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Systematic revision and total evidence phylogenetic analysis of the Andean family Metasarcidae Kury, 1994 (Opiliones: Laniatores), with description of two new genera and twenty new species

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Abstract

Metasarcidae Kury, 1994 (Gonyleptoidea) is exclusively distributed in the Andean region of South America, from northern Peru to southern Bolivia. This contribution reviews the family using traditional taxonomy and cladistics. The cladistic analysis is based on total evidence (TE), maximum likelihood (ML) and direct optimization of molecular and morphological characters. The data matrix is composed of DNA sequences from three mitochondrial loci (12S rRNA, 16S rRNA and COI), from two nuclear loci (28S rRNA and H3) and 68 phenotypic characters. The dataset consists of 25 ingroup terminals (representing 20 species of the family) and eight outgroup species. The parsimony analysis resulted in one most parsimonious tree (L=4910) that recovered a monophyletic Metasarcidae, sister-group of Cosmetidae. As a result of the taxonomic revision and cladistic hypothesis, a new classification is proposed with six genera and 38 valid species of Metasarcidae, of which two genera and 20 species are described for the first time. Additionally, the following are established: six generic name synonymies; four species synonymies; seven new species combinations; and three secondary homonym species names replaced.

Keywords

Direct Optimization, Gonyleptoidea, Neotropical fauna, parsimony, systematics, taxonomy

1. Introduction

There are over 6,600 described species of Opiliones, This order is subdivided into five suborders: Tetrophthalmi Garwood et al., 2014 (extinct), Cyphophthalmi Simon, 1879, Dyspnoi Hansen & Sørensen, 1904, Eupnoi Hansen & Sørensen, 1904 and Laniatores Thorell, 1876. The Laniatores include about 4,100 described species and account for approximately 70% of the species in the order (Kury 2013). Gonyleptoidea is the most diverse superfamily of Laniatores. It includes ca. 2,000 species distributed in the Neotropics, and is currently divided into

14 families (Kury et al. 2020). The family Metasarcidae Kury, 1994 currently has 22 valid species and is restricted to the Andean region of Bolivia and Peru (Kury 2013).

Carl-Friedrich Roewer (1881–1963) published several contributions on the taxonomy of Opiliones during the 1920s, the most important of which is "Die Weberknechte der Erde" in 1923. Roewer pioneered the use of standardized descriptions and illustrations and advanced the systematics of Opiliones. However, the so-called "Roewerian system" of classification attributed subjective weights to a limited set of characters. This created a rigid system that did not take into account new evidence (characters) (Pinto-da-Rocha 1997). The resulting groups were artificial, and some included distantly related species, whereas natural groups of species were scattered in different genera (Hara and Pinto-da-Rocha 2010; Pinto-da-Rocha et al. 2012). One notable characteristic of the Roewerian system is the great number of monotypic genera. Another oddity is that a limited number of species were repeatedly described in different genera (Kury 1990). In spite of these problems, Roewer's contribution to the taxonomy of the Opiliones, which included the description of 2,260 valid species, is undeniable (Machado et al. 2007).

In the last 20 years, several Neotropical groups of Opiliones have been subjected to systematic revisions that include analysis of type material, examination of large numbers of specimens, and cladistic analyses using characters from the external morphology and the male genitalia (Pinto-da-Rocha 1997; DaSilva and Pinto-da-Rocha 2010; Hara and Pinto-da-Rocha 2010; Pinto-da-Rocha and Bragagnolo 2010; Mendes 2011; Carvalho and Kury 2018; Carvalho and Kury 2020). Even though these revisions dealt with important taxonomic groups of Opiliones, there is still a lot of work to be done on underrepresented clusters, for instance Metasarcidae, the subject of this revision.

1.1. Taxonomic history of Metasarcidae

Roewer (1913) described the monotypic genus *Metasarcus*, with the single species, *M. bolivianus* Roewer, 1913 from the "Gran Chaco", Bolivia, and placed it in Mitobatinae (Gonylepidae). Sixteen years later, in the third supplement to his "Weberknechte der Erde" (1923), Roewer (1929) described four monotypic genera in Prostygninae (Gonyleptidae): *Chaconatus*, for *C. armatipalpus* Roewer, 1929 from "Chaco", Bolivia; *Chacoikeontus*, for *C. clavifemur* Roewer, 1929 from "Chaco", Bolivia; *Napostygnus*, for *N. bispinosus* Roewer, 1929, from Rio Napo valley, Napo, Ecuador; and *Nemastygnus*, for *N. ovalis* Roewer, 1929 from Bogotá, Cundinamarca, Colombia.

Twenty years later, Roewer (1949) described the new monotypic genus *Ayacucho* in Tricommatinae (Phalangodidae), for *A. titschacki* Roewer, 1949 from Ayacucho, Ayacucho, Peru. Later, the author (Roewer 1952) described in the same subfamily, the monotypic genus *Cajamarca* for *C. weyrauchi* Roewer, 1952 from Cajamarca, Cajamarca, Peru. In addition, Roewer (1956) described two monotypic genera in Tricommatinae: *Cargaruaya* for *C. insignita* Roewer, 1956 from La Libertad, Peru; and *Taulisa* for *T. koepckei* Roewer, 1956 from Lambayeque, Peru.

In another publication on Peruvian arachnids, Roewer (1957) described three monotypic genera in Tricommatinae (Phalangodidae): *Cajacaybia* for *C. spinigera* Roewer, 1957 from Río Fortaleza, Cajacay, Ancash, Peru; *Palcares* for *P. spiniger* Roewer, 1957 from Campañillaya, Junín, Peru; and *Tapacochana* for *T. insignita* Roewer, 1957 from Tapacocha, Ancash, Peru. In the same publication, Roewer described the monotypic genus *Tschaidicancha* for *T. weyrauchi* Roewer, 1957 from Tschaidicancha, Huánuco, Peru, and placed it in Prostygninae (Gonyleptidae). In the same publication, Roewer described a species of *Pinocchio* Mello-Leitão, 1940 (Phalangodidae, Tricommatinae), *P. inermis* from Huamachuco, La Libertad, Peru and four new species of the hitherto monotypic *Cajamarca* Roewer, 1952: *C. affinis* from Cajamarca, Cajamarca, Peru; *C. bambamarca* from Bambamarca, Cajamarca, Peru; *C. triseriata* from Cerro Macheipungo, Bambamarca, Cajamarca, Peru; and *C. uniseriata* from Cutervo, Cajamarca, Peru. Finally, Roewer (1959) described a species of *Palcares* Roewer, 1957, *P. serrifemur* and a species of *Tapacochana*, *T. triseriata*.

In his study of the early lineages of Gonyleptidae, Kury (1994) described three new subfamilies: Cobaninae, Heteropachylinae and Metasarcinae, the latter for the Bolivian *Metasarcus* and a hitherto undescribed genus from Argentina. In the same contribution, the author considered *Chaconatus* as junior subjective synonym of *Metasarcus*, which resulted in the new combination *Metasarcus armatipalpus* (Roewer 1929). Four years later, Kury and Maury (1998) described the new genus *Incasarcus* in Metasarcinae, with five new species: *I. argenteus* Kury & Maury, 1998 from Ollantaytambo, Cusco, Peru; *I. dianae* Kury & Maury, 1998 (type species) from Manu National Park, Cusco, Peru; *I. ochoai* Kury & Maury, 1998 from Yanacocha, Cusco, Peru; *I. pictus* Kury & Maury, 1998 from Wiñayhuana, Cusco, Peru; and *I. viracocha* Kury & Maury, 1998 from Machu Picchu, Cusco, Peru. In the same contribution, the authors transferred three genera to Metasarcinae: *Cajamarca* and *Tschaidicancha* from Peru, and *Chacoikeontus* from Bolivia. Later, Kury (2003), in his catalogue of Laniatores, transferred eight genera to Metasarcinae: *Nemastygnus* from Colombia; *Napostygnus* from Ecuador; and *Ayacucho*, *Cajacaybia*, *Cargaruaya*, *Palcares*, *Tapacochana* and *Taulisa*, all from Peru; and transferred *Pinocchio inermis* to *Palcares.* Pinto-da-Rocha et al. (2012), after examining type material, transferred three genera from Metasarcinae: *Napostygnus* to Cranaidae; *Nemastygnus* and *Taulisa* to Agoristenidae Leiosteninae.

A number of studies have been conducted using Metasarcinae species as outgroups in analyses involving Gonyleptidae (e.g. Pinto-da-Rocha 2002; Yamaguti and Pinto-da-Rocha 2009; Mendes 2011; Caetano and Machado 2013; see discussion below). Pinto-da-Rocha et al. (2014) tested the monophyly of Metasarcinae for the first time, in their comprehensive phylogeny of Gonyleptidae, encompassing 101 taxa (four Metasarcinae:

Cajamarca uniseriata, *Incasarcus dianae*, *Metasarcus* sp. and *Tapacochana insignita*). Their analysis recovered the subfamily as monophyletic, but separated from the other Gonyleptidae subfamilies, as the sister-group to the Cosmetidae. Based on those findings, the authors proposed the elevation of the group to family rank (Metasarcidae). Townsend et al. (2019), in a non-taxonomic study, cited *Chacoikeontus clavifemur* as *Metasarcus clavifemur* (Roewer, 1929) and consequently established a new combination without giving a justification. In addition, as *Chacoikeontus clavifemur* is the type-species of the genus, *Chacoikeontus* was synonymized with *Metasarcus* by implication.

Currently, and because of the historical background outlined above, Metasarcidae is composed of nine genera and 22 species.

The main goal of this contribution is to review the Metasarcidae family based on combined analyses of morphology and molecular data.

2. Materials and methods

2.1. Material examined

The material examined is housed in the following depositories (curators in parentheses): **CBF** – Coleccíon Boliviana de Fauna, La Paz, Bolivia (Jaime Sarmiento); **MACN** – Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, Argentina (Martín Ramirez); **MNRJ** – Museu Nacional do Rio de Janeiro, Rio de Janeiro, Rio de Janeiro, Brazil (Adriano B. Kury); **MUBI** – Museo de Biodiversidad del Perú, Cusco, Peru (José A. Ochoa C.); **MUSM** – Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru (Diana Silva); **MZSP** – Museu de Zoologia da Universidade de São Paulo, São Paulo, São Paulo, Brazil (Ricardo Pinto-da-Rocha); **SMF** – Naturmuseum Senckenberg, Frankfurt am Main, Germany (Peter Jäger); **USNM** – National Museum of Natural History, Smithsonian Institution, Washington D.C., United States of America (Jonathan Coddington).

2.2. Abbreviations

The following abbreviations are used in the synonymic listing: cat = catalogue; cit = citation; desc = description; diag = diagnosis; dist = distribution; key = taxonomic key; mat = character matrix; morp = morphology; rdesc = redescription; syst = systematic discussion.

The following morphological abbreviations are used in the descriptions: ChL = Chelicera length; CL = carapace maximum length; DS = dorsal scutum; DSL = dorsal scutum maximum length; DSS = dorsal scutum shape; DSW = dorsal scutum maximum width; FIVL = femur IV length; FT I–III = Free Tergites I–III; MS A–E = penis ventral plate pairs of macrosetae A–E; VP, ventral plate of the penis.

The following abbreviations are used in phylogenetic results and discussion: DO = Direct optimization; GB = Goodman-Bremer support; IP = Iterative pass; ML01 = Total evidence hypothesis under Maximum Likelihood; ML02 = Molecular only hypothesis under Maximum Likelihood; MP01 = Total evidence hypothesis under Maximum Parsimony; MP02 = Molecular only hypothesis under Maximum Parsimony.

2.3. Description and figures

The terminology for the armature of the dorsal scutum and legs follows DaSilva and Gnaspini (2010) with some adaptations to characteristics of the group (see Benedetti and Pinto-da-Rocha 2019). The area sometimes referred to as "scutal area V" is here referred to as the posterior margin of the dorsal scutum. A region or article is considered unarmed when there is no large structure that stands out (*i.e.*, larger than mere granules) and smooth when there is no structure (not even granules) that stand out of the cuticle. Dry mark is a patch of external serose layer of the cuticle that forms white drawings in the alive animal or when it dries up after been removed from ethanol (DaSilva and Gnaspini 2010). The topological terms for the appendages follow Acosta et al. (2007). The code for the length of the setae on the tibia–tarsus of the pedipalpus follows Pinto-da-Rocha (2002). The numbers in parentheses indicate the number of tarsomeres in the distitarsi I–II. The nomenclature for the shape of the dorsal scutum follows Kury and Medrano (2016). The nomenclature used for penial macrosetae and microsetae follows Kury and Villareal (2015) and Kury (2016), respectively. Macrosetae C polymorphism has been recorded (e.g. Pinto-da-Rocha et al. 2012; Hara et al. 2014; Pessoa-Silva et al. 2021). Therefore, when there is a discrepancy, it was decided to place the polymorphism in parentheses. The description of coloration is based on specimens immersed in 70% ethanol. All measurements are in millimeters unless otherwise stated. The descriptions are based on one specimen or more, when available. The female characteristics are described only if they differ from the male. The measurements, tarsal segmentation, number of armatures on pedipalpus, posterior margin of DS, free tergites and leg IV referring to the holotype are in parentheses.

The drawings were sketched using a Leica stereomicroscope (model MZ APO, Heerbrugg, Switzerland) coupled with a camera lucida. The penises were prepared following Pinto-da-Rocha (2002). The structures were observed and photographed with a Leica LEO 440 scanning electron microscope, at Museu de Zoologia, Universidade de São Paulo or a Zeiss DSM940 scanning electron microscope, at Instituto de Biociências, Universidade de São Paulo.

2.4. Outgroups

Our choice of outgroups was based on a phylogenetic hypothesis proposed by Pinto-da-Rocha et al. (in prep.) for the Gonyleptoidea and the tree was rooted with *Stygnus*

Table 1. List of primer sequences used for amplification and sequencing of H3 gene fragments.

Primer Name	Primer sequence	Source	Annealing (°C)
H3AF	5′-ATGGCTCGTACCAAGCAGAC(ACG)GC-3′	Colgan et al. (1998)	54
H3AR	5′-ATATCCTT(AG)GGCAT(AG)AT(AG)GTGAC-3′	Colgan et al. (1998)	54
H3AF_edit	5′-GCVMGVAAGTCYACVGGMGG-3′	This study	54
H3AR_edit	5′-ATGGTSACTCTCTTGGCGTGR-3′	This study	54

multispinosus (Piza, 1938) (Stygnidae). We complemented our taxon sampling by adding representatives of the families Cryptogeobiidae, Nomoclastidae, Gonyleptidae and Cosmetidae, to account for the morphological and systematic diversity of Metasarcidae and related clades. The specimens and their collection numbers, collecting data and depository institutions are in the Supplementary list.

2.5. Ingroup

The choice of ingroup for the analyses was based on the availability of biological material from sequences which could be obtained. This includes all species represented by specimens that had been maintained in 98% ethanol at –20ºC in the tissue collection of the Laboratório de Aracnologia (IBUSP).

2.6. Molecular data acquisition

We extracted DNA from the muscle tissues of the legs (preferably leg IV) (Pinto-da-Rocha et al. 2014). In the case of small specimens, we used the tissues from pedipalpus and chelicerae. The Agencourt® DNAdvance System kit (Beckman Coulter, California, USA) was used for extractions. The manufacturer's protocols were modified as in Pinto-da-Rocha et al. (2014).

Five molecular loci were amplified from the extracted DNA: the nuclear ribosomal 28S rRNA gene; the 12S and 16S mitochondrial ribosomal genes; the mitochondrial cytochrome c oxidase subunit I (COI) coding gene; and the nuclear gene encoding histone H3 (H3). We amplified the fragments of 12S, 16S, 28S and COI using the primers as in Pinto-da-Rocha et al. (2014); for H3, we used the primers H3AF–H3AR (Colgan et al. 1998) and, alternatively, we used the primers H3AF_edit and H3AR_edit (table 1) designed in Laboratório de Sistemática Molecular (IBUSP). PCR reactions, inspection, purification, quantification, preparation of sequencing reactions, precipitation and sequencing of PCR products were done as in Pinto-da-Rocha et al. (2014).

We assembled contiguous sequences using the package Consed/PhredPhrap (Ewing and Green 1998; Ewing et al. 1998; Gordon et al. 1998, 2001). Before conducting the phylogenetic analysis, we aligned sequences with the program MAFFT (Katoh et al. 2002), visualized, and edited them in BioEdit (Hall 1999). After the alignment, we inspected sequences of COI and H3 for stop codons using AliView (Larsson 2014), after which we trimmed all sequences so that the first base corresponded to the first codon position. Lastly, we created four internal fragments for 12S, three for 16S, and eight for 28S, based on putative homologous regions within each gene, to increase the computational efficiency for the dynamic homology analysis (Giribet 2001; Pinto-da-Rocha et al. 2014).

Additionally, we used sequences of four markers (12S, 16S, 28S and COI) present in Pinto-da-Rocha et al. (2014) and newly sequenced H3 for them: from outgroups (*Metalibitia paraguayensis*, *Napostygnus bispinosus*, *Phareicranaus hermosa* and *Pseudopachylus alticola*) and from Metasarcidae (*Ayacucho uniseriatus* **comb. nov.**; *Ayacucho tapacocha* **nom. nov.**, *Incasarcus dianae*, *Metasarcus fellinii* **sp. nov.**)

2.7. Morphological data analysis

We used Mesquite 2.5 computer software (Maddison and Maddison 2017) to edit the character matrix. The multistate characters were treated as non-additive. The data matrix was polarized with the outgroups (Nixon and Carpenter, 1993). The structure of character descriptions follows Sereno (2007).

2.8. Phylogenetic inferences

The analysis based on molecular and morphological data combined (total evidence) and molecular data alone was conducted under the optimality criteria of maximum parsimony and maximum likelihood (ML).

Parsimony analyses: The analyses of total evidence with molecular and phenotypic data (MP01) and with only molecular data (MP02) were implemented in the POY 5.1.1 program (Varón et al. 2010), in which searches for the most parsimonious trees were performed through direct optimization (DO; Wheeler, 1996) of the non-aligned nucleotide sequences. This strategy is also referred to as dynamic homology (Wheeler, 2001a, 2001b). The epistemological justification for dynamic homology is based on logical and empirical relationships between topologies, alignments and sets of parameters. As noted by Kluge and Grant (2006), it "leads to more powerful explanations than those parsimony methods that assume a correspondence between state similarity and steps" (p. 277; see also Grant and Kluge 2009))

The search strategy was conducted in two stages, following Pinto-da-Rocha et al. (2014). First, analyses were carried out in search of the most parsimonious topolo-

gies through direct optimization for a total of 10 sets of parameters (or cost functions). These parameter sets are costs (or weights) assigned to transformation classes, such as substitutions (transversions and transitions) and indels (insertions and deletions). The first set of parameters assigned equal costs for all transformations and no penalties for indel openings. The other nine parameter sets considered a range of indel extension costs (from 1 to 8), a range of transformation costs (from 1 to 4), and indel openings costs (equal to 2 x indel extension cost + extension cost). The resulting cost ratios for indel openings, extensions, transversions, and transitions in these 10 parameters sets used here were 1: 1: 1: 1; 2: 1: 1: 1; 2: 1: 1: 2; 2: 1: 2: 1; 2: 2: 1: 1; 2: 2: 1: 2; 2: 2: 2: 1; 2: 4: 1: 1; 2: 4: 1: 2 and 2: 4: 2: 1. There are several discussions on the use of cost parameters (Wheeler 1995; Kluge 1997, 1998, Giribet 2003; Grant and Kluge 2005; see a summary of the discussion in Pinto-da-Rocha et al. 2014). For each set of parameters, 10 iterations were applied with three searches lasting two hours each. We used the "search" command of POY, which implements searches through the construction of Wagner trees by random addition of taxa (Random Addition Sequence); the branch swapping algorithms SPR (Subtree Pruning and Regrafting) and TBR (Tree Bisection and Reconnection) (Goloboff 1996); Ratchet (Nixon 1999); and Tree Fusing (Goloboff 1999). The searches were performed in a cluster (2.83 GHz Q9550 Intel CoreTM2 Quad) at the Instituto de Biociências of Universidade de São Paulo (IBUSP). After each search, the best and only trees found were selected and used in the next step.

During the second step, the topologies selected on DO were re-diagnosed using the iterative pass algorithm (IP; Wheeler 2003). This algorithm seeks to apply direct optimization simultaneously in three sequences, in addition to performing new tree fusing steps. The procedure tends to generate shorter phylogenetic hypotheses. Machado and Marques (2013) demonstrated that, in addition to hypotheses with fewer steps, the algorithm is also able to reduce the number of equally parsimonious topologies, and find new unidentified topologies in the DO process. Re-diagnosis with IP was performed under a set of parameters with equal costs. The strategy of selecting topologies under the use of other parameter sets was to expand the search in the universe of trees, an idea similar to Ratchet (Nixon 1999). We made no attempt to perform a sensitivity analysis. At the end of the analysis, the implied alignment (IA) was transformed into a static homology character array with the command "transform (all, (static_approx))".

Maximum Likelihood Analysis: The sequences aligned in MAFFT were used in the maximum likelihood analysis. The analyses of total evidence with molecular and phenotypic data (ML01) and with only molecular data (ML02) were implemented in the parallel version of the IQ-TREE version 1.5.4 program (Nguyen et al. 2015). The different partitions were subjected to the IQ-TREE through the partition model (Chernomor et al. 2016) with the command "-p". The best performance of replacement models for partitions, either individually or in combination, was evaluated by the ModelFinder program (Kalyaanamoorthy et al. 2017), used in association with IQ-TREE through the "-m MFP+MERGE" command. The evaluations were based on the AICc – corrected Akaike information criterion (Posada and Buckley 2004) through the "--merit AICc" command. We carried out 1000 iterations of searches through the command "-n 1000".

2.9. Optimization of morphological characters and node support metric

The optimization of the morphological characters present in the analysis of total evidence was visualized through the Winclada-ASADO program (Nixon 2002). The characters were optimized under ACCTRAN (Accelerated Character Transformation), where homoplasies are treated as a single appearance and later reversal. According to de Pinna (1991) and in contradiction to Agnarsson and Miller (2008), this type of optimization is the most efficient in preserving primary homology hypotheses. However, when discussing the results, we distinguish between unambiguous synapomorphies and those recovered only under ACCTRAN (see supplementary Figs. 1, 2).

Node support was evaluated for maximum parsimony analyses using the Goodman-Bremer method (Goodman et al. 1982; Bremer 1988; Grant and Kluge 2008). To calculate the Goodman-Bremer support, the implicit alignment matrix and the tree found were subjected to the TNT program (Goloboff et al. 2003, 2008) and the BREMER. RUN script (distributed with the program) was executed with the default values. For the ML analyses, the bootstrap support was calculated using the "ultrafast bootstrap approximation – UFBoot" (Hoang et al. 2018) used in the association with IQ-Tree. We carried out 1000 iterations using the command "-bb 1000"

3. Results

3.1. Molecular and morphological data

Our matrix consisted of 33 taxa (eight outgroup taxa and 25 ingroup taxa). There are no missing data in the 12S, 16S, 28S and COI datasets (33 sequences). In contrast, there are missing data from nine exemplars in the H3 gene dataset (24 sequences; see Table 2). The alignment of the coding gene fragments resulted in sequences of 647 bp for COI and 338 bp for H3. The ribosomal gene fragments had been previously aligned for maximum likelihood analyses and resulted in sequences of 366 bp for 12S, 331 bp for 16S and 1,006 bp for 28S. For maximum parsimony analyses, the ribosomal gene fragments were subjected to dynamic homology. The MP01 implicit alignment resulted in 486 bp for 12S, 371 bp for

Table 2. List of species with voucher and GenBank accession numbers for the amplified fragments.

Family	Species	Voucher	12s	16s	28s	COI	H3
Cosmetidae	*Cynorta coxaepunctata*	MZSP 72886	MG797727	MG798345	MG798032	MG769081	MG769400
Cosmetidae	*Metalibitia paraguayensis*	MZSP 72962	KF726468	KF726580	KF726692	KF726804	—
Cosmetidae	*Taito insperatus*	MZSP 73174	MG797960	MG798601	MG798288	MG769317	MG769680
Cranaidae	*Phareicranaus hermosa*	MZSP 59989	KF767675	KF767679	KF767683	KF767687	—
Cryptogeobiidae	*Pseudopachylus alticola*	MZSP 59952	KF726498	KF726604	KF726716	KF726828	MG769520
Nomoclastidae	*Napostygnus bispinosus*	MZSP 59876	KF726454	KF726566	KF726678	KF726790	—
Gonyleptidae	*Gonyleptes fragilis*	MZSP 72861	MG797707	MG798323	MG798010	MG769061	MG769359
Stygnidae	*Stygnus multispinosus*	MZSP 72954	MG797776	MG798407	MG798092	MG769131	MG769502
Metasarcidae	*Ayacucho glauberrochai* **sp. nov.**	MZSP 73010	MG797827	MG798460	MG798146	MG769179	MG769560
Metasarcidae	*Ayacucho pomacocha* **sp. nov.**	MZSP 73011	MG797828	MG798461	MG798147	MG769180	MG769561
Metasarcidae	*Ayacucho querococha* **sp. nov.**	MZSP 72990	MG797808	MG798440	MG798126	MG769161	MG769534
Metasarcidae	*Ayacucho silvae* **sp. nov.**	MZSP 73008	MG797825	MG798458	MG798144	MG769177	MG769558
Metasarcidae	*Ayacucho spielbergi* **sp. nov.**	MZSP 72986	MG799804	MG798436	MG798122	MG769158	—
Metasarcidae	*Ayacucho spielbergi* **sp. nov.**	MZSP 72988	MG799806	MG798438	MG798124	MG769160	MG769532
Metasarcidae	*Ayacucho spiniger* **comb. nov.**	MZSP 73009	MG797826	MG798459	MG798145	MG769178	MG769559
Metasarcidae	*Ayacucho tapacocha* **nom.nov.**	MZSP 59859	KF726439	KF726551	KF726663	KF726775	MG769427
Metasarcidae	*Ayacucho tapacocha* **nom.nov.**	MZSP 72993	MG797811	MG798443	MG798129	MG769164	MG769537
Metasarcidae	*Ayacucho titschacki*	MZSP 73006	MG797823	MG798456	MG798142	MG769175	MG769555
Metasarcidae	*Ayacucho uniseriatus* **comb. nov.**	MZSP 59969	KF726497	KF726609	KF726721	KF726833	MG769528
Metasarcidae	*Ayacucho vargasllosai* **sp. nov.**	MZSP 73007	MG799824	MG798457	MG798143	MG769176	MG769556
Metasarcidae	*Incasarcus argenteus*	MZSP 72982	MG799801	MG798433	MG798119	MG769155	—
Metasarcidae	*Incasarcus dianae*	MZSP 59864	KF726444	KF726556	KF726668	KF726780	—
Metasarcidae	*Incasarcus ochoai*	MZSP 72964	MG797786	MG798416	MG798102	MG769141	MG769511
Metasarcidae	*Incasarcus viracocha*	MZSP 72965	MG797787	MG798417	MG798103	MG769142	MG769512
Metasarcidae	*Huancabamba kubricki* **gen. nov. et sp. nov.**	MZSP 72984	MG797802	MG798434	MG798120	MG769156	MG769529
Metasarcidae	*Lumieria antonionii* **gen. nov. et sp. nov.**	MZSP 73005	MG797822	MG798455	MG798141	MG769174	MG769554
Metasarcidae	*Metasarcus bergmani* **sp. nov.**	MZSP 72960	MG797783	MG798413	MG798099	MG769138	MG769507
Metasarcidae	*Metasarcus clavifemur* **comb. nov.**	MZSP 72959	MG797781	MG798411	MG798097	MG769136	MG769506
Metasarcidae	*Metasarcus clavifemur* **comb. nov.**	MZSP 73216	MG797782	MG798412	MG798098	MG769137	—
Metasarcidae	*Metasarcus fellinii* **sp. nov.**	MZSP 59946	KF726489	KF726601	KF726713	KF726825	MG769508
Metasarcidae	*Metasarcus trispinosus* **sp. nov.**	MZSP 73047	MG797856	MG798493	MG798179	MG769210	—
Metasarcidae	*Metasarcus vacafloresae* **sp. nov.**	MZSP 72958	MG797780	MG798410	MG798096	MG769135	—
Metasarcidae	*Tschaidicancha chaplini* **sp. nov.**	MZSP 73002	MG797819	MG798452	MG798138	MG769171	MG769553

16S and 1071 bp for 28S. The MP02 implicit alignment resulted in 489 bp for 12S, 368 bp for 16S and 1079 bp for 28S.

Our morphological matrix consisted of 68 characters (see "List of morphological characters" below and Table 3), as follows: one from the chelicerae, eight from the pedipalpus, 20 from the dorsal scutum, two from the free tergites I–III, 21 from the legs II–IV and 16 from male genitalia.

The complete matrix for each of the analyses had the total characters as follows: MP01 = 2,981; MP02 = 2,921; ML01 = 2,756; ML02 = 2,688.

3.2. List of morphological characters

1) Chelicerae. Segment II. Shape: (0) monomorphic (Figs. 5B, 26C); (1) hypertelic in males, with dorsal elbow like projection; (2) hypertelic in males, without dorsal elbow like projection (Figs. 4A, 25C).

2) Pedipalpus. Trochanter. Shape: (0) distally enlarged, with a short basal neck; (1) distally enlarged, with a long basal neck (longer than wide).

3) Pedipalpus. Tibia. Dorsal-ventral shape: (0) not flat; (1) flat, spoon-shaped.

4) Pedipalpus. Tarsus. Setae length: (0) long, greater than or equal to half length of the tarsus; (1) short, less than half the length of the tarsus.

5) Pedipalpus. Femur. Ventral armature: (0) smooth or with sparse granules; (1) with large spines; (2) with conical short tubercles; (3) with short tubercles, laterally depressed

6) Pedipalpus**.** Femur. Dorsal armature: (0) with blunt tubercles; (1) with pointed, enlarged tubercles; (2) unarmed.

7) Pedipalpus**.** Femur. Proapical spine in males: (0) absent; (1) present.

8) Pedipalpus Femur. Shape. (0) subcylindrical, not flattened; (1) subcylindrical, slightly flattened; (2) dorsally curved, ventrally straight, considerably flattened laterally.

9) Pedipalpus. Patella. Proapical spine: (0) absent; (1) present.
10) Dorsal scutum. Shape: (0) type alpha (Fig. 3D); (1) type gamma (Fig. 3A); (2) type gamma-P (Fig. 5B); (3) type kappa (Fig. 5D); (4) type iota; (5) type theta; (6) type beta.
11) Dorsal scutum. Areas: (0) Delimited areas (Fig. 5I); (1) Non-delimited areas.
12) Dorsal scutum. Number of ozopore openings: (0) One opening; (1) Two openings.
13) Dorsal scutum. Ocularium shape: (0) saddle-shaped (Fig. 4B); (1) domed-shaped (Figs. 2A, F).
14) Dorsal scutum. Ocularium. Armature: (0) unarmed (Fig. 2G); (1) paired armature (Fig. 6C); (2) unpaired armature.
15) Dorsal scutum. Ocularium. Type of paired armature: (0) tubercles (Fig. 4A); (1) spines (Fig. 6C).
16) Dorsal scutum. Carapace. Granulation: (0) densely granulate (Fig. 2F); (1) sparsely granulate (Fig. 5H).
17) Dorsal scutum. Lateral margin. Granulation: (0) densely granulate (Fig. 2F); (1) sparsely granulate (Fig. 5H).
18) Dorsal scutum. Scutal areas III–IV: (0) as divided scutal areas (Fig. 2A); (1) fused as a single scutal area (Fig. 4C).
19) Dorsal scutum. Scutal areas granulation: (0) densely granulate (Fig. 2B); (1) sparsely granulate (Fig. 4C).
20) Dorsal scutum. Scutal area I. State of fusion: (0) undivided (Fig. 3D); (1) divided by a longitudinal groove, between scutal grooves I–II (Fig. 5B); (2) divided by scutal groove II (Fig. 6A); (3) divided by projections of both scutal grooves I and II towards each other (Fig. 5D).
21) Dorsal scutum. Scutal area I. A pair of median tubercles: (0) absent (Fig. 5D); (1) present (Fig. 5E).
22) Dorsal scutum. Scutal area II. Armature: (0) unarmed (Fig. 5E); (1) with a pair of tubercles (Fig. 3C); (2) with a pair of spines.
23) Dorsal scutum. Scutal area III. Armature: (0) unarmed (Fig. 4D); (1) with a pair of tubercles (Fig. 4B); (2) with a pair of spines (Fig. 4F).
24) Dorsal scutum. Scutal area III. Armature. Spine insertion: (0) direct on integument (Fig. 3B); (1) with an inflated and rounded base (Fig. 6A).
25) Dorsal scutum. Scutal area IV. Armature: (0) unarmed (Fig. 6A); (1) with a pair small tubercles (Fig. 3C); (2) with a pair of large tubercles.
26) Dorsal scutum. Posterior margin. Granulation: (0) densely granulate (Fig. 3D); (1) sparsely granulate (Fig. 4B).
27) Dorsal scutum. Posterior margin. Shape: (0) straight (Fig. 4B); (1) concave (Fig. 5H).
28) Dorsal scutum. Posterior margin. A row of tubercles: (0) absent (Fig. 5H); (1) present (Fig. 3B).
29) Dorsal scutum. Posterior margin. A pair of spines: (0) absent (Fig. 5H); (1) present (Fig. 3B).
30) Free tergite I–IV. A row of tubercles: (0) absent (Fig. 6A); (1) present (Fig. 3B).
31) Free tergite III. Apophysis: (0) absent (Fig. 3B); (1) present (Fig. 5B).
32) Leg III. Coxa III. Number of apophysis: (0) one (Fig. 4B); (1) two (Fig. 3H).
33) Leg II. Distitarsus: (0) 3-segmented; (1) 4/5-segmented.
34) Legs III–IV. Tarsal claws: (0) smooth; (1) pectinate.
35) Leg IV. Coxa IV. Coxae dorsally reaching the posterior margin of DS: (0) Not reaching (Fig. 2F); (1) reaching (Fig. 3A).
36) Leg IV. Coxa IV. Prolateral apical armature: (0) unarmed (Fig. 2F); (1) as a short apophysis (Fig. 3A); (2) as a long apophysis.
37) Leg IV. Coxa IV. Retrolateral apical armature: (0) unarmed (Fig. 4B); (1) armed (Fig. 5B).
38) Leg IV. Coxa IV. Apical width of coxa IV: (0) as wide as coxa III apex (Fig. 3C); (1) 1.5 to twice wider than coxa III apex (Fig. 5B).
39) Leg IV. Trochanter IV. Prolateral armature: (0) absent (Figs. 7S, T); (1) present.
40) Leg IV. Trochanter IV. Retrolateral armature: (0) absent (Figs. J–L); (1) with a small distal tubercle (Figs. 11C, D).
41) Leg IV. Femur IV. Length of femur IV: (0) long (FIV/DSL > 1,5; Fig. 24); (1) short (FIV/DSL < 1,2; Fig. 23).
42) Leg IV. Femur IV. Granulation: (0) smooth or slightly granulate (Figs. 10C, D); (1) densely granulate (Figs. 7E, F).
43) Leg IV. Femur IV. Retrodorsal row of tubercles: (0) absent or with small granules (Figs. 10C, D); (1) with a row of blunt tubercles (Figs. 10E, F); (2) with an apical row of acuminate tubercles;
44) Leg IV. Femur IV. Retrolateral row of tubercles: (0) absent or with small granules (Figs. 10C, D); (1) with a row of laminate tubercles (Figs. 7S, T); (2) with a row of acuminate tubercles (Figs. 8A, B); (3) with a distal row of acuminate tubercles; (4) with a distal row of small blunt tubercles.
45) Leg IV. Femur IV. Retroventral armature: (0) absent or with small granules (Figs. 10C, D); (1) with a distal row of small tubercles (Figs. 7M, N); (2) with a distal row of acuminate tubercles (Figs. 7Q, R); (3) with a row of acuminate tubercles (Figs. 9A, B).
46) Leg IV. Femur IV. Proventral armature: (0) absent or with small granules (Figs. 10C, D); (1) with a distal row of small tubercles (Figs. 7M, N); (2) with a distal row of acuminate tubercles (Figs. 7Q, R); (3) with a row of acuminate tubercles (Figs. 7O, P); (4) with a row of small blunt tubercles (Figs. 10E, F).
47) Leg IV. Femur IV. Prolateral row of tubercles: (0) absent or with small granules (Figs. 10C, D); (1) with a row of laminate tubercles (Figs. 7K, L); (2) with a row of small blunt tubercles (Figs. 8A, B); (3) with a row of acuminate tubercle (Figs. 7O, P); (4) with a basal row of acuminate tubercles (Figs. 9A, B); (5) with a distal row of small blunt tubercles (Figs. 9C, D).
48) Leg IV. Femur IV. Prodorsal row of tubercles: (0) absent or with small granules (Figs. 10C, D); (1) with a basal row of acuminate tubercles; (2) with a basal row of blunt tubercles (Figs. 10E, F).

Table 3. Morphological data matrix used in the cladistic analysis of Metasarcidae.

Taxa	Characters						
	0000000001	1111111112	2222222223	3333333334	4444444445	5555555556	66666666
	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	12345678
Stygnus multispinosus	1000020?04	00-2-11113	1121?10101	0100010001	1104325010	001000----	11110110
Pseudopachylus alticola	0000021?05	0112-11010	000?010101	0000000000	1000000000	000?-0----	11000001
Metalibitia paraguayensis	1111300202	1010-00000	111-200101	0100020011	1100000000	00111100-1	??000100
Cynorta coxaepunctata	0111300206	1010-11?1?	1021?11000	0000000000	0000000000	001110----	01111100
Taito insperatus	2111300206	1000-11?10	101-?10000	0000010000	1003000010	001100----	01?11100
Napostygnus bispinosus	0000020004	0000-11010	111-110101	1000000000	1000000000	001000----	10111110
Phareicranaus hermosa	2000110001	0101111113	0021-10100	0000110111	0000000000	001000----	20100000
Gonyleptes fragilis	0000021011	0111111111	111-10101	0100120111	1023012000	101310----	12100001
Ayacucho glauberrochai **sp. nov.**	1000220100	0010-00000	000-000101	0100000000	1100000000	0011121010	21111100
Ayacucho pomacocha **sp. nov.**	1000220100	0010-00000	000-000101	0000000000	1100110000	0010021000	21111100
Ayacucho querococha **sp. nov.**	1000220101	0010-00000	111-100101	0100010001	1101221010	1010121001	21000100
Ayacucho silvae **sp. nov.**	1000220100	0010-00000	000-000101	0100000000	1100110000	0012121000	10111100
Ayacucho spielbergi **sp. nov.**	1000220011	0001111010	0021010101	0000110001	0002233020	0010021001	10?11110
Ayacucho spielbergi **sp. nov.**	1000220011	0001111010	0021010101	0000110001	0002233020	0010021001	10?11110
Ayacucho spiniger **comb. nov.**	1000220101	0011100000	1220100111	0100010001	1101221010	0011121000	10010110
Ayacucho tapacocha **nom.nov.**	1000220101	0011100000	111-100101	0100010001	1101221010	1010121001	21001100
Ayacucho tapacocha **nom.nov.**	1000220101	0011100000	111-100101	0100010001	1101221010	1010121001	21001100
Ayacucho titschacki	0000220100	0010-00000	000-000101	0100000000	1100000000	0011121010	21?11100
Ayacucho uniseriatus **comb. nov.**	1000220101	0011110000	000-000000	0100010001	1102002010	00121211?0	10000100
Ayacucho vargasllosai **sp. nov.**	1000220100	0010-00000	000-000101	0100000000	1100110000	0010121010	21?11110
Incasarcus argenteus	1000121010	0000-00000	101-010001	0000000001	0100334021	0010121011	?1?11100
Incasarcus dianae	1000121010	0000-11010	1020000000	0000000001	0102003021	0011021011	21?11100
Incasarcus ochoai	1000221010	0000-00000	000-000000	0000000000	0100300020	0012121010	11111100
Incasarcus viracocha	1000221010	0000-00000	0020000000	0000000000	0100300021	0010121001	21001100
Huancabamba kubricki **gen. et.sp. nov.**	1000121013	0011011010	1021010000	0111000000	0100000000	0010120011	21111100
Lumieria antonionii **gen. et. sp. nov.**	1000221013	0001110012	0021010010	0010000001	0102000000	0110021010	21121100
Metasarcus bergmani **sp. nov.**	0000221012	0000-11011	1021011000	1100101101	1000000000	0010121011	1000?100
Metasarcus clavifemur **comb. nov.**	1000121013	0000-11013	0021010000	0100100000	0010040200	0011121000	10011100
Metasarcus clavifemur **comb. nov.**	1000121013	0000-11013	0021010000	0100100000	0010040200	0011121000	10011100
Metasarcus fellinii **sp. nov.**	0000121011	0000-11011	1020010000	1100001100	0100000000	0010020011	10011100
Metasarcus trispinosus **sp. nov.**	0000121012	0000-11010	001-011000	1100100100	0000000000	0010121011	10001110
Metasarcus vacafloresae **sp. nov.**	1000221013	0000-11010	000-010000	0100000000	0000000000	0012121001	10011110
Tschaidicancha chaplini **sp. nov.**	1000221013	0001111010	1121010000	0000000000	0002000000	0112121000	10011110

49) Leg IV. Patella. Apical armature: (0) absent (Figs. 10C, D); (1) with small tubercles (Figs. 7K, L); (2) with large tubercles (Figs. 9A, B).
50) Leg IV. Patella. Ventral armature: (0) absent (Fig. 8F); (1) with two ventral rows of tubercles (Fig. 9B)
51) Leg IV. Tibia. Proventral armature: (0) absent (Figs. 8A, B); (1) with a distal row of acuminate tubercles (Figs. 7K, L).
52) Leg IV. Tibia. Retrolateral armature: (0) absent (Figs. 8A, B); (1) with a row of acuminate tubercles (Figs. 11C, D).
53) Penis. Shape: (0) malleus plus Lamina Parva; (1) with VP well defined (Figs. 15A–C).
54) Penis. Ventral plate. Distal margin. Shape: (0) straight (Figs. 16G, I); (1) concave, wider than deep (Figs. 19D, F); (2) convex (Figs. 20D, F); (3) with a deep cleft (deeper than wide).
55) Penis. Apex of truncus invading VP: (0) absent (Fig. 19G); (1) present (Fig. 19C).
56) Penis. Ventral plate. Lateral sacs: (0) absent; (1) present, bump-like; (2) present, finger-like;
57) Penis. Ventral plate. Lateral sacs. Length: (0) very short (base width equal to the length of the lateral sac; Figs. 19G–I); (1) short to long (base width less than the length of lateral sac; Figs. 19A–C).
58) Penis. Ventral plate. Lateral sacs. Microsetae: (0) present (Figs. 19A–C); (1) absent (Figs. 17A–C).
59) Penis. Ventral plate. Lateral sacs. Microsetae shape: (0) long (Figs. 21D–F); (1) short (Figs. 19A–C).
60) Penis. Ventral plate. Lateral sacs. Apex: (0) acuminate (Figs. 19D–F); (1) rounded (Figs. 19A–C).
61) Penis. Ventral plate. MS C: (0) two pairs; (1) three pairs (Figs. 19DD–F); (2) four or more pairs (Figs. 18G–I).
62) Penis. Ventral plate. MS C. Shape: (0) straight (Figs. 19D–F); (1) curved (Figs. 18A–C); (2) helicoidal.
63) Penis. Ventral plate. Microsetae on ventral face: (0) absent (Fig. 19D); (1) present (Fig. 15A).
64) Penis. Stylus. Shape: (0) cylindrical (Figs. 16G–I); (1) laterally flattened, dorsoventrally widened (Figs. 15A–C); (2) broad and sturdy, laterally flattened (Figs. 17D, E).
65) Penis. Stylus. Caruncle on apex: (0) absent (Figs. 16A, B); (1) present (Fig. 15A).
66) Penis. Insertion of the pedestal in the glans: (0) ventral; (1) medial.
67) Penis. Dorsal process: (0) absent (Figs. 18G, I); (1) present (Figs. 16A, B).
68) Penis. Ventral process: (0) absent (Figs. 18G, I); (1) present.

