

Pseudoscorpions from Cusco, Peru, with description of a new species of *Neochelanops* (Pseudoscorpiones: Chernetidae)

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Abstract. A review of the pseudoscorpion fauna from the Limatambo and Yanaoca districts, Cusco department, Peru, is presented. The species *Parachernes* (*Parachernes*) *peruanus* Beier, 1955 and *Stenolpiodes gracillimus* Beier, 1959, are reported for the first time for the Cusco department and a new species of *Neochelanops*, *N. unsaac*, is described.

Keywords: Taxonomy, Limatambo, Yanaoca, fauna, new record, *Parachernes*, *Stenolpiodes*

The pseudoscorpion fauna of Peru currently includes 44 species in 26 genera and 10 families, with the families Chernetidae and Olpiidae being the most abundant with 17 and 12 species respectively (Harvey 2013; Morrow et al. 2017).

Peru is administratively divided in 25 departments. Cusco department (Fig. 1) covers an area of 71,986 km² and is composed of 13 provinces: Acomayo, Anta, Calca, Canas, Canchis, Chumbivilcas, Cusco, Espinar, La Convención, Paruro, Paucartambo, Quispicanchi and Urubamba. Sampling efforts to obtain pseudoscorpions were carried out in Anta province, Limatambo district and in Canas province, Yanaoca district (Fig. 1). Limatambo district has a surface area of 513 km², an average annual precipitation of 2,280 mm and an average annual temperature of 20.96°C, corresponding to a montane dry low subtropical forest (Figs. 2, 3); and Yanaoca (293 km²), has an average annual precipitation of 836 mm and an average annual temperature of 7.54°C, corresponding to a subtropical subalpine wetland moor (Figs. 4, 5). Three pseudoscorpion species were collected during this survey and are reported here: *Parachernes* (*Parachernes*) *peruanus* Beier, 1955 (Chernetidae) in Yanaoca district and *Stenolpiodes gracillimus* Beier, 1959 (Olpiidae) and a new species of *Neochelanops* (Chernetidae), described herein, in Limatambo district. All three species represent the first pseudoscorpion records for the Cusco department, Peru.

METHODS

During April to August 2017, five field trips were conducted in each district and pseudoscorpion specimens were captured by hand under stones, fallen tree trunks and tree bark. Soil and leaf litter samples were transported to the laboratory for Berlese funnel extraction.

Specimens were examined as temporary glycerine mounts in cavity slides after dissection of one chelicera and one pedipalp, of which the chela was also separated. Afterward, they were preserved in 70% ethanol inside glass vials, with the dissected articles placed in a glass microvial. When necessary, some specimens were cleared by immersion in 60% lactic acid at room temperature for a few days. A Zeiss Axiolab light microscope was used for detailed study and measurements were taken with an ocular micrometer, using the reference points proposed by Chamberlin (1931a).

Measurements are expressed in millimetres, followed by standard ratios in parentheses. Inclusion of the pedicel in measurements of the chela is indicated by a plus sign (e.g., hand⁺) and its exclusion by a minus sign (e.g., hand⁻) (Judson 2007a). The ratios given are length/width for carapace, chelicera and pedipalps, and length/depth for legs; when two articles are compared the ratio is length/length index. The general terminology follows Chamberlin (1931a), including trichobothriotaxy, with modifications proposed by Harvey (1992) and Judson (2007b). The chaetotaxic formula of the chelicera follows Harvey & Volschenk (2007) and the anterior setae on hemitergites follows Hernández-Corral et al. (2018:fig. 36).

Abbreviations used in the text. *Repositories*. DEUA: Departamento de Ecología, Universidad de Alicante, España. MHNC: Museo de Historia Natural de la Universidad Nacional de San Antonio Abad del Cusco, Cusco, Perú. *Other abbreviations used in text*: *bs*, cheliceral intermediate basal seta; *ds*, hemitergite discal seta; *gp*, glandular pore; *sbs*, cheliceral dorsal basal seta; *ls*, hemitergite lateroanterior seta; *pc*, coupled sensilla of movable chelal finger.

TAXONOMY

Family Chernetidae Menge, 1855

Subfamily Chernetinae Menge, 1855

Tribe Chernetini Menge, 1855

Genus *Parachernes* Chamberlin, 1931

Parachernes Chamberlin 1931b:192–194.

Parachernes (*Parachernes*) Chamberlin: Beier 1932:118.

Type species.—*Parachernes ronniai* Chamberlin, 1931, by original designation.

Parachernes* (*Parachernes*) *peruanus Beier, 1955
(Fig. 6)

Parachernes (*Argentochernes*) *peruanus* Beier 1955:6–7, figs. 6–7.

Parachernes (*Parachernes*) *peruanus* Beier: Harvey 1991:618.

Type locality.—PERU: *Ayacucho department*: Huanta province, Sivia district (Beier 1955).

