seta (28 cases), 2 (4)
 - lateral (n=32): 4 (2), 5 (10), 6 (19), 7 (1)
 - ventral lateral (n=32): 6 (2), 7 (15), 8 (15)
 - ventral (n=16): 6 (1), 7 (2), 8 (11), 9 (1), 10 (1)
- Number of setae on tarsus III (n=31):
 - dorsal of telotarsus: 7 (15), 8 (16).
 - lateroventral on telotarsus: 4 (1), 5 (30).
 - dorsal on basitarsus: 5 (29), 6 (2).



Figs. 13-16.— Left hemispermaphore. 13-14, *Brachistosternus titicaca* sp. n., holotype (MUSM), 13, internal view, 14, external view. 15-16, *Brachistosternus quiscapata* sp. n., holotype (MUSM), 15, internal view, 16, external view. Scale bars = 1 mm.

Distribution and habitat. Southern Peru, in Departamento Puno. Localities are placed in the Titicaca basin (“Meseta del Collao”), roughly surrounding the lake, between 3850 and 3900 m. All specimens were collected under stones. This area corresponds to the Puna ecoregion (Brack, 1986), also known as Puna plateau, which in the Peruvian territory includes high montane slopes and table-lands above 3800 m. The climate is cold and the precipitations are highly variable, mostly concentrated in November - March. The vegetation is characterised by the “pajonal” or “ichu” (gramineae formations principally of the genera *Stipa* and *Festuca*); there are also some shrubs like *Baccharis*, *Mutisia*, *Lupinus*, *Cajophora* and *Chiquiraga*, among others. Although not still documented, the species might very likely occur also in the Bolivian portion of the Titicaca basin.

***Brachistosternus (Leptosternus) quiscapata* sp. n.**
(Figs. 15-28)

Etymology. The specific name is a noun composed by two Quechua words: *quisca*, meaning spine, and *pata*, place, “a spiny place”; it refers to the habitat of the species, only captured in sites with cactaceae vegetation.

Type series. Peru, Departamento Tacna: Holotype male (MUSM), allotype female (MUSM), 1 male paratype (MHNC), mountains around Tarata (3370 m, 17°28'S 70°01'W), 20 February 2000 (J. A. Ochoa) — 1 male, 1 female paratypes (CDA 000.127), 1 male, 1 female paratypes (MHNC), Palca (3230 m, 17°46'S 69°57'W), 26 February 2000 (J. A. Ochoa) — 1 female paratype (CDA 000.128), 5 km NW Ticaco (3400 m, c. 17°26'S 70°02'W), 29 October 1998 (J. A. Ochoa).

Other materials examined (no types).

PERU, DEPARTAMENTO TACNA: Mountains around Tarata (3370 m), 20 February 2000 (J. A. Ochoa), 1 female, 1 juv. (MHNC); 5 km NW Ticaco (3400 m), 29 October 1998 (J. A. Ochoa), 1 female (MHNC); Cerro Condoriquiña (3300 m, c. 17°24'S 70°03'W), 27 October 1998 (J. A. Ochoa), 1 juv. (MHNC). CHILE, PROVINCIA ARI-CA (I Región de Tarapacá): Azapa – Zapahuira (3100 m, c. 18°24'S 69°44'W), “tolar”, 21 November 1965 (G. Arriagada), 2 juv. (AMNH).

Diagnosis. Species belonging in the subgenus *Brachistosternus* (*Leptosternus*); its closest relative is *B. (L.) montanus*. Compared with the latter, the length/width ratio of metasomal segment V in *B. quiscapata* sp. n. is lower (Table 2). In contrast, the number of lateral and ventrolateral setae of metasomal segment V is higher in *B. quiscapata* sp. n. than in *B. montanus*. Additionally, the number of pectinal teeth is slightly higher in this new species. The lamina of the hemispermatophore and the length of the cylindric apophysis are very similar in both species (Figs. 15-16). The pigmentary pattern on the ventral side of metasoma

provides additional differences: in *B. quiscapata* sp. n. the median stripe joins distally the latero-ventral pigment in all segments (Fig. 24), while in *B. montanus* the stripes only join on segments IV and V (Roig Alsina, 1977). Differences with *B. titicaca* sp. n. are conspicuous. In the latter, tergites have three separate pigmentary spots (Fig. 6), while in *B. quiscapata* sp. n. the pigmentation is normally continuous, covering transversally the anterior three quarters (Fig. 20); also the thickness of the ventral pigment stripe of the metasoma shows easily observable differences (Figs. 5, 24)