3.3. Phylogenetic results

3.3.1. Total Evidence analysis under maximum-parsimony

We chose MP01 analysis to obtain a working phylogenetic hypothesis of Metasarcidae (see Discussion section). Therefore, the results of this hypothesis will be presented in more detail (the main differences between the topologies will be indicated). Iterative pass optimization resulted in a single topology with 4,626 steps (Fig. 1; supplementary figs. 1, 2). Metasarcidae was recovered as the sister-group of Cosmetidae (GB=31). There is a homoplastic unambiguous morphological synapomorphy for Metasarcidae + Cosmetidae: apex of truncus invading VP [55:1] also present in *Gonyleptes fragilis* (Gonyleptidae). Under ACCTRAN, there are additional six homoplastic morphological synapomorphies [1:1; 5:1; 10:2; 28:0; 30:0 42:1].

The monophyly of Metasarcidae (*sensu* Pinto-da-Rocha et al. 2014) was recovered (GB=40). Of the 38 species of Metasarcidae recognized in this study, the analysis has a representativeness of 22 species (total of 25 terminals). The presence of lateral finger-like sacs on the penis [56:2] is an exclusive unambiguous synapomorphy of the Metasarcidae. There are also three homoplastic unambiguous morphological synapomorphies of Metasarcidae: presence of a proapical spine on femur of pedipalpus [7:1] (present also in *Pseudopachylus alticola* (Cryptogeobiidae) and *G. fragilis*); presence of a proapical spine on patella of pedipalpus [9:1] (present also in *G. fragilis*) and femur IV long (FIV/DSL > 1,5) [41:0], although it is short [41:2] in most *Ayacucho*. Additionally, under ACCTRAN there are two other exclusive morphological synapomorphies: DSS kappa-type [10:3] present in *Huancabamba* **gen. nov.**, *Lumieria* **gen. nov.**, some *Metasarcus* and some *Tschaidicancha*; and ventral plate's lateral sacs short to long (base width less than the length of lateral sac) [57:1], with very short state present only in *Huancabamba kubricki* **gen. et sp. nov.** and *Metasarcus fellinii* **sp. nov.** Moreover, there are two additional homoplastic morphological synapomorphies under ACCTRAN: ocularium with paired armature [14:1]; and scutal area III with a pair of tubercles [23:2]; (all these three characters with several transformations to different character states within Metasarcidae).

We recognized six genera in Metasarcidae, of which four had been previously described (*Ayacucho*, *Incasarcus*, *Metasarcus* and *Tschaidicancha*) and two new genera (*Huancabamba* **gen. nov.** and *Lumieria* **gen. nov.**). Three genera are represented only by one terminal taxon in the present analysis, one of which is monotypic (*Huancabamba* **gen. nov.**). The other genera are *Lumieria* **gen. nov.** (two species recognized in this study) and *Tschaidicancha* (four species recognized in this study). *Huancabamba kubricki* **gen. et sp. nov.** is recovered as the sister-group of the *Lumieria antonionii* **gen. et sp. nov.** (GB=12). There is an exclusive unambiguous morphological synapomorphy: distitarsus II 4/5-segmented [33:1]; and a homoplastic unambiguous synapomorphy: four or more pairs of MS C [61:2], also present in several other Metasarcidae species. This clade is not recovered in ML02, each of the genera as independent basal lineages of Metasarcidae.

The ocularium armed with a pair of tubercles [15:0] and tarsal claws of legs III–IV pectinated [34:1] are exclusive autapomorphies of *H. kubricki* **gen. et sp. nov.** Two exclusive unambiguous autapomorphies were recov-

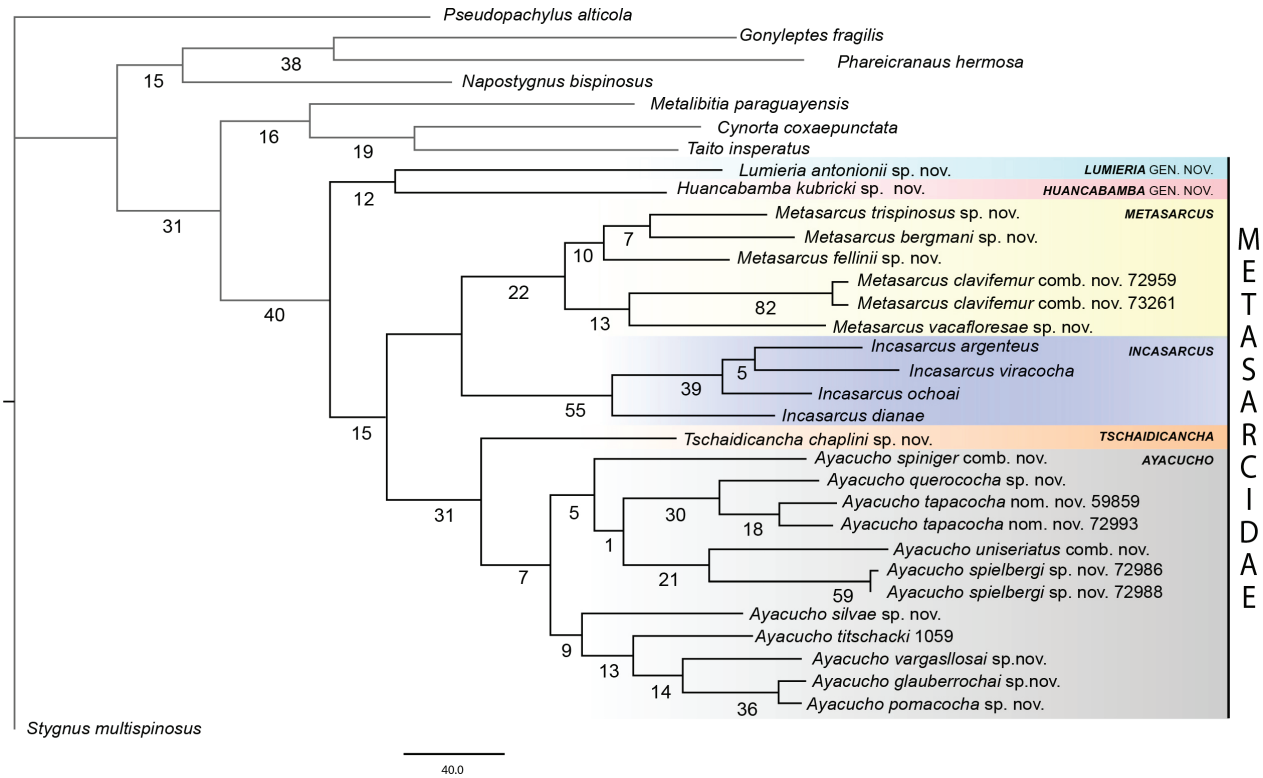

Figure 1. Phylogenetic hypotheses of Metasarcidae species. Total evidence hypothesis under Maximum Parsimony (IP) of Metasarcidae species, based on five molecular markers (12S, 16S, 28S, COI and H3) and 68 morphological characters. Goodman-Bremer support is given near each node. Asterisks represent clades that were not found in the Maximum Likelihood analysis.

ered for *Lumieria antonionii* **gen. et sp. nov.**: DS scutal area I divided by scutal groove II [20:2]; and penial stylus broad and sturdy, laterally flattened [64:2]. *L. antonionii* **gen. et sp. nov.** is also supported by a homoplastic unambiguous autapomorphy: presence of a retrolateral row of acuminate tubercles on tibia IV [65:1], also present in *Tschaidicancha chaplini* **sp. nov.**

The sister-group of *Huancabamba* **gen. nov.** + *Lumieria* **gen. nov.** is the clade *Incasarcus* + *Metasarcus* + *Tschaidicancha* + *Ayacucho* (GB=15), supported by one unambiguous yet homoplastic morphological synapomorphy: VP of penis without microsetae on ventral face [63:0]. Additionally, under ACCTRAN, MS C straight [62:0]. This group contains two well-supported clades: *Incasarcus* + *Metasarcus* (GB=22) and *Tschaidicancha* + *Ayacucho* (GB=31). The clade *Incasarcus* + *Metasarcus* is supported by one homoplastic morphological synapomorphy under ACCTRAN: ocularium unarmed [14:0]. The sister-group relationship between *Incasarcus* and *Metasarcus* corroborates the hypothesis of Pinto-da-Rocha et al. (2014). In our results, this clade is more robustly supported and is represented by a greater number of terminal taxa (one terminal of each genus in Pinto-da-Rocha et al., 2014).

The monophyly of *Incasarcus* (represented by four of the five described species) was recovered (GB=55), supported by four unambiguous, yet homoplastic morphological synapomorphies: DSS alpha-type [10:0]; spine insertion direct on integument on scutal area III [24:0]; posterior margin of DS with densely granulation [26:0]; patella IV apically with large tubercles [49:2]. Additionally, there is an exclusive synapomorphy under ACCTRAN: patella IV with two ventral rows of tubercles [50:1], absent in *I. ochoai*; and two more homoplastic synapomorphies [61:2; 62:1].

The monophyly of *Metasarcus* (*sensu hoc*) was recovered (GB=38), supported by one homoplastic unambiguous morphological synapomorphy: coxa III with two apophyses [32:1]. Also supporting this clade, there is one additional homoplastic morphological synapomorphy under ACCTRAN: femur IV densely granulated [42:1]. Internally, there are two clades, one grouping two species from the Bolivian department of La Paz (*Metasarcus clavifemur* and *Metasarcus vacafloresae* **sp. nov.;** GB=13) and the other with species from the Bolivian departments of Cochabamba (*Metasarcus trispinosus* **sp. nov.** and *Metasarcus bergmani* **sp. nov.**) and Tarija (*Metasarcus fellinii* **sp. nov.**; GB=10).

The *Tschaidicancha* + *Ayacucho* clade is supported by two homoplastic unambiguous synapomorphies: long microsetae on penial lateral sacs [59:0] and lateral sacs with acuminate apex [60:0]. The internal relationships of this clade are the most inconstant when comparing all the hypotheses of the different analyses. When morphological data are used, *Tschaidicancha chaplini* **sp. nov.** is recovered at the base of the clade, as a sister-group of *Ayacucho* (ML01; MP01). In the analyses built only with molecular data (ML02; MP02), the monophyly of *Ayacucho* is not obtained, because *T. chaplini* **sp. nov.** is recovered nested in the genus (see Discussion section). *Tschaidicancha* was previously monotypic. *Tschaidicancha chaplini* **sp. nov.** is supported by five homoplastic unambiguous auta-

pomorphies [22:1; 44:2; 52:1; 54:2; 67:1] (see Discussion section).

The monophyly of *Ayacucho* (*sensu hoc*) was recovered in the MP01 analysis with low support (GB=7). The clade has an unambiguous exclusive synapomorphy: femur of pedipalpus sub cylindrical, slightly flattened [8:1] and 10 homoplastic unambiguous morphological synapomorphies: femur and patella of pedipalpus in males without proapical spine [7:0; 9:0]; DS with carapace, lateral margins, scutal areas and posterior margin densely granulated [16:0; 17:0; 19:0; 26:0]; posterior margin of DS with a row of tubercles [28:1]; free tergites I–III with a row of tubercles [30:1]; coxa III with two apophyses [32:1]; and femur IV short (FIV/DSL < 1,2) [41:1]. Additionally, the genus is supported by one exclusive synapomorphy under ACCTRAN; femur IV with a distal retroventral row of acuminate tubercles [45:1]. Furthermore, under ACCTRAN, three additional homoplastic morphological synapomorphies support the clade [10:0; 13:1; 46:1; see discussion section].

Ayacucho, as recovered by the MP01 analysis, is split into two clades: 1) *A. silvae* **sp. nov.** + *A. titschacki* + *A. vargasllosai* **sp. nov.** + *A. pomacocha* **sp. nov.** + *A. glauberrochai* **sp. nov.** (henceforth "*silvae* clade"); 2) *A. spiniger* **comb. nov.** + *A. uniseriatus* **comb. nov.** + *A. spielbergi* **sp. nov.** + *A. querococha* **sp. nov.** + *A. tapacocha* **nom. nov.** (henceforth "*spiniger* clade").

Support for both inner clades is also low: "*silva* clade" (GB=9); "*spiniger* clade" (GB=5). The "*silvae* clade" is supported by three homoplastic unambiguous synapomorphies: DS area I [21:0] and III [23:0] unarmed; VP with microseta on ventral face [63:1]. Under ACCTRAN, ocularium without armature [14:0] is a homoplastic synapomorphy for the clade. The "*spiniger* clade" is supported by two exclusive unambiguous morphological synapomorphies: femur IV with a retrolateral [44:1] and a prolateral [47:1] rows of laminate tubercles, both absent on *A. uniseriatus* **comb. nov.** and *A. spielbergi* **sp. nov.**; and three homoplastic synapomorphies: coxa IV with a proapical short apophysis [36:1]; trochanter IV with a small distal tubercle [40:1]; and patella IV with small apical tubercles [49:1]. Additionally, under ACCTRAN, the clade is supported by one exclusive synapomorphy, femur IV with a distal retroventral row of acuminate tubercles [45:2]; and four homoplastic characters [10:1; 25:1; 46:2; 65:0].

3.3.2. Molecular only analysis under maximum-parsimony

The topology of the phylogenetic hypothesis found with the exclusive use of molecular data (MP02) is identical to that of MP01, with exception of the relationships within clade *Tschaidicancha* + *Ayacucho* (Supplementary Fig. 3). Since *Tschaidicancha chaplini* **sp. nov.** is nested within *Ayacucho*, the monophyly of the genus was not recovered. *Tschaidicancha chaplini* **sp. nov.** is recovered as a sister-group of "*silvae* clade", whose topology is identical to MP01. The "*spiniger* clade" is polyphyletic in this hypothesis.

3.3.3. Maximum-likelihood analyses

ML01: The best replacement model performances for the six partitions (five molecular markers + morphology) were evaluated, based on the AICc – corrected Akaike information criterion (Posada and Buckley 2004). The data matrix consisted of 2,756 characters, of which IQ-TREE recognized 1,132 character state distribution patterns. AICc favored the choice of the following replacement models: TIM3+F+G4 for non-coding 12S partition; GTR+F+I+G4 for non-coding 16S; GTR+F+R3 for non-coding 28S; TIM2+F+R4 for coding COI; TIM+F+I+G4 for coding H3; and MK+G+ASC+R2 for morphology. The analysis resulted in a topology with lnL = –22433.387.

ML02: The best replacement model performances for the five partitions (five molecular markers) were evaluated based on the AICc. The data matrix consisted of 2,688 characters, of which IQ-TREE recognized 1,067 character state distribution patterns. AICc favored the choice of the following replacement models: TIM3+F+G4 for non-coding 12S; GTR+F+I+G4 for non-coding 16S; TIM+F+R4 for non-coding 28S; TIM2+F+I+G4 for coding COI; and TIM+F+I+G4 for coding H3. The analysis resulted in a topology with lnL = –20724.827.

The monophyly of Metasarcidae was recovered in both analyses. The topology in ML01 (Supplementary fig. 4) is very similar to the one recovered by MP01, with the exception that the "*spiniger* clade" is paraphyletic to the "*silvae* clade". *A. spielbergi* **sp. nov.** is recovered as the sister group of *A. uniseriatus* **comb. nov.**, which is the sister-group of the other *Ayacucho*. The ML02 hypothesis (Supplementary fig. 5) recovered *T. chaplini* **sp. nov.** nested within *Ayacucho*, as a sister-group of "*silvae* clade", as in MP02. The "*spiniger* clade" is paraphyletic to the clade *T. chaplini* **sp. nov.** + "*silvae* clade". Additionally, *H. kubricki* **gen. et sp. nov.** is a sister-group to the other Metasarcidae, with *Lumieria antonionii* **gen. et sp. nov.** as the most basal lineage of this clade. This result is different from the other phylogenetic hypotheses (MP01, MP02, ML01), in which *Huancabamba* **gen. nov.** and *Lumieria* **gen. nov.** are sister-groups.

3.4. Identification key to males of genera of the Metasarcidae

1 Leg IV elongate (FIVL/DSL > 1.6; Figs. 26, 27); ocularium low and medially depressed (Figs. 4–6) 2
1' Leg IV short (FIVL/DSL < 1.5; Figs. 22, 23); ocularium generally high and rounded (Figs. 2, 3) ..... *Ayacucho*
2 Alpha-type DSS (Fig. 6B–F) ..... *Incasarcus*

2’ Gamma-type (Fig. 5A), gamma-P-type (Fig. 5B) or kappa-type DSS (Fig. 5D) 3
3 Eye mound armed with a pair of tubercles (at least eye length or longer; Fig. 6) 4
3’ Eye mound unarmed (Fig. 5) ..... *Metasarcus*
4 Apex of coxa IV reaching area III (Fig. 4A); penis with 13–14 macrosetae C (Fig. 18 A–C) ..... *Huancabamba* **gen. nov.**
4’ Apex of coxa IV reaching area IV or posterior border of dorsal scutum (Fig. 6); penis with less than 10 macrosetae C (Figs. 17D–F, 21) 5
5 Posterior margin and free tergites with one or a pair of tubercles larger than the others in the segment (Fig. 6A, B); stylus extended, thick and robust in lateral view (Figs. 14A, B, 17D–F) ..... *Lumieria* **gen. nov.**
5’ Posterior margin and free tergite I unarmed, free tergite II and III unarmed or armed with a pair of large tubercles (Fig. 6C–F); stylus’s stem cylindrical and thin (Figs. 14I–L, 21) ..... *Tschaidicancha*

3.5. Identification key to males of *Ayacucho*

1 Eye mound unarmed (Fig. 2F) or with small tubercles (Figs. 2G, I) 2
1’ Eye mound with two conspicuous tubercles (Fig. 2E) 7
2 Femur–tibia IV with large tubercles (Figs. 7K–N) 3
2’ Femur–tibia IV minute tuberculate (Figs. 7I, J) 4
3 Areas I–IV with same-sized tubercles (Fig. 2I); femur IV with spaced large ventral tubercles; tibia IV small tuberculate (Figs. 7M, N) ..... *A. silvae* **sp. nov.**
3’ Areas I–IV with a median pair of tubercles slightly larger than others (Fig. 2G); femur IV and tibia IV with rows of adjacent large tubercles (Figs. 7K, L) ..... *A. querococha* **sp. nov.**
4 Penis with 5–6 MS C (Figs. 16 D–F) 5
4’ Penis with 7–9 MS C (Figs. 15A–C) 6
5 Chelicerae strongly inflated (Fig. 3D); VP rectangular with distal margin slightly concave, with short lateral-apical projections (Figs. 12I, J) ..... *A. titschacki*
5’ Chelicerae moderately inflated (Figs. 2B, F); VP subrectangular and with distal margin with a V-notch, and with conspicuous laterodistal projections (Figs. 16 D–F) ..... *A. glauberrochai* **sp. nov.**
6 Areas I–IV densely and uniformly tuberculate (Fig. 2F); VP hexagonal in dorsal view; subrectangular in ventral view, with distal half larger than basal half; distal margin straight (Figs. 15A–C) ..... *A. pomacocha* **sp. nov.**
6’ Areas I–IV with central region less tuberculate than laterals (Fig. 3G); VP subrectangular in dorsal view, with distal half larger than basal half; distal margin straight (Fig. 13A, B) ..... *A. vargasllosai* **sp. nov.**
7 Coxa IV with large dorsoapical tubercle (e.g. Fig. 3B) 8
7’ Coxa IV without large dorsoapical tubercle (Fig. 2E); lateral margins and lateral portions of areas I–IV with yellowish spots (Fig. 22G) ..... *A. pasolinii* **sp. nov.**
8 Area III with two long and acute tubercles (Fig. 3A) 9
8’ Area III with same-sized tubercles or a pair slightly larger on median region (Fig. 3E) 10
9 Areas I–II and IV with a pair of tubercles larger than others in same area (Fig. 3B) ..... *A. spiniger* **comb. nov.**
9’ Areas I–II and IV with same-size tubercles (Fig. 3A) ..... *A. spielbergi* **sp. nov.**
10 Femur IV with rows of tubercles of varied morphology (apex can be blunt, acuminate or lanceolate; Figs. 7S, T) ..... *A. tapacocha* **nom. nov.**
10’ Femur IV with rows of acuminate tubercles (e.g. Figs. 7W, X) 11
11 Femur IV with dorsal row of large tubercles (Fig. 7W) 12
11’ Femur IV without dorsal row of large tubercles (Fig. 8A) 14
12 Larger tubercles on dorsal femur IV concentrated on distal half (Fig. 8C) ..... *A. weyrauchi* **comb. nov.**
12’ Larger tubercles on dorsal femur IV concentrated on basal half (Figs. 7A, W) 13
13 Eye mound with divergent large tubercles (Fig. 3E); femur IV with ventral rows of tubercles concentrated on distal half (Fig. 7X) ..... *A. triarmatus* **nom. nov.**
13’ Eye mound with large parallel tubercles (Fig. 2A); femur IV ventral row of tubercles along the entire length (Fig. 7B) ..... *A. bambamarca* **comb. nov.**
14 Femur IV with two ventral rows of tubercles (Fig. 7F) ..... *A. inermis* **comb. nov.**
14’ Femur IV with one ventral row of tubercles (Fig. 8B) ..... *A. uniseriatus* **comb. nov.**

3.6. Identification key to males of *Incasarcus*

1 Area III unarmed (Fig. 4D) ..... *I. ochoai*
1’ Area III armed with a pair of spines (e.g. Figs. 4B, C) 2
2 White or silver patches on dorsal scutum 3

2’ Without patches on dorsal scutum 4
3 White patches on prosoma behind ocularium and on area I (Fig. 4E); weak armature on femur IV; patella IV with long and acute dorsoapical tubercle (Figs. 9E, F)....*I. pictus*
3’ Silver patches on prosoma, area I and lateral margin; femur IV with ventral row of conspicuous tubercles; patella IV with two long and acute dorsoapical tubercles (Figs. 9A, B)....*I. argenteus*
4 Dorsal scutum with sparse granules (Fig. 4C); femur IV with retrolateral and prolateral rows of tubercles (Figs. 9C, D)....*I. dianae*
4’. Dorsal scutum densely granulate (Fig. 4F); femur IV with only one row of tubercles (Figs. 9G, H)... *I. viracocha*

3.7. Identification key to males of *Metasarcus*

1 Free tergite III with conspicuous apophysis (Figs. 5B, E, G, H)....2
1’ Free tergite III unarmed or with a pair of acute tubercles (Figs. 5A, D, F, I)....5
2 Area I divided (Figs. 5B, E)....3
2’ Area I undivided (Figs. 5G, H)....4
3 Coxa IV with long retrolateral apophyses; free tergite with short and simple apophysis (Fig. 5B)....*M. bergmani* **sp. nov.**
3’ Coxa IV without retrolateral apophysis; free tergite with bifid apophysis (Fig. 5E)....*M. fellinii* **sp. nov.**
4 Dorsal scutum grooves virtually inconspicuous; free tergite III with short, wide and trifid apophysis (Fig. 5H) ....*M. trispinosus* **sp. nov.**
4’ Dorsal scutum grooves conspicuous; free tergite III with long and simple apophysis (Fig. 5G)....*M. limachii* **sp. nov.**
5 Area III with one pair of spines (Figs. 5A, D)....6
5’ Area III unarmed....*M. vacafloresae* **sp. nov.**
6 Trochanter IV with a retrolateral apophysis; Femur IV robust, with a retrolateral basal apophysis and two dorsal rows of tubercles (Figs. 10E, F)....*M. clavifemur*
6’ Trochanter IV without apophysis....7
7 Gamma-P type DSS; Coxa III without apophysis (Fig. 5A); femur IV with one small retrodorsal distal apophysis (Fig. 10A)....*M. beni* **sp. nov.**
7’ Kappa type DSS; Coxa III with two dorsal apophyses (Fig. 5F); femur IV with small tubercles (Figs. 10I, J)....*M. kurosawai* **sp. nov.**

3.8. Identification key to males of *Tschaidicancha*

1 Free tergite III armed with a pair of tall tubercles (longer than its tergite length; Figs. 6C, F)....2
1’ Free tergite III unarmed, tubercles absent or small (Figs. 6D, E)....3
2 Ventral distal half of femur IV and patella IV with tubercles longer than segment width (Fig. 11N)... *T. weyrauchi*
2’ Leg IV with small tubercles (Figs. 11G, H)....*T. chaplini* **sp. nov.**
3 Femur IV with tall tubercles (most similar-sized or longer than segment width); Figs. 11I, J)....*T. joseochoai* **sp. nov.**
3’ Femur IV with small tubercles (Figs. 11K, L)....*T. scorsesei* **sp. nov.**

3.9. Metasarcidae Kury, 1994

Phalangodidae Tricommatinae [part]: Mello-Leitão 1926: 330 (key); Roewer 1927: 536 (cit, key); 1935: 45 (cit, key); Mello-Leitão 1935: 92 (key); 1938: 137 (key); Roewer 1949: 56 (cit); Rambla 1978: 305 (cit).

Prostygninae [part.]: Roewer 1913: 140 (desc, key); 1923: 449 (rdesc, key); 1943: 30 (cit); Mello-Leitão 1926: 348 (key); Roewer 1952: 57 (cit); Soares et al. 1992: 1 (rdesc, key)

Mitobatinae [part.]: Roewer 1913: 284; 1923: 508 (rdesc, key); Mello-Leitão 1932: 390 (rdesc, key); Soares and Soares 1949: 224 (rdesc), 225 (key).

Metasarcinae Kury, 1994: 349 (desc); Kury and Maury 1998: 144; (cit); Kury 2003, 144 (cat); Acosta 2002: 72 (cit), 78 (biog); Giribet and Kury 2007: 82; Kury 2007: 168 (cit); Kury and Pinto-da-Rocha 2007a:185 (cit); Kury and Pinto-da-Rocha 2007b: 196 (cit), 198 (biol), 199 (biol), 201 (key), 203 (biog); Pinto-da-Rocha and Giribet 2007: 91 (cit); Yamaguti and Pinto-da-Rocha 2009: 319 (syst), 320 (biol), 321–324 (cit), 324 (syst), 325 (cit), 326–329 (syst), 358 (syst); Ferreira and Kury 2010: 706 (biol). Mendes 2011:437 (cit), 439 (cit), 441 (cit), 479 (syst).

Metasarcidae: Pinto-da-Rocha et al. 2014: 525 (cit), 527 (syt), 532 (syst); Kury and Villarreal 2015: 3–5, 10, 14, 23, 26, 29–30, 38 (cit); Kury and Carvalho 2020: 55 (cit); Benavides et al. 2021: 655 (syst).

Type genus. *Metasarcus* Roewer, 1913.

Genera composition. *Ayacucho* Roewer, 1949; *Huancabamba* **gen. nov.**; *Incasarcus* Kury & Maury, 1998; *Lumieria* **gen. nov.;** *Metasarcus* Roewer, 1913; and *Tschaidicancha* Roewer, 1957.

Diagnosis. Metasarcidae can be easily diagnosed by other Gonyleptoidea by only one feature, the penis with lateral finger-like sacs. Only one genus (*Metalibitia*, Cosmetidae) of Gonyleptoidea possess lateral sacs on ventral plate but its shape and position is different from it and not homologous. It differs from Stygnidae by having ocularium undivided; by Gonyleptidae by pedipalpal femur with long spines; by Cosmetidae by pedipalpus somewhat cylindrical and with spines; by Agoristenidae by having tarsal process; by Cranaidae by pedipalpal femur smooth or small-tuberculate.

Redescription. Gonyleptoidea with eye mound tall and rounded (*Ayacucho*) or low, medially depressed (the other genera); ocularium with a pair of low tubercles, a pair of high spines or unarmed. Chelicerae swollen in males of some species (also in some females of *A. titschacki*). Pedipalpus long and robustly armed; femur sub cylindrical, not flattened (slightly flattened in *Ayacucho*); femur and patella in males with a proapical spine (except *Ayacucho*). Alpha-type DSS (*Incasarcus* and majority of *Ayacucho*), gamma-type DSS (*Metasarcus fellinii* **sp. nov.** and *Ayacucho spielbergi* **sp. nov.**), gamma-P-type DSS (some *Metasarcus* and *Tschaidicancha joseochoai* **sp. nov.**) and kappa-type DSS (*Huancabamba* **gen. nov.**, *Lumieria* **gen. nov.**, *Tschaidicancha* and some *Metasarcus*). DS moderate to densely granulate. Scutal area I undivided or divided (*Lumieria* **gen. nov.** and some *Metasarcus* and *Tschaidicancha*); area III generally armed with a pair of high spines, a pair of low spines (*I. argenteus*) or tubercles (most *Ayacucho*, *Metasarcus trispinosus* **sp. nov.**) or unarmed (some *Ayacucho*, *I. ochoai*, *Metasarcus vacafloresae* **sp. nov.**). Male coxa IV generally unarmed; armed with an acute long prolateral tubercle in most *Ayacucho* or with a retrolateral armature in *Metasarcus bergmani* **sp. nov.** and *M. limachii* **sp. nov.** Femur IV shorter than DSL in most *Ayacucho*, about same size in *Huancabamba* **gen. nov.** and much longer in the other genera. Tarsal process present. VP of penis well defined, generally subrectangular, without cleft, with three to many (more than 13) pairs of MS C, and lateral finger-like sacs. Stylus long and generally laterally flattened, dorsoventrally widened (broad and sturdy *Lumieria* **gen. nov.** and cylindrical in some species); generally with swollen apex and with a caruncle. Dorsal process of glans absent or present.

Distribution. The family Metasarcidae occurs in Andean Mountains of Bolivia and Peru, the southern limit being the border with Argentina and the northern limit the Huancabamba depression, situated in northern Peru (Figs. 28–31). Most species are found in moderate to high altitudes (circa 4,000 m above sea level). The only exception to is *Metasarcus beni* **sp. nov.** (about 170 m above sea level) which occurs in the mountain foothills. A second species, the type-species of the genus *Metasarcus*, *M. bolivianus*, has been attributed to the Bolivian lowland region, the Chaco Province, without mention of a more precise locality.

Most species (28 spp.) are known only from their type-locality, and those known from a few records of distribution (6 spp.) are endemic to small areas, where the maximum distance between two records is 150km. A few localities possess sympatric species, such as: Parque Nacional Yanachaga-Chemillén/Peru (*T. chaplini* **sp. nov.**, *T. joseochoai* **sp. nov.**, *A. pasolinii* **sp. nov.**, *T. scorsesei* **sp. nov.**), Centro Turistico Ilpa/Peru (*L. woodyalleni* **gen. et sp. nov.**, *L. antonionii* **gen. et sp. nov.**), Zongo/Bolivia (*M. kurosawai* **sp. nov.**, *M. vacafloresae* **sp. nov.**), Cutervo/Peru (*A. uniseriatus* **comb. nov.**, *H. kubricki* **gen. et sp. nov.**, *A. spielbergi* **sp. nov.**). *Ayacucho titschacki*, which occurs in the Peruvian Central Andes, (near to Ocollo, Virgem de Cacharras de Cocha) and *Ayacucho tapacocha* **nom. nov.**, which occurs in northern Peru, are the species with the largest distributions recorded in the Ayacucho and Ancash areas, respectively. This high level of endemism is comparable to the eastern coast of South America, where most species occupy small areas of endemism (see Da-Silva et al. 2017). However, the harvestmen fauna from Peru and Bolivia is poorly sampled, which prevents a more detailed comparison with other regions.

All Bolivian species of Metasarcidae belong to the type genus, *Metasarcus*, and occur in the eastern Andes from La Paz to Tarija Province (*M. fellinii* **sp. nov.** is the southernmost species of the family), the Altiplano being the northern distribution limit. Its sister genus, *Incasarcus* is present only in the Peruvian Cusco Department, in Montane tall grass vegetation (Puna) and scrub and montane Rain Forest. Both genera are separated by Puna Seca and Titicaca lake, which means the Altiplano.

Ayacucho is widespread in most of the Peruvian Andean region, from Cajamarca to Ayacucho departments, the Rio Apurimac being the southern limit of its distribution. The only metasarcid species recorded from the western Andean foothills is *A. roeweri* **nom. nov.**, from Rio Fortaleza (2700 m above sea level, Ancash, Cajacay, Peru), where the riparian forest El Bosque de Fortaleza is found. Most species can be found in two types of vegetation, the Mountain short grass and Andean wastes (Quechua) and Mountain tall grass and scrub (Puna). One species, *A. pasolinii* **sp. nov.** was recorded from the Mountain Rain Forest (Parque Nacional Yanachaga-Chemillén, Oxapampa, Peru).

The monotypic genus *Huancabamba* **gen. nov.** is recorded only in Cutervo (Cajamarca Department), in Mountain Rain Forest.

Lumieria **gen. nov.** has only two species, sympatrically distributed at Centro Turistico Ilpa (Junin Department – Bolivia). This locality is covered by Mountain tall grass and scrub.

Tschaidicancha has four species recorded in only three regions, two of which are very close to each other. *T. scorsesei* **sp. nov.**, *T. joseochoai* **sp. nov.**, and *T. chaplini* **sp. nov.** occur in Mountain Rain Forest, and *T. weyrauchi* in areas with scrubs of Mountain Tall Grass and Scrub.

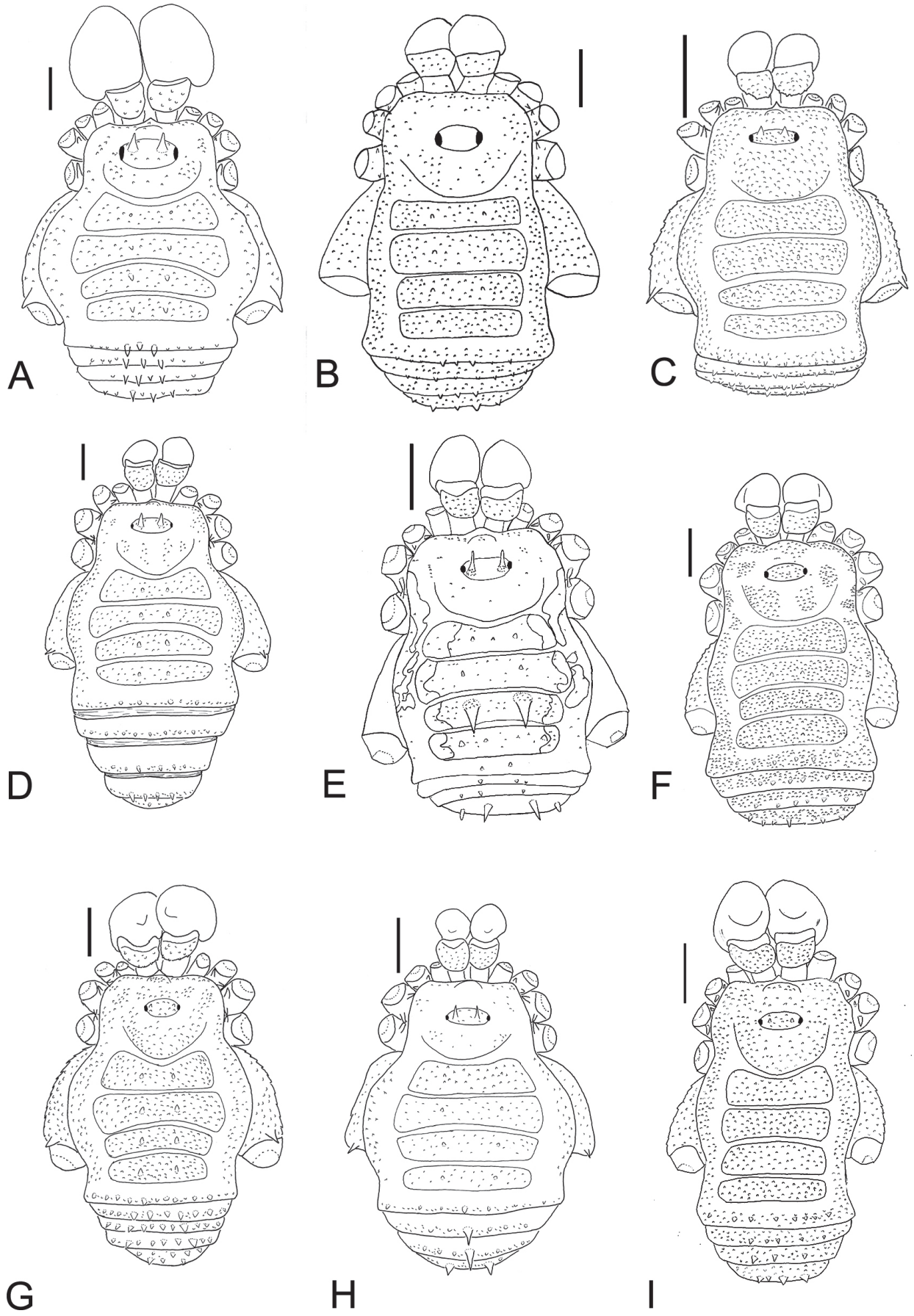

Figure 2. Habitus, dorsal of *Ayacucho*. **A** *A. bambamarca* (Roewer, 1957) **comb. nov.**, male; **B** *A. glauberrochai* **sp. nov.**, male; **C** *A. inermis* (Roewer, 1957) **comb. nov.**, male; **D** *A. insignitus* (Roewer, 1956) **comb. nov.**, female; **E** *A. pasolinii* **sp. nov.**, male; **F** *A. pomacocha* **sp. nov.**, male; **G** *A. querococha* **sp. nov.**, male; **H** *A. roeweri* **nom. nov.**, female; **I** *A. silvae* **sp. nov.**, male; Legend bars = 1 mm.

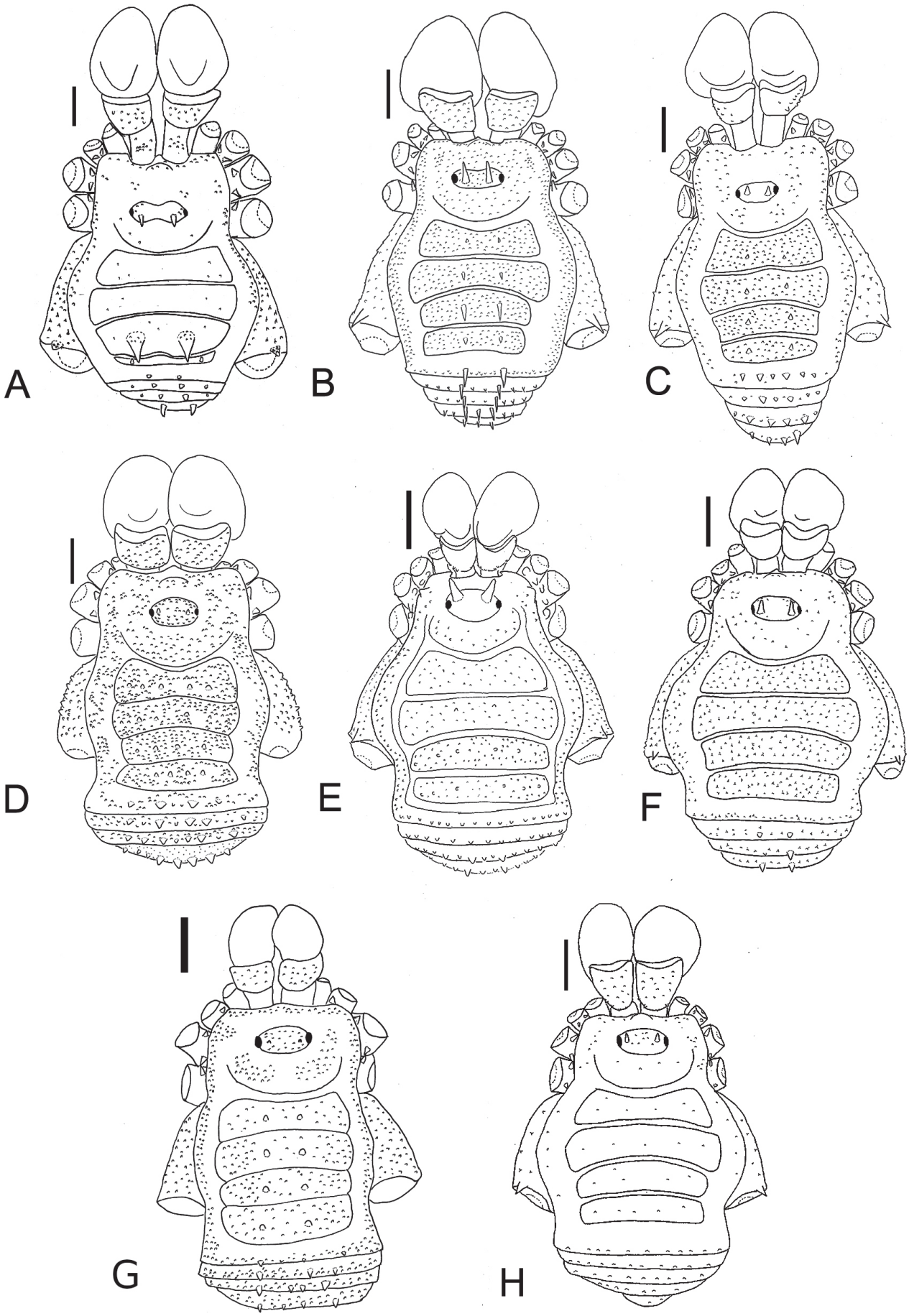

Figure 3. Habitus, dorsal of males of *Ayacucho*. **A** *A. spielbergi* **sp. nov.**; **B** *A. spiniger* (Roewer, 1957) **comb. nov.**; **C** *A. tapacocha* **nom. nov.**; **D** *A. titschacki* Roewer, 1949; **E** *Ayacucho triarmatus* **nom. nov.**; **F** *A. weyrauchi* (Roewer, 1952) **comb. nov.**; **G** *Ayacucho vargasllosai* **sp. nov.**; **H** *A. uniseriatus* (Roewer, 1959) **comb. nov.**; Legend bars = 1 mm.