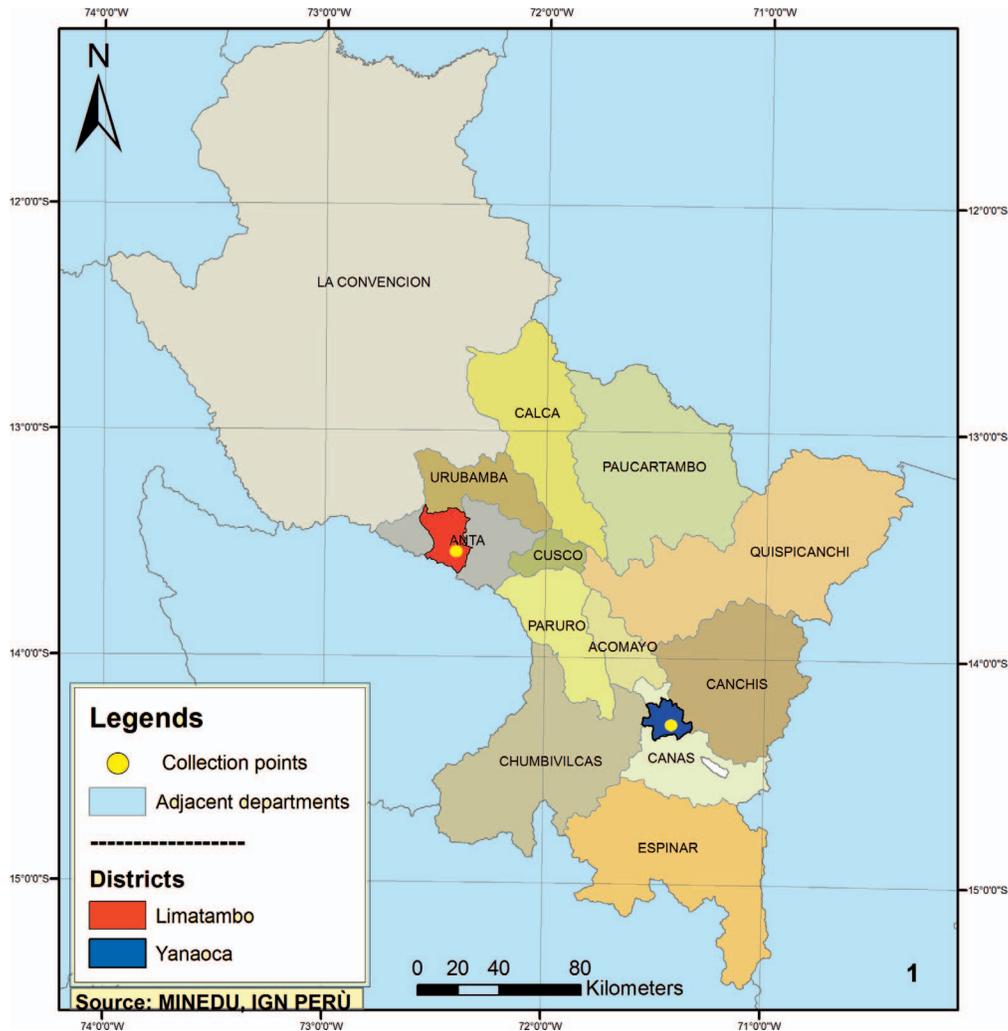


Figure 1.—Map of the Cusco department, Peru. Limatambo and Yanaoca districts highlighted.

Material examined.—PERU: *Cusco department*: Canas province, Yanaoca district, Paromani sector, Puca Pucara peak (14°13'29.59"S, 71°25'59.55"W; 3,918 m a.s.l.), 2 ♂, 5 ♀, 5 tritonymphs, 6 July 2017, D. Condori (1 ♂, 2 ♀, 2 tritonymphs DEUA; 1 ♂, 3 ♀, 3 tritonymphs MHNC).

Description (adults).—*Body*: medium-sized epigeic species (Fig. 6). Body and pedipalps dark brown, legs and chelicerae medium brown. Carapace and pedipalps strongly granulate, more attenuated in the chelae. Vestitural setae on carapace, pedipalps, legs, tergites and sternites clavate or apically dentate; except on chelal fingers, ventral face of legs and sternites where they are acuminate.

Carapace: broader than long, wider at the posterior margin, granulations small, rounded, distant one from another, without microsculpture between them; 2 transverse furrows, subbasal one close to the posterior margin, metazone with a well sclerotized and dark medial area with more dense granulations, contrasting with desclerotized whitish or pale areas at lateral sides, as usual for the subgenus; prozone longer than mesozone and metazone together. Chaetotaxy: 38–40: 24–26: 10–14(76–78). With one large eye-spot at each side,

distanced from the anterior margin of the carapace by a length equal to the diameter of the eyespot (0.08–0.09 mm).

Chelicera: 5 setae on hand, *sbs* and *bs* apically fine dentate, the others smooth; fixed finger with 3 tiny subapical teeth and 3 larger medial teeth. Movable finger distally without distinct tubercles; seta *gl* ratio 0.8 from base; galea 0.053–0.058 mm long in females, partially broken in males, with 3–5 rami at the distal half, 2 of them apically; rallum with 3 blades, the distal one dentate, with 8–10 teeth, the others smooth and distinctly shorter than the distal one; serrula exterior with 19 blades, velum present at the paraxial face of fixed finger.

Abdomen: Tergites I–X fully divided, XI partially divided. Anterior tergites I–III without lateral whitish areas, tergite I slightly paler than the others, hemitergites I–III with only marginal setae, IV–XI in addition to the marginal setae, with one lateromedial (*ls*) and one discal seta (*ds*), as in Hernández-Corral et al. (2018:fig. 36), lacking a medial seta, chaetotaxy of hemitergites 5–6: 5–6: 5–6: 6–8: 6–7: 6–8: 6–8: 6–8: 5–7: 5–6, tergite XI 8, with two lateral, acuminate and long, tactile setae (length 0.17 mm), XII 2 short and acuminate setae. Sternites with acuminate setae, sternites IV–X divided; anterior genital sternite with 45–50 microsetae in males, 26–27 microsetae in a



Figures 2–5.—Locations sampled with pseudoscorpions. 2. Limatambo, Badén, on the way to the Colorado River; 3. Badén, detail of the sampled vegetation; 4. Yanaoca, Puca Pucara peak; 5. Puca Pucara peak, detail of sampled vegetation.

cluster within an medial oval-shaped area and 9 marginal setae in females, posterior genital sternite with 11–16 medial and 8–13 marginal setae in males, 5–6 internal setae in males, females with 6–10 marginal setae, 2 microsetae on each stigmata of sternite III, 1 on IV; female spermatheca with two short tubes, apically with terminal expanded sacs; chaetotaxy hemisternites IV–X: 3–5: 4–7: 5–8: 5–10: 6–8: 5–8: 5–7, sternite XI 6–8 setae, with two lateral tactile setae, not so long as those in tergite XI, XII 2 short setae.

Coxae: pedipalpal coxa with 4–5 setae on manducatory process (including 1 suboral seta) and 22–26 setae on disk, leg coxa I 9–11, II 13, III 16–19, IV 30–31 setae.