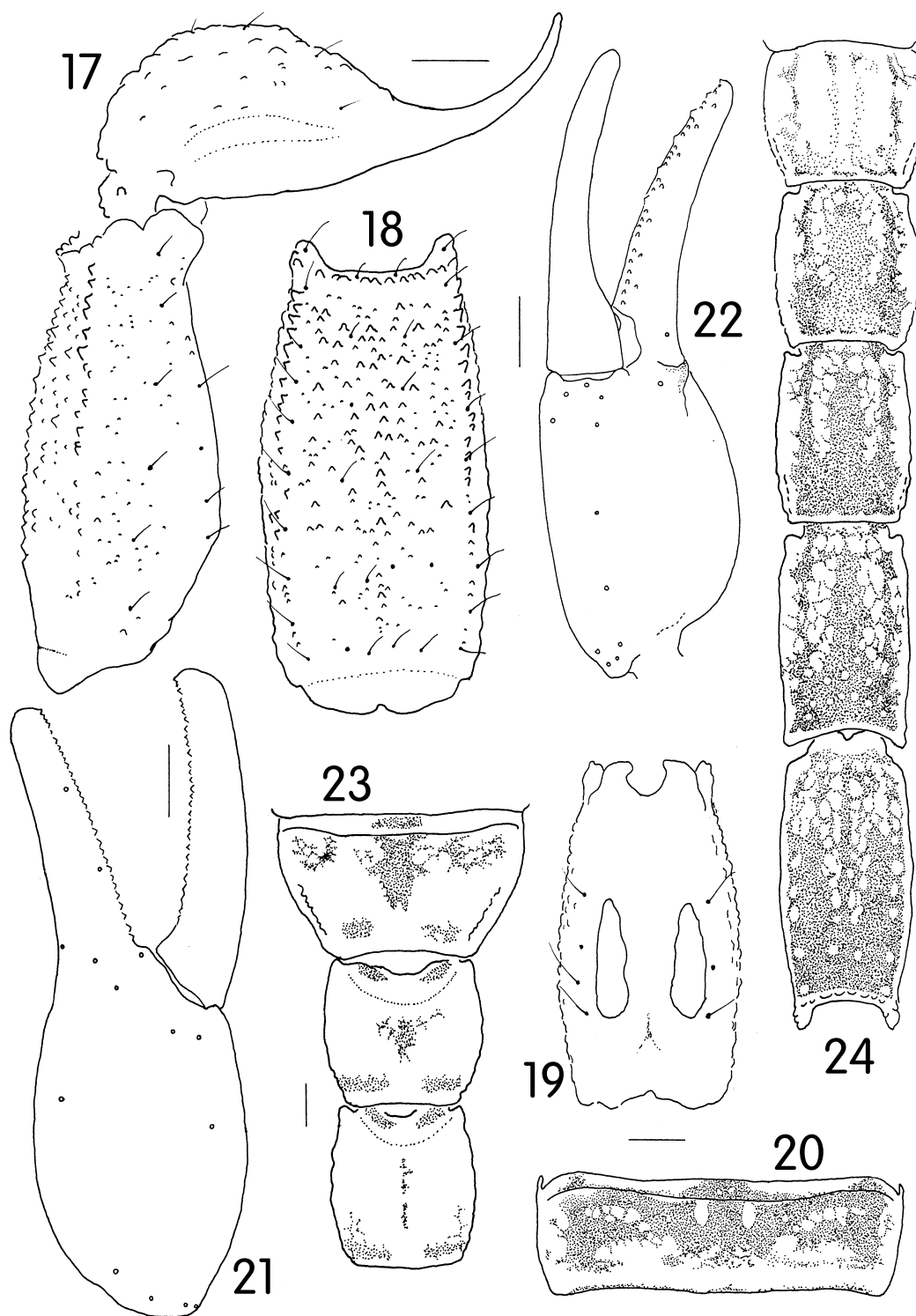
Description. General color yellowish, with brown spots. Central area of carapace densely pigmented, decreasing towards the front edge (in some specimens, anterior third depigmented); ocular tubercle dark, with two fine lines projected along the borders of the anterior longitudinal furrow; posterior third with reticulate pigment. Tergites I-VI (Fig. 20) with continuous pigment on the anterior three-quarters (except of few little clear areas on the laterals); posterior quarter depigmented; pretergites with pigment. Tergite

Table 2. Comparisons between *Brachistosternus titicaca* sp. n., *B. quiscapata* sp. n., *B. intermedius* Lönnberg and *B. montanus* Roig Alsina.