3.10. *Ayacucho* Roewer, 1949

Figs. 2, 3, 7, 8, 12, 13A–D, 15, 16, 17A–C, 22, 23; 28

Ayacucho Roewer, 1949: 57 (desc); Rambla 1978: 304 (cit); Kury 2003: 144 (cat, syst); Kury and Villarreal 2015: 5, 14 (cit). **Type species**: *Ayacucho titschacki* Roewer, 1957 (by original designation).

Ayachuco [lapsus calami]: Caporiacco 1951: 9 (cit)

Cajamarca Roewer, 1952: 41 (desc); Roewer 1957: 75 (desc); Rambla 1978: 304 (cit); Kury and Maury 1998: 145 (syst); Kury 2003: 144 (cat); Kury and Villarreal 2015: 5, 14, 23 (cit). **Type species** *Cajamarca weyrauchi* Roewer, 1952 (by original designation). **syn. n.**

Cargaruaya Roewer, 1956: 439 (desc); Rambla 1978: 304 (cit); Kury 2003: 144 (cat, syst). (**Type species** *Cargaruaya insignita* Roewer, 1956, by original designation). **syn. n.**

Palcares Roewer, 1957: 72 (desc); Roewer 1959: 70 (desc); Rambla 1978: 304 (cit); Kury 2003: 145 (cat, syst) (**Type species** *Palcares spiniger* Roewer, 1957 by original designation). **syn. n.**

Cajacaybia Roewer, 1957: 73 (desc); Rambla 1978: 304 (cit), Kury 2003: 144 (cat, syst). (**Type species** *Cajacaybia spinigera* Roewer, 1957, by original designation). **syn. n.**

Pinocchio [in part] Roewer, 1957: 70 (desc).

Tapacochana Roewer, 1957: 73 (desc); Roewer 1959: 69 (desc); Rambla 1978: 304 (cit); Kury 2003: 145 (cat, syst) (**Type species** *Tapacochana insignita* Roewer, 1957 by original designation). **syn. n.**

Distribution. PERU. Ancash, Ayacucho, Cajamarca, Huancavellica, Junín, La Libertad and Pasco (Fig. 28).

Diagnosis. ***Ayacucho*** can be differentiated from all other Metasarcidae genera by its short leg IV (femur IV length/DS length < 1.5). Most of its species can be distinguished from other genera by having, alpha-type DSS; a femur of pedipalpus slightly flattened and males without a proapical spine (present in all other genera), an ocularium high and rounded and a DS densely granulated.

Redescription. Alpha-type DSS (Figs. 2C, F, G), except for *A. spielbergi* **sp. nov.** (gamma-type; Fig. 2A) type. Femur of pedipalpus slightly flattened (except for *A. spielbergi* **sp. nov.**) and generally armed in ventral surface; males without a proapical spine; females armed with a proapical spine (absent in some species of "*silvae* clade", *A. spielbergi* **sp. nov.** and *A. pasolinii* **sp. nov.**) Ocularium high and rounded in most species (Fig. 2A–C); low, medially depressed (*A. pasolinii* **sp. nov.**, *A. spielbergi* **sp. nov.**, *A. spiniger* **comb. nov.**, e.g. Figs. 2E, 3A). Ocularium with two low tubercles or high spines (most species). Areas of dorsal scutum moderately (*A. pasolinii* **sp. nov.**, *A. spielbergi* **sp. nov.**, *A. weyrauchi* **comb. nov.**, e.g. Figs. 2E, 3A) to densely tuberculate (most species, e.g. Fig. 2B, C). Area I undivided. Area III unarmed (*A. silvae* **sp. nov.**, *A. uniseriatus* **comb. nov.**, *A. weyrauchi* **comb. nov.**, e.g. Fig. 3H), armed with two tubercles (most species, e.g. Fig. 2C), or armed with two high spines (*A. pasolinii* **sp. nov.**, *A. spielbergi* **sp. nov.**, e.g. Fig. 2E). Posterior margin of DS small tuberculate (Fig. 2C), or armed with a pair of high tubercles (Fig. 3B) or a row of high tubercles. Coda elongate, with constriction in most species (Fig. 3D–F). Coxa III with two apophyses (execpt in *A. pomacocha* **sp. nov.** and *A. spielbergi* **sp. nov.**). Coxa IV reaching area III or sulcus IV (Fig. 3D–F). Coxa IV armed with an acute long tubercle in most species (Fig. 3H), or unarmed (*A. pasolinii* **sp. nov.**, *A. pomacocha* **sp. nov.**, *A. silvae* **sp. nov.**, *A. titschacki*, e.g. Fig. 3G). Femur IV shorter than dorsal scutum length in most species or longer (*A. tapacocha* **nom. nov.**, *A. spiniger* **comb. nov.**). Less than 10 MS C. Penis stylus thin. Penis VP thin (Figs. 12, 15).

Species composition. *Ayacucho bambamarca* (Roewer, 1957) **comb. nov.**; *Ayacucho inermis* (Roewer, 1957) **comb. nov.**; *Ayacucho glauberrochai* **sp. nov.**; *Ayacucho insignitus* (Roewer, 1956) **comb. nov.**; *Ayacucho pasolinii* **sp. nov.**; *Ayacucho pomacocha* **sp. nov.**; *Ayacucho querococha* **sp. nov.**; *Ayacucho roeweri* **nom. nov.**; *Ayacucho silvae* **sp. nov.**; *Ayacucho spielbergi* **sp. nov.**; *Ayacucho spiniger* (Roewer, 1957) **comb. nov.**; *Ayacucho tapacocha* **nom. nov.**; *Ayacucho titschacki* Roewer, 1949; *Ayacucho triarmatus* **nom. nov.**; *Ayacucho uniseriatus* (Roewer, 1959) **comb. nov.**; *Ayacucho vargasllosai* **sp. nov.**; *Ayacucho weyrauchi* (Roewer, 1952) **comb. nov.**

3.11. *Ayacucho bambamarca* (Roewer, 1957) comb. nov.

Figs. 2A, 7A, B, 12A, B, 28

Cajamarca bambamarca Roewer, 1957: 76 (desc.), fig. 33 (male femur IV); Kury 2003: 144 (cat.).

Cajamarca triseriata Roewer, 1957: 75 (desc.), fig. 32 (male femur IV); Kury 2003: 144 (cat.), **syn. n.**

Redescription. MALE: ***Measurements*** (*n*=7) DSW: 3.6–5.1 (5.1); DSL: 3.8–5.2 (5.2); CL: 1.5–1.7 (1.7). FIVL: 4.4–5.2 (4.6). ChL: 1.5–3.7 (3.6). ***Coloration*** (in ethanol): Predominantly yellowish. Dark spots on carapace. Areas I–IV, lateral and posterior margin of dorsal scutum and free tergites I–III more brownish. ***Dorsum***: (Fig. 2A) Alpha-type DSS. Anterior margin of dorsal scutum with median elevation, granules distributed throughout its length. Ocularium with a pair of spines and few granules. Carapace with scattered granules distributed throughout its length. Areas I–IV densely granulate; area I with a pair of median tubercles slightly larger than the surrounding granules; area II with a pair of small median tubercles, larger than that of area I. Areas III–IV with a pair of small tubercles. Posterior margin of dorsal scutum and free tergites I–III with a row of acuminate tubercles, the median larger than that on areas I–IV. Lateral margins of dorsal scutum with granules distributed throughout their length. ***Chelicerae***: (Fig. 2A) Swollen in large males (as in the holotype), similar to females in the small males. Segment I granulate. Segment II predominantly smooth, finger with one tooth. Segment III with two teeth. ***Pedipalpus***: Small granules distributed on the dorsal surface of the femur and patella. Trochanter with a large ventroapical setiferous tubercle. Femur with a ventrobasal setiferous tubercle; a row of six ventral setiferous tubercles, except at base and apex, larger in larger males. Tibia: prolateral

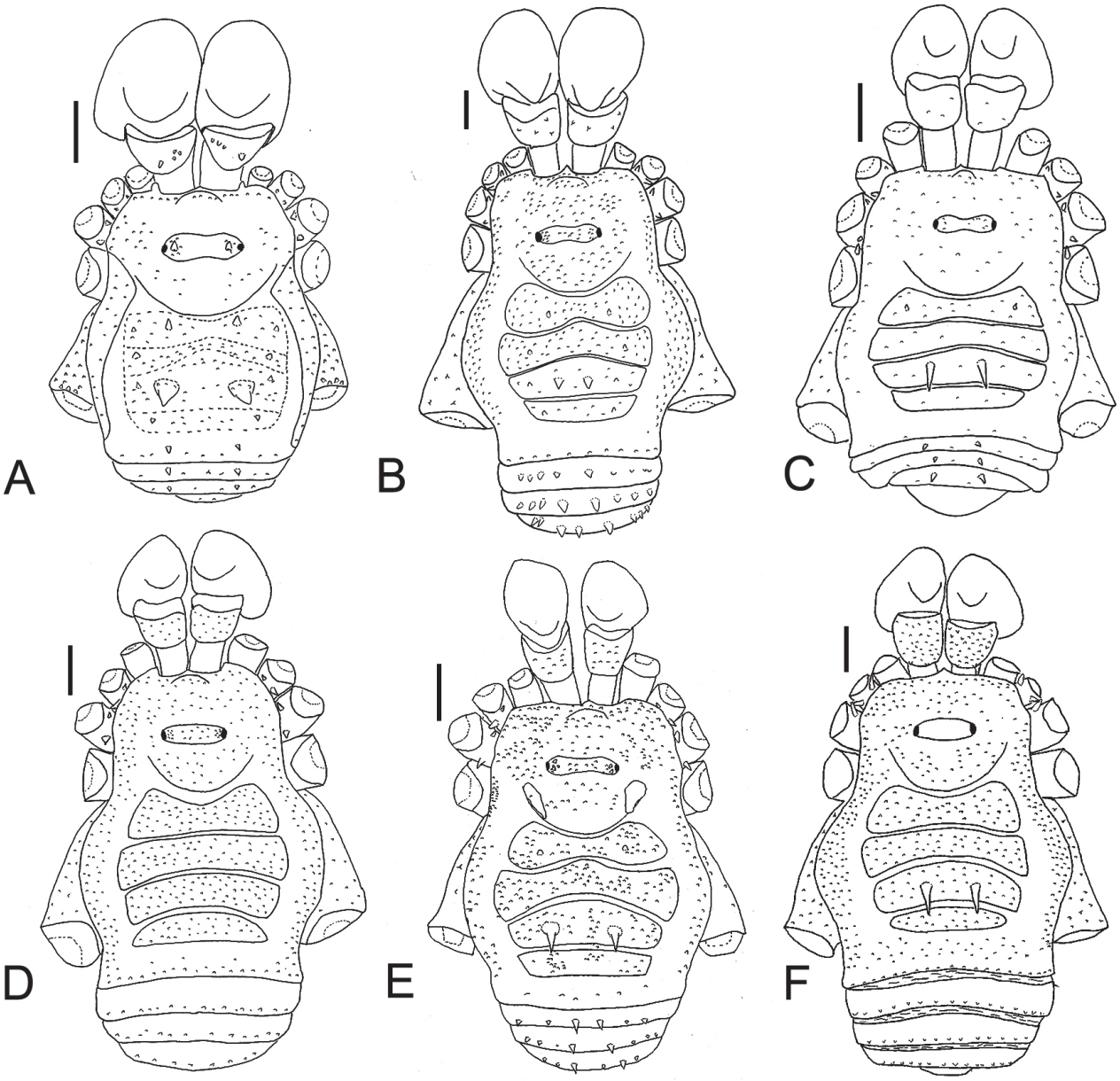

Figure 4. Habitus, dorsal of males of *Huancabamba* **gen. nov.** and *Incasarcus*. **A** *H. kubricki* **gen. et sp. nov.**; **B** *I. argenteus* Kury & Maury, 1998; **C** *I. dianae* Kury & Maury, 1998; **D** *I. ochoai* Kury & Maury, 1998; **E** *I. pictus* Kury & Maury, 1998; **F** *I. viracocha* Kury & Maury, 1998; Legend bars = 1 mm.

III, retrolateral iiIi. Tarsus: prolateral IIi, retrolateral iIiii. ***Venter***: Coxa I with a median row of six small tubercles. Coxae II–IV smooth. With three tiny tubercles apically between coxae II–III and III–IV. Smooth genital area. Free sternites with a row of small granules. Anal operculum with granules sparsely distributed throughout. ***Legs***: (Figs. 2A, 7A, B) Coxae II–III with a prolateral apophysis. Coxa IV with granules distributed throughout its surface, and a proapical apophysis with acuminate apex. Trochanters I–III smooth. Trochanter IV with dorsal granules and an apical retrodorsal acuminate tubercle. Femora I–II with granules scattered throughout their length; III densely granulate; with retro and prolateral rows of small acuminate tubercles; IV granulate; with a dorsal row of 7–9 (8) large acuminate tubercle, at to basal ⅔, growing apically; a retroventral row of 16–23 (23) large acuminate tubercles; a retroventral apical tubercle; a proventral row of 10–11 (11) large acuminate tubercles, at ⅔ of its length apically. Patellae I–III with granulation throughout their extension; IV with dorsoapical tubercles. Tibiae I–IV unarmed, with granules throughout their length. Tarsal formula: (*n*=8) 7, 12–13 (13), 6–7 (7), 7–8. ***Penis***: (Fig. 12A, B) VP subrectangular; distal margin slightly concave, with lateral projections; straight in lateral view. MS C1–C3 subapical long, slender and straight or slightly curved; MS A1 and MS B1 short and straight, placed next to MS C. Lateral sacs long and apically acuminate, with long T3-like microsetae. Stylus slightly thick, apically inflated, with tiny apical projections. — **FEMALE:** ***Measurements*** (*n*=4) DSW: 3.4–4.7; DSL: 3.8–5.0; CL: 1.2–1.8. FIVL: 3.7–4.5. ChL: 1.3–2.3. Chelicerae similar to that of small males. Presence of a proapical spine in femur of pedipalpus. Femora III–IV unarmed. Tarsal segmentation: (*n*=4) 7, 10–12, 7, 8–9.

Diagnosis. Similar to *Ayacucho triarmatus* **nom. nov.** and *A. weyrauchi* **comb. nov.** by possessing three rows of spiniform tubercles in male femur IV (Fig. 7A, B). It differs from *A. weyrauchi* **comb. nov.** for having more than four spiniform tubercles in retroventral row of femur IV (Fig. 7B); higher tubercles in free tergites (Fig. 2A); areas I–IV with a pair of median tubercles (Fig. 2A); dorsal process absent in the penis (Fig. 12A, B). Differs from *A. triarmatus* **nom. nov.** by possessing the retroventral row of spiniform tubercles along entire length of femur IV (Fig. 7B); apical margin of the ventral plate with conspicuous lateral projections (Fig. 12A, B); dorsal process absent (Fig. 12A, B).

Remarks. Considering that *Cajamarca bambamarca* and *C. triseriata* were described in the same work (Roewer 1957), we established the precedence of *C. bambamarca* (Art. 24.2 of ICZN). Regarding the type of *C. bambamarca*: Roewer designated one male as holotype and five males as paratypes, but the type material is preserved without separation in the same vial. Therefore, it is not possible to recognize with absolute certainty which of the males is the holotype. As a consequence of this, one of the males, whose femur IV most closely resembles the drawing in the original description, was separated as the holotype (although it is important to point out that the drawing does not faithfully represent any of the specimens).

Distribution. (Fig. 28) PERU. Cajamarca. Bambamarca; Cerro Macheipungo.

Material examined. ***Type material*:** Of *C. bambamarca*: **Holotype** ♂, 'PERU, Cajamarca, Bambamarca | 2,800m | 29/VI/1956, Weyrauch leg. (SMF RII 11649/32) – **Paratypes** 5 ♂, 3 ♀ 'ditto' (SMF RII 11649/32). Of *C. triseriata*: **Holotype** ♂ 'PERU, Cajamarca, Cerro Macheipungo | 4 km NE Bambamarca, 3,000m | 28/VI/1956, Weyrauch leg. (SMF RII 11647/30) – **Paratype** ♀ 'ditto' (SMF RII 11647/30).

3.12. *Ayacucho glauberrochai* sp. nov.

http://zoobank.org/9347FBBA-3028-4F71-9ACE-668A0FEB159B

Figs. 2B, 7C, D, 16D–F, 22A, B, 28

Description. MALE: ***Measurements*** (*n*=9) DSW: 3.3–3.4 (3.3); DSL: 4.6–5.2 (4.6); CL: 1.5–2.0 (1.5). FIVL: 5.0–5.3 (5.0). ChL: 1.7–3.0 (2.1). ***Coloration***: (Fig. 22A): Predominantly orange, with two longitudinal black spots in the lateral portion of areas I–IV. Lateral margins of the dorsal scutum yellowish, with small black spots. Posterior margin of the dorsal scutum, free tergites and legs predominantly black. Chelicerae and pedipalpus orange and reddish. ***Dorsum***: (Fig. 2B) Alpha-type DSS, with the constrictions weakly marked (when compared to most *Ayacucho* spp.). Anterior margin of carapace covered with granules in all its width. Ocularium unarmed, smooth or with a few granules in some individuals. Carapace with scattered granules distributed throughout its surface. Areas I–IV with one pair of small median tubercles; densely granulate. Posterior margin of dorsal scutum with a median row of 6–8 (6) acuminate tubercles (larger than tubercles of areas I–IV). Free tergites I–III with a row of tubercles similar to those on the posterior margin of dorsal scutum. ***Chelicerae***: (Fig. 2B) Swollen in some males (not swollen in the holotype). Segment I covered with granules throughout their length. Segment II predominantly smooth; finger with three teeth. Segment III with two teeth. ***Pedipalpus***: With granules sparsely distributed on the dorsal surface of the femur and patella. Trochanter with a distal ventral setiferous tubercle. Femur with a ventrobasal setiferous tubercle and a row of 5–6 (5) small ventromedial setiferous tubercles. Tibia: prolateral IIII, retrolateral IIII. Tarsus: prolateral IIi, retrolateral Iii. ***Venter***: Coxa I with scattered small tubercles; coxae II–III, predominantly smooth, with sparse granules; Coxa IV with denser granulation than coxae II–III. Genital area smooth. Free sternites I–IV and anal operculum with granules sparsely distributed. ***Legs***: (Figs. 2B, 7C, D) Coxa I with a prolateral apophysis; coxa II with a retrolateral and a prolateral apophysis. Coxa IV densely granulate. Trochanters I–IV with few granules, unarmed. Femora I–IV, with granules distributed throughout its length. Tarsal formula: (*n* = 9) 7–8 (7), 11, 7, 8. ***Penis***: (Fig. 16D–F) VP subrectangular; distal margin with a V-notch, and with conspicuous laterodistal projections; slightly curved in lateral view. MS C1–C7 subdistal long and curved; MS A1 long and straight; medially placed; MS B1 sub basal long and straight; MS D1 subdistal very short, dorsally placed. Lateral sacs long and apically acuminate; with long T3-like microsetae. Stylus apically robust and with projections. Dorsal process absent. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=10) DSW: 3.5–4.0; DSL: 4.5–5.2; CL: 1.6–1.8. FIVL: 4.7–5.6. ChL: 1.7–2.1. (Fig. 22B) Chelicerae not swollen. Strongly similar to small males. Tarsal segmentation: (*n*=10) 6, 10–11, 7, 8.

Diagnosis. Similar to *Ayacucho pomacocha* **sp. nov.**, *A. silvae* **sp. nov.**, *A. titschacki* and *A. vargasllosai* **sp. nov.** in the following combination of characteristics: dorsal scutum densely granulate; ocularium and areas I–IV of DS unarmed or armed with tiny tubercles, slightly greater than granules; posterior margin of DS and free tergites I–III with median rows of acuminate tubercles (Fig. 2B); femur IV of males without strong armature (except in ventral surface of femur IV in *A. silvae* **sp. nov.**, Fig. 7C, D). It differs from the four previously mentioned species in the following combination of characteristics: DSS with weakly marked constrictions (Fig. 2B); ocularium unarmed and smooth or with a few granules (Fig. 2B); male femur IV unarmed (unlike *A. silvae* **sp. nov.**, Fig. 7C, D); and penis VP subrectangular with a V-notch on distal margin (Fig. 16D, F).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the Brazilian filmmaker, actor and writer Glauber de Andrade Rocha (1939–1981).

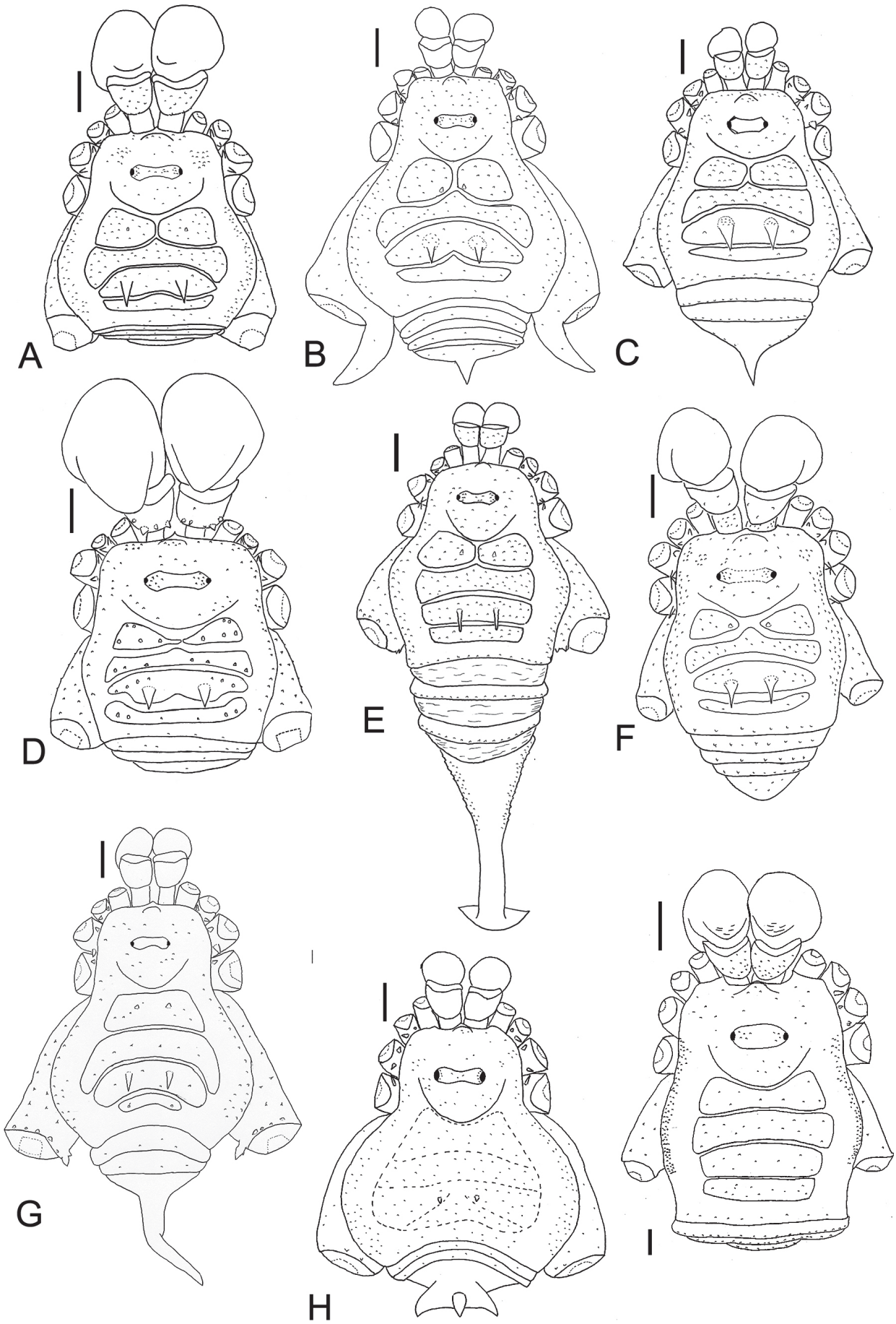

Figure 5. Habitus, dorsal of *Metasarcus*. **A** *M. beni* **sp. nov.**, male; **B** *M. bergmani* **sp. nov.**, male; **C** *M. bolivianus* Roewer, 1913, female; **D** *M. clavifemur* (Roewer, 1929), male; **E** *M. fellinii* **sp. nov.**, male; **F** *M. kurosawai* **sp. nov.**, male; **G** *M. limachii* **sp. nov.**, male; **H** *M. trispinosus* **sp. nov.**, male; **I** *M. vacafloresae* **sp. nov.**, male; Legend bars = 1 mm.

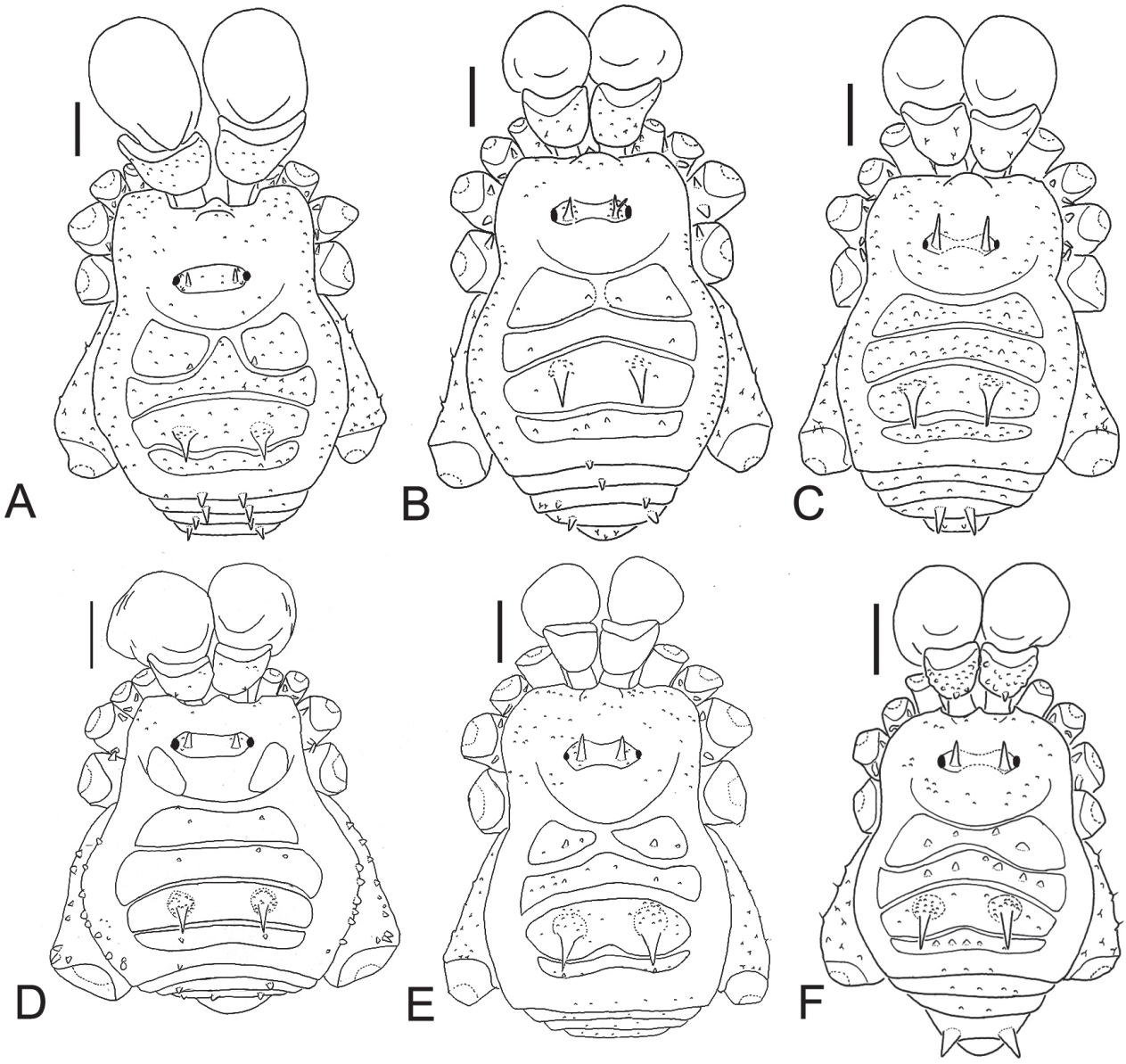

Figure 6. Habitus, dorsal of males of *Lumieria* **gen. nov.** and *Tschaidicancha*. **A** *L. antonionii* **gen. et sp. nov.**; **B** *L. woodyalleni* **gen. et sp. nov.**; **C** *T. chaplini* **sp. nov.**; **D** *T. joseochoai* **sp. nov.**; **E** *T. scorsesei* **sp. nov.**; **F** *T. weyrauchi* Roewer, 1957; Legend bars = 1 mm.

Distribution. (Fig. 28) PERU. Huancavellica. Huancavellica, Quebrada Potreros.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Huancavellica, Huancavellica, Quebrada Potreros | 12º46′10.7″S 75°01′02.5″W | 28/IV/2011, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUBI) – **Paratypes** 1 ♂, 5 ♀, 'ditto' (MUBI); **Paratypes** 5 ♂, 11 ♀, 'ditto' (MZSP 36974); **Paratypes** 2 ♂, 5 ♀, 'ditto' (MUSM).

3.13. *Ayacucho inermis* (Roewer, 1957) comb. nov.

Figs. 2C, 7E, F, 12C, D, 28

Pinocchio inermis Roewer, 1957: 70 (desc.), fig. 3 (male coxa–patella IV).

Palcares inermis: Kury 2003: 145 (cat., syst.).

Redescription. MALE: ***Measurements*** (*n*=1) DSW: 2.8; DSL: 3.2; CL: 1.0. FIVL: 2.0. ChL: 1.2. ***Coloration*** (in ethanol): Uniformly yellowish. In the original description: rusty-yellow body, dorsally darker than ventrally; legs rusty-yellow, slightly blackish. ***Dorsum***: (Fig. 2C) Alpha-type DSS, with long coda. Anterior margin densely covered with granules, with median elevation. Ocularium with a pair of spines; densely granulate. Carapace densely granulate at lateral and posterior regions. Areas I–IV densely covered with granules; I unarmed; II–IV with two pairs of small paramedian tubercles, slightly larger than the granules. Posterior margin of dorsal scutum with a row of acuminate and scattered tiny tubercles. Free tergites I–III with a row of large acuminate tubercles, much larger than tubercles of the areas of dorsal scutum and interspersed with small tubercles. Lateral margins of dorsal scutum densely covered with granules. ***Chelicerae***: (Fig. 2C) Similar to the female. Segment I

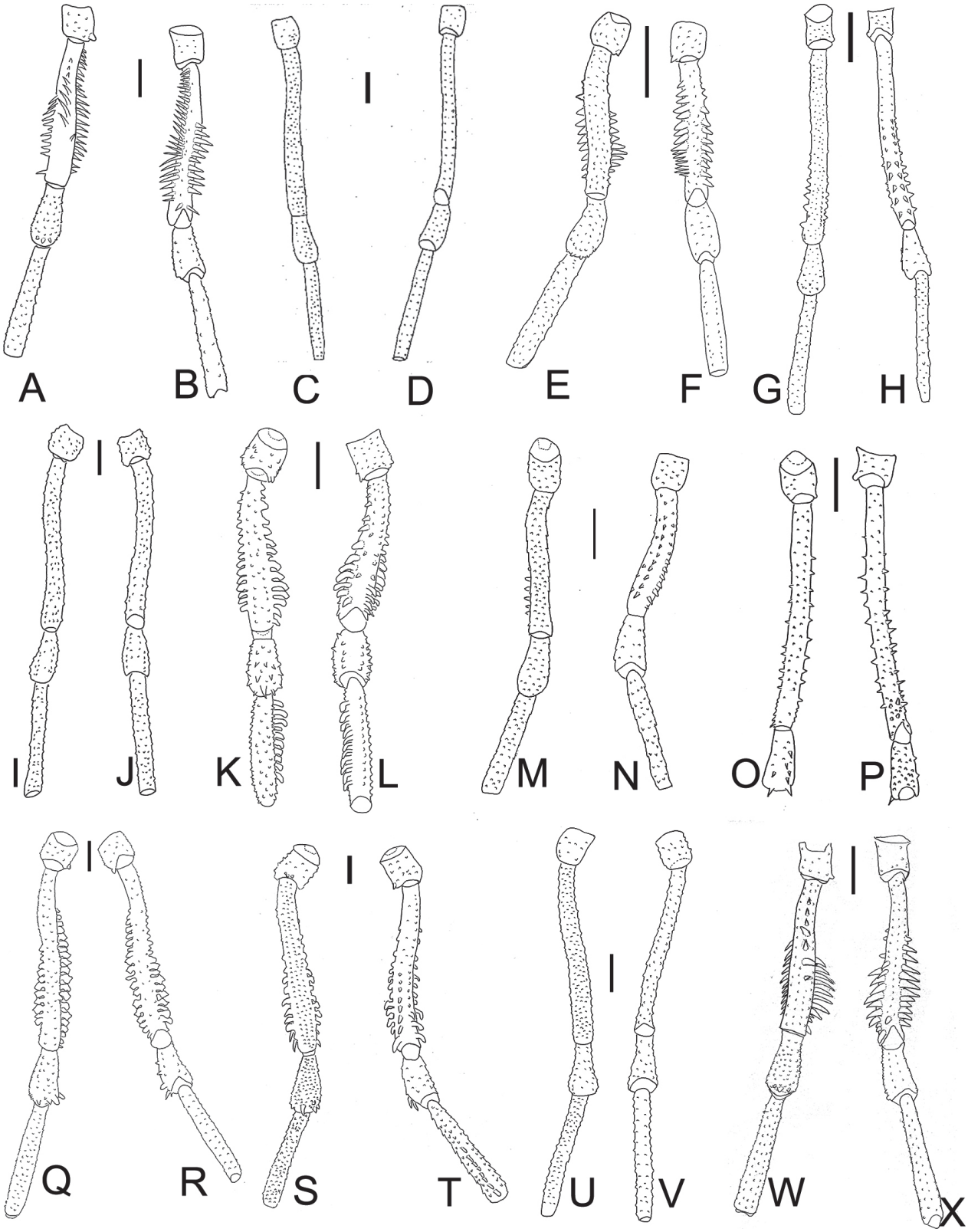

Figure 7. Male trochanter–tibia IV of *Ayacucho*, dorsal and ventral view, respectively. **A**–**B** *A. bambamarca* (Roewer, 1957) **comb. nov.**; **C**–**D** *A. glauberrochai* **sp. nov.**; **E**–**F** *A. inermis* (Roewer, 1957) **comb. nov.**; **G**–**H** *A. pasolinii* **sp. nov.**; **I**–**J** *A. pomacocha* **sp. nov.**; **K**–**L** *A. querococha* **sp. nov.**; **M**–**N** *A. silvae* **sp. nov.**; **O**–**P** *A. spielbergi* **sp. nov.**; **Q**–**R** *A. spiniger* (Roewer, 1957) **comb. nov.**; **S**–**T**: *A. tapacocha* **nom. nov.**; **U**–**V** *A. titschacki* Roewer, 1949; **W**–**X**: *A. triarmatus* **nom. nov.**; Legend bars = 1 mm.

densely granulate. Segment II with granules with a much lower density than on segment I; four teeth on finger. Segment III with two teeth. ***Pedipalpus***: Trochanter with a ventroapical tubercle. Femur with a ventrobasal tubercle; a row of three small ventral tubercles, smaller than the ventrobasal tubercle. Tibia: prolateral IIi, retrolateral iIi. Tarsus: prolateral IIi, retrolateral iIii. ***Venter***: Coxa I with a middle row of four small tubercles. Coxae II–IV dense-

ly covered with granules. The area between coxae II–III and III–IV with a small tubercle at the apex. Smooth genital area. Free sternites with a row of small granules. Anal operculum covered with granules. ***Legs***: (Figs. 2C, 7E, F) Coxae I–II with a prolateral apophyses; III unarmed; IV densely granulate throughout its length, with an apical spiniform apophysis. Trochanters I–IV granulate; IV with a retroapical acuminate tubercle. Femora I–III with granules scattered throughout their extension; IV densely granulate; a retroventral row of 15 large acuminate tubercles throughout its length except at the base and apex; a proventral row of 10–12 large acuminate tubercles (tiny at base) throughout its length, with variation in number of tubercles between right and left legs in the same specimen. Patellae I–IV densely granulate. Tibiae I–IV densely granulate. Tarsal segmentation (*n*=1) 3, 8, 5–6, 6. ***Penis***: (Fig. 12C, D) VP subrectangular with sides diverging towards the apex; distal margin straight; slightly sinuous on lateral view. MS C1–C3 subapical short and straight; MS A1 short and straight; placed more dorsally than MS C. Lateral sacs long, robust and apically blunt; with short T3-like microsetae. Stylus slightly thick, with long apex and small apical projections. Dorsal process present. — **FEMALE:** ***Measurements*** (*n*=1) DSW: 3.2; DSL: 3.6; CL: 1.2. FIVL: 2.3. ChL: 1.5. Female very similar to male. Chelicerae of similar size. Femur IV with a retroventral and a proventral rows of eight and 11 tubercles respectively, being much smaller than the tubercles in males and tubercles in proventral row larger than that of the retroventral row. Tarsal segmentation: (*n*=1) 5, 8, 6, 6.

Diagnosis. Resembles *Ayacucho spiniger* **comb. nov.** because two ventral rows of tubercles in femur IV (Fig. 7F). Differs from *A. spiniger* **comb. nov.** because femur IV with spiniform tubercles (Fig. 7F); ventral plate of penis without lateral projections; VP with short macrosetae; lateral sacs with short microsetae; dorsal process shorter than the stylus (Fig. 12C, D).

Distribution. (Fig. 28) PERU. La Libertad. Huamachuco.

Material examined. ***Type material*: Holotype** ♂, 'PERU, La Libertad, Huamachuco, 3,200m a.s.l. without date, Weyrauch leg. (SMF RII 11393/23) – **Paratype** ♀, 'ditto' (SMF RII 11393/23).

3.14. *Ayacucho insignitus* (Roewer, 1956) comb. nov.

Figs. 2D, 28

Cargaruaya insignita Roewer, 1956: 439 (desc.), figs. 11–12 (oculariu m), 13 (female pedipalp). Kury 2003: 144 (cat.).

Redescription. FEMALE: ***Measurements*** (*n*=1) DSW: 4.0; DWL: 4.5; CL: 1.5. FIVL: 4.2. ChL: 1.5. ***Coloration*** (in ethanol): Predominantly yellowish with dark spots at carapace, areas, lateral and posterior margin of the dorsal scutum and free tergites. ***Dorsum***: (Fig. 7D) Alpha-type DSS, with long and wide coda. Anterior margin with median elevation with granules sparsely distributed. Ocularium with a pair of large spines, with few scattered granules. Carapace with granules distributed on lateral and posterior regions. Areas I–IV with granules sparsely distributed, with a pair of small tubercles. Lateral margins of dorsal scutum with granules irregularly distributed throughout its length. Posterior margin of dorsal scutum and free tergite I with a row of tiny tubercles with base wider than its height, interspersed with small granules. Free tergites II–III with a row of acuminate tubercles, larger than those of tergite I and with smaller granules interspersed. DSS: alpha, with coda larger than mid-bulge. ***Chelicerae***: (Fig. 7D) Not swollen. Segment I densely granulate; segment II smooth; four teeth on finger. Segment III with four teeth. ***Pedipalpus***: Small granules distributed on dorsal surface of femur. Trochanter with a ventroapical setiferous tubercle. Femur with a ventrobasal setiferous tubercle; a ventral row of six small setiferous tubercles, except at apex and base, smaller than the ventrobasal tubercle; one tall proapical tubercle. Tibia: prolateral IIi, retrolateral iIIii. Tarsus: prolateral II, retrolateral iIii. ***Venter***: Coxa I with four tubercles. Coxae II–IV with granules sparsely distributed; with two small tubercles at the apical region between the coxae III–IV. Genital area smooth. Free sternites with a row of small granules. Anal operculum with granules sparsely distributed throughout its surface. ***Legs***: (Fig. 7D) Coxae I–III with a prolateral and one retrolateral apophyses; IV with few granules distributed throughout its surface; an apical spiniform apophysis. Trochanters I–IV with few granules; IV with a small blunt retroapical tubercle. Femora I–IV with granules throughout their length, without prominent tubercles. Patellae I–IV with sparse granulation. Tarsal segmentation: (*n*=1): 7, 12, 8, 8. — **MALE:** unknown.

Diagnosis. It differs from females of *Ayacucho uniseriatus* **comb. nov.** and *A. weyrauchi* **comb. nov.** because it has one pair of median tubercles in areas I–IV; from *A. inermis* **comb. nov.**, *A. spiniger* **comb. nov.** and *A. quererococha* **sp. nov.** because it has sparser granulation on carapace, and it is larger than *A. inermis* **comb. nov.**; *A. bambamarca* **comb. nov.** and *A. tapacocha* **nom. nov.** because it has smaller tubercles present in the posterior margin of dorsal scutum and free tergite I–II; and *A. roeweri* **nom. nov.** because it does not present a huge median spine in free tergites I–II. (Fig. 7D).