Pedipalps: strongly granulate, more pronounced paraxially. Trochanter with prominent antiaxial hump. Femur hardly pedicellate, widest basal of the middle. Chelal hand with attenuate granulations, widest basally. Chelal fingers smooth,

dental row of fixed chelal finger shorter than that of movable finger, with 33–35 marginal teeth, cusped and retrorse, additionally with 3–8 accessory teeth on the antiaxial face and 3–4 on the paraxial face; movable finger with 36–43 marginal teeth, the distal 16–22 teeth cusped and retrorse, the others subquadrate, 3–5 accessory teeth on the antiaxial face and 2–3 on the paraxial face; venom duct well developed in movable finger, nodus ramosus up to halfway between the finger tip and trichobothrium *t*, almost relictual, thin and shorter in the fixed finger. Trichobothria: all trichobothria in the fixed finger located in basal half, except *et*; distance between *isb* and *it* shorter than between *it* and the finger tip, *est* level or slightly distad of *ist*, both well proximad of *it*, distance between *isb* and *ist* longer than that between *ist* and *it* (1.2–1.4x); movable finger with trichobothrium *st* closer to *sb* than to *st*, *st* proximad with respect to *ist* and *t* distad with



Figures 6–8.—Habitus of species from Cusco, Peru: 6. *Parachernes (P.) peruanus* Beier, 1955; 7. *Neochelanops unsaac* sp. nov. 8. *Stenolpiodes gracillimus* Beier, 1959. Scale bars: Figs. 6 and 8, 1.20 mm; Fig. 7, 1.40 mm.

respect to *it*. One coupled sensilla (*pc*) between *sb* and *st* in the movable finger.

Legs: more granulate in the dorsal face, subterminal setae simple, claws smooth, arolia slightly shorter than the claws. Tarsus IV with tactile seta, distad of the middle, ratio 0.66–0.71.

Measurements and ratios. Males: body 2.62–2.78. Carapace 0.82–0.83/0.68–0.69 (1.2 ×). Chelicera 0.26/0.13 (2.0 ×), movable finger 0.20. Pedipalp: trochanter 0.39–0.41/0.26 (1.5–1.6 ×), femur 0.67–0.68/0.27–0.28 (2.4–2.5 ×), patella 0.62–0.63/0.30 (2.1 ×), patellar club 0.42–0.43 (1.4–1.5 ×), chela⁺ 1.14–1.19/0.37–0.38 (3.1 ×), chela⁻ 1.05–1.09 (2.8–2.9 ×), hand⁺ 0.67–0.68/0.37–0.38 (1.8 ×), hand⁻ 0.58 (1.5 ×), movable finger 0.53–0.58; ratio hand⁺/movable finger 1.2–1.3 ×, hand⁻/movable finger 1.0–1.1 ×, femur/movable finger 1.2–1.3 ×, carapace/femur 1.2 ×, femur/patella 1.1 ×, hand⁺/patella 1.1 ×, chela⁺/carapace 1.4 ×, chela⁺/femur 1.7–1.8 ×. Leg I: femur+patella 0.44–0.45/0.15 (2.9–3.1 ×), femur 0.21–0.23/0.12 (1.4–1.6 ×), patella 0.33/0.14 (2.3–2.4 ×), tibia 0.31/0.09 (3.4 ×), tarsus 0.30–0.33/0.07 (4.5 ×). Leg IV: femur+patella 0.63/0.19–0.20 (3.2–3.3 ×), tibia 0.49–0.50/0.12 (4.3 ×), tarsus 0.37–0.38/0.08–0.09 (4.5–4.6 ×). Females: body 2.90–3.60. Carapace 0.87–1.00/0.75–0.80 (1.2–1.3 ×). Chelicera 0.26–0.29/0.14–0.15 (1.8–2.1 ×), movable finger 0.21. Pedipalp: trochanter 0.42–0.45/0.29–0.30 (1.4–1.5 ×), femur 0.76–0.80/0.29–0.31 (2.6 ×), patella 0.69–0.71/0.32–0.33 (2.1–2.2 ×), patellar club 0.48–0.49 (1.5 ×), chela⁺ 1.30–1.34/0.41–0.45 (2.9–3.1 ×), chela⁻ 1.20–1.23 (2.7–2.9 ×), hand⁺ 0.74–0.79/0.41–0.45 (1.8 ×), hand⁻ 0.64–0.68 (1.5–1.6 ×), movable finger 0.57–0.60; ratio hand⁺/movable finger 1.3 ×, hand⁻/movable finger 1.1 ×, femur/movable finger 1.3 ×, carapace/femur 1.1–1.2 ×, femur/patella 1.1 ×, hand⁺/patella 1.1 ×, chela⁺/carapace 1.3–1.5 ×, chela⁺/femur 1.7 ×. Leg I: femur+patella 0.46–0.51/0.15–0.17 (3.0 ×), femur 0.23/0.15–0.17 (1.4–1.6 ×), patella 0.36/0.14–0.15 (2.4–2.6 ×), tibia 0.32–0.33/0.10 (3.3–3.5 ×), tarsus 0.32–0.33/0.07–0.08 (4.4–4.6 ×). Leg IV: femur+patella 0.68–0.74/0.19–0.22 (3.4–3.6 ×), tibia 0.52–0.56/0.12–0.13 (4.4–4.5 ×), tarsus 0.41–0.43/0.08–0.09 (4.8–4.9 ×).

Description (tritonymphs).—Data that coincide with the adults are omitted.

Carapace: metazone with sclerotized and dark medial area, lateral areas pale. Chaetotaxy: 4 setae on anterior margin of prozone, mesozone with 20–22 setae, metazone with 8–9. One large and low convex eye at each side, distanced from the anterior margin of the carapace by a length equal to the diameter of the eyespot (0.06–0.07 mm).

Chelicera: 4–5 setae on hand, *sbs* and *bs* apically fine dentate, the others smooth. Movable finger with seta *gl* 0.8–0.9 from base; galea 0.055 mm long, with 5 rami apically.

Abdomen: Tergites I–X divided, XI entire. First tergites without whitish areas. Chaetotaxy of hemitergites 4–5:4–5:4–5:4–6:5:5–6:5–6:5–6:4–5, tergite XI 6–7, with two lateral tactile setae. Sternites IV–X divided; chaetotaxy sternites II–III: 7–8:6–7, hemisternites IV–X: 3:4–5:5–6:6–7:5–6:5–7:4, sternite XI 6 setae, with two lateral tactile setae.

Coxae: pedipalpal coxa with 4 setae on manducatory process (including 1 suboral seta) and 11–14 setae on disk, leg coxa I 5–6, II 7–9, III 9–10, IV 9–11 setae.