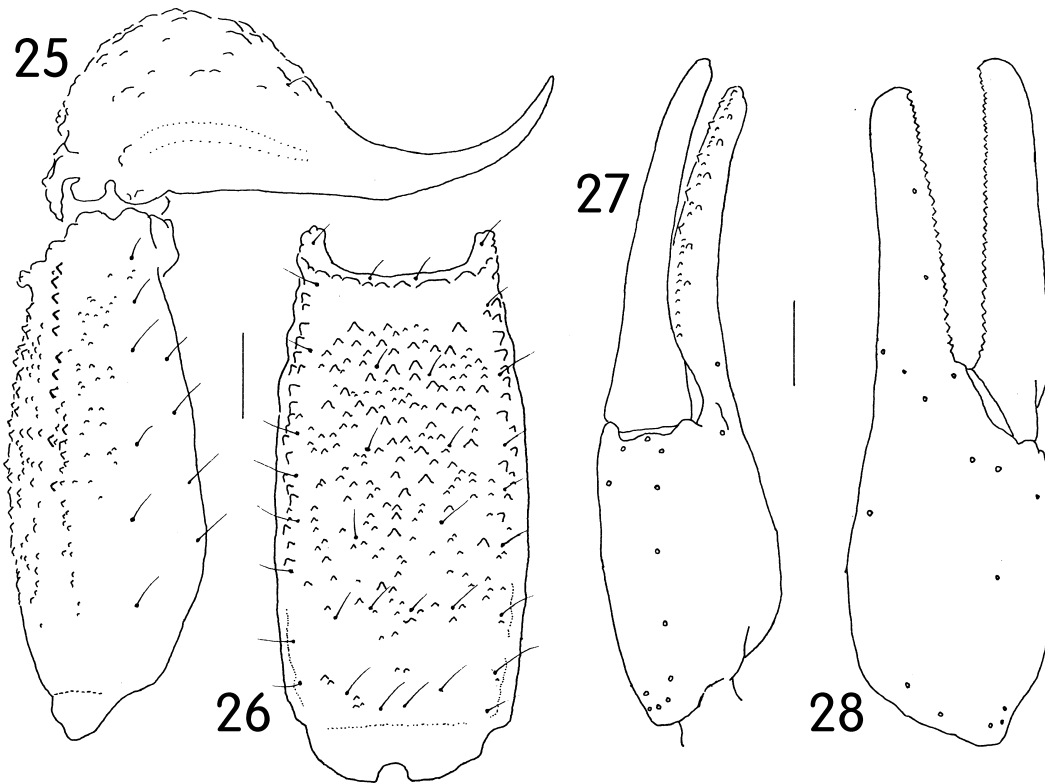
| | <i>B. titicaca</i> | <i>B. quiscapata</i> | <i>B. intermedius</i> ¹ | <i>B. montanus</i> ² |
|--|--|------------------------------|--------------------------------------|---------------------------------|
| Metasomal segment V | | | | |
| Ventral setae | 6-10 | 12-17 | 6-8 | 11-14 |
| Ventral-lateral setae | 6-8 | 8-11 | 7-10 | 7-8 |
| Lateral setae | 4-7 | 6-9 | 7-9 | 5-8 |
| Dorsal-lateral setae | 1-2 | 2-6 | 1-2 | 2-3 |
| Length/width ratio | 1.5-1.6 | 1.7-1.9 | 1.5-1.6 | 1.9-2.1 |
| Telotarsus III | | | | |
| Dorsal setae | 7-8 | 8-10 | 9-10 | 8-10 |
| Lateroventral setae | 4-5 | 5-6 | 5-6 | 4-6 |
| Pectinal teeth: males/females | 24-27 / 20-21 | 29-32 / 24-26 | 25-26 / 20-21 | 26-30 / 23-25 |
| Pigmentation on metasoma: | | | | |
| lateroventral and ventral median stripes | I-IV: separate V: stripes join on the posterior third | stripes join in all segments | stripes are separate on segments I-V | stripes join on segments IV-V |

¹ Material examined from El Quemado, Provincia de Jujuy, and San Antonio de los Cobres, Provincia de Salta (Argentina).

² Data according to Roig Alsina (1977).



Figs. 17-24.— *Brachistosternus quiscapata* sp. n.; 17-22, holotype male (MUSM); 17, metasomal segment V and telson, lateral view; 18-19, metasomal segment V, 18, ventral view, 19, dorsal view; 20, mesosomal tergite V, pigmentary pattern; 21-22, right pedipalp chela, 21, lateral view, 22, ventromedial view. 23-24, allotype female (MUSM); pigmentary pattern, 23, mesosomal tergite VII and metasomal segments I-II, dorsal view, 24, metasomal segments I-V, ventral view. Scale bars = 1 mm.