Remarks. This species is known only by the female holotype, which ends up being a taxonomic problem, since it is not uncommon for females of *Ayacucho*, whose males are clearly morphologically distinct, to be very similar to each other. This similarity between the females justifies the not so much informative diagnosis (see above). Geographically, *A. insignitus* **comb. nov.** occurs near to three other species of the genus: *A. inermis* **comb. nov.**, *A. triarmatus* **nom. nov.** and *A. weyrauchi* **comb. nov.** (Fig. 28). The female of *A. triarmatus* **nom. nov.** is unknown and the type locality of this species is closest to the type

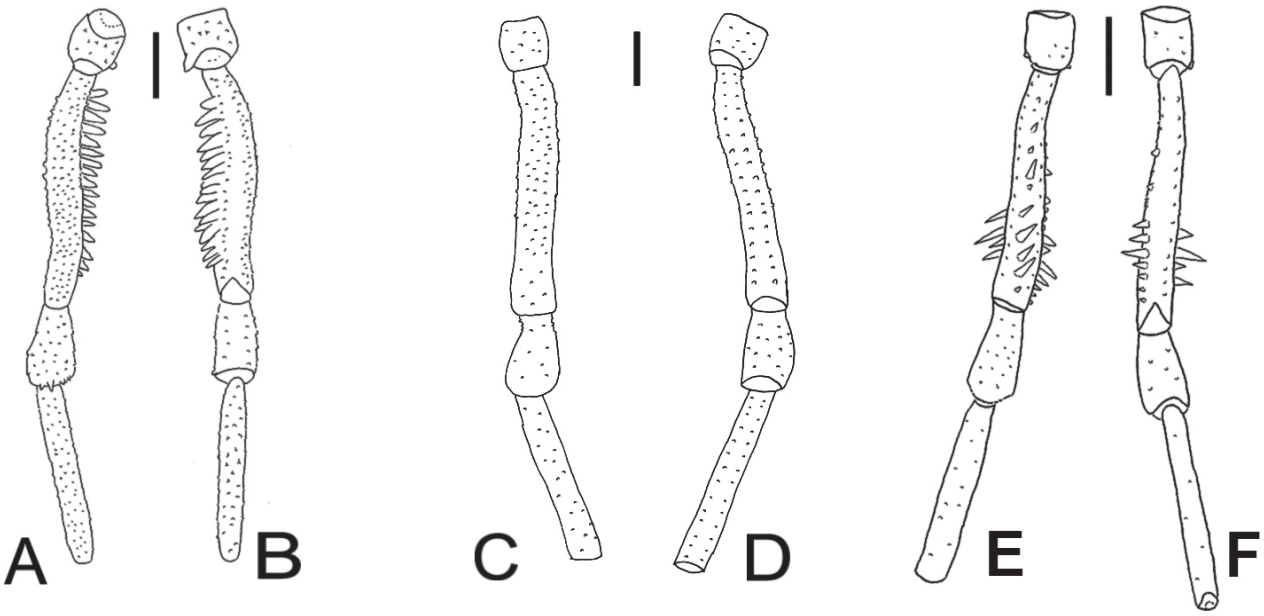

Figure 8. Male trochanter–tibia IV of leg IV of *Ayacucho*, dorsal and ventral view, respectively. **A**–**B** *A. uniseriatus* (Roewer, 1959) **comb. nov.**; **C**–**D** *A. vargasllosai* **sp. nov.**; **E**–**F** *A. weyrauchi* (Roewer, 1952) **comb. nov.**; Legend bars = 1 mm.

locality of *A. insignitus* **comb. nov.** It would be possible that *A. insignitus* **comb. nov.** was tentatively pointed as the female of *A. triarmatus* **nom. nov.**, although the male of *A. triarmatus* **nom. nov.** has very minute armature in areas I–IV of the DS (compared to *A. insignitus* **comb. nov.**). Furthermore, *A. insignitus* **comb. nov.** has subtle differences in relation to females of *A. inermis* **comb. nov.** and *A. weyrauchi* **comb. nov.** Therefore, it is not possible to point out with sufficient certainty that *A. insignitus* **comb. nov.** is synonymous with one of these three species and, therefore, we prefer the more conservative option of keeping the species valid, until further evidence (e.g. collection of males from the type locality) can clarify this issue.

Distribution. (Fig. 28) PERU. La Libertad. Hacienda Llaguén. Rejo Cargaruay forest.

Material examined. *Type material*: Holotype ♀, ‘PERU, La Libertad. Hacienda Llaguén, Rejo Cargaruay forest, 2,650m a.s.l., 14/XII/1952, Koepcke leg. (SMF RII 9706)

3.15. *Ayacucho pasolinii* sp. nov.

http://zoobank.org/189A9470-DA77-42AD-8F09-3E19390856D9

Figs. 2E, 7G, H, 12E, F, 22A, 28

Description. MALE: ***Measurements*** (*n*=1) DSW: 3.2; DSL: 3.6; CL: 1.2. FIVL: 5.4. ChL: 1.0. ***Coloration***: (Fig. 22G) Carapace, chelicerae, pedipalpus, legs and central part of areas of dorsal scutum brown; darker spots behind and laterally to the ocularium. Lateral parts and tubercles of areas of DS and lateral margins of DS with yellowish spots. Spines of area III black. Free tergites I–III yellowish. ***Dorsum***: (Fig. 2E) Alpha-type DSS, with shallower constrictions (especially constriction II, almost faint). Anterior margin of carapace with median elevation, almost smooth, with very few granules scattered. Ocularium with a median depression little sharped; a pair of spines, with granules in high density in the base. Carapace with few granules concentrated in the lateral regions. Areas I–II and IV with few granules scattered; III with greater quantity of granules than other scutal areas; I–II with a median pair of small tubercles; III totally granulate, with two spines, directed backwards, located at the highest point of the integument; IV with a median pair of small tubercles. Posterior margin of DS smooth with a pair of small median tubercles. Free tergites I–II without granules, with two–three median tubercles. Free tergite III with a pair of large median acuminate tubercles and a pair of smaller lateral acuminate tubercles. Lateral margins of DS with few granules covering its entire length. ***Chelicerae***: (Fig. 2E) Slightly swollen. Segment I densely covered with granules. Segment II smooth, with four teeth. Segment III with three teeth. ***Pedipalpus***: dorsal region of the femur, tibia and patella granular. Trochanter with two ventroapical setiferous tubercles. Femur with a row of five ventral setiferous tubercles, except in the apical portion. Tibia: retrolateral iIII, prolateral IiII. Tarsus: retrolateral Iiii, prolateral Iiii. ***Venter***: Coxae I–IV densely covered with granules and small tubercles throughout their surface. Genital area, anal operculum and free sternites granulate. ***Legs***: (Figs. 2E, 7G, H) Coxae I–II each one with a prolateral and a retrolateral apophysis; III with a prolateral apophysis, fused with retrolateral apophysis of coxa II; IV smooth. Trochanters I–IV unarmed and few granulate. Femora I–II unarmed and with small granules; III with a ventral retrobasal row of three tubercles; IV with dense granulation; a retrolateral row of eight–nine acuminate tubercles, growing apically occupying the distal ⅓; a prolateral row of seven acuminate tubercles,

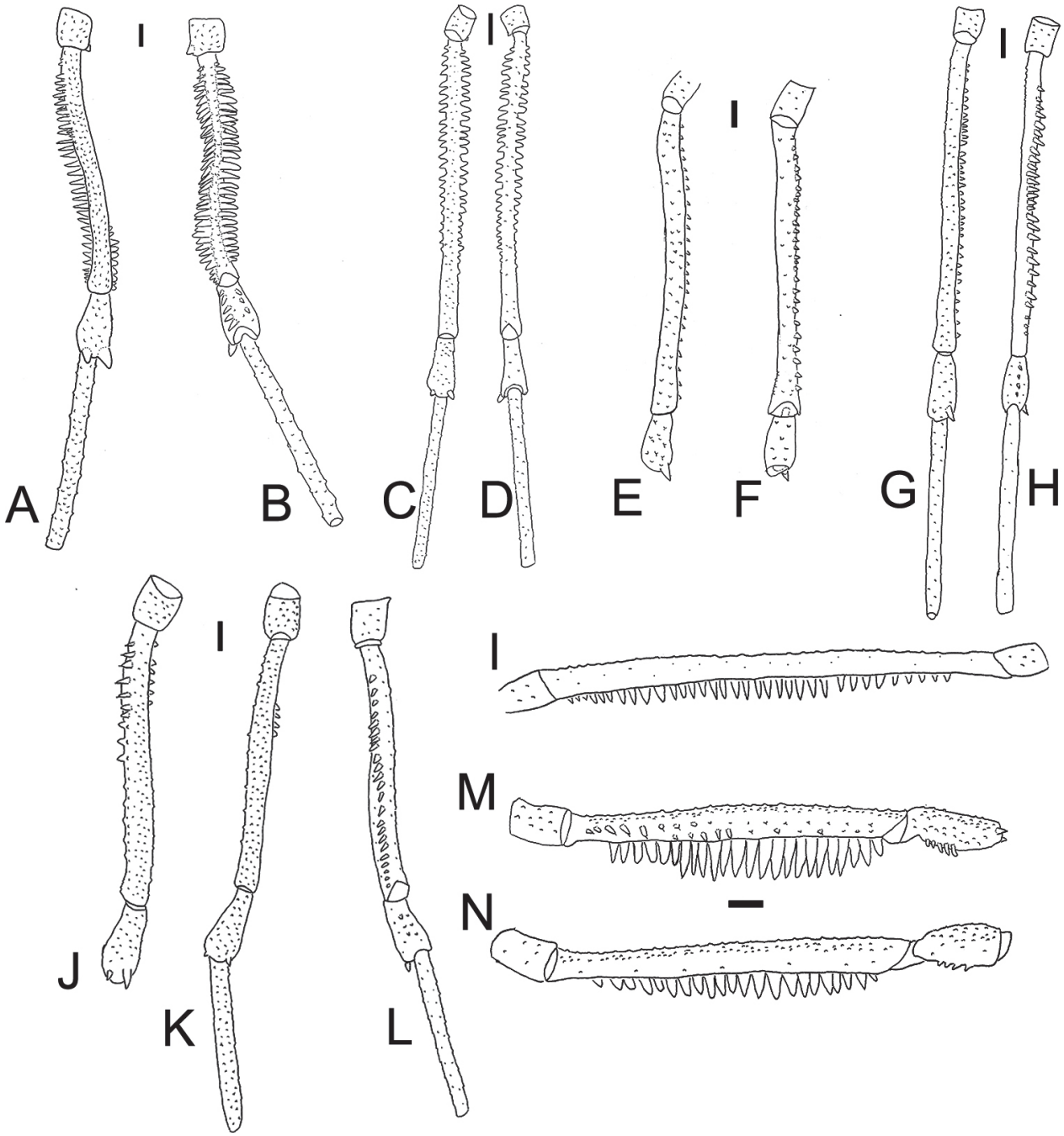

Figure 9. Male trochanter–patella/tibia IV of *Incasarcus*. **A**–**B** Trochanter–tibia IV of *I. argenteus* Kury & Maury, 1998, dorsal and ventral view, respectively; **C**–**D** Trochanter–tibia IV of *I. dianae* Kury & Maury, 1998, dorsal and ventral view, respectively; **E**–**F** Trochanter–tibia IV of *I. pictus* Kury & Maury, 1998, dorsal and ventral view, respectively; **G**–**H** Trochanter–tibia IV of *I. viracocha* Kury & Maury, 1998, dorsal and ventral view, respectively; **I** Trochanter–patella of *I. viracocha*, lateral view; **J** Trochanter–patella of *I. ochoai* Kury & Maury, 1998, large male, dorsal view; **K**–**L** Trochanter–tibia of *I. ochoai*, small male, dorsal and ventral view, respectively; **M** Trochanter–patella of *I. ochoai*, large male, lateral view; **N** Trochanter–patella of *I. ochoai*, small male, lateral view; Legend bars = 1 mm.

smaller than those in retrolateral row, covering the distal ⅓; a prodorsal row of eight small tubercles, extending over the distal ⅓; two ventral rows of nine acuminate tubercles each one on the distal half. Patellae I–III unarmed, with few granules; IV granular, with three tiny dorsoapical acuminate tubercles. Tibiae I–IV unarmed and densely granular. Tarsal segmentation: (n=1) 7, 13, 10, 11. ***Penis***: (Fig. 12E, F) VP rectangular; distal margin straight; sinuous in lateral view. MS C1–C4 apical long and slightly curved; MS A1–A2 median long and straight (shorter than MS C); MS B1 basal (near the lateral sacs) short and straight. Lateral sacs long, robust and apically blunt, with long T3-like microsetae. Stylus apically inflated, with slight ventral projection and small projections at the apex. Dorsal process long, cylindrical and apically acuminated. Promontory straight. — **FEMALE:** ***Measurements*** (*n*=2) DSW: 3.1; DSL: 3.7–4.0; CL: 1.5–1.7. FIVL: 5.5–5.7. ChL: 1.5–1.6. Chelicerae slightly small-

er than in male. Femur IV armed, but tubercles smaller than in males. Tarsal segmentation: (n=2) 7, 12–13, 9–10, 10–11.

Diagnosis. It differs from other species of the genus by the set of following characteristics: dorsal scutal area III with a pair of long spines (Fig. 2E; also present in *A. spielbergi* **sp. nov.**); longer legs (ratio between FIVL and DSL greater than 1; 1.5 in *A. pasolinii* **sp. nov.**); yellowish spots on the lateral margins of the DS, lateral portions and tubercles of the scutal areas I–IV (Fig. 22A).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the Italian writer and filmmaker Pier Paolo Pasolini (1922–1975).

Distribution. (Fig. 28) PERU. Pasco. Oxapampa, Parque Nacional Yanachaga-Chemillén.

Material examined. ***Type material*: Holotype** ♂, ‘ PERU, Pasco, Oxapampa, Parque Nacional Yanachaga-Chemillén, 10º32′42.1″S 75°21′24.4″W, 22/IV/2011, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUBI) – **Paratypes** 2 ♀, ‘ditto’ (MZSP 36993).

3.16. *Ayacucho pomacocha* sp. nov.

http://zoobank.org/55D5469C-44BE-46F2-B85D-ACD6A4B30967

Figs. 2F, 7I, J, 15 A–C, 22C, D, 28

Description. MALE: ***Measurements*** (*n*=12). DSW: 3.2–4.0 (3.2); DSL: 4.7–5.3 (4.7); CL: 1.7–1.0 (1.7); FIVL: 4.5–5.0 (4.5); ChL: 1.2–3.5 (2.2). ***Coloration***: (Fig. 22C) Dorsal scutum ranging from brown to yellowish-brown, with darker regions on the lateral margins of carapace and scutal areas of the DS and others lighter, as bands. Lateral regions of scutal areas darker than the center, or completely brownish. Posterior margin of DS and free tergites brown. Legs dark brown. Chelicerae and pedipalpus yellow. ***Dorsum***: (Fig. 2F) Alpha-type DSS. Anterior margin of the dorsal scutum completely covered with granules, with median elevation. Ocularium totally covered with granules of equal size (a single specimen [on MZSP], has a pair of larger tubercles). Areas I–IV with a pair of slightly larger median tubercles. Posterior margin of DS and free tergites I–III with rows of tubercles larger than those of areas I–IV. ***Chelicerae***: (Fig. 2F) Equal to the females (including the holotype), swollen in a single specimen. Segment I covered with granules. Segment II predominantly smooth, with a few hairs on the frontal surface; finger with two teeth. Segment III with two teeth. ***Pedipalpus***: With very small granules sparsely distributed on the dorsal surface of the femur and the patella. Trochanter with a ventrodistal setiferous tubercle. Femur with a ventrobasal setiferous tubercle; a row of five small ventral setiferous tubercles, except at the ends of the article. Some males (*n*=3) have (at least in one of pedipalpus) a proapical setiferous tubercle, present in all females, but smaller. Tibia: prolateral IiIi, retrolateral iiIi. Tarsus: prolateral IIi, retrolateral Iii. ***Venter***: Coxae I–II with granules in a row; Coxae III–IV with granules sparsely distributed. Smooth genital area. Free sternites I–IV and anal operculum with rows of small granules. ***Legs***: (Figs. 2F, 7I, J) Coxae I–II with a retrolateral and a prolateral apophysis; coxa III with a prolateral apophysis; coxa IV with granules distributed throughout its length. Trochanters I–IV with few granules, unarmed. Femora I–III, with granules distributed throughout their length; femur IV with granules densely distributed throughout its length, except for a small ventroapical strip without granules. Patellae I–IV with granules distributed predominantly in the dorsal and lateral regions, scarcer ventrally. Tibiae I–IV with granules throughout their length. Tarsal segmentation: (*n*=12) 7, 11–12 (11), 7, 7–8 (8). ***Penis***: (Fig. 17A–C) VP hexagonal in dorsal view; subrectangular in ventral view, with distal half larger than basal half; distal margin straight. MS C1–C9 subapical, long and curved; MS A1 median placed, long and straight (smaller than MS C); MS B1 sub basal, long and straight (longer than MS A); MS D1 very short, dorsally placed, near to MS A. Lateral sacs short, apically tapered; with long T3-like microsetae. Stylus apically robust, with a large dorsal projection, and several small apical projections. Dorsal process absent. Promontory slightly convex. — **FEMALE:** ***Measurements*** (*n*=12) DSW: 3.5–4.0; DSL: 4.8–5.2; CL: 1.7–1.9. FIVL: 4.5–5.0. ChL: 1.9–2.0. (Fig. 22D) Chelicerae slightly smaller than those of smaller males. Presence of a proapical setiferous tubercle in femur of pedipalpus (also seen in some males), higher than the tubercles of the ventral femur. Femur IV slightly thinner, with smaller granules. Tarsal segmentation: (*n*=12) 6, 11–12, 7, 8.

Diagnosis. Similar to *Ayacucho glauberrochai* **sp. nov.**, *A. silvae* **sp. nov.**, *A. titschacki* and *A. vargasllosai* **sp. nov.** in the following combination of characteristics: dorsal scutum densely granulate; ocularium and areas I–IV of DS unarmed or armed with tiny tubercles, slightly greater than granules; posterior margin of DS and free tergites I–III with median rows of acuminate tubercles (Fig. 2F); femur IV of males without strong armature (Fig. 7I, J; except in ventral surface of femur IV in *A. silvae* **sp. nov.**). It differs from the previously mentioned species in the following combination of characteristics: ocularium unarmed and densely granulate (Fig. 2F); male femur IV unarmed (unlike *A. silvae* **sp. nov.**; Fig. 7I, J); penis VP hexagonal in dorsal view with straight distal margin; 9 pairs of subapical MS C (Fig. 15A–C).

Derivatio nominis. The specific epithet, a noun in apposition, in reference to the type locality, Laguna Pomacocha (Junín, Peru), a beautiful pond surrounded by grass and large rocks that harbor this species.

Distribution. (Fig. 28) PERU. Junín. Laguna Pomacocha.

Material examined. ***Type material*: Holotype** ♂, ‘ PERU, Junín, Laguna Pomacocha, 4,500m a.s.l., 11º46′36″S, 75º14′07″W, 27/IV/2011, R.

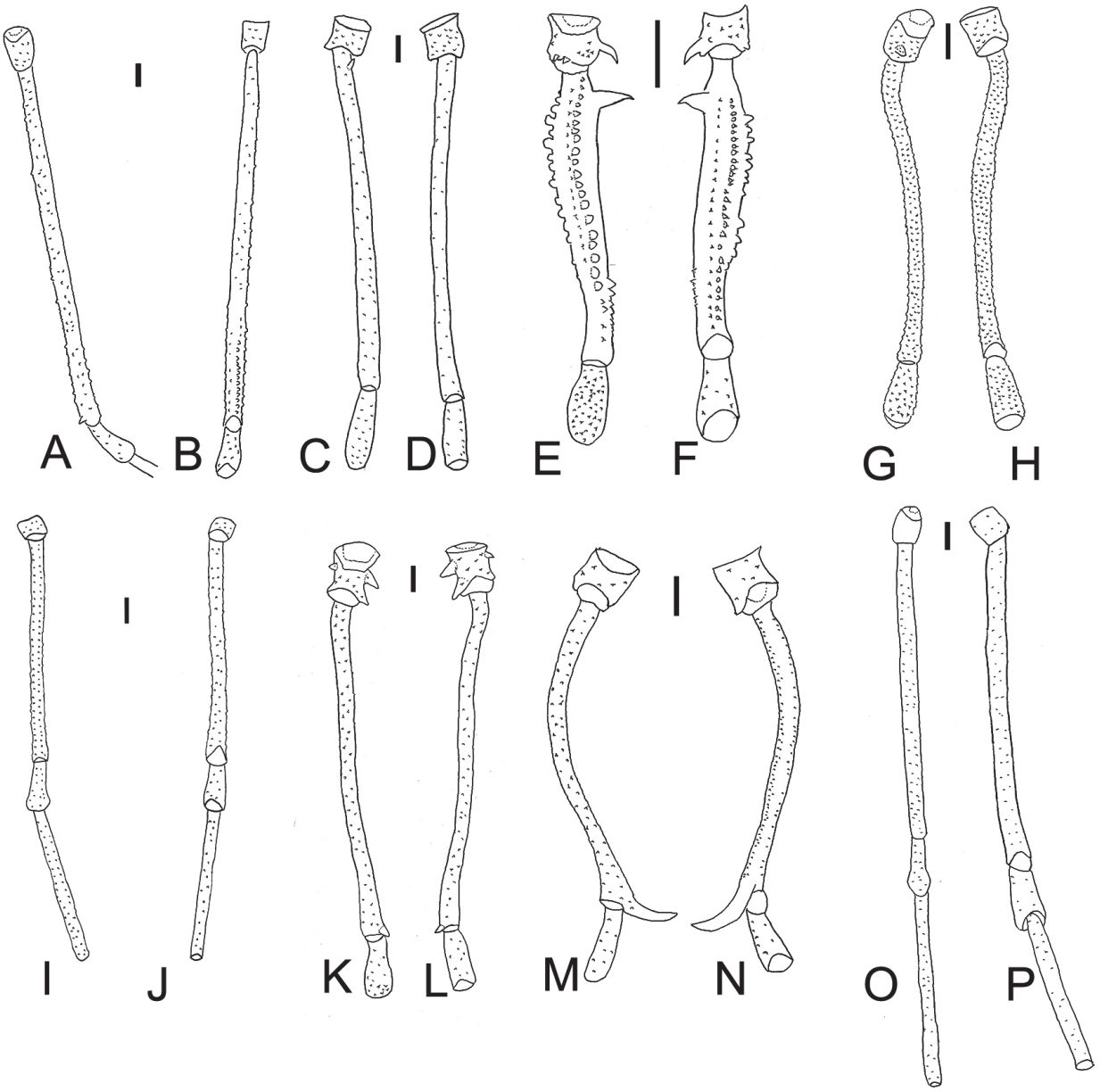

Figure 10. Male trochanter–patella/tibia IV of *Metasarcus*, dorsal and ventral view, respectively. **A–B** *M. beni* **sp. nov.**; **C–D** *M. bergmani* **sp. nov.**; **E–F** *M. clavifemur* (Roewer, 1929); **G–H** *M. fellinii* **sp. nov.**; **I–J** *M. kurosawai* **sp. nov.**; **K–L** *M. limachii* **sp. nov.**; **M–N** *M. trispinosus* **sp. nov.**; **O–P** *M. vacafloresae* **sp. nov.**; Legend bars = 1 mm.

Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUBI) – **Paratypes** 2 ♂, 3 ♀, 'ditto' (MUBI); **Paratypes** 3 ♂, 3 ♀, 'ditto' (MUSM); **Paratypes** 6 ♂, 6 ♀, 'ditto' (MZSP 36970);

3.17. *Ayacucho querococha* sp. nov.

http://zoobank.org/FDA70238-4039-4FF9-B280-6DBE0943BD93

Figs. 2G, 7K, L, 15 D–F, 28

Description. MALE: ***Measurements*** (*n*=3) DSW: 3.4–4.1 (4.0); DSL: 4.2–5.0 (4.8); CL: 1.4–1.7 (1.7). FIVL: 3.3–4.0 (3.5). ChL: 1.7–2.8 (2.4) ***Coloration*** (alive): Yellowish with black spots on carapace, lateral part of the scutal areas I–IV, lateral margins of dorsal scutum and legs. ***Dorsum***: (Fig. 2G) Alpha-type DSS. Anterior margin of DS with median elevation with granules densely distributed. Granular ocularium, with two pairs of small tubercles taller than others. Carapace with granules densely distributed. Areas I–IV densely granulate; each one with a pair of median tubercles. Lateral margins of dorsal scutum with granules distributed throughout their length. Posterior margin of dorsal scutum and free tergites I–III with a row of acuminate tubercles, larger than those tubercles of areas of dorsal scutum, interspersed by small granules. ***Chelicerae***: (Fig. 2G) Swollen in large males (Swollen in holotype). Slightly larger than females' chelicerae in smaller males. Segment I granulate. Segment II predominantly smooth. Segment III with one tooth. ***Pedipalpus***: Small granules distributed on the dorsal surface. Trochanter with a ventrodistal setiferous tubercle. Femur with a ventrobasal setiferous tubercle;

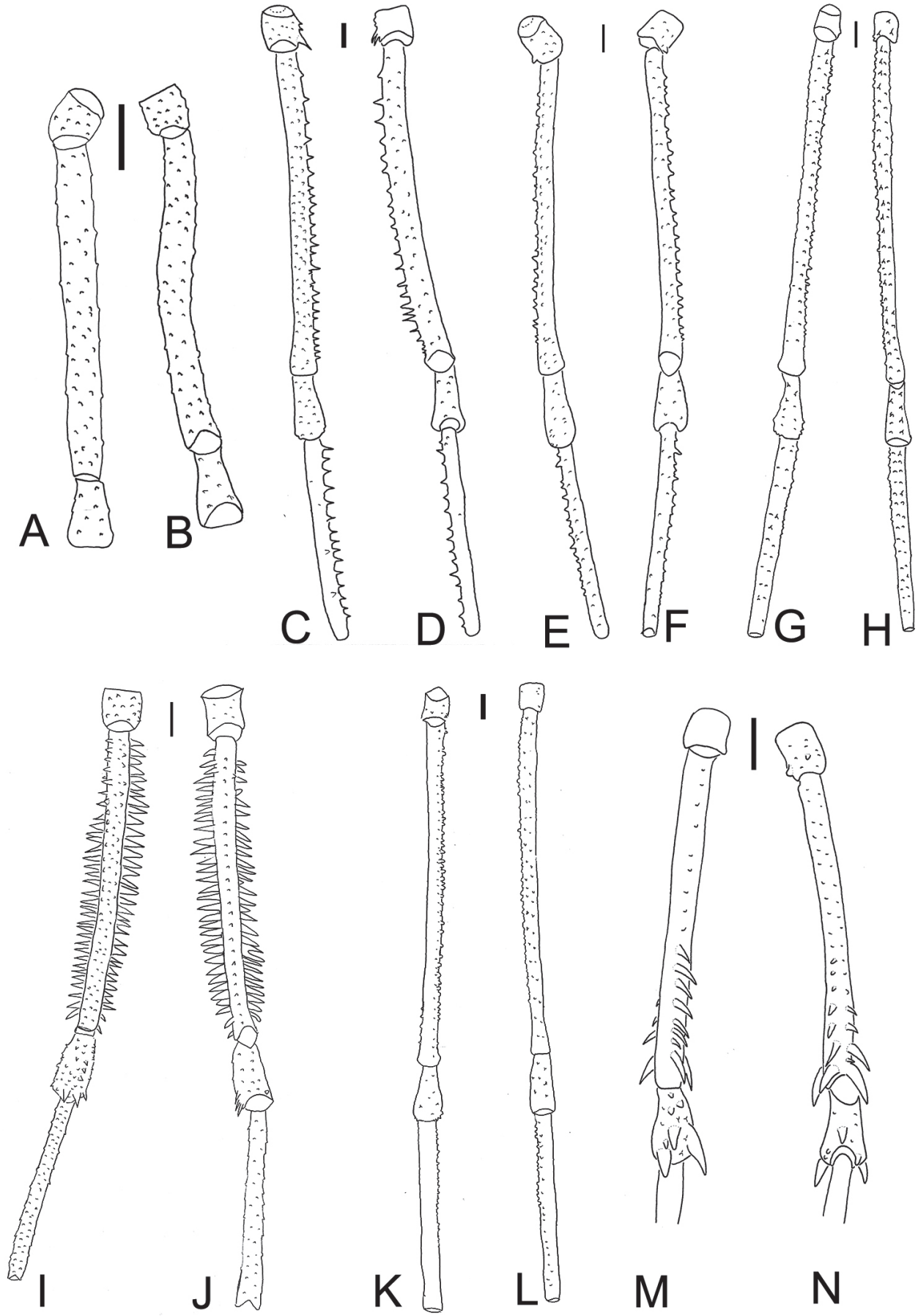

Figure 11. Male trochanter–patella/tibia IV of *Huancabamba* **gen. nov.**, *Lumieria* **gen. nov.** and *Tschaidicancha*, dorsal and ventral view, respectively. **A**–**B** *H. kubricki* **gen. et sp. nov.**; **C**–**D** *L. antonionii* **gen. et sp. nov.**; **E**–**F** *L. woodyalleni* **gen. et sp. nov.**; **G**–**H** *T. chaplini* **sp. nov.**; **I**–**J** *T. joseochoai* **sp. nov.**; **K**–**L** *T. scorsesei* **sp. nov.**; **M**–**N** *T. weyrauchi* Roewer, 1957; Legend bars = 1 mm.

a row of 5–6 ventrodistal median setiferous tubercles. Tibia: prolateral II, retrolateral iIii. Tarsus: prolateral Iii, retrolateral Iii. ***Venter***: Coxa I with a median row of 4–5 small tubercles. Coxae II–IV and genital area with few scattered granules. Free sternites with a row of small granules. Anal operculum with granules sparsely distributed across its surface. ***Legs***: (Figs. 2G, 7K, L) Coxae I–II each one with a prolateral and a retrolateral apophyses; III with only prolateral apophysis; coxa II retrolateral and coxa III prolateral apophyses fused; IV with granules distributed throughout its surface, with a proapical spiniform apophysis. Trochanters I–III smooth; IV with 3–4 small dorsoapical tubercles and a larger retroapical median acuminate tubercle. Femora I–III with scattered granules; IV granular; with a retroventral row of three small acuminate tubercles and one large apical tubercle; a proventral row of 9–10 small tubercles, growing apically, and four large tubercles with curved apex; a prolateral row of 15–16 lanceolate tubercles, with the most basal slightly larger than granules, the most apical large, covering the entire length of segment; a retrolateral row of 11–12 tubercles. The shape of of retro- and prolateral tubercles are extremely variable and can have a blunt, acuminate or truncated apex. Patellae I–III with sparse granules; IV densely granulate dorsally, with more sparsely distributed granules on the ventral face, with three apical retrodorsal tubercles and a greater dorsoapical acuminate tubercle. Tibiae I–IV granular; IV with a row of 11–13 acuminate tubercles, growing apically. Tarsal segmentation: (*n*=3) 7, 8–10 (10), 6–7 (7), 7–8 (8). ***Penis***: (Fig. 15D–F) VP rectangular; distal margin straight, with conspicuous laterodistal projections; slightly curved in lateral view. MS C1–C4 distal long and curved; MS A1 long and straight, medially placed; MS B1 sub basal long and straight; MS D1 very short, laterodorsally placed. Lateral sacs long, robust and with wider apex; with long T3-like microsetae. Stylus with triangular apex, with rounded corners; with a ventral projection with setae. Promontory straight. — **FEMALE:** ***Measurements*** (*n*=15) DSW: 3.5–3.6; DSL: 4.0–4.5; CL: 1.4. FIVL: 3.3–3.5. ChL: 1.2–1.4 Chelicerae similar to that of small males. Pedipalpus femur with a proapical spine. Femur IV unarmed. Tarsal segmentation: (*n*=15) 6, 9–10, 7, 7.

Diagnosis. Similar to *Ayacucho tapacocha* **nom. nov.** because the tibia IV is armed (Fig. 7K, L). Differs from *Ayacucho tapacocha* **nom. nov.** because DSS with constriction II most marked (Fig. 2G); the presence of basal tubercles in a prolateral row in femur IV (totaling 15–16; 11–12 in *A. tapacocha* **nom. nov.**); retroventral row of femur IV with less than 5 tubercles (7–9 in *A. tapacocha* **nom. nov.**); presence of tubercles on the basal retrolateral row of tibia IV (Fig. 7K, L); two pairs of small tubercles in ocularium; coxa III retrolateral apophysis absent (Fig. 2G).

Derivatio nominis. The specific epithet, a noun in apposition, in reference to the type locality, Laguna Querococha, a blue waters lagoon, from glacier of Parque Nacional Huascaran, Department of Ancash, type locality of the species.

Distribution. (Fig. 28) PERU. Ancash. Parque Nacional Huascarán, Laguna Querococha.

Material examined. ***Type material*: Holotype** ♂, ‘PERU, Ancash, Parque Nacional Huascarán, Laguna Querococha, 4,024 m a.s.l., 09º43′38.8″S 77º19′47.9″W, 17/V/2010, R. Pinto-da-Rocha & D. Silva leg. (MUSM) – **Paratypes** 7 ♀, ‘ditto’ (MUSM); **Paratypes** 2 ♂, 8 ♀, ‘ditto’ (MZSP 36979).

3.18. *Ayacucho roeweri* nom. nov.

http://zoobank.org/17FB2FC0-26E8-4FA5-9F79-877E9A4A903E

Figs. 2H, 28

Cajacaybia spinigera Roewer, 1957: 74 (desc.), figs. 27 (dorsal habitus), 28 (pedipalpus); Kury, 2003: 144 (cat.).

Redescription. FEMALE: ***Measurements*** (*n*=1) DWS: 3.6; DSL: 4.0; CL: 1.4. FIVL: 3.5. ChL: 1.3. ***Coloration*** (in ethanol): Uniformly yellowish (reddish-brown, in the original description), with darker spots on the carapace, especially behind ocularium and legs. ***Dorsum***: (Fig. 2H) Alpha-type DSS, with wide coda. Anterior margin of dorsal scutum with a median elevation; with granules sparsely distributed on the lateral regions of DS. Ocularium with a pair of long spines; with granules sparsely distributed. Carapace with few granules in lateral regions to predominantly smooth near its posterior margin. Areas I–IV with granules sparsely distributed; I with a paramedian pair of tubercles; II–IV with a median pair of small tubercles, of equal size, but larger than those on area I. Lateral margins of dorsal scutum with granules sparsely distributed. Posterior margin of dorsal scutum with a row of larger blunt tubercles, with a more acuminate median tubercle, interspersed with smaller tubercles. Free tergites I–II with a row of small blunt tubercles, with a large median acuminate tubercle, projecting backwards. Free tergite III with a row of granules and a median pair of acuminate tubercles that are smaller than those on tergites I–II. ***Chelicerae***. (Fig. 2H) Not swollen. Segment I granulate. Segment II predominantly smooth, two teeth on the finger. Segment III with three teeth. ***Pedipalpus***. Small granules distributed on the dorsal surface of the femur. Trochanter with a ventrodistal setiferous tubercle. Femur with a row of five tiny ventral tubercles, slightly larger than the dorsal ones. Tibia: prolateral III, retrolateral iiIi. Tarsus: prolateral IIii, retrolateral iIiii. ***Venter***. Coxae I–IV smooth. Between the coxae II–III and III–IV with a minute tubercle on the apical part. Genital area smooth. Free sternites without granules. Anal operculum smooth. ***Legs***. (Fig. 2H) Coxae I–II each with one prolateral and one retrolateral apophysis; III with prolateral apophysis; IV with granules distributed throughout its surface, and a prodistal apophysis with acuminate apex. Trochanters I–III smooth; IV with few dorsal median granules and a retroapical acuminate tubercle. Femora I–III with few granules sparsely distributed; IV densely granulate; with

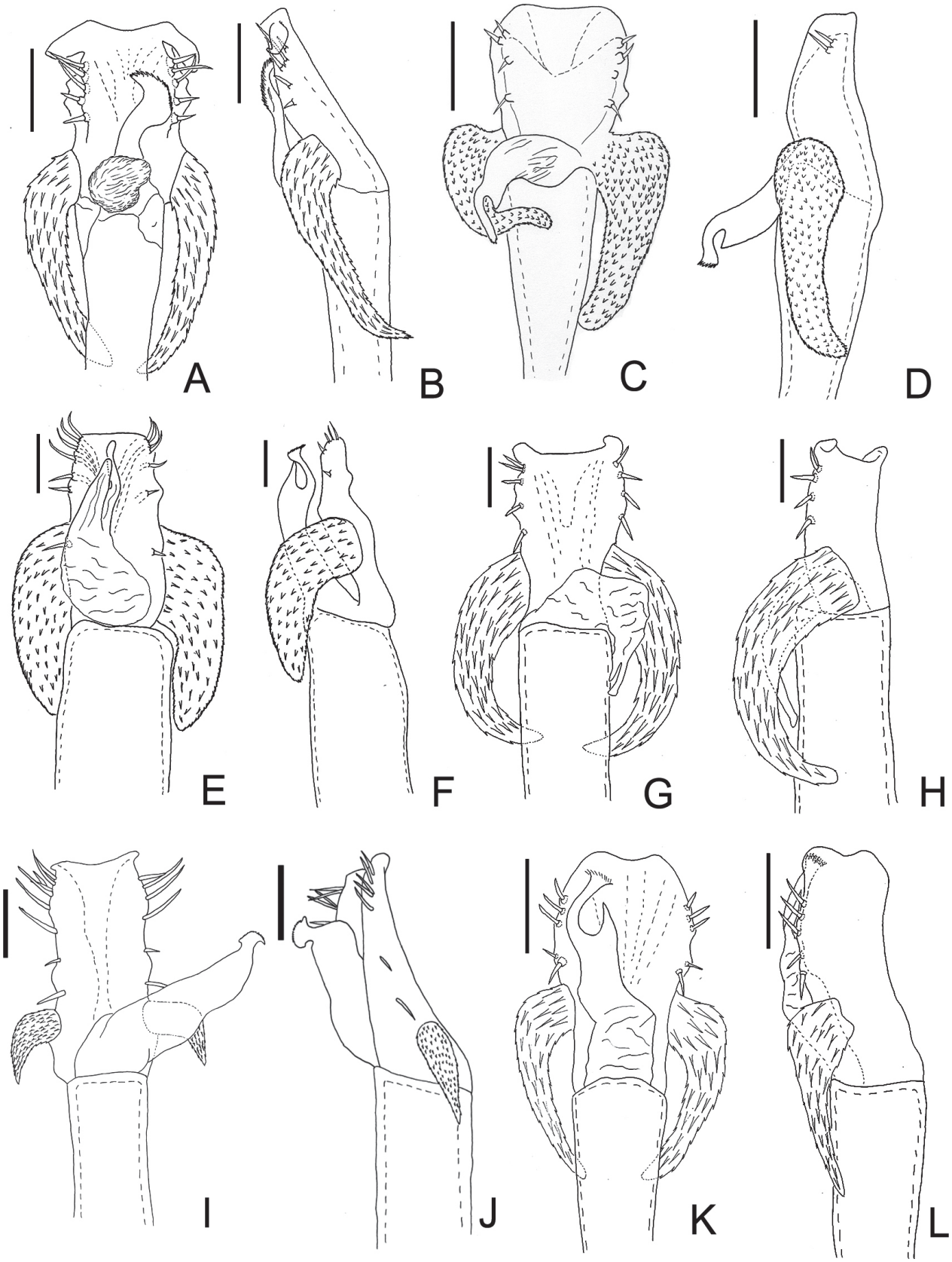

Figure 12. Penis of Metasarcidae, dorsal and lateral views, respectively. **A**–**B** *A. bambamarca* (Roewer, 1957) **comb. nov.**; **C**–**D** *Ayacucho inermis* (Roewer, 1957) **comb. nov.**; **E**–**F** *Ayacucho pasolinii* **sp. nov.**; **G**–**H** *Ayacucho spielbergi* **sp. nov.**; **I**–**J** *Ayacucho titschacki* Roewer, 1949; **K**–**L** *Ayacucho triarmatus* **nom. nov.**; Legend bars = 0.1 mm.

a retrolateral row of 10 small acuminate tubercles. Patellae–tibiae I–IV smooth. Tarsal segmentation: (*n*=1) 7, 12, 8, 8. — **MALE:** unknown.

Diagnosis. It differs from other species of the genus with known females by having a high median spine in the free tergites I–II (Fig. 2H).