Pedipalps: Dental row of fixed chelal finger with 30–31 marginal teeth, cusped and retrorse, additionally with 4 accessory teeth on the antiaxial face and 2 on the paraxial face; movable finger with 33 marginal teeth, teeth in the distal half of the row cusped and retrorse, teeth in the basal half of the row subquadrate, 4 accessory teeth on the antiaxial face and 1–2 on the paraxial face; venom duct with *nodus ramosus* slightly proximal of trichobothrium *t*. Trichobothria: lack trichobothria *isb* and *sb*, *est* slightly distad of *st* and slightly proximal of *ist*.

Legs: Tarsus IV with tactile seta, distad of the middle, ratio 0.62.

Measurements and ratios. Body 2.37–2.38. Carapace 0.70/0.55–0.58 (1.2–1.3). Chelicera 0.21/0.11–0.12 (1.8–1.9), movable finger 0.16. Pedipalp: trochanter 0.31–0.34/0.20–0.21 (1.6), femur 0.51–0.53/0.21–0.22 (2.4), patella 0.47/0.24–0.25 (1.9–2.0), patellar club 0.32 (1.3), chela⁺ 0.89–0.93/0.30–0.31 (3.0), chela⁻ 0.82–0.85 (2.7–2.8), hand⁺ 0.51–0.54/0.30–0.31 (1.7), hand⁻ 0.44–0.46 (1.5), movable finger 0.41–0.43; ratio

hand⁺/movable finger 1.2–1.3, hand⁻/movable finger 1.1, femur/movable finger 1.2, carapace/femur 1.3–1.4, femur/patella 1.1, hand⁺/patella 1.1, chela⁺/carapace 1.3, chela⁺/femur 1.8. Leg I: femur+patella 0.35–0.37/0.11–0.12 (3.1–3.2), femur 0.15–0.18/0.11–0.12 (1.4–1.5), patella 0.23–0.26/0.10–0.11 (2.1–2.3), tibia 0.23–0.25/0.07–0.08 (3.1–3.3), tarsus 0.25–0.26/0.06 (4.2). Leg IV: femur+patella 0.48–0.51/0.15 (3.2–3.4), tibia 0.37–0.38/0.09–0.10 (4.0–4.1), tarsus 0.31/0.07 (4.4).

Remarks.—The specimens from Cusco have the diagnostic characteristics of the genus *Parachernes*: cheliceral rallum with 3 blades, trichobothria *ib*, *isb*, *ist* and *it* situated in the basal half of the finger, tergite XI with tactile setae, tarsus IV with tactile seta distad of middle, accessory teeth present in both the antiaxial and paraxial faces of both chelal fingers, carapacial metazone usually with a well sclerotized and dark medial area with more dense granulations, in contrast with desclerotized whitish lateral areas, and female spermatheca consists of two short tubes with terminally enlarged sacs (Chamberlin 1931b; Beier 1932; Hoff 1956; Mahnert 1979). The specimens closely resemble those of *P. peruanus* Beier, 1955—which was originally described only from males from Ayacucho department, Peru, and later recorded from Argentina by Mahnert et al. (2011)—by the stouter pedipalpal femur (2.4–2.5 × in males) and particularly the patella (2.1 × in

males) and the trichobothriotaxy, particularly by the distant and distad position of *it* with respect to *ist* and *est*. Other similar species, by pedipalpal measurements, are *P. fallax* Beier, 1959, which females were misidentified by Beier (1955) as *P. peruanus*, and *P. pallidus* Beier, 1959, but both differ from the specimens studied here by the presence of whitish areas in the tergites, and also from *P. pallidus* by the position of trichobothrium *it* which is close to *ist* (Beier 1959). The specimens from Cusco have longer pedipalpal measurements and the patella is shorter than the femur in comparison with *P. peruanus* (equal or slightly longer), but we tentatively assign them to *P. peruanus*, taking also into consideration that the females of that species and, consequently, its variability is still unknown.

Distribution.—ARGENTINA: Buenos Aires province; PERU: Ayacucho and Cusco departments.

Genus *Neochelanops* Beier, 1964

Chelanops (*Neochelanops*) Beier 1964:370.

Neochelanops Beier: Muchmore 1999:105.

Type species.—*Chelifera* (*Chelanops*) *patagonicus* Tullgren, 1900, by original designation.

Key to adults of the *Neochelanops* species

1. Cheliceral hand with 7 setae 2
Cheliceral hand with 5–6 setae 4
2. Movable chelal finger as long as the chelal hand⁻. Trichobothrium *ist* halfway between *it* and *isb*
..... *N. patagonicus* (Tullgren, 1900) (Argentina, Chile)
- Movable chelal finger distinctly shorter than the chelal hand⁻. Trichobothrium *ist* closer to *it* than to *isb* 3
3. Pedipalpal femur length (♂) 0.69 mm, (♀) 0.77 mm. Vestitural setae distinctly clavate *N. fraternus*
(Beier, 1964) (Argentina, Chile)
- Pedipalpal femur length (♂) 0.83 mm, (♀) 0.90 mm. Vestitural setae apically dentate *N. michaelsoni*
(Simon, 1902) (Argentina, Chile)
4. Larger species. Pedipalpal femur more slender, pedicellate, widest at the middle, length (♂ ♀) 0.60–0.69 mm
..... *N. peruanus* (Mahnert, 1984) (Peru)
- Smaller species. Pedipalpal femur stouter, more abruptly pedicellate, widest basally, length (♂ ♀) 0.43–0.46 mm.
..... *N. unsaac* sp. nov. (Peru)

Neochelanops unsaac sp. nov.

(Figs. 7, 9–16)

Material examined.—*Holotype male*. PERU: Cusco department: Anta province, Limatambo district, Limatambo municipality, Badén, on the way to the Colorado River (13°29'37"S, 72°26'03"W; 2,594 m a.s.l.), 28 July 2017, D. Condori & M. Del Castillo (MHNC).

Paratypes. PERU: Cusco department: 1 ♂ (DEUA), 1 ♀ (MHNC), collected with holotype.