Figs. 25-28.— *Brachistosternus quiscapata* sp. n., allotype female (MUSM), 25, metasomal segment V and telson, lateral view; 26, metasomal segment V, ventral view; 27-28, right pedipalp chela, 27, ventromedial view, 28, lateral view. Scale bars = 1 mm.

VII (Fig. 23) with an elongated median spot on the anterior half, and four small lateral spots. Sternites depigmented. Metasomal segments I-IV (Fig. 23): dorsal side with a median spot (in some specimens, less evident on segments III-IV), and two lateral small spots close to the posterior border; in addition, reticulate fine lines can be present; telescopic portion pigmented; lateral side with reticular pigment, especially on the distal portion. Ventral side of metasomal segments I-IV densely pigmented (Fig. 24), three longitudinal stripes joining on the posterior third are discernible, the median stripe expanded and irregular (there are fine reticulate lines too); pigment is weaker on segments I-II, especially the median stripe, which may be faint in some specimens. Metasomal segment V: light dorsal reticular pigment on the anterior half, and dense pigmentation on the posterior third; lateral side with light reticulation; ventral side (Fig. 24) with three wide and

irregular stripes joining distally, and abundant fine reticular lines in paramedian position. Telson with ventral pigmentation. Chelicera with fine lines of pigmentation coalescing on the base of fingers. Pedipalps: femur with pigment on the distal quarter, patella with reticular pigment, chela with fine lines coalescing on the base of fingers. Legs pigmented on the prolateral side of femur and patella.

Measurements. Total length: adult males 34.5 – 49.3 mm (mean= 42.5), n=4, females up to 41.7 mm (measurements of holotype and allotype: Table 1).

Morphology: Front edge of carapace with a slight median prominence; anterior and posterior longitudinal furrows fairly developed. Tegument of carapace granulous in males, in females it is granulous only on the central area. Mesosomal tergites I-VI finely granulous in males (smooth in females); tergite VII granulous with four carinae. Sternites smooth in females; in males low blunt

granules cover all sternal plates. Metasomal segments I-IV: DL and LSM carinae complete in males, distally with more conspicuous granules; in females, DL and LSM complete on segment I, less evident on II, on the distal third of III, and even fainter on segment IV; areas between DL and LSM granulous; LIM delimit with LSM a concave surface, that is more evident on segment I, less developed on II-III, only present in males on segment IV; VL and VSM absent, ventral surface of segments I-III granulous in males (females smooth), segment IV smooth with numerous ventral setae. Metasomal segment V: DL complete but with separated granules, especially on the distal half; lateral sides with small scattered granules; ventral side with numerous granules (Figs. 18, 26), VL carinae complete and well developed; VM feeble, VSM absent. Metasomal glands (Fig. 19) elliptic, located on the central third of the segment V. Number of setae on segment V: dorsal lateral 2-6, lateral 6-9, ventral lateral 8-11, ventral 12-17 (holotype and allotype: 4-4-2-2-2). Telson high (Figs. 17, 25). Chelicera robust, movable finger with two small subdistal teeth; ventral face with scarce setae. Pedipalp chela (Figs. 21-22, 27-28) more robust in males, with a medial spine-shaped apophysis; movable finger with 5-6 external and 6-7 internal granules. Trichobothriotaxy typical for the subgenus (Maury, 1973). Legs with some granules on prolateral side of femur. Number of setae on tarsus III: dorsal of telotarsus 8-10, lateroventral of telotarsus 5-6, dorsal of basitarsus 6-7 (most frequent formulas: 9-6-6 in 7/26 cases, and 9-6-7 in 7/26 cases); see Variability. Number of pectinal teeth: males 29-32, females 24-26 (holotype 30-31, allotype 24-25); see Variability. Hemispermatophore (Figs. 15-16): Lamina slightly elongated and curved; distal lobe short; cylindric apophysis largely surpasses the length of the internal lobe and the laminar apophysis; basal triangle and spine groups like in *B. titicaca* sp. n.

Variability

- Number of pectinal teeth: males (n= 9 pectines), 29 teeth (2 pectines), 30 (3), 31(2), 32 (2); females (n=17), 24 (7), 25 (7), 26 (3).