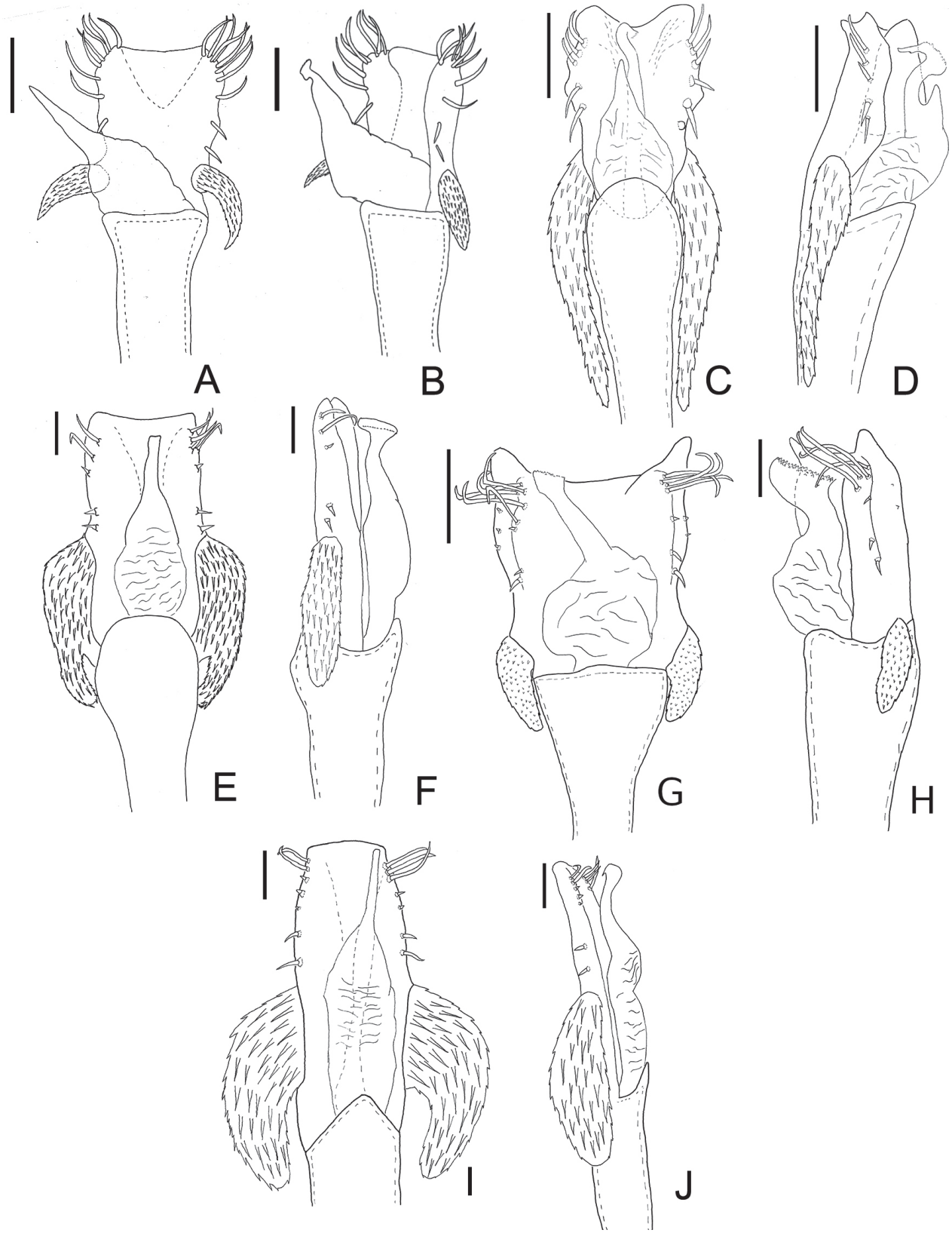

Figure 13. Penis of Metasarcidae, dorsal and lateral views, respectively. **A**–**B** *A. vargasllosai* **sp. nov.**; **C**–**D** *A. weyrauchi* (Roewer, 1952) **comb. nov.**; **E**–**F** *Incasarcus argenteus* Kury & Maury, 1998; **G**–**H** *Incasarcus dianae* Kury & Maury, 1998; **I**–**J**: *Incasarcus pictus* Kury & Maury, 1998; Legend bars = 0.1 mm.

Remarks. Considering that *Cajacaybia spinigera* and *Palcares spiniger* were described in the same work (Roewer 1957), we established the precedence of *Palcares spiniger* name (Art. 24.2 of ICZN). Therefore, since they are both species in the genus *Ayacucho*, *Cajacaybia spinigera* Roewer, 1957 is a secondary homonym of *Palcares spiniger* Roewer, 1957 and must be replaced.

Consequently, we create *Ayacucho roeweri* **nom. nov.** as a replacement name for Roewer's name.

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the German arachnologist Carl Friedrich Roewer (1881–1963), the author of original name in secondary homonymy.

Distribution. (Fig. 28) PERU. Ancash. Cajacay.

Material examined. ***Type material*: Hototype** ♀, 'PERU. Ancash. Cajacay, Rio Fortaleza, 2,700 m a.s.l., 5/III/1956, Weyrauch leg. (SMF RII 11645/28).

3.19. *Ayacucho silvae* sp. nov.

http://zoobank.org/8C20DC11-A90F-44F2-B244-06BC59A7C3F1

Figs. 2I, 7M, N, 15 G–I, 22E, F, 28

Description. MALE: ***Measurements*** (*n*=10) DSW: 1.7–3.0 (2.8); DSL: 4.0–4.3 (4.2); CL: 1.3–1.5 (1.5). FIVL: 2.6–2.8 (2.6). ChL: 1.2–2.5 (2.2). ***Coloration***: (Fig. 22E) Carapace and lateral margins of dorsal scutum yellowish. Scutal areas and posterior margin of dorsal scutum and free tergites brown, with yellowish spots. Legs trochanters yellow, other segments brown. Chelicerae yellow. Pedipalpus brownish. ***Dorsum***: (Fig. 2I) Alpha-type DSS. Anterior margin of the dorsal scutum completely covered with granules, with median elevation. Ocularium robust, with granules of equal size throughout its length in smaller males, larger males with a pair of small acuminate tubercles. Carapace densely covered with granules. Areas I–IV without larger granules. Posterior margin of the dorsal scutum and free tergites with rows of tubercles, in greater numbers in posterior margin than in free tergites. ***Chelicerae***: (Fig. 2I) Swollen in larger males (as in the holotype) and at similar size of females in smaller males. Segment I granulate. Segment II predominantly smooth; finger with one tooth. Segment III with one tooth. ***Pedipalpus***: Small granules distributed on the dorsal surface. Trochanter with a ventrodistal setiferous tubercle. Femur with ventrobasal setiferous tubercles, one ventral row of five small setiferous tubercles, distributed throughout the length of segment except at apex. Tibia: prolateral I(i)Ii, retrolateral IIIII. Tarsus: prolateral IIII, retrolateral III. ***Venter***: Coxae I–IV with scattered small granules. Genital area with few granules. Free sternites I–IV with rows of small granules. Anal operculum with granules sparsely distributed throughout its surface. ***Legs***: (Figs. 2I, 7M, N) Coxae I–II with an anterior and a posterior apophysis. Coxa IV with granules distributed throughout its length. Trochanters I–IV somewhat granulate, unarmed. Femora I–IV with granules densely distributed throughout their dorsal, retrolateral and prolateral surfaces, the ventral surface of femora I–III with two rows of granules, larger than other granules of those segments; femur IV with two ventral rows (in ⅔ distal) of tubercles that increase in size distally, whose size is more pronounced in large males. Patellae I–IV with granules distributed predominantly in the dorsal, retrolateral and prolateral faces, being scarcer ventrally. Tibiae I–IV with granules throughout their length, higher on the ventral side. Tarsal formula: (*n* = 10) 5–6 (6), 7–8 (8), 6, 6–7 (7). ***Penis***: (Fig. 15G–I) VP subrectangular, slightly convex, with lateroapical projections. MS C1–C3 subapical, long and straight; MS A1 median, long and straight (smaller than MS C); MS B1–B2 sub basal, long and straight (MS B1 longer than MS B2). Lateral sacs long and apically acuminate, with long T3-like microsetae. Stylus with apex inflated, with several apical projections and a small dorsal projection. Dorsal process absent. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=12) DSW: 1.8–3.1; DSL: 4.0–4.2; CL: 1.3. FIVL: 2.8–3.0. ChL:1.2–1.4 (Fig. 22F) Chelicerae slightly smaller than those of small males. Presence of a proapical setiferous tubercle on pedipalpus femur, larger than the tubercles of the ventral surface. Femur IV slightly thinner, with smaller granules and distal two rows of tubercles absent. Tarsal formula: (*n* = 12) 6–7, 8, 6, 5–6.

Diagnosis. Similar to *Ayacucho glauberrochai* **sp. nov.**, *A. pomacocha* **sp. nov.**, *A. titschacki* and *A. vargasllosai* **sp. nov.** in the following combination of characteristics: dorsal scutum densely granulate; ocularium and areas I–IV of DS unarmed or armed with tiny tubercles, slightly greater than granules; posterior margin of DS and free tergites I–III with median rows of acuminate tubercles (Fig. 2I). It differs from the previously mentioned species in the following combination of characteristics: ocularium unarmed and densely granulate (Fig. 2I); male femur IV with ventral surface armed (Fig. 7N); penis VP subrectangular; three pairs of subapical MS C; two pairs of MS B (Fig. 15G–I).

Derivatio nominis. The specific epithet of feminine gender, in the genitive form, dedicated to Dr. Diana Silva D. (MUSM), for her contribution to the knowledge of Peruvian arachnids.

Distribution. (Fig. 28) PERU. Pasco. Near to Cerro de Pasco.

Material examined. ***Type material*: Holotype** ♂, ' PERU, Pasco, Near to Cerro de Pasco, 10º41′39″S 76º13′08″W, 23/IV/2011, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUBI) – **Paratypes** 2 ♂, 5 ♀, 'ditto' (MUBI); **Paratypes** 2 ♂, 5 ♀, 'ditto' (MUSM); **Paratypes** 5 ♂, 11 ♀, 'ditto' (MZSP 36971).

3.20. *Ayacucho spielbergi* sp. nov.

http://zoobank.org/81B944C8-2A70-44BE-AA34-DA96925262B0

Figs. 3A, 7O, P, 12G, H, 22H, 28

Description. MALE: ***Measurements*** (*n*=3) DSW: 4.0–4.9 (4.9); DSL: 4.6–5.0 (5.0); CL: 1.6–2.0 (2.0). FIVL:

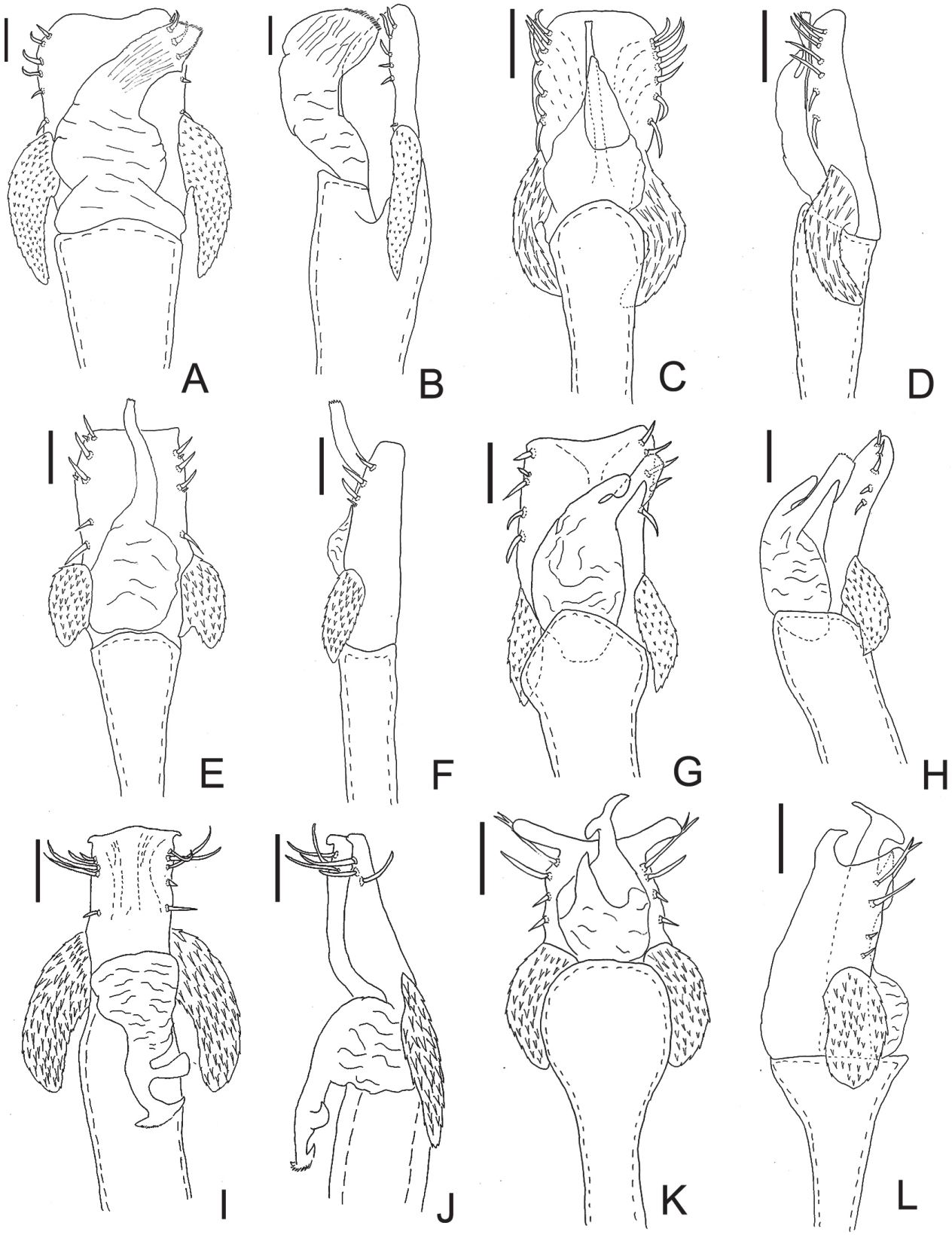

Figure 14. Penis of Metasarcidae, dorsal and lateral views, respectively. **A**–**B** *Lumieria woodyalleni* **gen. et sp. nov.**; **C**–**D** *Metasarcus beni* **sp. nov.**; **E**–**F** *Metasarcus kurosawai* **sp. nov.**; **G**–**H** *Metasarcus limachii* **sp. nov.**; **I**–**J** *Tschaidicancha joseochoai* **sp. nov.**; **K**–**L** *Tschaidicancha weyrauchi* Roewer, 1957; Legend bars = 0.1 mm.

7.6–8.6 (8.6). ChL: 2.1–3.9 (3.9). ***Coloration***: (Fig. 22H) Carapace, lateral margins of DS, spines of scutal area III and legs dark brown. Reddish chelicera. Pedipalpus yellowish with black spots. Posterior margin of DS and free tergites I–III light yellow. Scutal areas light yellow, with series of dark spots. ***Dorsum***: (Fig. 3A) Gamma-type DSS. Anterior margin of the DS with a median elevation, with few granules sparsely distributed. Ocularium with

medial depression; with a pair of spines and few granules near the eyes. Areas I–IV with few granules concentrated in the lateral regions; area III with a pair of spines directed backwards, located at the highest point in elevations of the integument, totally granular; area IV with a pair of small lateral tubercles. Posterior margins of DS smooth, with a pair of medium tubercles. Free tergites I–II with a pair of median tubercles; and a lateral pair of tiny tubercles. Free tergite III with two elongated median tubercles, larger than those of the free tergites I–II. ***Chelicerae***: (Fig. 3A) Swollen in large males (swollen in holotype); slightly larger than that of the females and small males. Segment I granulate; II with few granules; III with two teeth. ***Pedipalpus***: Trochanter with two ventroapical setiferous tubercles, one large and one smaller. Femur with a row of six ventral setiferous tubercles in the basal ⅔. Patella with a small retroapical tubercle. Tibia: prolateral iiIii, retrolateral IIi. Tarsus: prolateral iiIiIi, retrolateral iIiIi. ***Venter***: Coxa I with a row of 4–5 tubercles. Coxae II–IV with granules throughout their length. Genital area, free sternites and anal operculum with few granules. ***Legs***: (Figs. 3A, 7O, P) Coxae I–II each one with a retrolateral and prolateral apophyses. Coxa III with a prolateral apophysis. Coxa IV with setiferous granules distributed over the entire length. Trochanters I–III unarmed and with few granules. Trochanter IV with few granules and an apical retrolateral blunt tubercle. Femora I–III unarmed and with few granules. Femur IV with sparse granules; a retrolateral row of 15–17 acuminate tubercles over the entire length of the segment, except the base; a prolateral row of 10–12 acuminate tubercles along the distal ⅔; with four ventrodistal tubercles. Patellae I–III unarmed, with few granules. Patella IV with seven dorsal acuminate tubercles, the two largest apical ones; several granules on the ventral surface. Tibiae I–IV unarmed, with few granules. Tarsal formula: (*n*=3) 7–8 (8), 12–13 (13), 10–15 (10), 11–13 (13). ***Penis***: (Fig. 12G, H) VP subrectangular, with distal margin straight and lateral projections; straight in lateral view. MS C1–C3 subapical long and straight; MS A1 median long and straight; MS B1 sub basal long and straight. Lateral sacs long, apically acuminate, with long T3-like microsetae. Stylus with a non-swollen apex and without apical projections. Dorsal process conical, with acuminated apex. Promontory straight. — **FEMALE:** ***Measurements*** (*n*=2) DSW: 4.2–4.5; DSL: 4.5–4.9; CL: 1.5–1.7. FIVL: 7.2–8.1. ChL: 1.7–1.8. Chelicerae not swollen. Femur IV with retrolateral row of 13–14 tubercles, smaller than those of the retrolateral row of the males; prolateral row and ventrodistal tubercles absent or in the form of granules. Patella IV with dorsodistal acuminate tubercles, but smaller than in males. Tarsal formula: (*n*=2) 7, 11–12, 9–10, 10–12.

Diagnosis. It differs from other species of the genus by the combination of the following characteristics: Gamma-type DSS (Fig. 3A); area III of DS with a pair of large spines (also present in *A. pasolinii* **sp. nov.**); male femur IV armed (Fig. 7O, P); longer legs (ratio between FIVL and DSL greater than 1; 1.65 in *A. spielbergi* **sp. nov.**); and scutal areas light yellow, with series of dark spots (Fig. 22H).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the American filmmaker, producer and screenwriter Steven Allen Spielberg.

Distribution. (Fig. 28) PERU. Cajamarca. Parque Nacional Cutervo.

Material examined. ***Type material*: Holotype** ♂, ‘PERU, Cajamarca, Parque Nacional Cutervo, Puente Suro, 6º12′10″S 78°44′22″W, 22/V/2010, R. Pinto-da-Rocha & D. Silva leg. (MUSM) – **Paratypes** 2 ♂, 1 ♀, ‘ditto’ (MZSP 36995); **Paratype** 1 ♀, ‘PERU, Cajamarca, Parque Nacional Cutervo, near to Cueva San Andreas, 22/V/2010, R. Pinto-da-Rocha & D. Silva leg. (MZSP 36996). ***Additional material*:** 1 ♂, ‘PERU, Cajamarca, Parque Nacional Cutervo, San Andreas de Cutervo, 13/VI/1996, S. Córdova leg. (MUSM 0501248); 1 ♀, ‘ditto’ (MUSM 0501247).

3.21. *Ayacucho spiniger* (Roewer, 1957) comb. nov.

Figs. 3B, 7Q, R, 16 A–C, 23A, B, 28

Palcares spiniger Roewer, 1957: 72 (desc.), fig. 4 (dorsal habitus, femur IV), 5 (details of femur IV armature), 6 (pedipalpus); Kury 2003: 145 (cat.)

Palcares serrifemur Roewer, 1959: 70 (desc.) fig. 2A (dorsal habitus, femur IV), 2b (details of femur IV armature); Kury 2003: 145 (cat.), **syn. n.**

Redescription. MALE: ***Measurements*** (*n*=4) DSW: 3.4–3.8 (3.7); DSL: 4.2–4.6 (4.6); CL: 1.4–1.5 (1.4). FIVL: 4.9–5.9 (5.9). ChL: 1.3–2.7 (2.7). ***Coloration***: (Fig. 23A) Dorsal scutum and legs yellow-orange. Anterior and posterior margins of DS and free tergites darker. ***Dorsum***: (Fig. 3B) Alpha-type DSS, with shallower constriction II (almost faint). Anterior margin of DS with median elevation completely covered by granules. Ocularium covered with tiny granules and two long spines. Carapace densely covered by tiny granules. Areas I–IV densely covered with small granules; I with a pair of small spiniform tubercles; II and IV each one with a pair of tubercles twice the size of those on area I; III with pair of spines. Lateral margins of dorsal scutum covered with minute granules. Posterior margin of dorsal scutum with a small to slightly larger granules, armed with 2–3 spines; a single tubercle located to the right of the pair of spines, when present. Free tergites covered with granules of different sizes and armed with spines. Free tergite I with a pair of spines; II with 2–3 spines, two large and one three times lower; III with three spines. Anal operculum with three tubercles. ***Chelicerae***: (Fig. 3B) Swollen in large males (swollen in holotype); similar to females in small males. Segment I densely covered with granules. Segment II predominantly smooth, with setae at certain points of the frontal face, with two teeth on finger. Seg-

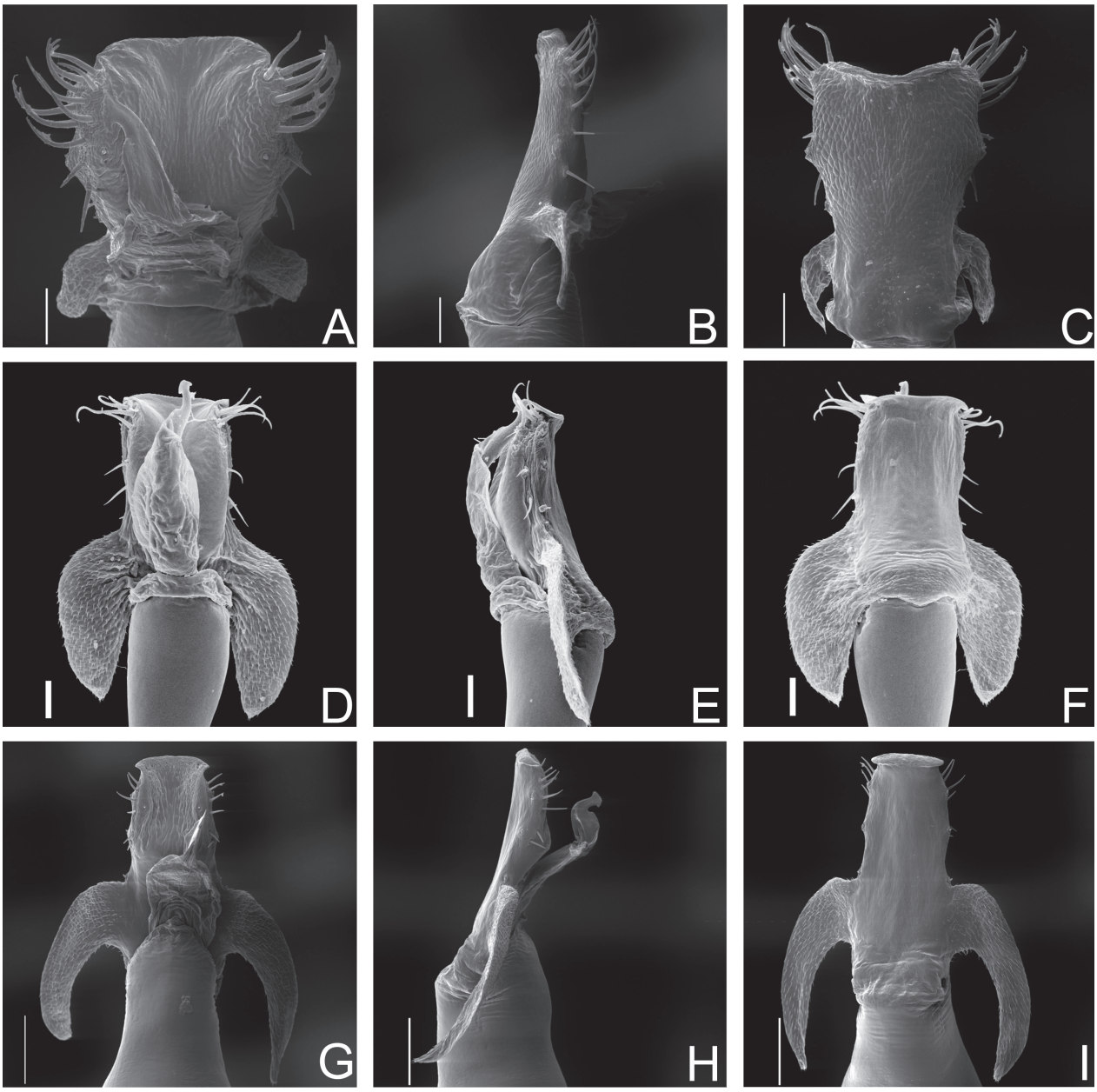

Figure 15. Penis of *Ayacucho*, dorsal, lateral and ventral views, respectively. **A**–**C** *A. pomacocha* **sp. nov.**; **D**–**F** *A. querococha* **sp. nov.**; **G**–**I** *A. silvae* **sp. nov.**; Legend bars = 0.1 mm.

ment III with one tooth. ***Pedipalpus***: With small granules distributed mainly on the dorsal surface of the femur, tibia and patella. Trochanter with a ventrodistal setiferous tubercle. Femur with a ventrobasal setiferous tubercle and a row of six ventral setiferous tubercles. ***Venter***: Coxae I–IV with granules sparsely distributed. Genital area almost smooth. Free sternites I–III with rows of small tubercles. Genital operculum granulate. ***Legs***: (Figs. 3B, 7Q, R) Coxae I–II each one with a prolateral and a retrolateral apophyses; III with a retrolateral apophysis; IV with granules distributed more densely on the prolateral face and an apical prodorsal apophysis. Trochanters I–IV with sparsely distributed granules. Femora I–III granular. Femur IV slightly sinuous, granular; with a retrolateral row of 15 tubercles along the apical ⅔ and a prolateral row of 12–13 tubercles along the apical ½; retro and prolateral tubercles size growing apically; the smallest tubercles are short and blunt, while the largest are long and with an approximately straight or lanceolate apex. Patella IV with granules distributed throughout its length and with three dorsoapical tubercles. Tibiae I–IV with sparse granules. Tarsal segmentation: (*n*=8) 6–8 (7), 11–14 (11), 7–8 (7), 8–9 (8). ***Penis***: (Fig. 16A–C) VP rectangular; distal margin slightly concave; large lateral projections. MS C1–C3 subapical long and apically curved; MS A1 sub basal long and straight; MS B1 sub basal long and straight (MS A1 and MS B1 shorter than MS C1–C3); MS D1 short, dorsally placed, next to MS A. Lateral sacs long and with blunt apex; with long T3-like microsetae. Stylus dorsally curved, with subapical ventral projection. Dorsal process long and tapered. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=4) DSW: 3.4–3.8; DSL: 4.2–4.6; CL: 1.4–1.5. FIVL: 4.9–5.5. ChL: 1.3–1.6. (Fig. 23B) DSS with constriction II well marked. Granules of ocularium

smaller than in male. Pedipalpal femur with a proapical spine, absent in males. Femora IV unarmed. Dorsodistal apophysis of coxa IV slightly lower than in male. Tarsal segmentation: (*n*=4): 7–8, 10–13, 7–9, 8.

Diagnosis. Similar to *Ayacucho inermis* **comb. nov.** because of two rows of tubercles on the femur IV (pro and retrolateral; Fig. 7Q, R). Differs from *Ayacucho inermis* **comb. nov.** because femur IV with some lanceolate tubercles (Fig. 7Q, R); ventral plate of penis with conspicuous lateral projections; long MS C on VP; lateral sacs with long T3-like microsetae, dorsal process long in relation to stylus (Fig. 16A–C)**.**

Distribution. (Fig. 28) PERU. Junín. Campañillaya. Hacienda Maraynioc. Palca

Material examined. ***Type material*:** Of *P. spiniger*: **Holotype** ♂, 'PERU, Junín, Campañillaya, near to Palca in Rio Tarma, 2,600 m a.s.l., 06/I/1955, Weyrauch leg. (SMF RII 11418/24). Of *P. serrifemur*: **Holotype** ♂, 'PERU, Junín, Hacienda Maraynioc, east Tarma, Chanchamayo bay, 3,500 m a.s.l., 10/X/1956, Weyrauch leg. (SMF RII 12764/35) – **Paratype** 1 ♀ 'ditto' (SMF RII 12764/35). ***Additional material*:** 3 ♂, 3 ♀ 'PERU, Junín, Palca, 11º21′28.9″S 75º33′23.9″W, 19/IV/2011, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUBI); 3 ♂, 2 ♀, 'ditto' (MUSM); 7 ♂, 5 ♀ 'ditto' (MZSP 36980).

3.22. *Ayacucho tapacocha* nom. nov.

http://zoobank.org/02A1211A-0ED8-4095-90DB-2FFF219B8B80

Figs. 3C, 7S, T, 16 G–I, 23C, D, 28

Tapacochana insignita Roewer, 1957: 73 (desc.), figs. 25 (dorsal habitus), 26 (pedipalpus); Kury 2003: 145 (cat.); Coronato-Ribeiro and Pinto-da-Rocha 2017: 203 (cit), 235–236 (mat).

Redescription. MALE: ***Measurements*** (*n*=15) DSW: 3.3–5.1 (3.3); DSL: 4.0–5.6 (4.0); CL: 1.3–2.2 (1.3). FIVL: 6,2–6,5. ChL: 1.3–4.0 (1.3). ***Coloration***: (Fig. 23C) Chelicerae, pedipalpus, carapace, lateral margins of DS reddish-brown. Areas I–IV, coxa IV, femora–tibiae I–IV dark brown (some specimens may have a longitudinal lighter strip running through the carapace and areas of dorsal scutum). Posterior margin of DS and free tergites I–III black. ***Dorsum***: (Fig. 3C) Alpha-type DSS, with constriction II shallow (almost faint). Anterior margin of dorsal scutum with median elevation; granules sparsely distributed. Ocularium with a pair of spines. Carapace with granules scattered in the lateral and posterior regions. Areas I–IV densely granulate; one pair of median tubercles in all areas. Posterior margin of DS and free tergites I–III with a row of acuminate tubercles, higher than those on scutal areas. Lateral margins of DS with granules distributed throughout their length. ***Chelicerae***: (Fig. 3C) In smaller males, chelicerae slightly larger than the females (as in the holotype). Swollen in large males. Segment I granulate in retrolateral half. Segment II predominantly smooth with one tooth on the finger. Segment III with two teeth. ***Pedipalpus***: Small granules distributed on the dorsal surface of the trochanter, femur, patella and tibia. Trochanter with a ventrodistal setiferous tubercle. Femur with a ventrobasal setiferous tubercle; wit a row of five or six ventral setiferous tubercles, except in the apical portion. Tibia: prolateral IiII retrolateral iiIi. Tarsus: prolateral iIii, retrolateral iiiIiii. ***Venter***: Coxa I with a median row of five small tubercles. Coxae II–IV with few granules. Genital area with few scattered granules. Free sternites with a row of small granules. Operculum anal with granules sparsely distributed on its surface. ***Legs***: (Figs. 3C, 7S, T) Coxae I–III each one with two apophyses (one prolateral, one retrolateral). Coxa IV with granules distributed throughout its surface; a distal prolateral apophysis apically acuminated. Trochanters I–III smooth. Trochanter IV with three small dorsoapical tubercles and a small median retroapical tubercle, apically acuminated. Femora I–III with granules scattered throughout their length. Femur IV densely granulate; a retroventral row of 7–9 small acuminate tubercles along the distal ½, apically growing; a proventral row of tiny tubercles, growing apically, the last three being larger and apically curved; a retrolateral row of 11–14 tubercles along the distal ⅔; a prolateral row of 11–12 tubercles along the distal ⅔. The shape of the femur IV tubercles are extremely variable and may be with blunt apex, acuminate and straight; in all rows of tubercles, the basal ones are tiny and round, slightly larger than granules, whereas the others have varied morphology (apex blunt, acuminate or lanceolate). Patellae I–III with sparse granules. Patella IV dorsally densely granulate, with granules more sparsely distributed on ventral surface; with three smaller dorsoapical tubercles and one larger tubercle. Tibiae I–III with granules throughout their length; tibia IV densely granulate, with a row of 13–14 ventral acuminate tubercles, growing apically. Tarsal segmentation: (*n*=15) 7, 10–12 (10), 6–9 (6), 7–10 (7). ***Penis***: (Fig. 16G–I) VP subrectangular, with lateral margins slightly convex (in ventral view); distal margin slightly convex; with laterodistal projections; MS C1–C4 subapical, long and curved; MS A1–A2 median long and straight; MS B1 sub basal very short; MS D1 median short and straight. Lateral sacs long, robust and with blunt apex. Stylus slightly flattened laterally, apically inflated; with a long dorsal projection, at a 90 degree angle to the stylus axis; with apical small projections. Promontory convex. — **FEMALES:** ***Measurements*** (*n*=12) DSW: 3.3–4.4; DSL: 4.0–5.4; CL: 1.3–1.6. FIVL: 4.9–5.6. ChL: 1.3–2.0 (Fig. 23D) DSS with constriction II well marked. Chelicerae similar to those of small males. Presence of a proapical spine on femur of pedipalpus. Femur and tibia IV unarmed. Tarsal segmentation: (*n*=12) 7, 10–11, 6–8, 7–8.

Diagnosis. Similar to *Ayacucho querococha* **sp. nov.** because armed tibia IV (Fig. 7S, T). It differs from *Ayacucho querococha* **sp. nov.** by the set of the following characteristics: DSS with constriction II not-so-well marked (almost faint; Fig. 3C); a pair of spines on ocularium (Fig. 3C); coxa III with two apophyses (Fig. 3C; only one apophysis in *Ayacucho querococha* **sp. nov.**); femur

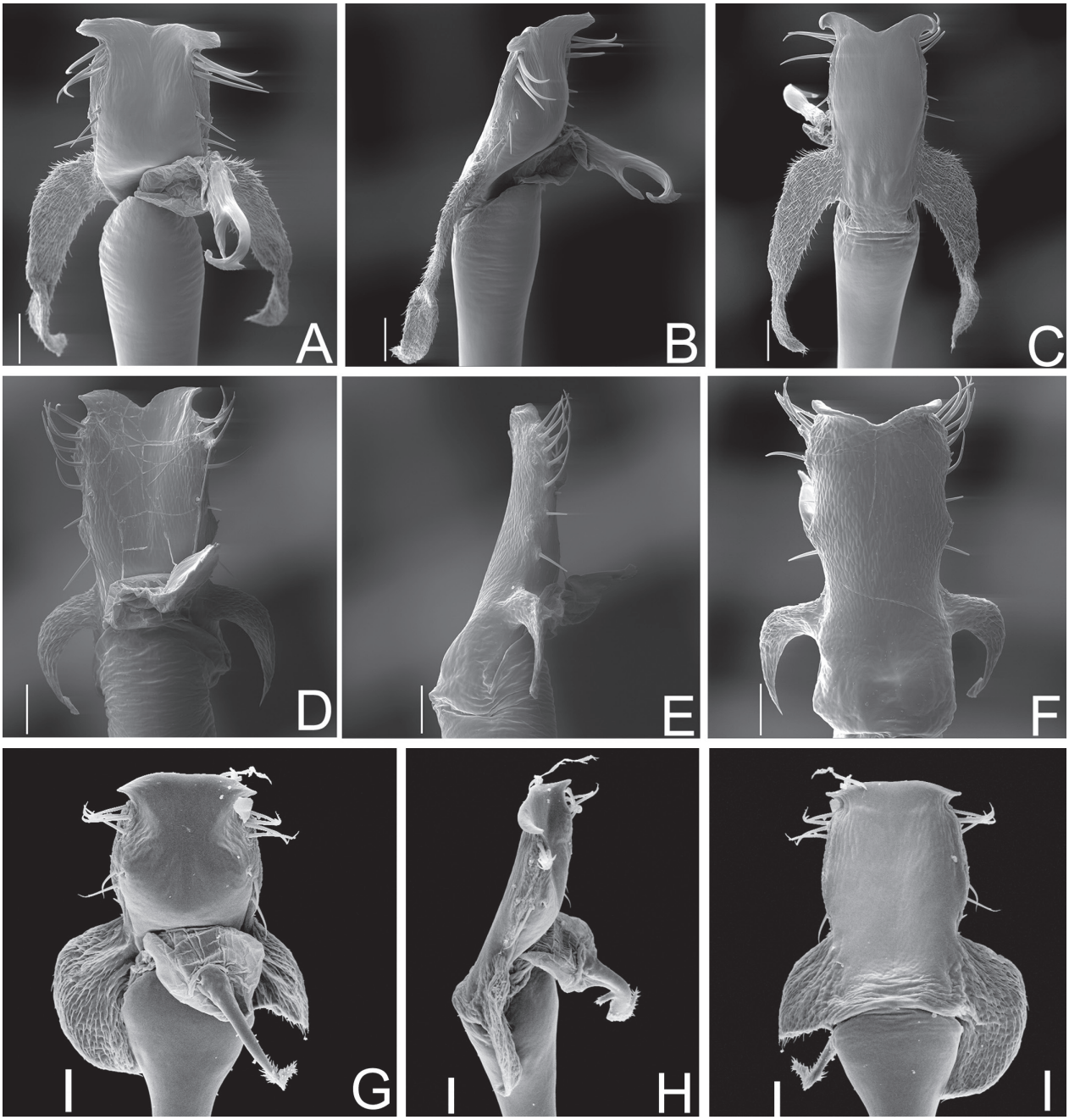

Figure 16. Penis of *Ayacucho*, dorsal, lateral and ventral views, respectively. **A**–**C** *A. spiniger* (Roewer, 1957) **comb. nov.**; **D**–**F** *A. glauberrochai* **sp. nov.**; **G**–**I** *A. tapacocha* **nom. nov.**; Legend bars = 0.1 mm

IV without probasal row of tubercles; tibia IV without basal row of tubercles (Fig.7S, T).

Remarks. Roewer described *Cargaruaya insignita* in 1956 and *Tapacochana insignita* in 1957. Since they are both species in the genus *Ayacucho*, *Tapacochana insignita* Roewer, 1957 is a secondary homonym of *Cargaruaya insignita* Roewer, 1957 and must be replaced. Consequently, we create *Ayacucho tapacocha* **nom. nov.** as a replacement name for Roewer's specific epithet.

Derivatio nominis. The specific epithet, a noun in apposition, in reference to the type locality, Tapacocha, Ancash, Peru, as well as in relation to the name of the genus where the species was originally described by Roewer (1957).

Distribution. (Fig. 28) PERU. Ancash. Huascaran National Park; Tapacocha, Rio Fortaleza.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Ancash, Tapacocha | Rio Fortaleza, 3,200 m a.s.l., 04/III/1956, Weyrauch leg. (SMF RII 11644/27). ***Additional material*:** 2 ♂, 2 ♀ 'PERU, Ancash, Parque Nacional Huascarán, Chinancoche, 9º04′18″S 77º38′38″W | 15/V/2011, R. Pinto-da-Rocha & D. Silva leg. (MUSM); 3 ♂, 3 ♀ 'ditto' (MUBI); 5 ♂, 5 ♀ 'ditto' (MZSP 36976). 2 ♂, 4 ♀ 'PERU, Ancash, Parque Nacional Huascarán, Laguna Parón, 8º59′43″S 77º40′41″W | 16/V/2011, R. Pinto-da-Rocha & D. Silva leg. (MUSM); 2 ♂, 4 ♀ 'ditto' (MUBI); 4 ♂, 8 ♀ 'ditto' (MZSP 36977). 1 ♂, 2 ♀ 'PERU, Ancash, Parque Nacional Huascarán | Llaco, 9º28′11″S 77º27′50.8″W, 14/V/2011, R. Pinto-da-Rocha & D. Silva leg. (MUSM); 2 ♂, 3 ♀ 'ditto' (MUBI); 3 ♂, 6 ♀ 'ditto' (MZSP 36978).

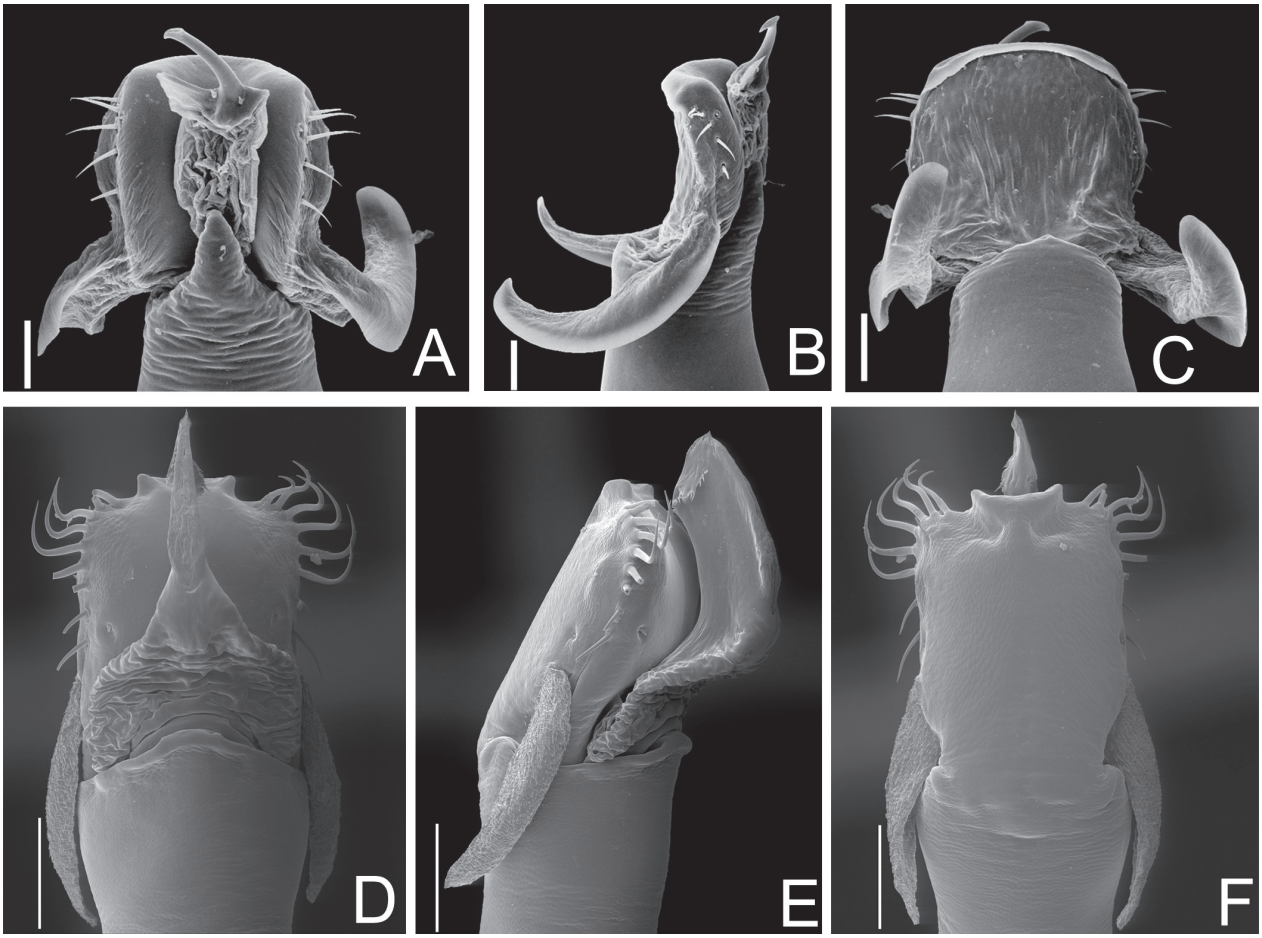

Figure 17. Penis of *Ayacucho* and *Lumieria* **gen. nov.**, dorsal, lateral and ventral views, respectively. **A**–**C** *A. uniseriatus* (Roewer, 1959) **comb. nov.**; **D**–**F** *L. antonionii* **gen. et sp. nov.**; Legend bars = 0.1 mm.