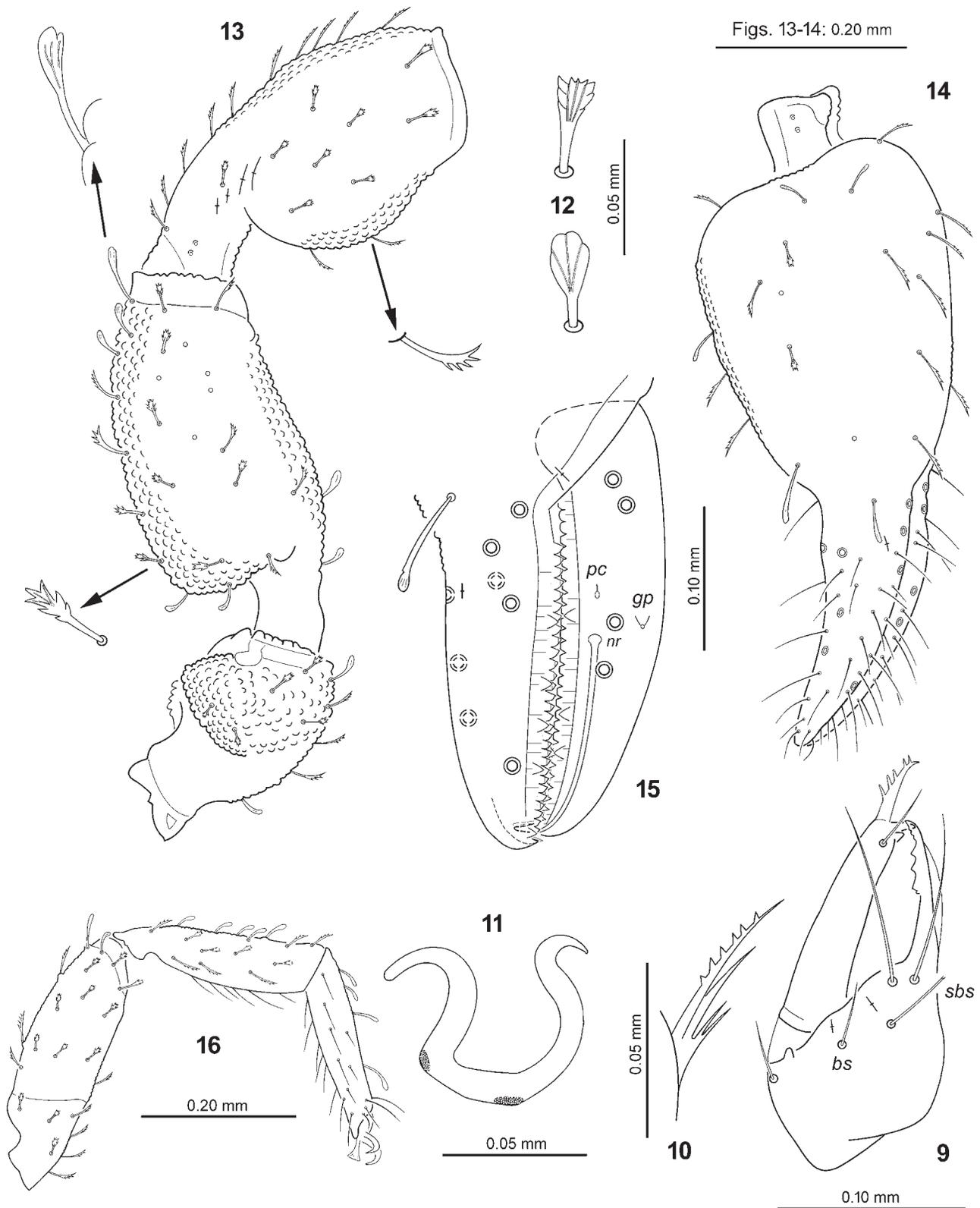
Diagnosis.—*Neochelanops unsaac* sp. nov. is a small, epigeal species that differs from other species of the genus as follows: pedipalpal femur shorter than 0.50 mm, chela⁺ 0.70 mm; femur extremely abrupt basally, chela widest basally; trichobothrium *ist* closer to *it* than to *isb*, distad of *est* and level *t*; *est* closer to *isb* than to *ist*; *it* halfway between *isb* and the tip of the finger; and *st* closer to *t* than to *sb*.

Description (adults).—*Body*: small epigeal species (Fig. 7). Body and pedipalps medium brown, legs and chelicerae pale brown. Carapace and pedipalps strongly granulate, more

attenuate in the chelae. Vestitural setae on carapace, pedipalps, legs, tergites and sternites palmate (Fig. 12), except those on chelal fingers, ventral face of legs and anterior sternites, which are acuminate. Some of the vestitural setae are apparently covered by some type of secretion and are club-shaped (Fig. 12).

Carapace: broader than long, wider at the posterior margin, granulate; 2 transverse furrows, subbasal one close to the posterior margin. Chaetotaxy: 24–33: 15–18: 8–9(49–57); 4 setae on anterior prosomal margin; mesozone with 6–8 setae on the anterior margin, 7–8 on the posterior margin and one lateromedial seta on each side; metazone with 8–9 setae on the posterior margin. Without eyes or eye-spots.

Chelicera (Figs. 9, 10): 5–6 setae on hand, *sbs* apically bifurcate and finely dentate, the others smooth (Fig. 10); fixed finger with 3 tiny subapical teeth and 2–3 larger medial teeth. Movable finger distally without distinct tubercles, apically bifurcate to receive the tip of the fixed finger; seta *gl* 0.8–0.9 from base; galea 0.033–0.038 mm long in males, 0.050 mm in female, with 5–6 paraxial rami at the distal half; rallum with 4



Figures 9–16.—*Neochelanops unsaac* sp. nov., male holotype, dorsal views, unless stated otherwise: 9. Left chelicera. 10. Cheliceral rallum. 12. Setae of tergites VI–VII. 13. Left pedipalp, except chela, with magnifications of some setae. 14. Left chela. 15. Left chela, partial antiaxial view. 16. Left leg IV, antiaxial view. 11. Female paratype: spermatheca. See Methods for abbreviations.

blades (Fig. 10), the distal one with 5 teeth, the others smooth, both basal blades distinctly shorter than the others and very close together, in one paratype overlapping, being difficult to recognize if the rallum comprises 3 or 4 blades; serrula exterior with 15–17 blades, velum present at the antiaxial face of fixed finger.