- Metasomal segment V, length/width ratio: adult males 1.7-1.8 (mean=1.8; n=4), holotype: 1.8 — adult females, 1.7-1.9 (mean=1.8; n=6), allotype: 1.8.
- Telson, length/height ratio: adult males 2.9-3.1 (mean=3.0; n=4), holotype: 2.9 — adult females 2.7-3.1 (mean=2.9; n=6), allotype: 2.9.
- Pedipalp femur, length/width ratio: adult males 3.2-3.7 (mean=3.4; n=4), holotype: 3.2 — adult females, 2.8-3.3 (mean=3.1; n=6), allotype: 3.1.
- Pedipalp chela, length / width ratio: adult males 3.7-3.9 (mean=3.8; n=4), holotype: 3.9 — adult females 3.8-4.5 (mean=4.2; n=6), allotype: 4.0.
- Number of setae on metasomal segment V:
 - Dorsal lateral (n=28): 2 setae (1 case), 3 (8), 4 (14), 5 (4), 6 (1).
 - Lateral (n=28): 6 (14), 7 (9), 8 (4), 9 (1).
 - Ventral lateral (n=28): 8 (17), 9 (5), 10 (5), 11(1).
 - Ventral (n=14): 12 (1), 13 (1), 14 (4), 15 (3), 16 (3), 17 (2).
- Number of setae on tarsus III (n=26):
 - Dorsal on telotarsus: 8 (8), 9 (16), 10 (2).
 - Lateroventral on telotarsus: 5 (5), 6 (21).
 - Dorsal on basitarsus: 6 (13), 7 (13).

Distribution and habitat. Southern Peru (Departamento Tacna) and northern Chile (Provincia Arica), on west-facing Andean slopes between 3100 and 3400 m. All specimens were captured under stones. Capture sites correspond to the highest portion of the ecoregion named “Serrania Esteparia” (Brack, 1986). The vegetation is characterised by abundant cacti and some shrubs, like *Senecio*, *Baccharis* and *Lupinus*. At this altitude, the Serrania Esteparia shows more influence of the Puna Ecoregion than in lower sites, being therefore more humid (below 2500 m the climate conditions are dry, with scarce rains). No *Brachistosternus* species was found to cohabit with *B. quiscapata* sp. n. The geographically nearest congener is *B. ehrenbergii*, very

common in the Pacific desert, and ascending up to 2550 m in the Serranía Esteparia (near Arequipa; Acosta & Ochoa, in press). Our altitudinal records in the Departamento Tacna for *B. ehrenbergii* are the localities Calientes (1500 m) and Miculla (1470 m). Another neighbour species is *B. titicaca* sp. n., occurring around Lake Titicaca in the “Meseta del Collao” above 3800 m. *Brachistosternus quiscapata* sp. n. was not found above 3400 m and probably the Puna represents its upper distributional limit.

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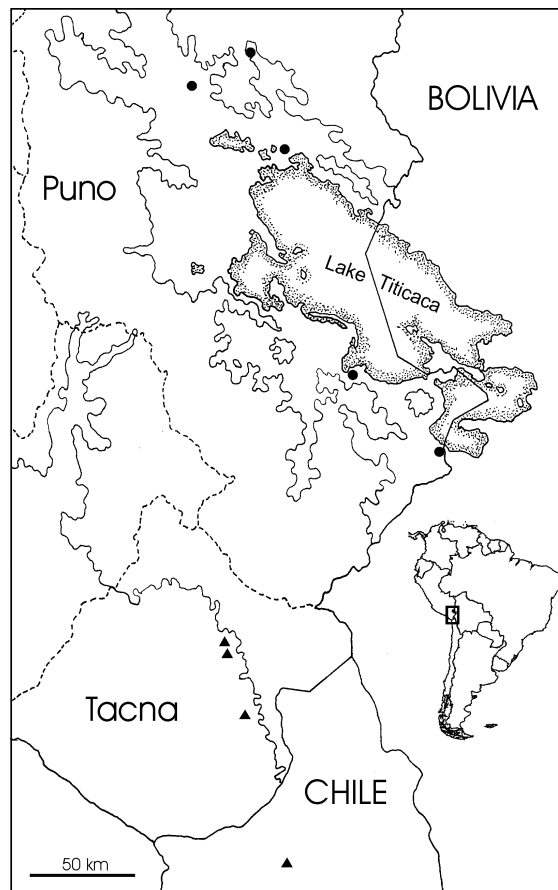


Fig. 29.— Records of *Brachistosternus titicaca* sp. n. (circles) and *B. quiscapata* sp. n. (triangles) in southern Peru (Departaments Puno and Tacna) and northern Chile. Solid lines: country boundaries. Dashed lines: administrative boundaries of Peruvian departamentos. Thin line: 4000 m altitude.

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