3.23. *Ayacucho titschacki* Roewer, 1949

Figs. 3D, 7U, V, 12I, J, 23E, 28

Ayacucho titschacki Roewer, 1949: 57 (desc.), figs. 114a (dorsal habitus), 114b (ventral habitus), 114c (chelicera, pedipalpus and carapace in lateral view); 114d (detail of coxa IV), 114e (sternum), 114f (chelicera in lateral view); Kury 2003: 144 (cat.).

Redescription. MALE: ***Measurements*** (*n*=2) DSW: 3.0–4.1; DSL: 4.5–5.4; CL: 1.5–2.2. FIVL: 4.8–5.4. ChL: 2.5–4.0. ***Coloration***: (Fig. 23E) Predominantly yellowish, with two longitudinal black stripes in the lateral region of dorsal scutum (carapace and lateral edges of the areas I–IV). Lateral margins of DS yellowish, with small black spots. Posterior margin of the dorsal scutum, free tergites and legs predominantly black. Chelicerae and pedipalpus predominantly dark yellow. ***Dorsum***: (Fig. 3D) Alpha-type DSS. Anterior margin of carapace with median elevation totally covered with granules. Ocularium with two small acuminate tubercles, absent in some individuals. Areas I–IV with two pairs of small median tubercles; the lateral pair can be greatly reduced in some individuals. Posterior margin of dorsal scutum with a transverse row of 4–5 acuminate tubercles (larger than tubercles of areas I–IV). Free tergites I–III with a row of tubercles similar to the posterior margin of dorsal scutum, increasing the number of free tergite I to III. ***Chelicerae***: (Fig. 3D) Swollen or not in males. Segment I densely covered with granules throughout its length. Segment II predominantly smooth, with some hairs on the front face; finger with three teeth. Segment III with two teeth. ***Pedipalpus***: With very small granules sparsely distributed on the dorsal surface of the femur and patella. Trochanter with a distal ventral setiferous tubercle. Femur with a ventrobasal setiferous tubercle and a row of six small ventromedian setiferous tubercles. Tibia: prolateral IIII, retrolateral IIII. Tarsus: prolateral IIi, retrolateral Iii. ***Venter***: Coxa I with dispersed small tubercles. Coxae II–III, predominantly smooth, with sparse granules. Coxa IV with granulation denser than coxae III–IV. Genital area smooth. Free sternites I–IV and anal operculum with small granules sparsely distributed. ***Legs***: (Figs. 3D, 7U, V) Coxa I with a prolateral apophysis; coxa II with a retrolateral and a prolateral apophysis. Coxa IV densely granulate, with larger tubercles distributed more densely in the prolateral portion. Trochanters I–IV with few granules, unarmed. Femora I–III, with granules distributed throughout its length. Femur IV with granules densely distributed in the dorsal and lateral, less heavily on the ventral surface. Tarsal formula: (*n*=2) 7, 12, 7, 8. ***Penis***: (Fig. 12I, J) VP rectangular; distal margin slightly concave, with short lateral-apical projections; slightly concave in lateral view. MS C1–C5 (or C6) subapi-

cal long and straight; MS A1 median short and straight; MS B1 sub basal long and straight (longer than MS A and shorter than MS C). Lateral sacs short and apically acuminated, with short T3-like microsetae. Stylus slightly thick, apically inflated, dorsally inclined, with apical tiny projections. Dorsal process absent. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=4) DSW: 3.0–4.4; DSL: 4.5–5.4; CL: 1.9–4.7. FIVL: 3.7–4.5. ChL: 1.7–4.0. Swollen chelicerae in some specimens, like males. Tubercles of femur of pedipalpus slightly smaller. Ocularium tubercles smaller than in male. Granules on femur IV thinner when compared with those of male. Tarsal segmentation: (*n*=4) 6–7, 10–11, 7, 7–8.

Diagnosis. Similar to *Ayacucho glauberrochai* **sp. nov.**, *A. pomacocha* **sp. nov.**, *A. silvae* **sp. nov.** and *A. vargasllosai* **sp. nov.** in the following combination of characteristics: dorsal scutum densely granulate; ocularium and areas I–IV of DS unarmed or armed with tiny tubercles, slightly greater than granules; posterior margin of DS and free tergites I–III with median rows of acuminate tubercles (Fig. 3D). It differs from the previously mentioned species in the following combination of characteristics: ocularium with two small acuminate tubercles and densely granulate (Fig. 3D); male femur IV unarmed (Fig. 7U, V; unlike *A. silvae* **sp. nov.**); penis VP rectangular; five–six pairs of subapical MS C; one pair of MS A and B (Fig. 12I, J).

Remarks. The male holotype and paratypes examined by Roewer (SMF RII 8589/20) are actually females.

Distribution. (Fig. 28) PERU. Ayacucho. Ayacucho, Ocollo and Virgem de Cacharras de Cocha.

Material examined. ***Type material*.** **Holotype** ♀, ‘PERU, Ayacucho, Ayacucho, without date and leg. (SMF RII 8589/20) – **Paratype** ♀, ‘ditto’ (SMF RII 8589/20). ***Additional material*.** 1 ♂, 2 ♀ ‘PERU, Ayacucho, Virgem de Cacharras de Cocha, 13°01′47″S 73°52′14″W, without date and leg. (MZSP 36972). 2 ♀ ‘PERU, Ayacucho, Near Ocollo, 13°19′53.0″S 74°30′17,6″ W, 29/IV/2011, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUSM); 1 ♂, 2 ♀, ‘ditto’ (MUBI); 1 ♂, 5 ♀ ‘ditto’ (MZSP 36973).

3.24. *Ayacucho triarmatus* nom. nov.

http://zoobank.org/BFC470B8-0400-4499-AB32-9AF-88A0F68B4

Figs. 3E, 7W, X, 12K, L, 28

Tapacochana triseriata Roewer, 1959: 69 (desc.), fig. 1 (dorsal habitus and trochanter–femur IV); Kury 2003: 145 (cat.)

Redescription. MALE: ***Measurements*** (*n*=1) DSW: 4.0; DSL: 4.4; CL: 1.4. FIVL: 4.2. ChL: 1.2. ***Coloration*** (in ethanol): Predominantly yellow with dark spots on the scutal areas I–IV, lateral and posterior margin of the dorsal scutum and free tergites. ***Dorsum***: (Fig. 3E) Alpha-type DSS. Anterior margin with median elevation without granules distributed. Ocularium with a pair of spines, few granules. Carapace with granules distributed mainly in the lateral region of ocularium; posterior region with sparse granules. Areas I–IV with granules sparsely distributed; II–IV with some slightly larger granules. Posterior margin of dorsal scutum and free tergite I with a row of small blunt tubercles. Free tergites II–III with a row of acuminate tubercles, larger than those on free tergite I. Lateral margins of dorsal scutum with granules sparsely distributed. ***Chelicerae***: (Fig. 3E) Not swollen. Segment I granulate. Segment II predominantly smooth, with 11 small teeth. Segment III with 12 teeth. ***Pedipalpus***: Small granules distributed on the dorsal surface of the femur and patella. Trochanter with a large ventrodistal setiferous tubercle. Femur with a ventrobasal setiferous tubercle; a row of four ventral setiferous tubercles, except at the apex. Tibia: prolateral IIi, retrolateral iIi. Tarsus: prolateral IIi, retrolateral IiIi. ***Venter***: Coxae I–II with a middle row of six and eight small tubercles respectively; III–IV smooth. Three tiny tubercles among the apical part of coxae II–III and III–IV. Genital area smooth. Free sternites and anal operculum smooth. ***Legs***: (Figs. 3E, 7W, X) Coxae I–II each one with an anterior and posterior apophysis; III with a prolateral apophysis; IV with setiferous granules distributed throughout its surface, and a proapical spiniform apophysis. Trochanters I–III smooth; IV with 3–4 dorsal median granules and a retroapical blunt tubercle. Femora I–III with granules scattered; IV granulate; a dorsal row of large acuminate tubercles, distributed in median region of the femur, with seven tubercles, the median tubercles larger than the basal ones; a retrolateral row of 12 large acuminate tubercles at along distal ⅓, with the size growing apically; a single apical retroventral acuminate tubercle; a proventral row of 11 acuminate tubercles along the distal ⅔, varying in size, interleaving several larger and smaller tubercles. Patellae and tibiae I–IV with sparse granulation, unarmed. Tarsal segmentation: (*n*=1) 6, 10, ?, 6. ***Penis***: (Fig. 12K, L) VP rectangular along the basal ½ and somewhat hexagonal along the apical ½ apical; wider at the middle region; distal margin concave; sinuous at lateral view. MS C1–C3 subapical short and straight; MS A1–A2 median short and straight (smaller than MS C). Lateral sacs long, apically slightly blunt, with long T3-like microsetae. Stylus with apex inflated and several small apical projections. Dorsal process conical and apically acuminated. Promontory slightly convex. — **FEMALE:** unknown.

Diagnosis. Similar to *Ayacucho bambamarca* **comb. nov.** and *A. weyrauchi* **comb. nov.** because three rows of spiniform tubercles in femur IV (Fig. 7W, X). Differs from *A. weyrauchi* **comb. nov.** by having nine spiniform tubercles in retrolateral row of femur IV (Fig. 7W, X); large tubercles in free tergites (Fig. 3E), distal margin of ventral plate slightly concave (Fig. 12K). Differs from *A. bambamarca* **comb. nov.** by having retrolateral row of tubercles covering only distal half distal of femur IV length (Fig. 7W, X); areas I–IV unarmed (Fig. 3E); distal margin of the VP without conspicuous lateral projections; dorsal process present in the penis (Fig. 12K, L).

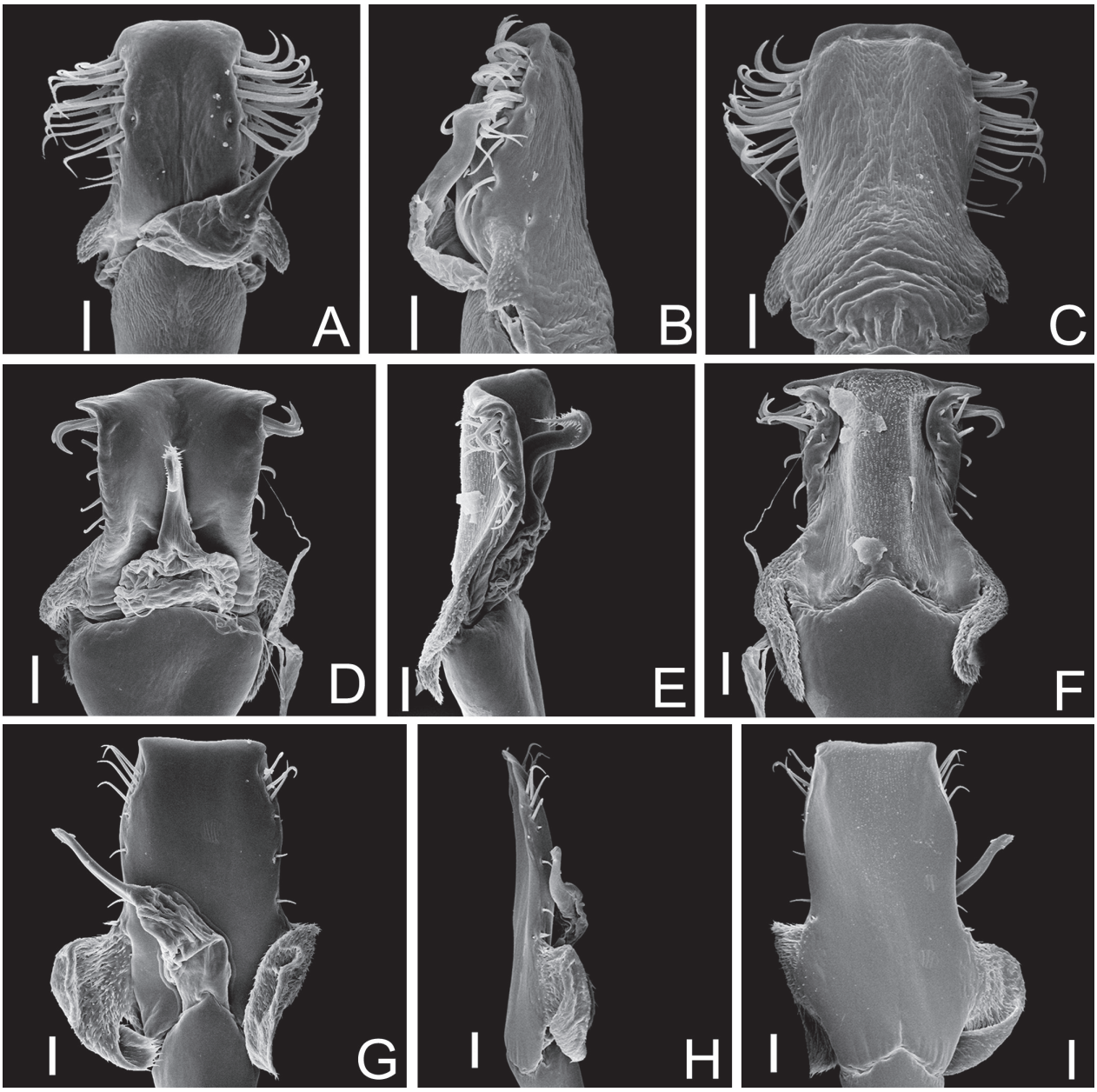

Figure 18. Penis of *Huancabamba* **gen. nov.** and *Incasarcus*, dorsal, lateral and ventral views, respectively. **A**–**C** *H. kubricki* **gen. et sp. nov.**; **D**–**F** *I. ochoai* Kury & Maury, 1998; **G**–**I** *I. viracocha* Kury & Maury, 1998; Legend bars = 0.1 mm.

Remarks. Roewer described *Cajamarca triseriata* in 1957 and *Tapacochana triseriata* in 1959. Since they are considered here as belonging to the genus *Ayacucho*, *Tapacochana triseriata* Roewer, 1959 is a secondary homonym of *Cajamarca triseriata* Roewer, 1957 and must be replaced. *C. triseriata* Roewer, 1957 is considered here synonymy of *Cajamarca bambamarca* Roewer, 1957, but junior synonyms are also combinations with the genus where they are included and consequently compete for homonymy. Therefore, we create *Ayacucho triarmatus* **nom. nov.** as a replacement name for Roewer's previous name.

Derivatio nominis. The specific epithet, an adjective in nominative singular, formed by Latin prefix *tri-* + Latin *armātus*, *ta*, *tum* (armed), in reference to three rows of tubercles on male femur IV.

Distribution. (Fig. 28) PERU. Cajamarca. Cajamarca and near San Juan.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Cajamarca, near San Juan, between Chiclayo and Cajamarca, 1,900 m a.s.l., 06/VII/1956, Weyrauch leg. (SMF RII 12763/34). ***Additional material*:** 1 ♂, 'PERU, Cajamarca, Cajamarca, 3,200 m a.s.l., 6º40′S 78º45′W, 14/III/1958, Buschwald leg. (MUSM 0501238).

3.25. *Ayacucho uniseriatus* (Roewer, 1957) comb. nov.

Figs. 3H, 8A, B, 17A–C, 23G, H, 28

Cajamarca uniseriata Roewer, 1957: 76 (desc.), fig. 34 (femur IV); Kury 2003: 144 (cat.).

Redescription. MALE: ***Measurements*** (*n*=5) DSW: 3.6–4.6 (4.4); DSL: 4.1–4.8 (4.3); CL: 1.3–1.7 (1.7). FIVL: 3.5–4.0 (4.0). ChL: 1.8–2.7 (2.6). ***Coloration***: (Fig. 23G) Predominantly brown-orange. Trochanters lighter. Chelicerae and pedipalpus more orange. ***Dorsum***: (Fig. 3H) Alpha-type DSS, with wide and slightly short coda. Anterior margin of dorsal scutum with granules scattered; with median elevation. Ocularium granulate, with a pair of spines. Areas I–IV covered with setiferous granules of similar size throughout their length. Lateral margins of dorsal scutum granulate. Posterior margin of dorsal scutum with a row of granules. Free tergites I–III with a row of tubercles; I with a pair of small tubercles; II–III with large acuminate tubercles. ***Chelicerae***: (Fig. 3H) Slightly to proeminently swollen (as in the holotype). Segment I smooth. Segment II predominantly smooth, with four teeth on finger. Segment III with five teeth. ***Pedipalpus***: Small granules distributed on the dorsal surface of the femur, tibia and patella. Trochanter with two ventrodistal setiferous tubercles. Femur with a ventrobasal setiferous tubercle; a row of five tiny ventral setiferous tubercles. Tibia: prolateral IiIi, retrolateral iIii. Tarsus: prolateral IiIii, retrolateral Iiii. ***Venter***: Coxae I–IV with scattered small granules. Genital area with few granules. Free sternites I–III with row of small granules. Anal operculum with granules distributed throughout extension. ***Legs***: (Figs. 3H, 8A, B) Coxae I–III each one with a prolateral and a retrolateral apophysis. Coxa IV granulate, with a proapical acuminate apophysis. Trochanters I–III few granulate. Trochanter IV with some dorsal median granules; one retroapical acuminate tubercle. Femora I–IV with granules densely distributed throughout their length. Femur IV with a prolateral row of 11–13 small blunt tubercles; a retroventral row of 17–18 long and acuminate tubercles. Patellae I–III with few granules sparsely distributed. Patella IV with densely distributed granules and 3–4 dorsoapical acuminate tubercles. Tarsal formula: (*n*=5) 7–9 (7), 11–16 (13), 7–8 (7), 8–10 (9). ***Penis***: (Fig. 17A–C) VP rectangular; distal margin slightly convex; slightly curved in lateral view; there is a more ventral projection, across the entire length of the VP, to the lateral sacs. MS C1–C3 subapical long and straight; MS A1 median long and straight; MS B1 sub basal long and straight (shorter than MS C and A); MS D1 very short, dorsally placed, near MS C3. Lateral sacs long, with blunt apex; without T3-like microsetae. Stylus cylindrical; with inflated apex, laterally flattened, ventrally projected. Dorsal process keel-shaped, laterally flattened. Promontory extremely elongated, triangle shaped. — **FEMALE:** ***Measurements*** (*n*=4) DSW: 3.6–3.9; DSL: 4.1–4.2; CL: 1.3–1.4. FIVL: 3.2–3.7. ChL: 1.3–1.4. (Fig. 23H) Chelicerae slightly smaller than that of males. Pedipalpus femur with a proapical setiferous tubercle, bigger than the ventral tubercles of femur. Femur IV unarmed. Tarsal segmentation: (*n*=4) 7, 10–12, 7–8, 8–9.

Diagnosis. It differs from other species of the genus (with males known) by the set of the following characteristics: ocularium with a pair of spines; scutal areas unarmed; free tergites I–III with a pair of tubercles (Fig. 3H); male femur IV with a retroventral row of long acuminate tubercles (Fig. 8A, B); penial lateral sacs without T3-like microsetae (Fig. 17A–C).

Remarks. Regarding the type of *C. uniseriata*: Roewer designated one male as holotype and two males as paratypes, but the type material is preserved without any distinction in the same vial. Therefore, it is not possible to recognize with absolute certainty which of the males is the holotype. Because of this, one of the males, whose femur IV most closely resembles the drawing in the original description, was separated as the holotype (although it is important to point out that the drawing does not faithfully represent any of the specimens).

Distribution. (Fig. 28) PERU. Cajamarca. Cutervo.

Material examined. ***Type material*: Holotype** ♂, ‘PERU, Cajamarca, Cutervo, 15/VI/1956, Weyrauch leg. (SMF RII 11648/31) – **Paratypes** 2 ♂, 2 ♀ ‘ditto’ (SMF RII 11648/31). ***Additional material*:** 1 ♂, 1 ♀ ‘PERU, Cajamarca, near Cutervo, 6º20′42“S 78º49′19″W, 20/V/2010, R. Pinto-da-Rocha & D. Silva leg. (MUSM); 2 ♂, 1 ♀ ‘ditto’ (MZSP 36981).

3.26. *Ayacucho vargasllosai* sp. nov.

http://zoobank.org/C3D23CAE-1661-4036-AD00-E4D4F304070F

Figs. 3G, 8C, D, 13A, B, 23F, 28

Description. MALE: ***Measurements*** (*n*=1) DSW: 3.3; DSL: 4.6; CL: 1.7. FIVL: 4.7. ChL: 2.5. ***Coloration***: (Fig. 23F) Chelicerae, pedipalpus, carapace and lateral margin of dorsal scutum and legs orange. Scutal areas, posterior margin of dorsal scutum and free tergites brownish. ***Dorsum***: (Fig. 3G) Alpha-type DSS, with shallower constrictions. Anterior margin of carapace with median elevation totally covered with granules. Ocularium with tiny acuminate tubercles. Areas I–IV with one pair of small median tubercles (larger than the pair of the ocularium). Posterior margin of dorsal scutum with a transverse row of four tubercles. Free tergites I—III with a row of 3–6 tubercles, larger than tubercles of areas I–IV. ***Chelicerae***: (Fig. 3G) Swollen in male. Segment I densely covered with granules throughout its length. Segment II predominantly smooth, with some hairs on the front surface; finger with four teeth. Segment III with two teeth. ***Pedipalpus***: With very small granules sparsely distributed on the dorsal surface of the femur–tibia. Trochanter with a distal ventral setiferous tubercle. Femur with a ventrobasal setiferous tubercle and a row of five small ventromedian setiferous tubercles. Tibia: prolateral IIII, IiI; retrolateral iII(II), iIII. Tarsus: prolateral IIi; retrolateral Iii, Ii. ***Venter***: Coxae I–IV and stigmatic area with sparse small granules; coxa I with a longitudinal row of small setiferous tubercles. Genital area smooth. Free sternites I–IV and anal operculum with sparse small granules. ***Legs***: (Figs. 3G, 8C, D) Coxae I–III each one with a retrolateral and a pro-

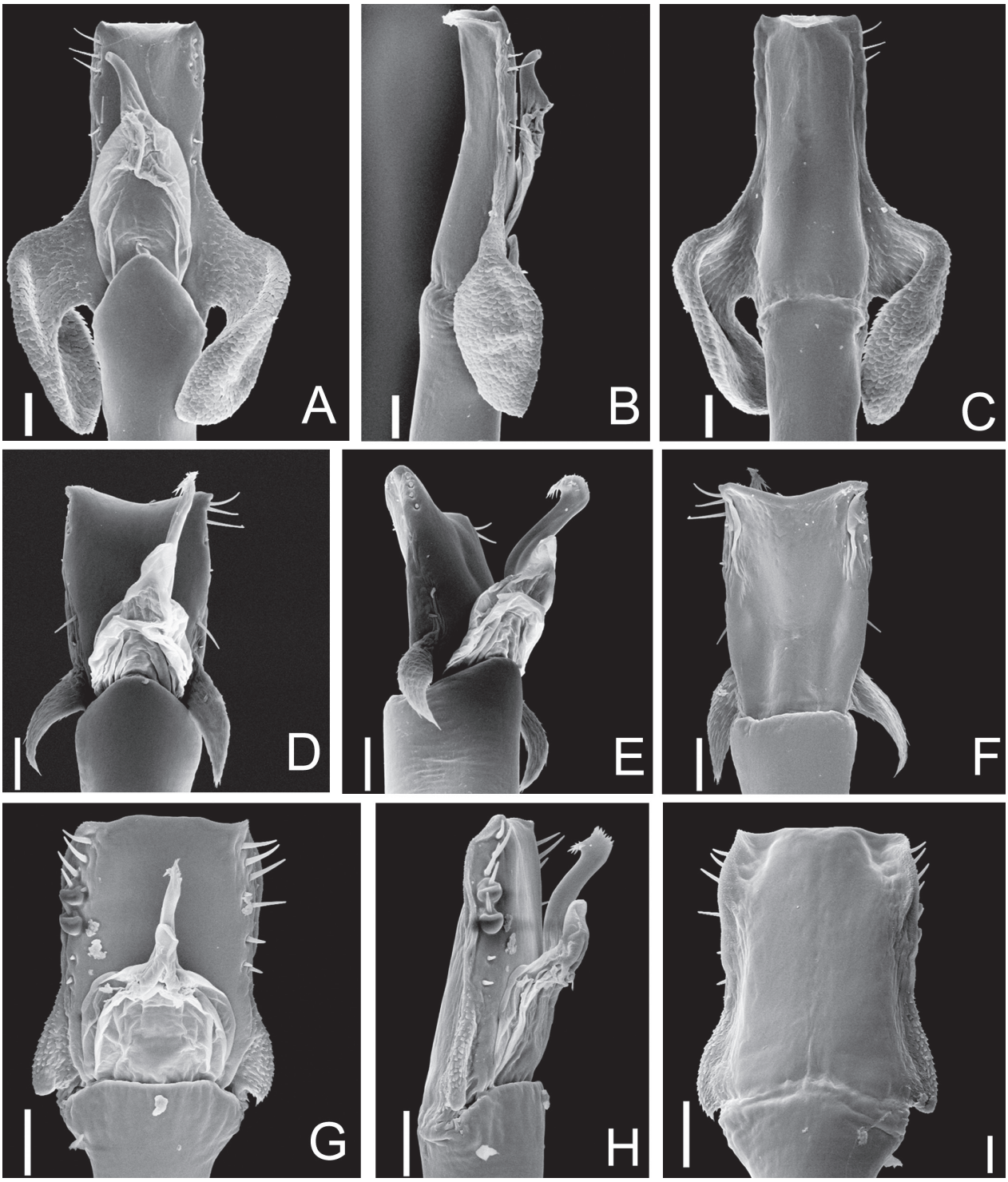

Figure 19. Penis of *Metasarcus*, dorsal, lateral and ventral views, respectively. **A**–**C** *M. bergmani* **sp. nov.**; **D**–**F** *M. clavifemur* (Roewer, 1929); **G**–**I** *M. fellinii* **sp. nov.**; Legend bars = 0.1 mm.

lateral apophysis. Coxa IV densely granulate, unarmed. Trochanters I–IV densely granulate, unarmed. Femora I–IV densely granulate throughout their dorsal, retrolateral and prolateral faces. Femora I–III with two rows of granules in the ventral face, larger than other granules of these segments. Femur IV with two ventral rows of granules that increase in size apically, greater than other granules of femur IV. Patellae I–IV densely granulate. Tibiae I–IV granulate (larger granules on ventral face). Tarsal segmentation: (*n* = 1) 7, 11, 7, 7. ***Penis***: (Fig. 13A, B) VP subrectangular in dorsal view, with distal half larger than basal half; distal margin straight. MS C1–C7 (C8) apical, long and curved; MS A1 median placed, long and straight (smaller than MS C); MS B1 sub basal, long and straight (smaller than MS A). Lateral sacs long, apically tapered; with long T3-like microsetae. Stylus apically inflated, with a conspicuous ventral projection. Dorsal process absent. Promontory straight. — **FEMALE:** ***Measurements*** (n=3) DSW: 3.0–3.1; DSL: 4.4–4.5; CL: 1.7. FIVL: 4.5–4.7. ChL: 2.2–2.3. Areas I–IV with one pair of

small median tubercles, smaller than in males. Pedipalpus with ventral tubercles slightly smaller than in males. Tibia: prolateral IiI; retrolateral iIIIi, iIII. Tarsus: retrolateral iIIi, iIii. Genital area with sparse granules. Femur IV with ventral tubercles smaller than in males. Tarsal segmentation (*n*=3): 7,11,7,8.

Diagnosis. Similar to *Ayacucho glauberrochai* **sp. nov.** *A. pomacocha* **sp. nov.**, *A. silvae* **sp. nov.**, and *A. titschacki* in the following combination of characteristics: dorsal scutum densely granulate; ocularium and areas I–IV of DS unarmed or armed with tiny tubercles, slightly greater than granules; posterior margin of DS and free tergites I–III with median rows of acuminate tubercles (Fig. 3G); femur IV of males without strong armature (except in ventral surface of femur IV in *A. silvae* **sp. nov.**; Fig. 8C, D). It differs from the previously mentioned species in the following combination of characteristics: ocularium with a pair of small tubercles; areas I–IV with a pair of tubercles (larger than those in ocularium; Fig. 3G); male femur IV unarmed (unlike *A. silvae* **sp. nov.**; Fig. 8C, D); and penis VP subrectangular, with 7–8 apical MS C (Fig. 13A, B).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the Peruvian writer, politician, journalist, essayist, filmmaker, college professor and Nobel Prize winner Jorge Mario Pedro Vargas Llosa (born 1936), more commonly known as Mario Vargas Llosa.

Distribution. (Fig. 28) PERU. Junín. Cruce Mina.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Junín, Cruce Mina, Cemento Andino, 11º22′45.4″S 75°52′43.5″W,| 22/IV/2011, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUBI) – **Paratype** 1 ♀, 'ditto' (MUBI); **Paratype** 1 ♀, 'ditto' (MZSP 36975); **Paratype** 1 ♂, 1 ♀, 'ditto' (MZSP 73007).

3.27. *Ayacucho weyrauchi* (Roewer, 1952) comb. nov.

Figs. 3F, 8E, F, 13C, D, 28

Cajamarca weyrauchi Roewer, 1952: 41 (desc.); Roewer 1957: 75 (cit.), fig. 30 (male femur IV); Kury 2003: 144 (cat.).

Cajamarca affinis Roewer, 1957: 75 (desc.), fig. 31 (male femur IV); Kury & Maury 1998: 145 (cit.); Kury 2003: 144 (cat.), **syn. n.**

Redescription. MALE: ***Measurements*** (*n*=2) DSW: 4.5; DSL: 4.6–5.0 (5.0); CL: 1.5–1.7 (1.5). FIVL: 4.2–4.5 (4.5). ChL: 1.5–3.0 (3.0). ***Coloration*** (in ethanol): Predominantly yellowish. Areas I–IV, posterior margin of DS and free tergites I–IV brown. ***Dorsum***: (Fig. 3F) Alpha-type DSS, with wide coda. Anterior margin of DS with median elevation with few sparsely granules. Ocularium with a pair of short spines; with granules between the spines. Carapace with few granules in the lateral regions of the ocularium, predominantly smooth in the posterior region of the ocularium. Areas I–IV few granular. Lateral margins of DS with few sparsely granules. Posterior margin of DS with 10–11 tiny tubercles. Free tergites I–III each one with a row of tiny tubercles with a wider base than their height. ***Chelicerae***: (Fig. 3F) Swollen in the largest specimen (the holotype of *Cajamarca weyrauchi*); similar to the females in the other male. Segment I granular. Segment II predominantly smooth; finger with one tooth. Segment III with five teeth. ***Pedipalpus***: Small granules distributed on the dorsal surface of the femur and patella. Trochanter with a large ventrodistal setiferous tubercle. Femur with a ventrobasal setiferous tubercle; a ventral row of four or five setiferous tubercles, larger in larger males. Tibia: prolateral iiIi, retrolateral iIi. Tarsus: prolateral IIi, retrolateral Iii. ***Venter***: Coxa I with a median row of six small tubercles. Coxae II–IV smooth. Three tiny apical tubercles between the coxae II–III and III–IV. Genital area smooth. Free sternites with a row of granules. Anal operculum with granules sparsely distributed over its length. ***Legs***: (Figs. 3F, 8E, F) Coxae I–III each one with a prolateral and a retrolateral apophysis (largest on coxa II); retrolateral apophysis on coxa II and prolateral apophysis on coxa III fused. Coxa IV with few granules, concentrated more on the distal part, with a prodistal spiniform apophysis. Trochanters I–III smooth. Trochanter IV with 3–4 median dorsal granules and a retroapical acuminate tubercle. Femora I–III with sparse granules throughout their length. Femur IV granular; with a median dorsal row of 5–8 large acuminate tubercles, growing apically in size; a retrolateral row with 3–4 large acuminate tubercles at distal half of this article; a retroventral row of 9–13 small tubercles, some of them similar to granules; a proventral row of 6–7 large acuminate tubercles along the apical portion. Patella I–IV with sparse granulation. Tibiae I–IV granular. Tarsal formula: (*n*=2) 7, 11–12 (12), 6–7 (6), 8 (?). ***Penis***: (Fig. 13C, D) VP with greater width in the median region; distal margin concave; straight in lateral view (except the apical portion). MS C1–C3 subapical long and curved or straight; MS A1–A2 median long and straight. Lateral sacs long and apically acuminated, with long T3-like microsetae. Stylus sinuous, with inflated apex, a long ventral projection and several small apical projections. Dorsal process half the length of the stylus. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=7) DSW: 3.8–4.1; DSL: 4.2–4.5; CL: 1.1–1.7. FIVL: 3.4–3.6. ChL: 1.3–1.6. Chelicerae similar to that of small males. Pedipalpus femur with a proapical spine. Femur IV with a dorsal row of 3–4 acuminate tubercles, spaced apart from each other; a retrolateral row of granules, with two acuminate tubercles in the median portion; a proventral row of 15–17 small tubercles, larger in the apical portion. All tubercles present in females are smaller than those in males. Tarsal formula: (*n*=7) 7, 11–13, 5–7, 8.

Diagnosis. Similar to *Ayacucho bambamarca* **comb. nov.** and *A. triarmatus* **nom. nov.** for presenting three rows of acuminate tubercles in the male femur IV (Fig. 8E, F). It differs from *A. bambamarca* **comb. nov.** and *A. triarmatus* **nom. nov.** in having a maximum of four acumi-

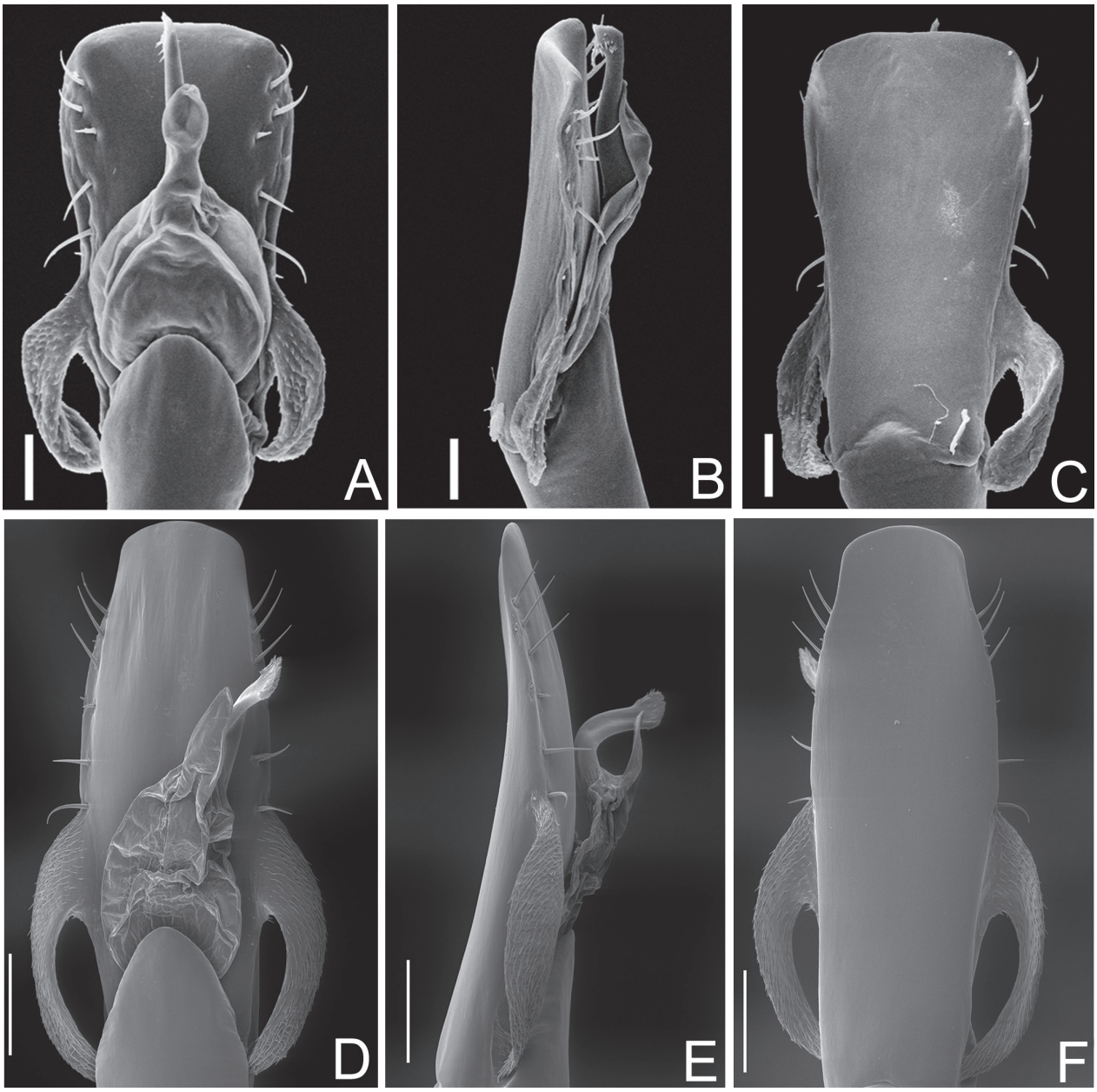

Figure 20. Penis of *Metasarcus*, dorsal, lateral and ventral views, respectively. **A–C** *M. trispinosus* **sp. nov.**; **D–F** *M. vacafloresae* **sp. nov.**; Legend bars = 0.1 mm.

nate tubercles in the retrolateral row (Fig. 8E, F); smaller tubercles in ocularium; free tergites with small tubercles (with wide base); areas I–IV with few granulation (Fig. 3F). It differs from *A. bambamarca* **comb. nov.** in having scutal areas unarmed (Fig. 3F).

Distribution. (Fig. 28) PERU. Cajamarca. Cajamarca.

Material examined. ***Type material*:** Of *C. weyrauchi*: **Holotype** ♂, 'PERU, Cajamarca, Cajamarca,| 2,750 m a.s.l., without date, Weyrauch leg. (SMF RII 10128/22) – **Paratypes** 2 ♀, 'ditto' (SMF RII 10128/22). Of *C. affinis*: **Holotype** ♂, 'PERU, Cajamarca, near Cajamarca, 24 km from Cajamarca, road to Celendin, 3,150 m a.s.l., 04/VIII/1956, Weyrauch leg. (SMF RII 11646/29) – **Paratypes** 5 ♀, 'ditto' (SMF RII 11646/29).

3.28. *Huancabamba* gen. nov.

http://zoobank.org/4A0804FA-3092-4585-A75A-51146B4ECB5B

Figs. 4A, 11A, B, 18A–C, 24A, B, 29A

Type species. *Huancabamba kubricki* **gen. et. sp. nov.** by present designation.

Diagnosis. *Huancabamba* **gen. nov.** can be distinguished from all other Metasarcidae genera by the combination of following: Kappa-type DSS; male femur IV at least 1.6 longer than DS length and with low tubercles; ocularium with two low tubercles; area III with spines; coxa IV apex

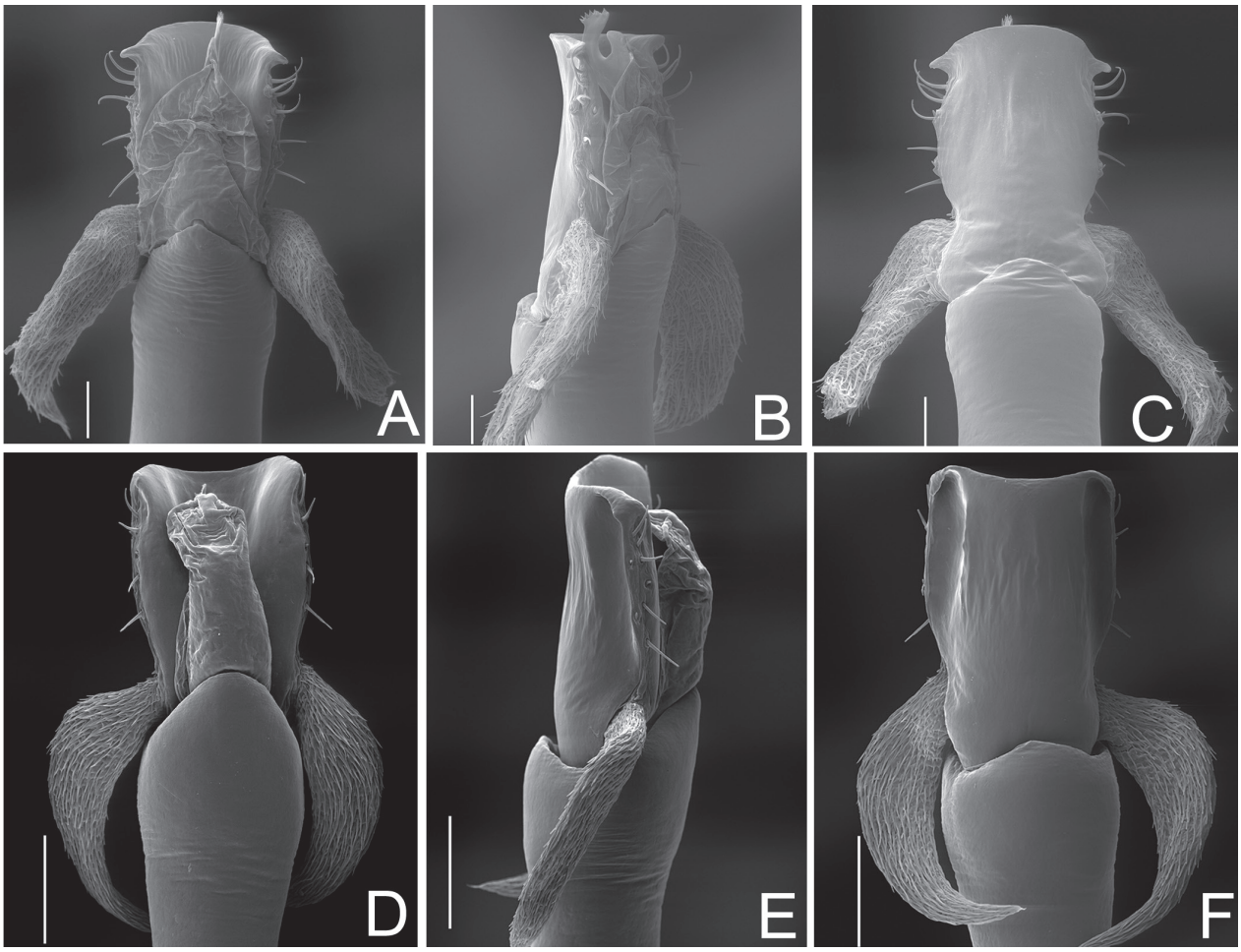

Figure 21. Penis of *Tschaidicancha*, dorsal, lateral and ventral views, respectively. **A**–**C** *T. chaplini* **sp. nov.**; **D**–**F** *T. scorsesei* **sp. nov.**; Legend bars = 0.1 mm.

reaching area III; penis with more than 13 MS C; a dry-mark in depression of ocularium, carapace, and lateral region to ocularium.