Abdomen: Tergites I–X fully divided, XI partially divided. Hemitergites I–III with marginal setae, IV–XI in addition to the marginal setae, with 1 lateromedial seta (*ls*), lacking medial and discal setae, chaetotaxy of hemitergites 3–5: 4–5: 4–5: 3–6: 4–7: 5–7: 4–7: 5–7: 5–6: 4–6, tergite XI 8–9, without tactile setae, tergite XII 2 short and apically dentate setae. Sternites IV–X divided; setae on sternites II–VII and XII with acuminate setae, palmate in the others, as those on tergites; anterior genital sternite with 15–20 long setae in males, 20 short setae in female, posterior genital sternite with 4–5 medial and 9–11 marginal setae in males, 9 marginal setae in female, 5 acuminate internal setae in males, female spermatheca with 2 tubular branches apically narrowed, without terminal sacs, with 2 small cribrate plates at base (Fig. 11); hemisternites IV–X: 3–5: 6–8: 7–9: 5–8: 5–6: 5–6: 4–6 (2 long tactile setae), sternite XI 6 setae, without tactile setae, XII 2 acuminate short setae.

Coxae: pedipalpal coxa with 5 setae on manducatory process (including 1 suboral seta) and 17–19 setae on disk, leg coxa I 10–14, II 12–16, III 15–20, IV 24–37 setae.

Pedipalps (Figs. 13–15): strongly granulate, more pronounced paraxially. Trochanter with prominent antiaxial hump. Femur extremely abruptly pedicellate, widest basally. Chela (Figs. 14, 15): hand with attenuate granulation, widest basally; chelal fingers smooth, dental row of fixed chelal finger shorter than that of movable finger, with 27–29 marginal teeth, cusped and retrorse, additionally with 4–6 accessory teeth on antiaxial face and 2–4 on paraxial face; movable finger with 29–33 marginal teeth, the 9 distal teeth cusped and retrorse, the others subquadrate, 4–6 accessory teeth on antiaxial face and 1–2 on paraxial face; venedens short and venom duct vestigial in fixed finger; both well developed in movable finger, nodus ramosus situated between trichobothria *t* and *st*. Trichobothria as in Figs. 14, 15; *ist* closer to *it* than to *isb*, also distad of *est* and level *t*; *est* closer to *isb* than to *ist*; *it* almost halfway between *isb* and the tip of the finger; *st* distad of *est* and distinctly close to *t* than to *sb*; *b* and *sb* separated by less than one external areolar diameter. One glandular pore (*gp*) close to trichobothrium *st* and one coupled sensilla (*pc*) proximad of *st* in the movable finger.

Legs: subterminal setae simple, claws smooth, arolia slightly shorter than claws. Leg IV (Fig. 16) tarsus without tactile seta.

Measurements and ratios. Male holotype, followed, when different, by male paratype in square brackets: Body 1.36 [1.54]. Carapace 0.53/0.49 (1.1 ×) [0.53/0.45 (1.2 ×)]. Chelicera 0.19/0.10 (1.9 ×) [0.18/0.10 (1.8 ×)], movable finger 0.14 [0.13]. Pedipalp: trochanter 0.26/0.17 (1.5 ×), femur 0.45/0.20 (2.3 ×) [0.43/0.19 (2.2 ×)], patella 0.41/0.21 (2.0 ×) [0.40/0.20 (2.1 ×)], patellar club 0.28 (1.3 ×) [(1.4 ×)], chela⁺ 0.70/0.26 (2.7 ×) [0.68/0.24 (2.8 ×)], chela⁻ 0.65 (2.5 ×) [0.61], hand⁺ 0.40/0.26 (1.6 ×) [0.39/0.24], hand⁻ 0.35 (1.4 ×) [0.36 (1.5 ×)], movable finger 0.32 [0.30]; ratio hand⁺/movable finger 1.3 ×, hand⁻/movable finger 1.1 × [1.2 ×], femur/movable finger 1.4 ×, femur/carapace 1.2 ×, femur/patella 1.1 ×, patella/hand⁺ 1.0 ×,

chela⁺/carapace 1.3 ×, chela⁺/femur 1.6 ×. Leg I: femur+patella 0.26/0.10 (2.8 ×) [(2.7 ×)], femur 0.14/0.10 (1.5 ×) [0.13 (1.4 ×)], patella 0.19/0.08 (2.3 ×) [0.18/0.09 (2.1 ×)], tibia 0.20/0.07 (3.0 ×) [0.19 (2.9 ×)], tarsus 0.23/0.05 (5.2 ×) [0.22 (4.5 ×)]. Leg IV: femur+patella 0.36/0.11 (3.4 ×) [0.36/0.10 (3.5 ×)], tibia 0.29/0.07 (3.9 ×) [(4.1 ×)], tarsus 0.26/0.05 (4.7 ×) [0.26/0.06 (4.6 ×)]. Female paratype: Body 1.76. Carapace 0.53/0.49 (1.1 ×). Chelicera 0.19/0.10 (2.0 ×), movable finger 0.14. Pedipalp: trochanter 0.27/0.17 (1.6 ×), femur 0.46/0.19 (2.4 ×), patella 0.40/0.19 (2.1 ×), patellar club 0.29 (1.5 ×), chela⁺ 0.70/0.24 (2.9 ×), chela⁻ 0.63 (2.6 ×), hand⁺ 0.43 (1.8 ×), hand⁻ 0.36 (1.5 ×), movable finger 0.31; ratio movable finger/hand⁺ 1.4 ×, ratio hand⁻/movable finger 1.2 ×, femur/movable finger 1.5 ×, femur/carapace 1.2 ×, femur/patella 1.1 ×, patella/hand⁺ 1.0 ×, chela⁺/carapace 1.3 ×, chela⁺/femur 1.5 ×. Leg I: femur+patella 0.27/0.10 (2.7 ×), femur 0.14/0.10 (1.4 ×), patella 0.20/0.08 (2.4 ×), tibia 0.20/0.07 (3.1 ×), tarsus 0.22/0.05 (5.0 ×). Leg IV: femur+patella 0.38/0.10 (3.7 ×), tibia 0.30/0.07 (4.3 ×), tarsus 0.26/0.06 (4.7 ×).

Remarks.—*Neochelanops unsaac* sp. nov. is easily distinguishable from the other *Neochelanops* species by its small size: femur shorter than 0.50 mm, chela⁺ no longer than 0.70 mm, versus femur length 0.70–0.85 mm and chela⁺ length 1.0–1.60 in the others. The medium-sized species *N. peruanus* (Mahnert, 1984) is similar to the new species, but *N. unsaac* is distinctly smaller and the shape of the pedipalpal femur is quite different, extremely abrupt basally, where it has its maximum width, and more attenuate in *N. peruanus*, with its greatest width at the middle; the chelal hand also is widest at the basal margin in the new species, but more distally in *N. peruanus* (Mahnert 1984). *Neochelanops peruanus* is also endemic to Peru, and has been recorded from Cajamarca department, northern Peru (Mahnert 1984), geographically distant from *N. unsaac*.

Distribution.—PERU: Cusco Department.

Etymology.—This species is named after the Universidad Nacional de San Antonio Abad del Cusco (UNSAAC). It is to be treated as a noun in apposition.

Family Olpiidae Banks, 1895
Subfamily Hesperolpiinae Hoff, 1964
Genus *Stenolpiodes* Beier, 1959

Stenolpiodes Beier 1959:190.

Type species.—*Stenolpiodes gracillimus* Beier, 1959, by original designation.

Stenolpiodes gracillimus Beier, 1959
(Fig. 8)

Stenolpiodes gracillimus Beier 1959:190–191, fig. 4.

Type locality.—PERU: La Libertad department, Otuzco province, Otuzco.

Material examined.—PERU: Cusco department: Anta province, Limatambo district, Badén, on the way to the Colorado River (13°29'37"S, 72°26'03"W; 2,594 m.a.s.l.), 1 ♂, 1 ♀, 1 tritonymph, 28 July 2017, D. Condori & M. Del Castillo (1 ♂ DEUA; 1 ♀, 1 tritonymph MHNC).

Description (adults).—*Body*: medium-sized epigeal species (Fig. 8). Body and pedipalps light brown, legs and chelicerae pale. Carapace and pedipalps strongly granulate, more attenuate in the chelae, almost smooth. Vestitural setae acuminate, usually thin and small.

Carapace: distinctly broader than long, wider at the posterior margin, granulate; a short cucullus at anterior margin, slightly depressed at middle of anterior margin. Anterior margin with 6 setae, posterior with 4 setae. Two pairs of convex and well-developed eyes, anterior eyes diameter 0.060–0.065 mm, separated 0.095–0.10 mm from anterior margin and 0.02–0.03 mm from posterior eyes, posterior eyes diameter 0.050–0.065 mm.

Chelicera: 5 acuminate setae on hand; fixed finger with some tiny granulations. Movable finger distally without distinct tubercles, apically bifurcate to receive tip of fixed finger; seta *gl* 0.9 from base; galea 0.035 long in male, 0.038 mm in female, with 2–3 rami at the apex; rallum with 3 blades, the distal one very thick and long with respect to the others and with 8–10 teeth, the others tiny dentate; serrula exterior with 19–22 blades, velum present at antiaxial face of fixed finger.

Abdomen: Tergites undivided; chaetotaxy of tergites 4: 4: 6: 6–8: 6: 6: 6–7: 6: 1T2T1–2: 1T2T1–2: 2T2T2: 2. Sternites undivided; male anterior genital sternite with 8 medial and 8 discal setae, posterior genital sternite with 6 marginal setae; female sternite II with 18 setae, III with 7 marginal setae; chaetotaxy sternites IV–XII: 6–8: 7–9: 8–9: 7: 8: 2T2T2: 2T2T1: 2T2T2: 2.

Coxae: pedipalpal coxa with 4–5 setae on manducatory process (including 1 suboral seta) and 10–11 setae on disk, leg coxa I 8–9, II 8, III 9–11, IV 11 setae.

Pedipalps: trochanter, femur and patella strongly granulate, more pronounced paraxially. Femur with short pedicel, widest distad of the middle, 1 trichobothrium proximad on dorsal face. Chelal hand with attenuate granulations, widest basally. Movable chelal finger distinctly longer than the hand⁺, as long as the patella and shorter than the femur. Chelal fingers smooth, dental row of fixed chelal finger longer than that of movable finger, with 43–46 marginal teeth, cusped and retrorse, 8–12 basal teeth subquadrate; movable finger with 31 marginal teeth, distal teeth cusped and retrorse, decreasing in size progressively, 10–15 basal teeth almost unrecognizable and only distinguishable by the dental channels. Trichobothria: *isb* close to base of finger, *est* proximad of middle of finger, *ist*, *it* and *et* at distal third, *est* distinctly proximad with respect to *st* and *it* distad with respect to *t*, *st* distinctly closer to *t* than to *sb*, ratio *st-t/sb-st* 1.7.

Legs: subterminal setae simple, claws smooth, arolia distinctly longer than the claws. Tarsus IV with a seta distad of middle, not longer than 2–3 times the depth of the article, probably tactile.

Measurements and ratios. Male: Body 2.74. Carapace 0.78/0.53 (1.5 ×). Chelicera 0.24/0.13 (1.9 ×), movable finger 0.17. Pedipalp: trochanter 0.33/0.19 (1.7 ×), femur 0.83/0.18 (4.7 ×), patella 0.71/0.19 (3.8 ×), patellar club 0.56 (3.0 ×), chela⁺ 1.18/0.35 (3.4 ×), chela⁻ 1.09 (3.1 ×), hand⁺ 0.51/0.35 (1.5 ×), hand⁻ 0.42 (1.2 ×), movable finger 0.69; ratio movable finger/hand⁺ 1.4 ×, movable finger/hand⁻ 1.6 ×, femur/movable finger 1.2 ×, femur/carapace 1.1 ×, femur/patella 1.2 ×, patella/hand⁺ 1.4 ×, chela⁺/carapace 1.5 ×, chela⁺/femur 1.4 ×. Leg I: femur 0.40/