Description. Kappa-type DSS, with carapace very wide, constriction I weakly marked and coda undefined, coalescing with mid-bulge. Ocularium low, medially depressed. Ocularium with two low tubercles. Areas of dorsal scutum moderately tuberculate. Area I undivided. Area III armed with two high spines. Posterior margin of DS armed with a pair of high tubercles. Coda short, without constriction. Coxa IV reaching area III. Coxa IV unarmed (Fig. 4A). Femur IV about same size as dorsal scutum length (Figs. 11A, B, 24A). More than 13 MS C. Penis stylus thin thickness. Penis VP thin thickness (Fig. 18A–C).

Derivatio nominis. The genus name, a noun in the nominative singular, from Quechua, *huanca* (stone) + *bamba* (plain). It refers to Huancabamba depression, an interruption of the Andean Mountains, located between southern Ecuador and northern Peru. This depression constitutes a biogeographic barrier between the northern Andes and the central Andes. The name is a reference to this Metasarcidae genus occurred fartherst north. Gender: feminine.

Distribution. (Fig. 29A) PERU. Cajamarca.

Species composition. *Huancabamba kubricki* **gen. et. sp. nov.**

3.29. *Huancabamba kubricki* gen. et. sp. nov.

http://zoobank.org/1789853E-3528-489A-8F3E-1E4309E56C74

Figs. 4A, 11A, B, 18A–C, 24A, B, 29A

Description. MALE: ***Measurements*** (*n*=3) DSW: 4.0–4.2 (4.2); DSL: 3.6–4.3 (4.1); CL: 1.5–2.0 (2.0). FIVL: 6.6–7.3 (7.3). ChL: 1.2–3.6 (3.2). ***Coloration***: (Fig. 24A) Reddish carapace with blackish sides. Dorsal scutum and free tergites brownish orange. Lateral margins of DS, small tubercles on scutal areas, spines on area III and free tergites yellow. A dry-mark on depression of ocularium, carapace, and lateral region to ocularium. Pedipalpus and chelicerae yellow with small black spots. Legs I–II with coloration similar to dorsal scutum. Legs III–IV reddish brown. ***Dorsum***: (Fig. 4A) Row of granules on the anterior margin of dorsal scutum and the median elevation.

Granules more concentrated on carapace sides and on posterior region to ocularium. Ocularium with a relative strong depression; with pair of small tubercles and few granules near the eyes. Dorsal scutum with scutal grooves almost inconspicuous; grooves I and II more visible than others; granules sparsely distributed throughout scutal areas. Areas I–IV with a lateral pair of tubercles; I with a pair of median tubercles, larger than those on the lateral portion of scutal areas; III with a pair of large median blunt spines, base with small tubercles. Lateral margins of DS sparsely covered with granules throughout extension. Posterior margin of DS and free tergites I–III each one with a median pair of tubercles and a row of few granules. ***Chelicerae***: (Fig. 4A) Swollen in large males, similar to females in the small males. Segment I with three small prolateral tubercles and one large tubercle located medially or retrolaterally. Segment II with small setiferous granules, concentrated more distally; one tooth. Segment III with two teeth. ***Pedipalpus***: Trochanter with a ventroapical setiferous tubercle. Femur with a ventral row of 6–7 setiferous tubercles of irregular size, the largest being the most apical; one proapical spine. Patella with a promedian spine. Tibia: retrolateral iiIIIi, prolateral IIII. Tarsus: retrolateral iIiIi, prolateral iIIi. ***Venter***: Coxa I with a median row of 5–6 setiferous tubercles, the most median of which is larger; III–IV with small granules sparsely distributed. Rows of tubercles between the coxae II–III and III–IV. Genital area, anal operculum and free sternites with few granules. ***Legs***: (Figs. 4A, 11A, B) Coxa I–II each one with a prolateral and a retrolateral apophysis. Coxa III unarmed. Coxa IV with setiferous granules distributed throughout its surface, with the largest clustered apically. Trochanters I–IV unarmed and with a few granules. Femora I–III unarmed and with few granules. Femur IV unarmed and with more abundant and larger granulation than those of the other femora. Patellae–tibiae I–IV unarmed with few granules. Tarsal segmentation: (*n*=3) 7–8 (7), 16–17 (17), 15–17 (17), 16–17 (17). ***Penis***: (18A–C) VP rectangular, with distal margin straight; VP wide and robust in lateral view. MS C1–C13(C14) subapical long and apically curved; MS A1 median short and straight; MS B1–B2 median-basal long and straight (longer than MS A, shorter than MS C); MS D1 very short, placed dorsally, near MS C. Lateral sacs very short (twice as long as wide), apically blunt, with short T3-like microsetae. Stylus with apex dorsoventrally expanded and with apical projections. Dorsal process absent. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=3) DSW: 4.1–4.3; DSL: 4.1–4.3; CL: 1.6–1.8 FIVL: 6.9–7.0. ChL: 1.6–1.7. (Fig. 24B) Chelicerae small, not swollen. Femur IV with less dense granulation, with granules smaller than those of males. Tarsal segmentation: (*n*=3) 7, 13–16, 15–17, 15–17.

Diagnosis. As for the genus.

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the American director, producer and screenwriter Stanley Kubrick (1928–1999).

Distribution. (Fig. 29A) PERU. Cajamarca. Near Cutervo.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Cajamarca, near Cutervo, 06º20′42″S 78°49′19″W, 20/V/2011, R. Pinto-da-Rocha & D. Silva leg. (MUSM) – **Paratypes** 7 ♀, 'ditto' (MUSM); **Paratypes** 2 ♂, 7 ♀, 'ditto' (MZSP 36989).

3.30. *Incasarcus* Kury & Maury, 1998

Figs. 4B–F, 9, 13E–J, 18D–I, 30

Incasarcus Kury & Maury, 1998: 145 (desc); Kury 2003: 144 (cat); Kury and Villarreal 2015: 5 (cit), 23 (morp) and p. 29 (morp). **Type species:** *Incasarcus dianae* Kury & Maury, 1998 (by original designation).

Diagnosis. *Incasarcus* can be differentiated from other Metasarcidae genera by the combination of following: alpha-type DSS; males with a proapical spine on the pedipalpus femur; area I undivided; male femur IV at least 1.6 longer than dorsal scutum; ocularium with two low tubercles or spines; area III with spines; coxa IV apex reaching area IV or posterior margins of DS; penis with less than 10 MS C and stylus thin thickness.

Redescription. Alpha-type DSS. Ocularium low, medially depressed. Ocularium with two low tubercles or tall spines. Areas of dorsal scutum moderately to densely tuberculate. Area I undivided. Area III armed with two tall spines (most species), a pair of short spines (*I. argenteus*), or unarmed (*I. ochoai*). Posterior margin unarmed. Coxa IV reaching area IV or posterior margin. Coxa IV unarmed (Fig. 4B–F). Femur IV much longer than dorsal scutum length (Fig. 9). Less than 10 macrosetae C. Penis stylus thin. Penial ventral plate thickness thin (Figs. 13E–I, 18D–I).

Distribution. (Fig. 30) PERU. Cusco.

Species composition. *Incasarcus argenteus* Kury & Maury, 1998; *Incasarcus dianae* Kury & Maury, 1998; *Incasarcus ochoai* Kury & Maury, 1998; *Incasarcus pictus* Kury & Maury, 1998; *Incasarcus viracocha* Kury & Maury, 1998;

3.31. *Incasarcus argenteus* Kury & Maury, 1998

Figs. 4B, 9A, B, 13E, F, 30

Incasarcus argenteus Kury & Maury, 1998: 155 (desc.), 159 (key), figs. 32 (male dorsal habitus, chelicerae, pedipalpus), 33 (penis dorsal view), 34 (penis lateral view), 35 (male lateral habitus, chelicera, pedipalpus), 36 (female dorsal habitus, chelicerae, pedipalpus), 37 (male trochanter–tibia IV); Kury 2003: 144 (cat.); Benavides et al. 2021: 651(cit) fig.1 (cladogram).

Redescription. MALE: ***Measurements*** (*n*=3) DSW: 5.5–6.1 (6.1); DSL: 6.1–7.4 (7.4); CL: 2.5–3.1 (3.1).

FIVL: 9.7–10.8 (10.8). ChL: 3.4–5.2 (5.2). ***Coloration*** (in ethanol): Carapace (more accentuated behind and next to ocularium), area I and lateral margins of dorsal scutum, free tergites I–II, coxa IV (dorsal and ventral surfaces) and free sternites white-silver. Remaining mesotergum, pedipalpus and legs dark brown. Chelicerae yellowish brown. ***Dorsum***: (Fig. 4B) Anterior margin of dorsal scutum granulate. Ocularium with well-defined median depression; granulate. Carapace entirely covered by granules. Areas I–IV granulate, densely distributed in areas I–II and very sparsely distributed in areas III–IV; I with a pair of median tubercles; II–IV a pair of small tubercles near the lateral regions (absent in some specimens); III with a median pair of small or large spines, directed upwards. Lateral margins of dorsal scutum entirely covered by granules (irregularly distributed) except close to areas I–IV. Posterior margin of dorsal scutum predominantly smooth, with a row of granules. Free tergites I–III with irregular row of tubercles of different sizes, the largest and acuminate in the median portion. ***Chelicerae***: (Fig. 4B) Swollen. Segment I with four small granules. Segment II predominantly smooth, with four teeth. Segment III with three teeth. ***Pedipalpus***: Femur slightly granulate dorsally. Trochanter with a ventroapical setiferous tubercle. Femur with a ventral row of 7–8 large setiferous tubercles, divided into two groups, one basal with two tubercles and the remaining occupying the median portion of the segment; apical portion smooth; one large proapical spine. Patella with a proapical tubercle. Tibial: prolateral iiiIii, retrolateral IiIi. Tarsus: prolateral iiIiIi / iiiIiiIi, retrolateral iIiIii. ***Venter***: Coxa I with a median row of seven setiferous tubercles. Coxae II–IV covered by setiferous granules. Rows of four small tubercles between coxae II–III and seven between the coxae III–IV. Stigmatic area slightly granulate. Free sternites I–III each with row of granules. Anal operculum granulate. ***Legs***: (Figs. 4B, 9A, B) Coxae I–II each with a prolateral and a retrolateral apophysis. Coxa III unarmed. Coxa IV with few scattered granules. Trochanters I–III unarmed and granulate. Trochanter IV with a retroapical tubercle. Femora I–III unarmed and with scattered small granules. Femur IV covered with small granules; a retroventral row of 35–37 tubercles of equal size arranged along the entire length of article; a proventral row of 31–32 acuminate tubercles, the largest on the median portion; a prolateral row with 14 tubercles along the basal ⅓. Patellae I–III unarmed. Patella IV with a retrodorsal apical large tapered apophysis; a smaller apical prodorsal apophysis; a retroventral row of five acuminate tubercles and a proventral row of three tubercles. Tibiae I–IV unarmed and granulate. Tarsal segmentation: (*n*=3) 10–11 (10), 17–19 (19), 10–11 (11), 12–13 (13). ***Penis***: (Fig. 13E, F) Truncus swollen apically. VP rectangular with straight distal margin; straight in lateral view. MS C1–C3(C4) subapical long and apically curved; MS sub basal A1–A2 short; MS D1 very short, more dorsally placed (near MS C). Lateral sacs with long base, short length, apically blunt; with long T3-like microsetae. Stylus with apex dorsoventrally slightly inflated; with small apical projections. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=5) DSW: 4.3–5; DSL: 4.9–6.0; CL:1.6–2.3. FIVL: 9.7–10.9. ChL: 1.4–1.9. Tibia: prolateral iiIi / iIiIi. Tarsus: prolateral iiiIiI / iiiIiIi, retrolateral iIiIi. Chelicerae not swollen as in male. Femur–patella IV unarmed. Areas I–II and IV of dorsal scutum unarmed. White-silver only laterally behind ocularium and on area I of dorsal scutum. Tarsal segmentation: (*n*=5) 9, 16–18, 10–11, 10–12.

Diagnosis. It differs from other species of the genus by silver-white patches on carapace, area I and lateral margins of dorsal scutum; femur IV with two rows of acuminate large tubercles, a retroventral one with 35–37 tubercles and a proventral one with 31–32 tubercles (Fig. 9A, B).

Distribution. (Fig. 30) PERU. Cusco. La Convención and Urubamba provinces.

Material examined. ***Type material*: Holotype** ♂, ‘PERU, Cusco, Urubamba province, Ollantaytambo district, Abra de Málaga, Cancayoc, 3,000 m a.s.l., 13º16′S 72º16′W, 27/VIII/1995, J. Ochoa leg. (MACN 9549) – **Paratype** 1 ♀, ‘ditto’ (MACN 9550). ***Additional material*:** 2 ♂, 4 ♀, ‘PERU, Cusco, La Convención province, Carrizales, 3,250m a.s.l., 13/IV/2014, R. Cruz, S. Bejar & M. Serrano leg. (MZSP 76552).

3.32. *Incasarcus dianae* Kury & Maury, 1998

Figs. 4C, 9C, D, 13G, H, 30

Incasarcus dianae Kury & Maury, 1998: 146 (desc.), 159 (key), figs. 1 (male dorsal habitus, chelicerae, pedipalpus, trochanter–patella IV), 2 (penis dorsal view), 3 (penis lateral view), 4 (male lateral habitus), 5 (female dorsal habitus, chelicerae, pedipalpus), 6 (male ventral habitus); 7–10 (tarsi I–IV); Kury 2003: 144 (cat.), Pinto-da-Rocha et al. 2014: 6 (cit.); Kury 2014: 7 (cit.), 11 (cit.), 47 (mat.); Kury 2016: 146 (cit.), figs. 3a (penial microsetae).

Redescription. MALE: ***Measurements*** (*n*=3) DSW: 4.0–4.3 (4.0); DSL: 4.5–5.1 (4.5); CL: 1.1–1.5 (1.1). FIVL: 11.3–11.4 (11.4). ChL: 3.3–3.4 (3.4). ***Coloration*** (in ethanol): Yellow with black spots covering practically the entire dorsal scutum; area III brown. Pedipalpus, chelicerae and legs I–IV brown. ***Dorsum***: (Fig. 4C) Anterior margin of dorsal scutum granulate. Ocularium with well-defined median depression; sparsely granulate. Carapace sparsely granulate. Areas I–IV of dorsal scutum with scattered granules, with a slightly higher density at areas I–II. Area I with a pair of small lateral tubercles, slightly larger than granules. Area II and IV unarmed. Area III with a median pair of spines, directed backwards. Lateral margins of dorsal scutum with scattered granules. Posterior margin of dorsal scutum and free tergites I–III almost smooth, with few granules sparsely distributed. Free tergites I–III with a pair of median acuminate tubercles. ***Chelicerae***: (Fig. 4C) Swollen. Segment I with few granules distally. Segment II covered with small granules; with eight teeth. Segment III with five teeth. ***Pedipalpus***: Trochanter

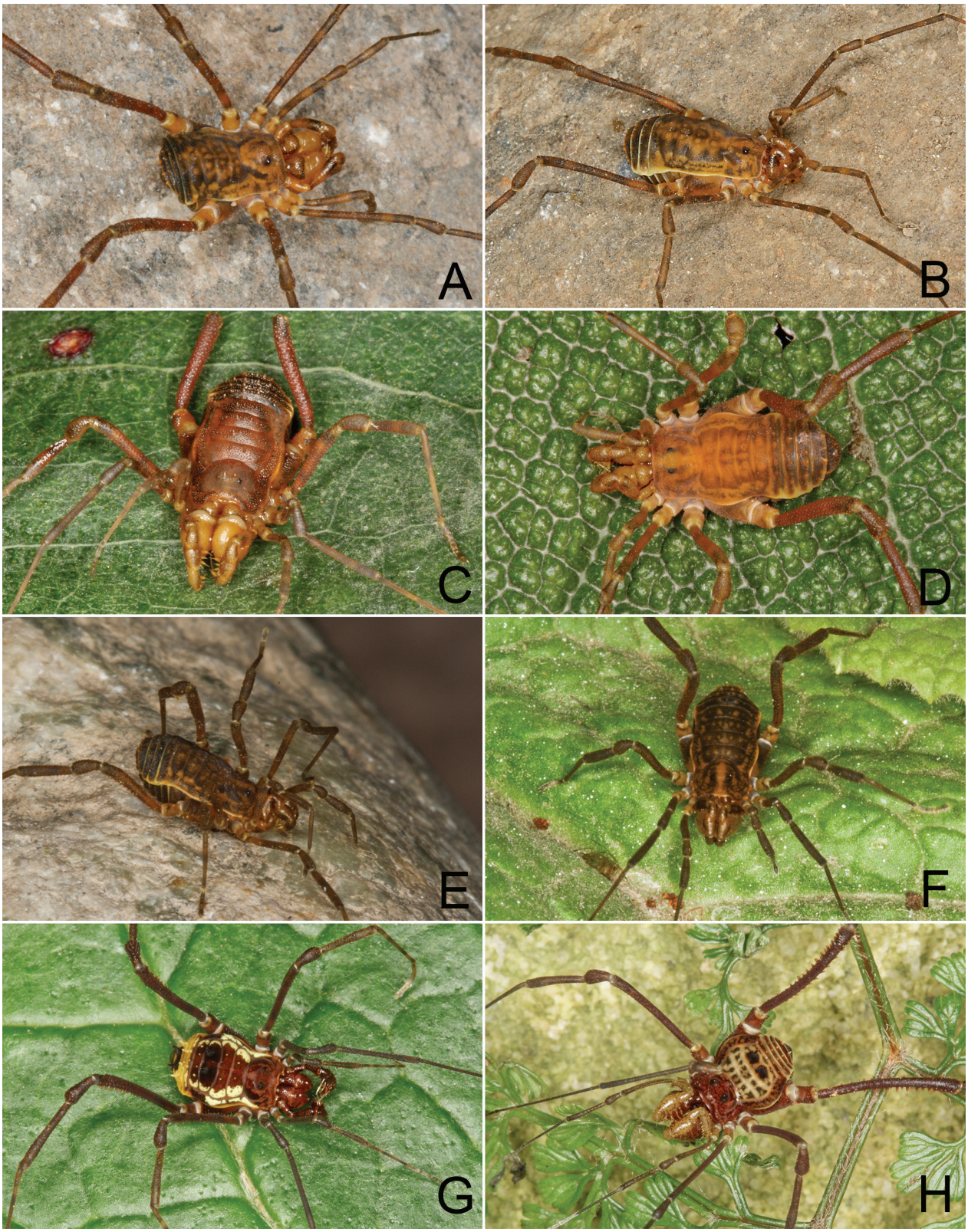

Figure 22. Live specimens of *Ayacucho*. **A**: *A. glauberrochai* **sp. nov.**, male. **B**: female. **C**: *A. pomacocha* **sp. nov.**, male. **D**, female. **E**: *A. silvae* **sp. nov.**, male. **F**: female. **G**: *A. pasolinii* **sp. nov.**, male. **H**: *A. spielbergi* **sp. nov.**, male.

with a ventroapical setiferous tubercle. Femur with a ventrobasal setiferous tubercles; a ventral row of three setiferous tubercles; with a large proapical spine. Patella with a proapical tubercle. ***Venter***: Coxa I with a median row of 4–5 setiferous tubercles; II–IV granulate. Rows of small tubercles between the coxae II–III and III–IV. Stigmatic area slightly granulate. Free sternites I–III with a row of small granules. Anal operculum granulate. ***Legs***: (Figs. 4C, 9C, D) Coxae I–II each with a prolateral and a retrolateral apophysis. Coxa III with a prolateral apophysis. Coxa IV with scattered setiferous granules. Trochanters I–III granulate and unarmed. Trochanter IV granulate and

with a retrolateral tubercle. Femora I–III with sparsely distributed small granules. Femur IV covered with small granules; a retrolateral row of 22–24 acuminate tubercles along basal ⅔, decreasing in size apically; a prolateral a row of 28–30 acuminate tubercles along basal ⅔, decreasing in size apically. Patellae I–III unarmed. Patella IV with a pair of dorsoapical tubercles (retrolateral one larger.) Tibiae I–IV with few scattered granules. Tarsal segmentation: (*n*=3) 9, 15–17 (17), 10, 11. ***Penis***: (Fig. 13G, H) VP rectangular; with straight distal margin, with conspicuous lateroapical projections. MS C1–C4(C5) subapical long and apically curved; MS A1–A2 median short and straight; MS D1 very short, dorsally placed near MS C; MS E1–E2(E3) very short, placed in lateral flanges of VP. Lateral sacs short, with blunt apex; with T3-like short microsetae. Stylus with broad apex; apically with small projections. Promontory truncated. — **FEMALE:** ***Measurements*** (*n*=3) DSW: 4.4–5.0; DSL: 5.5–5.8; CL: 1.3–1.4; FIVL: 11.2–11.5. ChL: 1.3–1.4. Females more robust than the males. Chelicerae not swollen. Femur IV unarmed. Tarsal segmentation: (*n*=3) 8–9, 14–16, 10–11, 11–13.

Diagnosis. It differs from other species of the genus by the set of following characters: DS without silver-white coloration; DS slightly granulate; area I with a pair of lateral tubercles; area III with a pair of spines (Fig. 4C); male femur IV with a retrolateral and a prolateral rows of tubercles at ⅔ basal (Fig. 9C, D); penis with short lateral sacs (Fig. 13G, H).

Distribution. (Fig. 30) PERU. Cusco. Paucartambo province, Manu National Park.

Material examined. ***Type material*: Holotype** ♂, ‘PERU, Cusco, Paucartambo province, Manu National Park, road to Paucartambo-Pilcopata, 2,900 m a.s.l., 13º01′40″S 71º16′40″W | 19/II/1990, A. Cano & D. Silva leg. (MUSM 410) – **Paratypes** 2 ♀, ‘ditto’ (MUSM 410); **Paratypes** 1 ♂, 2 ♀, ‘PERU, Cusco, Paucartambo province, Manu National Park,| road to Paucartambo-Pilcopata, 2,900 m, 13º01′40″S 71º16′40″W, 14/II/1990, A. Cano & D. Silva leg. (MNRJ 5315 ex-MUSM 410).

3.33. *Incasarcus ochoai* Kury & Maury, 1998

Figs. 4D, 9J–N, 18D–F, 30

Incasarcus ochoai Kury & Maury, 1998: 152 (desc.), 160 (key), figs. 21 (male dorsal habitus, chelicerae, pedipalpus, trochanter–patella IV), 22 (penis dorsal view); 23 (penis lateral view), 24 (male lateral habitus, chelicera, pedipalpus), 25 (female dorsal habitus), 26 (male sternum, coxae I–IV); 27 (male trochanter–patella IV), 28–31 (tarsi I–IV); Kury 2003: 144 (cat.); Ázara et al. 2020: 476 (cit), fig. 2 (cladogram).

Redescription. MALE: ***Measurements*** (*n*=3) DSW: 5.1–5.2 (5.2); DSL: 6.3–6.5 (6.5); CL: 1.6–1.7 (2.6). FIVL: 11.0–11.2 (11.2). ChL: 3.5–4.7 (3.5). ***Coloration*** (in ethanol): Yellow with black spots covering the areas of the dorsal scutum; pedipalpus and chelicerae brown. Legs I–IV yellow. ***Dorsum***: (Fig. 4D) Median elevation of anterior margin of dorsal scutum with granules. Ocularium with well-marked median depression; sparse granules. Carapace with sparse granules. Areas I–IV with granules more densely distributed than on carapace; unarmed. Lateral margins of dorsal scutum with granules throughout their length. Posterior margin of dorsal scutum slightly granulate. Free tergites I–III with a row of granules. ***Chelicerae***: (Fig. 4D) Swollen in large males, slightly greater than those on females in smaller males (as in the holotype). Segment I granulate. Segment II with small granules; finger with two teeth. Segment III with two teeth. ***Pedipalpus***: With granules scattered throughout the dorsal portion of the femur–patella. Trochanter with a ventroapical setiferous tubercle. Femur with a ventrobasal setiferous tubercle; a ventral row of seven setiferous tubercle throughout all extension of femur, except the apex and base; one proapical spine. Patella with a small proapical tubercle. ***Venter***: Coxae I–IV with granules; Coxae I–II with 2–3 sparse tubercles. Rows of tubercles between the coxae II–III and III–IV. Genital area and free sternites few granulate. Anal operculum sparsely granulate. ***Legs***: (Figs. 4D, 9J–N) Coxa I–II each with a retrolateral and a prolateral apophysis. Coxa III unarmed. Coxa IV with granules sparsely scattered. Trochanters I–IV unarmed and granular. Femora I–III with sparse granules. Femur IV with small granules throughout its surface; one retroventral row of 23–24 acuminate tubercles, the basal larger (in large males, the tubercles are larger and more robust); a prodorsal row of 7–8 tubercles at the base region (in large males, the tubercles are large and acuminated, whereas in smaller males, this row is virtually inconspicuous); a prolateral row of 5–7 tubercles, present only in the middle portion of femur, with some tubercles closer to the apex (only in large males). Patellae I–III granulate. Patella IV with a ventral row of five acuminate tubercles along the basal ½ (in smaller males, tubercles are smaller). Tibiae I–IV granulate. Tarsal segmentation: (*n*=3) 8–10 (10), 18–19 (19), 9–11 (10), 10–13 (13). ***Penis***: (Fig. 18D–F) VP subrectangular, distal margin slightly convex; with conspicuous lateral projections; lateral flanges ventrally folded. MS C1–C5 subapical long and curved; MS A1 median long and straight (half length of MS C), and MS A2–A3 sub basal long and straight; MS B1 basal short (placed near lateral sacs); MS D1 short, placed on flange near to MS C; MS E1–E2 short (larger than MS B and MS D), placed on ventrally fold of flanges. Lateral sacs long, apically slightly acuminated, with long T3-like microsetae. Stylus with broad apex, with a long ventral projection with small projections throughout its extension. Promontory straight. — **FEMALE:** ***Measurements*** (*n*=3) DSW: 5.2–5.7; DSL: 5.9–6.2; CL: 1.5. FIVL: 10.1–10.7. ChL: 1.2—1.3. Chelicerae not swollen. Femur IV unarmed. Tarsal segmentation (*n*=3): 8–9, 13–16, 9–10, 10–12.

Diagnosis. It differs from other species of the genus by the set of following characters: DS without silver-white coloration; DS granulate; ocularium, areas I–IV and free

tergites I–III unarmed (Fig. 4D); male femur IV with one ventral row of 23–24 acuminate tubercles, a prolateral row of 5–7 tubercles and a prodorsal row of 7–8 tubercles (virtually inconspicuous in smaller males; Fig. 9J–N).

Distribution. (Fig. 30) PERU. Cusco. Urubamba province.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Cusco, Urubamba Province, Huayllabamba district, Yanacocha, Huayocari, Huayoccare, 3,000–4,000 m a.s.l., 13º20′S 72º02′W, 14/XI/1992, J.C. Chaparro leg. (MACN 9551) – **Paratype** ♀, 'ditto' (MACN 9552); **Paratypes** 2 ♀, 'PERU, Cusco, Urubamba Province, Huayllabamba district, Yanacocha, Huayocari, Huayoccare, 3,000–4,000 m a.s.l., 13º20′S 72º02′W | 17/VI/1995, J.A. Ochoa leg. (MACN 9553); **Paratype** 2 ♂, 'ditto' (MACN 9554); **Paratype** 1 ♂, 'ditto' (MNRJ 5401); **Paratype** 1 ♂, 'ditto' (MNRJ 5402 ♀).

3.34. *Incasarcus pictus* Kury & Maury, 1998

Figs. 4E, 9E, F, 13I, J, 30

Incasarcus pictus Kury & Maury, 1998: 149 (desc.), 160 (key), figs. 11 (male dorsal habitus, chelicerae, pedipalpus, trochanter–patella IV), 12 (penis dorsal view), 13 (penis lateral view), 14 (male lateral habitus), 15 (female dorsal habitus), 16 (male sternum and coxae I–IV), 17–20 (tarsi I–IV); Kury 2003: 145 (cat.).

Redescription. MALE: ***Measurements*** (*n*=1) DSW: 4.9; DSL: 5.8; CL: 1.6. FIVL: 11.5. ChL: 3.2. ***Coloration*** (in ethanol): DS with conspicuous white spots, a pair of small rounded spots on carapace, behind ocularium and a large spot covering all area I. The remaining DS yellow with small black spots; chelicerae, pedipalpus, area III and legs I–III brown; leg IV black. ***Dorsum***: (Fig. 4E) Median elevation of anterior margin of carapace with granules. Ocularium with a mildly acute median depression; densely granular. Carapace densely granular. DS with granules densely distributed in areas I–II and more sparsely in III–IV. Areas I with a pair of small median tubercles, slightly larger than the granules present. Area III with a median pair of spines, directed posteriorly. Lateral margins of dorsal scutum with granules throughout their length. Posterior margin of dorsal scutum slightly granulate. Free tergite I–III with irregular row of acuminate tubercles of different sizes, the median largest. ***Chelicerae***: (Fig. 4E) Segment I with granules in distal part. Segment II with small granules throughout its length; finger with five teeth; Segment III with three teeth. ***Pedipalpus***: Trochanter with one ventroapical setiferous tubercles. Femur with a ventral row of 7–8 setiferous tubercles and a proapical spine. Patella with a proapical tubercle. Tibia: retrolateral (ii)iiIii, prolateral IiIi. Tarsus: retrolateral iIIiIi. ***Venter***: Coxa I with a median row of nine setiferous tubercles of varying sizes and with 2–3 small distal tubercles. Coxae II–IV with setiferous granules throughout their surface. Rows of tubercles between the coxae II–III and III–IV. Genital area slightly granulate. Free sternites with one row of granules. Anal operculum granulate. ***Legs***: (Figs. 4E, 9E, F) Coxae I–II each one with a retrolateral and a prolateral apophysis. Coxa III unarmed. Coxa IV with scattered setiferous granules. Trochanters I–IV unarmed and granular (III–IV being the most densely granular). Femora I–III with small sparse granules. Femur IV with small granules throughout its length; a retroventral row of 28–30 acuminate tubercles of equal size, occupying the entire length of segment; an apical proventral row with four tiny tubercles. Patellae I–III unarmed. Patella IV with a retroapical spiniform apophysis. Tarsal segmentation: (n=1) 12, 19–21, 11, 12–13. ***Penis***: (Fig. 13I, J) VP rectangular, elongated, with distal margin straight; MS C1–C2(C3) subapical long and apically curved; MS A1–A2 median to sub basal long and straight (A1 longer than A2; both with half length of MS C); MS D1–D2(D3) short, more dorsally placed, near MS C. Lateral sacs long, robust, with blunt apex; with long T3-like microsetae. Stylus long with apex swollen. Dorsal process absent. Promontory sharply convex. — **FEMALE:** Not examined. See Kury and Maury (1998) for details on female.

Diagnosis. It differs from other species of the genus by the set of following characters: DS with white coloration on carapace (behind ocularium) and area I; DS granulate; ocularium and areas II and IV unarmed; area I with a pair of tubercles; area III with a pair of spines; free tergites I–III with a row of tubercles (Fig. 4E); male femur IV with a retroventral row of 28–30 acuminate tubercles and an apical proventral row with four tiny tubercles (Fig. 9E, F).

Distribution. (Fig. 30) PERU. Cusco. Wiñayhuaina.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Cusco, Wiñayhuaina, Inca trail, 2,700–3,100 m a.s.l., 13º09′S 72º31′W, 10/II/1990, D. Silva leg. (MUSM 408).

3.35. *Incasarcus viracocha* Kury & Maury, 1998

Figs. 4F, 9G–I, 18G–I, 30

Incasarcus viracocha Kury & Maury, 1998: 157 (desc.), 160 (key), figs. 38 (male dorsal habitus, chelicerae, pedipalpus, trochanter–patella IV), 39 (penis dorsal view), 40 (penis lateral view), 41 (male lateral habitus), 42 (female dorsal habitus), 43 (male femur IV); Kury 2003: 145 (cat.).

Redescription. MALE: ***Measurements*** (*n*=3) DSW: 4.9–5.0 (4.9); DSL: 5.9–6.6 (5.9); CL: 2.4–3.0 (2.4). FIVL: 11.7–11.8 (11.8). ChL: 3.5–4.2 (4.2). ***Coloration*** (in ethanol): Brownish yellow body with reticular spots covering practically the entire carapace and chelicerae. ***Dorsum***: (Fig. 4F) Anterior margin of carapace with granular median elevation. Ocularium with very marked median depression; with sparse granules or smooth. Carapace with sparse granules. Areas I–IV with granules throughout their surface. Areas I–II and IV unarmed.

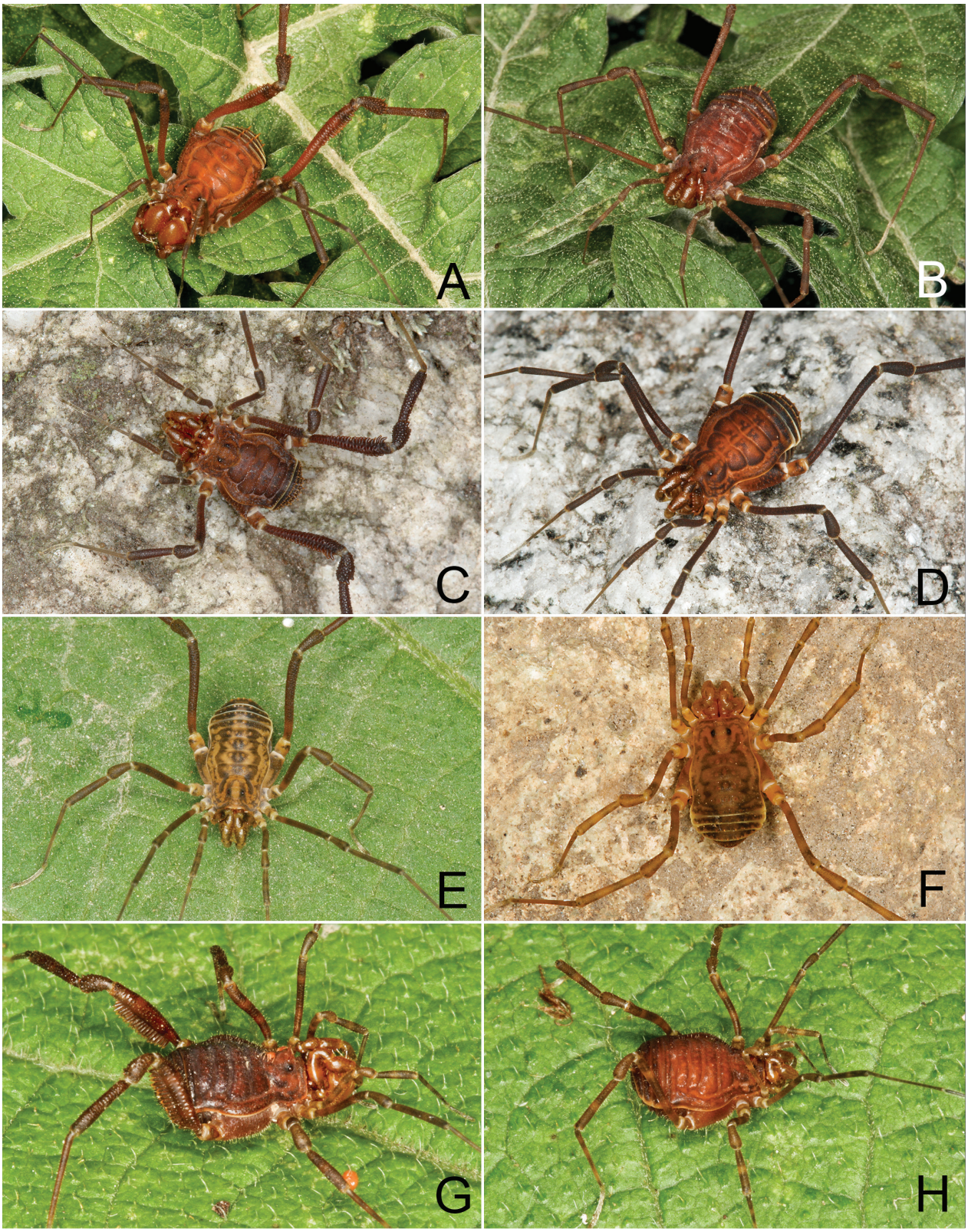

Figure 23. Live specimens of *Ayacucho*. **A** *Ayacucho spiniger* (Roewer, 1957) **comb. nov.**, male; **B** female; **C** *A. tapacocha* **nom. nov.**, male; **D** female; **E** *A. titschacki* Roewer, 1949, male; **F** *A. vargasllosai* **sp. nov.**, male; **G** *A. uniseriatus* (Roewer, 1959) **comb. nov.**, male; **H**: female.

Area III with a pair of median spines, facing posteriorly. Lateral and posterior margins of DS with granules throughout their length. Free tergites I–III with a row of granules. ***Chelicerae***: (Fig. 4F) Swollen in large males (as in the holotype). Segment I with densely distributed granules. Segment II with small granules or smooth; finger with five teeth. Segment III with three teeth. ***Pedipalpus***: Covered with sparse granules across the dorsal surface of the femur–tibia. Trochanter with a ventroapical setiferous tubercle. Femur with a ventral row of 6–7

small setiferous tubercles and a retro-subapical spine. Patella with a small retroapical setiferous tubercle. Tibia: prolateral iIiIIi, retrolateral IIii. Tarsus: prolateral iiiIiIIi, retrolateral iIiiIi. ***Venter***: Coxa I with a median row of 5–6 setiferous tubercles. Coxae II–IV with setiferous granules. Rows of four tubercles between the coxae II–III and seven between the coxae III–IV. Genital area with few granules. Free sternites with transverse rows of small granules. Anal few granular. ***Legs***: (Figs. 4F, 9G–I) Coxa I with a retrolateral and a prolateral apophysis. Coxa II with a prolateral apophysis. Coxa III unarmed. Coxa IV with sparse setiferous granules. Trochanters I–IV unarmed and granular. Femora I–III unarmed and with sparse granules. Femur IV with small granules; a retroventral row of 30–35 acuminate tubercles, distributed along the entire length of the article, except at the basal and apical ends (the most basal and apical tubercles are smaller than the median ones). Patellae I–III unarmed. Patella IV with a retroapical spiniform apophysis; a ventromedian row of four acuminate tubercles. Tibiae I–IV unarmed and granular. Tarsal formula: (*n*=3) 11, 21–22 (22), 11, 14–15 (15). ***Penis***: (Fig. 18G–I) VP rectangular, slightly tapering at the apex, with distal margin straight; straight in lateral view. MS C1–C3(C4) subapical long and apically curved; MS A1 median long and straight (⅓ of the length of the MS C); MS B1–B2 sub basal; MS B1 long and straight, MS B2 long and spatulated; MS D1 short, placed beneath MS C. Lateral sacs robust, with a blunt apex; with long T3-like microsetae. Stylus with slightly broad apex; with ventral projections. Promontory convex and tapered. — **FEMALES:** ***Measurements*** (*n*=3) DSW: 4.5–4.9; DSL: 5.5–5.8; CL: 2.0. FIVL: 12.4–12.5. ChL: 2.4–2.5. Chelicerae not swollen. Femur IV unarmed. Pedipalpal femur with five tubercles. Tarsal segmentation: (*n*=3) 9–10, 15–20, 10–12, 12–13.

Diagnosis. It differs from other species of the genus by the set of following characters: DS without white spots on DS; DS granular; ocularium unarmed and with few granules or smooth; areas I, II and IV unarmed; area III with a pair of spines; free tergites I–III with a row of tubercles, unarmed (Fig. 4F); male femur IV with a retroventral row of 30–35 acuminate tubercles (Fig. 9G–I).

Distribution. (Fig. 30) PERU. Cusco. Urubamba province.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Cusco, Urubamba province, Machu Picchu, 2,200–2,500m a.s.l., 13º07′S 72º34′W, 25/II/1994, J. Ochoa & J. Achicahuala leg. (MACN 9547) – **Paratype** ♀, 'ditto' (MACN 9548); **ParatypeS** 2 ♀, 'ditto' (MNRJ 5400). ***Additional material*:** 2 ♂, 3 ♀ 'PERU, Cusco' (MUBI).

3.36. *Lumieria* gen. nov.

http://zoobank.org/2AE4A3EB-D45E-4A4E-8EBC-626563FF93B8

Figs. 6A, B, 11C–F, 14A, B, 17D–F, 24C–F, 29A, B

Type species. *Lumieria antonionii* **gen. et. sp. nov.**, by present designation.

Diagnosis. *Lumieria* **gen. nov.** can be distinguished from all other Metasarcidae genera by the combination of following: Kappa-type DSS; area I divided; ocularium medially depressed, with two high tubercles, area III with two spines; posterior margin and free tergites with one or two higher tubercles; femur IV much longer than dorsal scutum length; penis VP and stylus robust and thick in lateral view; conspicuous dry-marks on the carapace, grooves of DS and free tergites.

Description. Kappa-type DSS, with constriction I well marked and constriction II absent. Coda undefined, coalescing with mid-bulge. Ocularium low, medially depressed. Ocularium unarmed, small tuberculate or smooth. Areas of dorsal scutum small to moderately tuberculate. Area I divided in two halves. Area III armed with two high spines. Posterior margin armed with one or a pair of high tubercles. Coda short, without constriction. Coxa IV reaching area IV or posterior margin. Coxa IV unarmed (Figs 6A, B, 24C, E). Femur IV much longer than dorsal scutum length (Figs. 11C–F, 24C, E). Less than 10 macrosetae C. Penis stylus elongate, robust, very thick and flattened latterally (with a almost subrectangular or claviform appearance in the lateral view), with apical or subapical projections. Penis VP thick in lateral view, with dorsal side with a robust curvature resulting in a laterally convex appearance (Figs. 14A, B, 17D–F).

Derivatio nominis. The genus name, a noun in the nominative singular, is derived from Auguste Marie Louis Nicholas Lumière (1862–1954) and Louis Jean Lumière (1864–1948), the Lumière brothers, who were the inventors of cinematograph, being frequently referred like the parents of the "Cinema". Gender feminine.