0.10 (4.0 ×), patella 0.20/0.10 (2.1 ×), tibia 0.31/0.07 (4.7 ×), basitarsus 0.22/0.05 (4.3 ×), telotarsus 0.19/0.04 (5.1 ×); ratio femur/patella 2.0 ×, basitarsus/telotarsus 1.2 ×. Leg IV: femur+patella 0.73/0.27 (2.7 ×), tibia 0.54/0.11 (4.9 ×), basitarsus 0.28/0.07 (4.0 ×), telotarsus 0.27/0.05 (5.4 ×); ratio basitarsus/telotarsus 1.0 ×. Female: Body 2.52. Carapace 0.75/0.55 (1.4 ×). Chelicera 0.24/0.14 (1.8 ×), movable finger 0.17. Pedipalp: trochanter 0.34/0.20 (1.7 ×), femur 0.88/0.18 (4.9 ×), patella 0.74/0.19 (4.0 ×), patellar club 0.59 (3.2 ×), chela⁺ 1.29/0.34 (3.8 ×), chela⁻ 1.19 (3.5 ×), hand⁺ 0.55/0.34 (1.6 ×), hand⁻ 0.45 (1.3 ×), movable finger 0.75; ratio movable finger/hand⁺ 1.4 ×, movable finger/hand⁻ 1.7 ×, femur/movable finger 1.2 ×, femur/carapace 1.2 ×, femur/patella 1.2 ×, patella/hand⁺ 1.3 ×, chela⁺/carapace 1.7 ×, chela⁺/femur 1.5 ×. Leg I: femur 0.41/0.10 (4.3 ×), patella 0.21/0.09 (2.3 ×), tibia 0.31/0.07 (4.7 ×), basitarsus 0.23/0.05 (4.6 ×), telotarsus 0.20/0.04 (5.0 ×); ratio femur/patella 1.9 ×, basitarsus/telotarsus 1.2 ×. Leg IV: femur+patella 0.74/0.28 (2.6 ×), tibia 0.55/0.11 (4.9 ×), basitarsus 0.30/0.08 (3.9 ×), telotarsus 0.27/0.05 (5.3 ×); ratio basitarsus/telotarsus 1.1 ×.

Description (tritonymph).—Data that coincide with the adults are omitted.

Carapace: Two pairs of convex and well-developed eyes, anterior eyes diameter 0.060 mm, separated 0.090 mm from anterior margin and 0.02 mm from posterior eyes, posterior eyes diameter 0.060 mm.

Abdomen: Tergites undivided; chaetotaxy of tergites 4: 2: 5: 4: 5: 5: 6: 6: 1T2T2: 1T2T2: 1T2T1: 2. Chaetotaxy sternites II–XII: 2: 4: 6: 9: 8: 7: 8: 2T2T1: 1T2T2: 1T2T1: 2.

Coxae: pedipalpal coxa with 4 setae on manducatory process (including 1 suboral seta) and 9 setae on disk, leg coxa I 4–5, II 7, III 7, IV 8 setae.

Pedipalps: Chelal fixed finger with 37 marginal teeth, cusped and retrorse, 7 basal teeth subquadrate; movable finger with 24 marginal teeth, distal teeth cusped and retrorse, decreasing in size progressively, 11 basal teeth almost unrecognizable and only distinguishable by the dental channel. Trichobothria: *est* proximad of finger halfway, *ist*, *it* and *et* at distal third.

Measurements and ratios. Body 2.58. Carapace 0.67/0.45 (1.5). Chelicera 0.21/0.11 (2.0), movable finger 0.14. Pedipalp: trochanter 0.27/0.16 (1.6), femur 0.64/0.16 (4.1), patella 0.54/0.16 (3.4), patellar club 0.47 (3.0), chela⁺ 0.99/0.29 (3.4), chela⁻ 0.92 (3.1), hand⁺ 0.44/0.29 (1.5), hand⁻ 0.37 (1.3), movable finger 0.57; ratio movable finger/hand⁺ 1.3, movable finger/hand⁻ 1.5, femur/movable finger 1.1, femur/carapace 1.0, femur/patella 1.2, patella/hand⁺ 1.2, chela⁺/carapace 1.4, chela⁺/femur 1.5. Leg I: femur 0.30/0.09 (3.5), patella 0.15/0.08 (1.9), tibia 0.25/0.06 (4.5), basitarsus 0.17/0.05 (3.7), telotarsus 0.16/0.04 (4.6); ratio femur/patella 2.0, basitarsus/telotarsus 1.0. Leg IV: femur+patella 0.57/0.22 (2.6), tibia 0.43/0.09 (4.8), basitarsus 0.23/0.06 (3.8), telotarsus 0.21/0.05 (4.6); ratio basitarsus/telotarsus 1.1.

Remarks.—The genus *Stenolpiodes* contains only a single species, *S. gracillimus* which was described by Beier (1959) from Otusco, La Libertad department, Peru. *Stenolpiodes* is characterized by the position of trichobothrium *est* proximad of the middle of the fixed finger, trichobothria *ist-it-et* close to the finger tip, *st* distinctly closer to *t* than to *sb*, and the pedipalp, except the chela, strongly granulate. Although the new specimens from Cusco department were collected about

500 km from the type specimens from La Libertad department in northwestern Peru, we cannot ascertain any significant differences to suggest that a separate species is represented. There is no doubt that the Cusco sample belongs to the same species as described by Beier (1959).

Distribution.—PERU: Cusco and La Libertad departments.

CONCLUSIONS

Of the 45 pseudoscorpion species currently recorded from Peru, 26 are endemic for that country (Harvey 2013; this study); of them, the families Chernetidae and Olpiidae have the greatest number of endemic taxa, with nine species each. Some of the countries neighbouring Peru have higher diversity: Brazil (165 species), Chile (86) and Ecuador (59) and for Colombia (46) the number is increasing considerably in recent years (e.g., Torres & Bedoya Roqueme 2018). Although not neighbouring Peru, but sharing some species, Argentina has 70 species (Mahnert et al. 2011; Harvey 2013). In all these countries the family Chernetidae is the most abundant in species number: Brazil (65), Argentina (40), Chile (35), Ecuador (24) and Colombia (18). On the contrary, the family Olpiidae is poorly represented in those countries, except in Brazil (14) and also Peru (12) (Mahnert et al. 2011; Harvey 2013; Torres & Bedoya Roqueme 2018).

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