Distribution. (Fig. 29) PERU. Junín.

Species composition. *Lumieria antonionii* **gen. et sp. nov.** and *Lumieria woodyalleni* **gen. et sp. nov.**

3.37. *Lumieria antonionii* gen. et sp. nov.

http://zoobank.org/1BB9A615-E739-4DA0-ABE4-2BA8C-3CA127F

Figs. 6A, 11C, D, 17D–F, 24C, D, 29A

Description. MALE: ***Measurements*** (*n*=10) DSW: 4.6–5.5 (5.5); DSL: 5.0–5.8 (5.6); CL: 1.1–1.5 (2.2). FIVL: 10.8–12.4 (12.4). ChL: 1.7–5.2. ***Coloration***: (Fig. 24C) Body reddish brown. Dry-marks on the carapace, grooves of dorsal scutum and free tergites. Pedipalpus, chelicerae and legs brown. ***Dorsum***: (Fig. 6A) Anterior margin of carapace with median elevation, with a few sparsely distributed granules. Ocularium with median saddle-shape depression; a pair of short median spines,

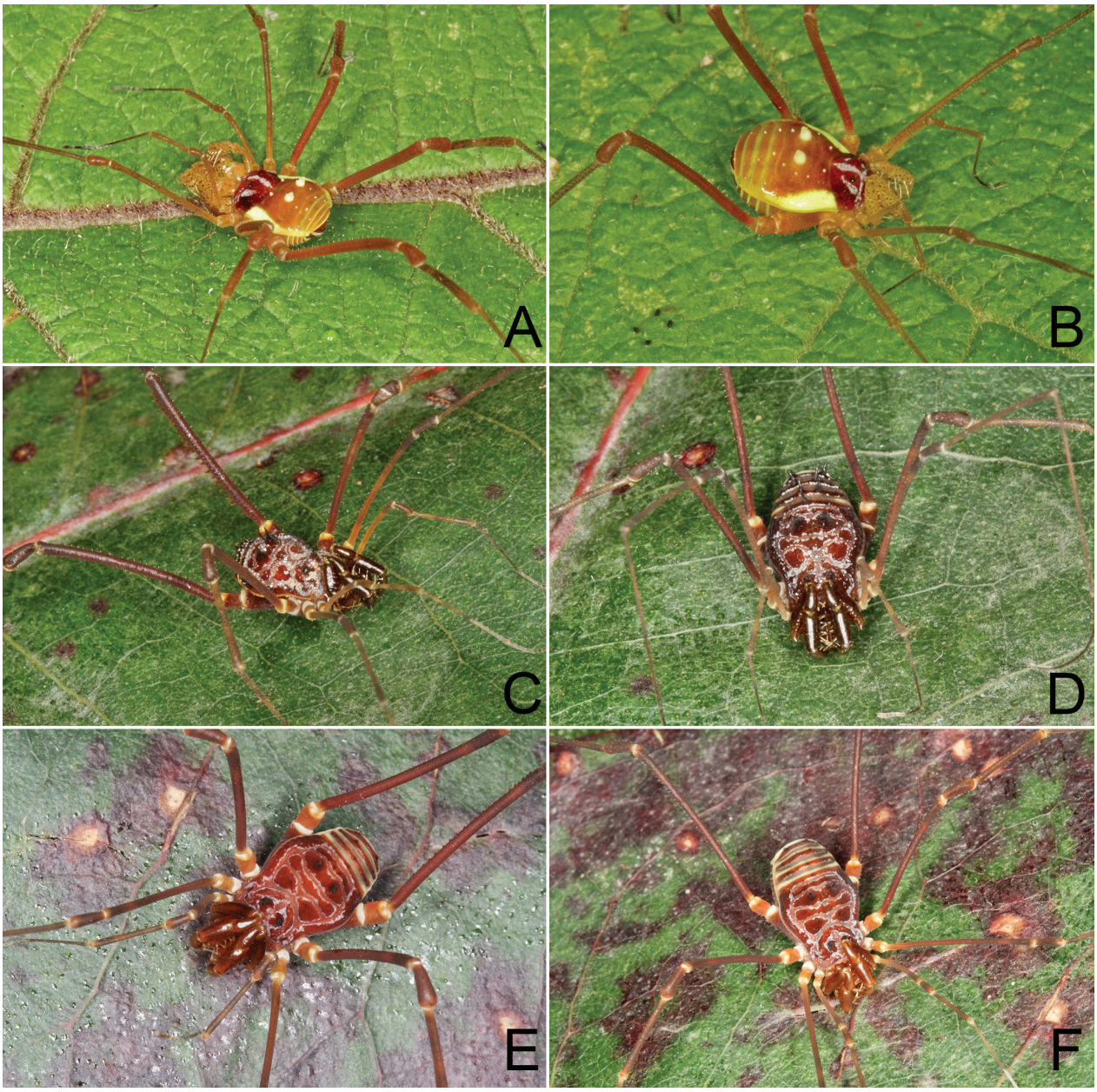

Figure 24. Live specimens of *Huancabamba* **gen. nov.** and *Lumieria* **gen. nov. A** *H. kubricki* **gen. nov.et sp. nov.**, male; **B** female; **C** *L. antonionii* **gen. nov. sp. nov.**, male; **D** female; **E** *L. woodyalleni* **gen. nov. sp. nov.**, male; **F** female.

and two pairs of tubercles near the eyes; slightly granulate. Carapace with scattered tubercles. Areas I–IV covered with scattered tubercles. Area I divided; with a pair of small median tubercles. Area II invading area I; unarmed. Area III with two long parallel spines, directed posteriorly, located at elevations of integument, totally granulate. Area IV unarmed. Posterior margin of dorsal scutum with two median acuminate tubercles and two small granules. Free tergites I–III with a pair of acuminate tubercles, medially in tergites I–II and laterally in tergite III. ***Chelicerae***: (Fig. 6A) Conspicuously swollen in large males (as in the holotype), to a lesser extent in smaller males. Segment I granulate. Segment II with few granules; finger with three teeth. Segment III with one tooth. ***Pedipalpus***: Granules on the ventral surface of the femur. Trochanter with a ventroapical setiferous tubercle. Femur with a ventral row of nine large setiferous tubercles (except at the apex), larger in the middle portion; one proapical spine. Patella with a small proapical setiferous tubercle. Tibia: prolateral iIiI, retrolateral IIII. Tarsus: prolateral iIiIi, retrolateral iII. ***Venter***: Coxa I with two rows with 6–7 large tubercles. Coxae II–III with two rows of granules. Coxa IV with scattered granules. Row of five small tubercles between the coxae III–IV. Genital area slightly granulate. Free sternites with few granules. Anal operculum granulate. ***Legs***: (Figs. 6A, 11C, D) Coxae I–II each one with a prolateral and a retrolateral apophyses. Coxa III with a prolateral apophysis Coxa IV with setiferous granules sparsely distributed throughout its surface; unarmed. Trochanters I–III unarmed and with sparse granules. Trochanter IV with few granules; a large retroapical apophysis; two small retrolateral tubercles medially near the retroapical apophysis. Femora I–III with small granules. Femur IV with granules sparsely

distributed throughout its length; a retrolateral row of 24–26 acuminate tubercles varying in size throughout femur length. Patellae I–IV unarmed, with few granules. Tibiae I–III few granulate; unarmed. Tibia IV with a retrolateral row of 15–16 acuminate tubercles, covering the entire length of segment; two dorsal small tubercles. Tarsal segmentation: (*n*=5) 9–10 (10), 20–23 (23), 11–12 (12), 11–15 (14). ***Penis***: (Fig. 17D–F) VP rectangular, with distal margin straight; a distal median projection with half the width of VP; Ventral plate strongly thick and straight in lateral view. MS C1–C6(C7) subapical long and well curved; MS A1–A2 median to sub basal, long and straight; MS D1 very short and straight, dorsally placed near MS A. Lateral sacs long, apically tapered; with short T3-like microsetae. Stylus elongate and flattened laterally, with lateral supapical filiform projections. Dorsal process absent. Promontory slightly convex. — **FEMALE:** ***Measurements*** (*n*=10) DSW: 4.9–5.3; DSL: 5.3–5.5; CL:1.0–1.2. FIVL: 11.5–12.5. ChL: 2.3–2.7. (Fig. 24D) Chelicerae not swollen, smaller or equal to the small males. Areas of the dorsal scutum more granular than that of males. Trochanter IV with retroapical apophysis shorter than the male; without prominent tubercles. Femur IV unarmed. Tarsal segmentation: (*n*=10) 8, 19–21, 11–12, 12–13.

Diagnosis. Similar to *Lumieria woodyalleni* **gen. et sp. nov.** because ocularium is armed with a pair of spines, area I divided, area III with a great pair of spines, free tergites with large tubercles (Fig. 6A) and femur–tibia IV with a retrolateral row of acuminate tubercles (Fig. 11C, D). Differs from *Lumieria woodyalleni* **gen. et sp. nov.** because the area II invading the area I; increased granulation on carapace and areas of dorsal scutum (Fig. 6A); male femur IV with less than 20 retrolateral acuminate tubercles (Fig. 11C, D); VP with distal margin straight and with a distal median projection (Fig. 17D–F).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the Italian filmmaker, editor, screenwriter, painter and writer Michelangelo Antonioni (1912–2007).

Distribution. (Fig. 29A) PERU. Junín. Near Comas.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Junín, Centro Turístico Ilpa, near Comas, 11º42′37.1″S 75°04′20.2″W, 27/IV/2011, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUBI) – **Paratypes** 5♂, 5 ♀, 'ditto' (MUSM); **Paratypes** 11 ♂, 11 ♀, 'ditto' (MZSP 36982); **Paratypes** 4 ♂, 6 ♀, 'ditto' (MUBI).

3.38. *Lumieria woodyalleni* gen. et sp. nov.

http://zoobank.org/23A02F9B-448F-42EC-8C74-45694D8D2AC6

Figs. 6B, 11E, F, 14A, B, 24E, F, 29B

Description. MALE: ***Measurements*** (*n*=1) DSW: 5.4; DSL: 5.8; CL: 1.3. FIVL: 11,8. ChL: 3.5. ***Coloration***: (Fig. 24E) Pedipalpus and chelicerae brown-orange, dark in tone. DS, free tergites and legs reddish brown; dry-marks around the scutal grooves and on the carapace. Distal parts of legs and lateral parts of free tergites dark brown. ***Dorsum***: (Fig. 6B) Anterior margin of carapace with median elevation, covered with a few scattered granules. Ocularium with pronounced median depression; a pair of spines, the right one bifurcated. Area I divided (although the division is barely conspicuous in the region close to the longitudinal groove that divides the area); with a lateral and a median pair of small tubercles. Area II with two lateral tubercles. Area III with two long spines, directed posteriorly, located at elevations of integument, totally granulate. Area IV with five sparse tubercles. Lateral margins of DS with granules, except on carapace. Posterior margin of the DS and free tergite I smooth, each one with an acuminate tubercle. Free tergites II–III with two lateral acuminate tubercles. ***Chelicerae***: (Fig. 6B) Segment I granular. Segment II with few granules; finger with four teeth. Segment III with three teeth. ***Pedipalpus***: Coxa with 1–2 retrodorsal tubercles. Trochanter with a ventroapical setiferous tubercle. Femur with a ventrobasal setiferous tubercle; a ventral row of 3–4 small granules; a small proapical tubercle. Patella with a small proapical tubercle. Tibia: prolateral II, retrolateral iIii. Tarsus: prolateral Iii, retrolateral Iii. ***Venter***: Coxa I with a median row of 4–5 setiferous tubercles. Coxae II–IV with granules throughout their surface. Rows of small tubercles between the coxae II–III and III–IV. Genital area slightly granulate. Free sternites with rows of small granules. Anal operculum granulate. ***Legs***: (Figs. 6B, 11E, F) Coxae I–II each one with a prolateral and a retrolateral apophysis. Coxa III with a prolateral apophysis. Coxa IV with few sparse granules. Trochanters I–III smooth. Trochanter IV with 1–2 retroapical tubercles. Femur I–III unarmed, with small granules. Femur IV with sparse granules; a retrolateral row of 24 tubercles, these of varying size, most with acuminate apex. Patellae I–IV unarmed, with few granules. Tibiae I–III unarmed and few granular. Tibia IV with a retrolateral row of 16 acuminate tubercles along the basal ¾. Tarsal segmentation: (*n*=1) 8, 18, 10, 11. ***Penis***: (Fig. 14A, B) VP rectangular, with distal margin slightly concave; VP strongly thick and straight in lateral view. MS C1–C5 subapical long and straight (some with curved apex); MS A1 basal, short and straight. Lateral sacs long, with acuminate apex; with short T3-like microsetae. Stylus extended and wide, with swollen apical region; with many small apical projections. Dorsal process absent. Promontory slightly convex. — **FEMALE:** ***Measurements*** (*n*=1) DSW: 5.5; DSL: 6.4; CL: 1.5. FIVL: 11.5. ChL: 1.5. (Fig. 24F) Chelicerae not swollen. Femur–tibia IV unarmed. Tarsal segmentation (*n*=1) 8, 16, 9, 11.

Diagnosis. Similar to *Lumieria antonionii* **gen. et. sp. nov.** by combination of following characters: ocularium with a pair of spines, area I divided, a long pair of spines

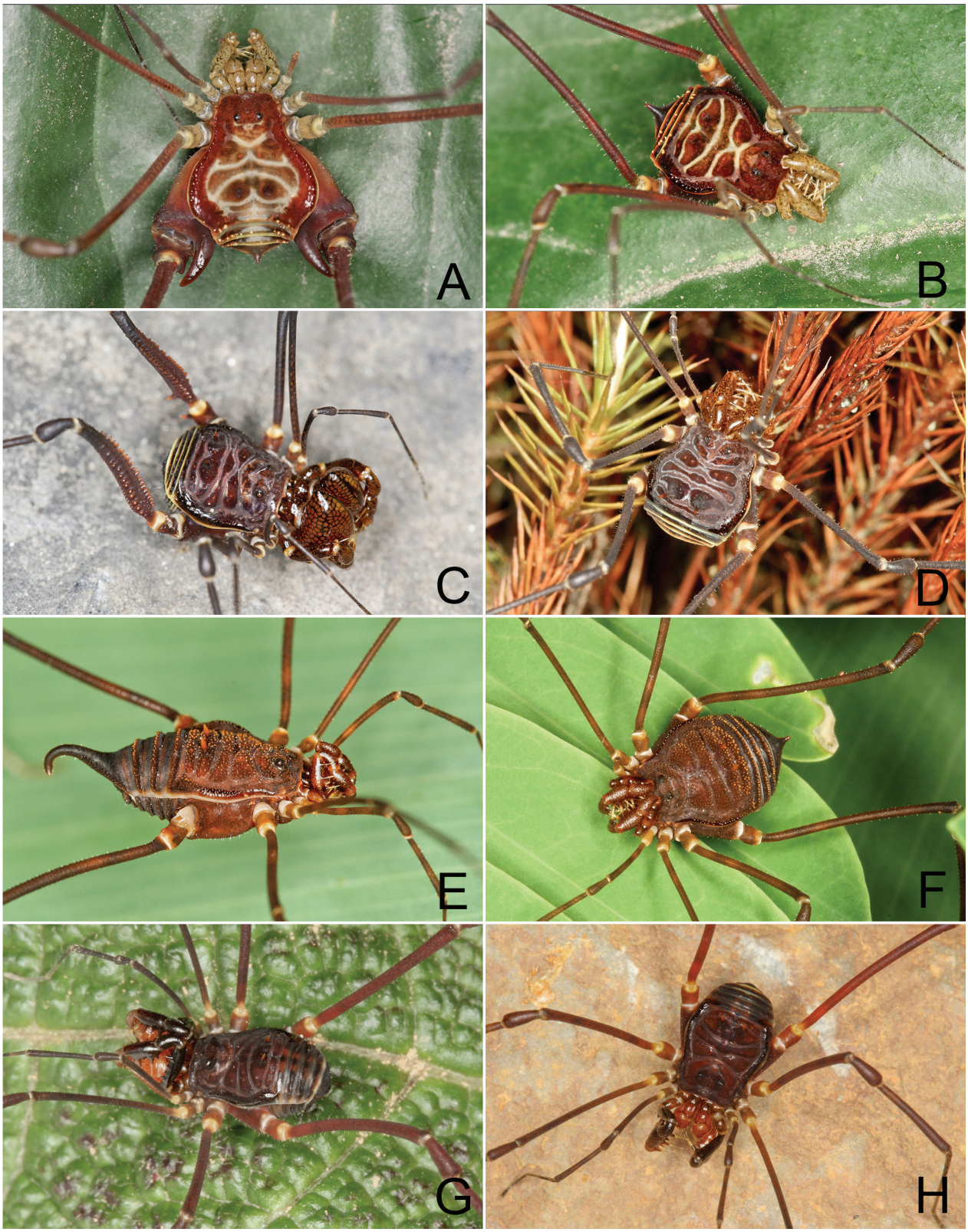

Figure 25. Live specimens of *Metasarcus*. **A** *M. bergmani* **sp. nov.**, male; **B** female; **C** *M. clavifemur* (Roewer, 1929), male; **D** female; **E** *M. fellinii* **sp. nov.**, male; **F** female; **G** *M. kurosawai* **sp. nov.**, male; **H** female.

in area III, free tergites with large tubercles (Fig. 6B) and femur–tibia IV with a retrolateral row of tubercles (Fig. 11E, F). Differs from *Lumieria antonionii* **gen. et. sp. nov.** because the division of the area I is less conspicuous; area II not invading the area I; carapace and scutal areas with very few granules (Fig. 6B); male femur IV with more than 20 retrolateral acuminate tubercles (Fig. 11E, F); VP with distal margin slightly concave (Fig. 14A, B).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the American

filmmaker, actor, musician and writer Heywood Allen (born Allan Stewart Königsberg in 1935), known as Woody Allen.

Distribution. (Fig. 29B) PERU. Junín. Near Comas.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Junín, Centro Turístico Ilpa, near Comas, 1°42′37.1″S 75°04′20.2″W, 27/IV/2011, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUBI) – **Paratype** ♀, 'ditto' (MZSP 51851).

3.39. *Metasarcus* Roewer, 1913

Figs. 5, 10, 14C–H, 19, 20, 25, 26, 31

Metasarcus Roewer, 1913: 304 (desc); Roewer 1923: 508 (key), 517 (rdesc); Mello-leitão 1926: 34 (key); 1932: 408 (rdesc); 1935: 108 (cit.); Soares and Soares 1949: 234 (rdesc); Kury 1994: 349 (syst); Kury and Maury 1998: 145 (cit); Kury 2003: 145 (cat): Kury & Villarreal, 2015: 5, 14 (syst). **Type-species:** *Metasarcus bolivianus* Roewer, 1913 (by monotypy).

Metarascus [lapsus calami]: Roewer 1931: 107 (key).

Chaconatus Roewer, 1929: 275 (key), 276 (desc); Mello-leitão 1932: 108 (rdesc); Juberthie 1970: 142 (cit); Soares, Soares and Jim 1992: 5 (cat); Kury 1994: 349 (syst); Kury 2003: 145 (cat). **Type-species:** *Chaconatus armatipalpus* Roewer, 1929 (by monotypy). Synonymy established by Kury 1994: 349.

Chacoikeontus Roewer, 1929: 275 (key), 278 (desc); Mello-leitão 1932: 104 (key), 108 (rdesc); Juberthie 1970: 142 (cit); Soares, Soares and Jim 1992: 3 (key), 5 (rdesc, cat); Kury and Maury 1998: 145 (syst); Kury 2003: 144 (cat); Yamaguti and Pinto-da-Rocha 2009: 321 (syst); Kury & Villarreal, 2015: 23, 26 (cit). **Type-species:** *Chacoikeontus clavifemur* Roewer, 1929 (by monotypy). Synonymy established by Townsend et al. 2019: 102

Diagnosis. *Metasarcus* can be diagnosed from other Metasarcidae genera with long legs (except *Ayacucho*) by the combination of the following features: gamma-type; gamma-P-type or kappa-type DSS; ocularium unarmed; area III with two spines. Half of *Metasarcus* species present a spine, long projection or trifid projection in free tergite III, present in no other Metasarcidae species; coxa III with two apophyses; coxa IV reaching posterior margin of dorsal scutum or surpassing it; femur IV smooth or slightly granulate; penis stylus and VP thin thickness, with less than 10 MS C

Redescription. Gamma-type DSS (*M. bolivianus* and *M. fellinii* **sp. nov.**; Fig. 6E), gamma-P-type DSS (*M. beni* **sp. nov.**, *M. bergmani* **sp. nov.**, *M. limachii* **sp. nov.** and *M. trispinosus* **sp. nov.**; Fig. 6A, B, G, H) or kappa-type DSS (*M. clavifemur*, *M. kurosawai* **sp. nov.** and *M. vacafloresae* **sp. nov.**; Fig. 6D, F, I). Ocularium low, medially depressed. Ocularium unarmed, small tuberculate or smooth (Fig. 6). Areas of dorsal scutum moderately or densely tuberculate (*M. fellinii* **sp. nov.**). Area I undivided (Fig. 6G–I) or divided in two halves (Fig. 6A–F). Area III armed with two high spines in most species (e.g. Fig. 6D), with two tubercles (*M. trispinosus* **sp. nov.**; Fig.6H) or unarmed (*M. vacafloresae* **sp. nov.**; Fig. 6I). Posterior margin unarmed. Coxa IV reaching area III–IV or posterior margin. Coxa IV unarmed or with retrolateral armature (*M. bergmani* **sp. nov.**, *A. limachii* **sp. nov.**; Fig. 6B, G). Femur IV much longer than dorsal scutum length. (Figs. 10, 25, 26) Less than 10 MS C. Penial stylus thin. Penial ventral plate thin (Figs. 14C–H, 19, 20).

Distribution. (Fig. 31) BOLIVIA. Beni, Cochabamba, La Paz and Tarija.

Remarks. Townsend et al. (2019: pp. 102–103, 105–106), in a non-taxonomic or systematic study, cited *Chacoikeontus clavifemur* as *Metasarcus clavifemur* (Roewer, 1929). The authors did not provide justification for or specify it was a new combination or nomenclatural act, did not mention the genus *Chacoikeontus* (and its consequent status as a junior subjective synonym) and did not discuss the genus *Metasarcus* with the inclusion of the species. Once the new combination has been published, the nomenclatural act is valid and herein confirmed (see below). As *Chacoikeontus clavifemur* is the type-species of the genus, by implication *Chacoikeontus* was considered a junior subjective synonym of *Metasarcus*.

Species composition. *Metasarcus beni* **sp. nov.**; *Metasarcus bergmani* **sp. nov.**; *Metasarcus bolivianus* Roewer, 1913; *Metasarcus clavifemur* (Roewer, 1929); *Metasarcus fellinii* **sp. nov.**; *Metasarcus kurosawai* **sp. nov.**; *Metasarcus limachii* **sp. nov.**; *Metasarcus trispinosus* **sp. nov.** and *Metasarcus vacafloresae* **sp. nov.**

3.40. *Metasarcus beni* sp. nov.

http://zoobank.org/F9403230-DD0E-4B48-B597-1954F056BF7E

Figs. 5A, 10A, B, 14C, D, 31

Description. MALE: ***Measurements*** (*n*=2) DSW: 5.0–5.1 (5.1); DSL: 5.0–5.2 (5.2); CL: 1.2–1.3 (1.3). FIVL: 16.0–17.0 (17). ChL: 3.3–3.4 (3.4). ***Coloration*** (in ethanol): Yellow. ***Dorsum***: (Fig. 5A) Gamma-P-type DSS. Anterior margin of carapace with median elevation, with few granules. Carapace with granules concentrated in the lateral regions to ocularium and sparse behind ocularium. Ocularium with pronounced median depression; granulate and unarmed. Areas I–II granulate; III–IV with sparse granulation. Area I divided by longitudinal groove; with one pair of median tubercles. Areas II and IV unarmed. Area III with two long spines, directed posteriorly. Posterior margin of dorsal scutum and free tergites with few granules distributed. Lateral margins of dorsal scutum with granules along the posterior ⅔. ***Chelicerae***: (Fig. 5A) Swollen. Segment I granular. Segment II with few granules; finger with seven teeth. Segment III with four teeth. ***Pedipalpus***: Femur–tibia with small tubercles on dorsal surface. Trochanter with a ventroapical setiferous tubercle. Femur a ventral row of 5–6 large

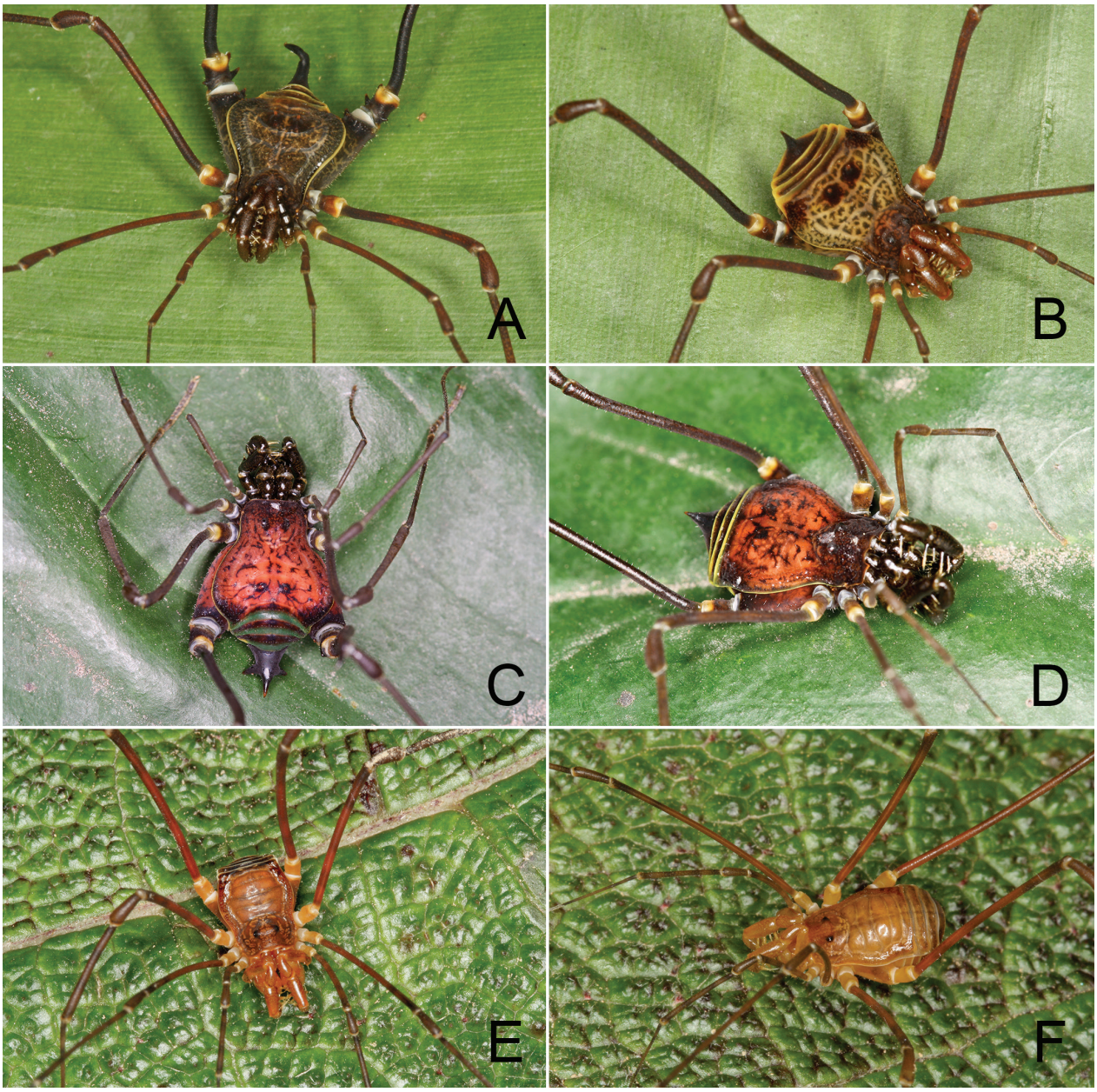

Figure 26. Live specimens of *Metasarcus*. **A** *M. limachii* **sp. nov.**, male; **B** female; **C** *Metasarcus trispinosus* **sp. nov.**, male; **D** female; **E** *M. vacafloresae* **sp. nov.**, male; **F** female.

spines; a large retroapical spine. Patella with a large retroapical and smaller proapical spines. Tibia: prolateral IIII, retrolateral IIII. Tarsus: prolateral IIi, retrolateral iIi. ***Venter***: Coxa I with a row of 5–6 tubercles. Coxae II–IV with sparse granules. Rows of four tiny tubercles between coxae II–III and six tubercles between coxae III–IV. Genital area, free sternites and anal operculum few granulate. ***Legs***: (Figs. 5A, 10A, B) Coxae I–II each with a prolateral and a retrolateral apophysis. Coxa III unarmed. Coxa IV with few sparse granules. Trochanters I–III unarmed and smooth. Trochanter IV unarmed and granular. Femora I–III unarmed and with small granules. Femur IV granular; a distal retrodorsal small apophysis; a distal retroventral row of 11–12 small tubercles. Patella–tibiae I–IV unarmed, with few granules. Tarsal segmentation (*n*=2) 7, 16–17 (17), 10, 11–12 (12). ***Penis***: (Fig. 14C, D) VP rectangular; distal margin slightly straight; straight in lateral view, with apex slightly inclined. MS C1–C4(C5) subapical long and straight (some with curved apex); MS A1–A2(A3) median long and straight, shorter than MS C. Lateral sacs long, with acuminate apex; with long T3-like microsetae. Stylus with apical region cylindrical, not swollen; with many apical small projections. Dorsal process conical, with acuminate apex, smaller than stylus. Promontory convex. — **FEMALE: *Measurements*** (*n*=3) DSW: 5.2–5.5; DSL: 4.5–4.7; CL: 1.7–1.8. FIVL: 11.8–12.4. ChL: 2.4–2.5. Chelicerae not swollen. Femur IV unarmed. Tarsal segmentation: (*n*=3) 7, 13, 10, 11.

Diagnosis. Similar to *Metasarcus kurosawai* **sp. nov.** because ocularium unarmed, area I divided, area III with a pair of long spines (Fig. 5A) and femur IV of males slender and without rows of tubercles (Fig. 10A, B). It differs

from *M. kurosawai* **sp. nov.** by gamma-P-type DSS; coxa III unarmed (Fig. 5A); male femur IV with a distal retrodorsal small apophysis (Fig. 10A, B) and penis with dorsal process and long lateral sacs (Fig. 14C, D).

Derivatio nominis. The specific epithet, a noun in apposition, in reference to Beni Department ("El Beni"), Bolivia, Department of the type locality of the species.

Distribution. (Fig. 31) BOLIVIA. Beni. Southwest of Yucumo.

Material examined. ***Type material*: Holotype** ♂, 'BOLIVIA, Beni, southwest of Yucumo | 15°23′S 66°59′W | 15–19/XI/1989, Coddington, Griswold, Silva, Larcher & Penaranda leg. (USNM) – **Paratypes** 1 ♂, 3 ♀, 'ditto' (USNM).

3.41. *Metasarcus bergmani* sp. nov.

http://zoobank.org/11B40D2F-108B-49D2-AF56-79AC64978832

Figs. 5B, 10C, D, 19A–C, 25A, B, 31

Description. MALE: ***Measurements*** (*n*=5) DSW: 5.2–6.0 (5.2); DSL: 5.5–6.8 (5.5); CL: 2.1–2.5 (2.1). FIVL: 12.5–13.0 (12.9). ChL: 2.0–2.1 (2.1). ***Coloration*** (Fig. 25A): Chelicerae, pedipalpus and trochanters I–III yellowish green. Ocularium, anterior and lateral margin of DS, anterior part of the carapace, coxa and trochanter IV reddish. Posterior part of the carapace and areas I–IV orange, in lighter tone. Spines of area III, apophysis of coxa IV and anterior angle on area I most blackened. Granules of posterior margin of DS and free tergites I–III orange. Grooves of dorsal scutum white. ***Dorsum***: (Fig. 5B) Gamma-P-type DSS, with concave posterior margin of DS. Anterior margin of carapace with median elevation, covered with granules. Ocularium with median depression granular, and 4–5 small tubercles near the eyes. Carapace with sparse granules. Areas I–IV covered by few granules; Area I divided by a longitudinal groove and invaded by area II; with a pair of median small tubercles. Area II and IV unarmed. Area III with a pair of median spines, parallel, directed posteriorly. Lateral margins of DS granular. Posterior margin of DS and free tergites with a row of small granules. Free tergite III with a spiniform apophysis slightly longer than the length of this tergite. ***Chelicerae***: (Fig. 5B) Not swollen, similar to females. Segment I covered with small granules. Segment II covered with granules larger than those of segment I; finger with four teeth. Segment III with three teeth. ***Pedipalpus***: Trochanter with a ventroapical setiferous tubercle. Femur with a ventral row of four spines and a proapical spine. Patella with a proventral small setiferous tubercle. Tibia: prolateral IiII/iIiII, retrolateral IiIIi. Tarsus: prolateral iIiIi, retrolateral iIiIi/iIiIii. ***Venter***: Coxa I with a median row of 5–6 setiferous tubercles and small sparse granules. Coxae II–III with setiferous tubercles and sparse granules. Coxa IV with granules smaller than those on other coxae, sparsely distributed. Smooth genital area. Free sternites with few granules. ***Legs***: (Figs. 5B, 10C, D) Coxae I–II each with a prolateral and a retrolateral apophysis. Coxa III unarmed. Coxa IV with a large retrolateral apophysis, curved posteriorly and laterally. Trochanters I–IV with small granules. Trochanter IV with prolateral base expanded and a retrolateral tubercle. Femora I–III straight and unarmed, with few small granules. Femur IV straight, with few sparsely scattered small granules and a small retrobasal blunt tubercle. Tarsal segmentation: (*n*=5) 9, 17–19 (18), 11–12 (12), 12–14 (14). ***Penis***: (Fig. 19A–C) VP rectangular, distal margin straight and with small lateral projections; with distal laterodorsal depressions; slightly concave in lateral view. MS C1–C3 subapical long and straight; MS A1 sub basal long and straight; MS B1 basal short and straight. Lateral sacs long and robust, with large base and blunt apex; with long tapered T3-like microsetae near the base and short and flattened near the apex. Stylus long and cylindrical (apex cannot be viewed in SEM). Dorsal process absent. Promontory conspicuous and convex. — **FEMALE:** ***Measurements*** (*n*=3) DSW: 5.0–5.2; DSL: 5.2–5.3; CL: 2.0. FIVL: 12.1–11.3. ChL: 2.0–2.2. (Fig. 25B) Granulation denser than in male, mainly in the areas of the dorsal scutum. Spine of area III with multiple granules at base. Retrolateral apophysis in the coxa IV short, much shorter than in male. Trochanter IV without expansion of the prolateral base. Apophysis of free tergite III longer than in male. Tarsal segmentation: (*n*=3) 8–9, 16–18, 10, 11–12.

Diagnosis. It differs from other species of the genus by having a large retrolateral apophysis on coxa IV, curved toward externally, and a short spiniform apophysis in free tergite III (Fig. 5B).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the Swedish filmmaker, director, producer and writer Ernst Ingmar Bergman (1918–2007).

Distribution. (Fig. 31) BOLIVIA. Cochabamba. Near Corani.

Material examined. ***Type material*: Holotype** ♂, 'BOLIVIA, Cochabamba, road next to Corani,| 17º11′18.9″S 65º53′49.2″W, 01/XII/2010, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & A. Saravia leg. (CBF) – **Paratypes** 1 ♂, 1 ♀, 'ditto' (CBF); **Paratypes** 3 ♂, 3 ♀, 'ditto' (MZSP 36983).

3.42. *Metasarcus bolivianus* Roewer, 1913

Figs. 5C

Metasarcus bolivianus Roewer, 1913: 305 (desc.), fig.123 (female dorsal habitus, pedipalpus); Roewer 1923: 517 (rdesc.), fig. 647 (female dorsal habitus and pedipalpus); Soares and Soares 1949: 234 (cat.); Kury 1994: 349 (cit.); Kury 2003: 145 (cat.).

Chaconatus armatipalpus Roewer, 1929: 275 (key), 276 (desc.), fig. 43 (female lateral habitus, pedipalpus), fig. 43a (ocularium); Soares et al. 1992: 5 (cat.); Kury 2003: 145 (cat.), **syn. n.**

Metasarcus armatipalpus: Kury 1994: 349 (sist.); Kury 2003: 145 (cat.).

Redescription. FEMALE: ***Measurements*** (*n*=2) DSW: 5.4–5.6 (5.4); DSL: 5.2–5.5 (5.5); CL: 2.2 (2.2). FIVL: 11.2–12.7 (12.7). ChL: 2.0–2.3 (2.0). ***Coloration*** (according to Roewer, 1913): Body, chelicerae and pedipalpus yellow-brown, in dark tone. Black legs. Granules of areas I–II yellow. ***Dorsum***. (Fig. 5C) Gamma-type DSS, slightly concave with posterior margin of DS. Anterior margin of carapace with median elevation, covered with a few sparse granules. Ocularium medially depressed, unarmed. Carapace with few sparse granules. Areas I–IV with granules (in lower density on areas III–IV). Area I divided by a longitudinal groove. Areas I, II and III unarmed. Area III with a median pair of large spines, directed posteriorly located at granular elevations of integument. Lateral margins of dorsal scutum granular. Posterior margin of DS and free tergites I–II with a row of granules. Free tergite III with a median spiniform apophysis, longer than the length of this tergite, directed posteriorly, with sparse granules on its posterior margin. ***Chelicerae***: (Fig. 5C) Segment I covered with small granules in the bulla. Segment II, finger with three teeth. Segment III with four teeth. ***Pedipalpus***: With granules irregularly distributed over the entire length, except tibia and tarsus. Trochanter with a ventroapical spine. Femur with a small ventroapical setiferous tubercle; a ventral row of four spines throughout its length; a proventral spine. Patella with a proventral spine. Tibia: prolateral iIIi, retrolateral iIii. Tarsus: prolateral IiI, retrolateral II. ***Venter***: Coxae I–IV with sparse granules. Coxa I with a median row of 3–4 small setiferous tubercles. Genital area with few granules sparsely distributed. Free sternites with a row of small tubercles. Anal operculum smooth. ***Legs***. (Fig. 5C) Coxae I–II each one with a prolateral and a retrolateral apophysis. Coxa III unarmed. Coxa IV with few granules. Trochanters I–III smooth. Trochanter IV with one–two retroapical tubercles with wide base, rhombus. Femora I–III straight and unarmed, with small granules. Femur IV slightly curved and unarmed, with small granules. Tarsal segmentation: (*n*=2) 7, 14, 10, 11–12 (11). — **MALE:** unknown.

Diagnosis. Very similar to females of *Metasarcus fellinii* **sp. nov.** because a long spiniform apophysis in tergite III (Fig. 5C). Differs from *M. fellinii* **sp. nov.** because longer DS (DSL greater than 5); a sparser granulation in dorsal scutum (Fig. 5C); longer legs (FIVL greater than 11) and coxa III unarmed (Fig. 5C).

Remarks. It is intriguing how Roewer described the same species from the Bolivian Chaco not only in different species and genera, but in different subfamilies (*M. bolivianus* was placed in Mitobatinae and *Chaconatus armatipalpus* in Prostygninae). As Kury (1994: p. 349) noted "There is no positive evidence for either of the assignments, furthermore both species are very closely related, if not the same." Possibly, this fact can be interpreted because of the Roewerian taxonomic system (see Introduction). Upon closer examination of the type material of both species and the observation of a great morphological similarity, it was possible to conclude that Kury's suspicion was correct, and hence the synonymy made here.

Distribution. BOLIVIA. Chaco.

Material examined. ***Type material*:** Of *M. bolivianus*: **Holotype** ♀, 'BOLIVIA, Gran Chaco, whitout date and leg. (SMF 873). Of *M. armatipalpus*: **Holotype** ♀, 'BOLIVIA, Chaco | whitout date and leg. (SMF 1003/2).

3.43. *Metasarcus clavifemur* (Roewer, 1929)

Figs. 5D, 10E, F, 19D–F, 25C, D, 31

Chacoikeontus clavifemur Roewer, 1929: 279 (desc.), fig. 45; Soares et al. 1992: 3 (cat.); Kury and Maury 1998: 145 (cit.); Kury 2003: 144 (cat.); Yamaguti and Pinto-da-Rocha 2009: 321 (syst.); Kury & Villarreal, 2015: 4–5 (cit.), fig 7 (penis).

Metasarcus clavifemur: Townsend et al. 2019: 102 (cit), 105–106 (biol), fig. 2 (ovipositor).

Redescription. MALE: ***Measurements*** (*n*=5) DSW: 4.6–5.1 (5.0); DSL: 4.3–5.1 (5.1); CL: 1.7–2.0 (1.9). FIVL: 6.6–10.6 (10.6). ChL: 3.1–5.3. ***Coloration***: (Fig. 25C) Chelicerae reddish brown with black reticulate pattern. Pedipalpus and legs I–III reddish brown. Lateral and posterior margin of DS, free tergites I–III and other segments of legs, dark brown. Anterior margin of DS, carapace and areas I–IV, brown. Small males in a lighter brown tone. ***Dorsum***: (Fig. 5D) Kappa-type DSS, with almost straight posterior margin of DS; constriction I not so well marked, constriction II absent, mid-bulge slightly larger than carapace and coda undefined, coalescing with mid-bulge. Ocularium with small granules grouped together close to the eyes. Carapace irregularly granulate, with granules concentrating mainly on the anterior margin of DS, and the median elevation and behind the ocularium. DS with four well defined areas. Area I divided by the scutal grooves I and II; with five pairs of small tubercles. Area II moderately projected toward area I; with seven small tubercles. Area III with two spines, directed posteriorly; seven small tubercles. Area IV with six small tubercles. Lateral margins of DS with granules throughout their length. Posterior margin of DS and free tergites I–III with few granules distributed irregularly. ***Chelicerae***: (Fig. 5D) Segment I with four basal tubercles of different sizes. Segment II with setiferous granules on the front surface; finger with three teeth more apical and a row of tiny denticles. Segment III with three apical teeth, a row of denticles and a large apical tooth, straight apex. ***Pedipalpus***: Trochanter with a ventroapical setiferous tubercle. Femur with a ventral row of five spines, the most basal and more apical of which are

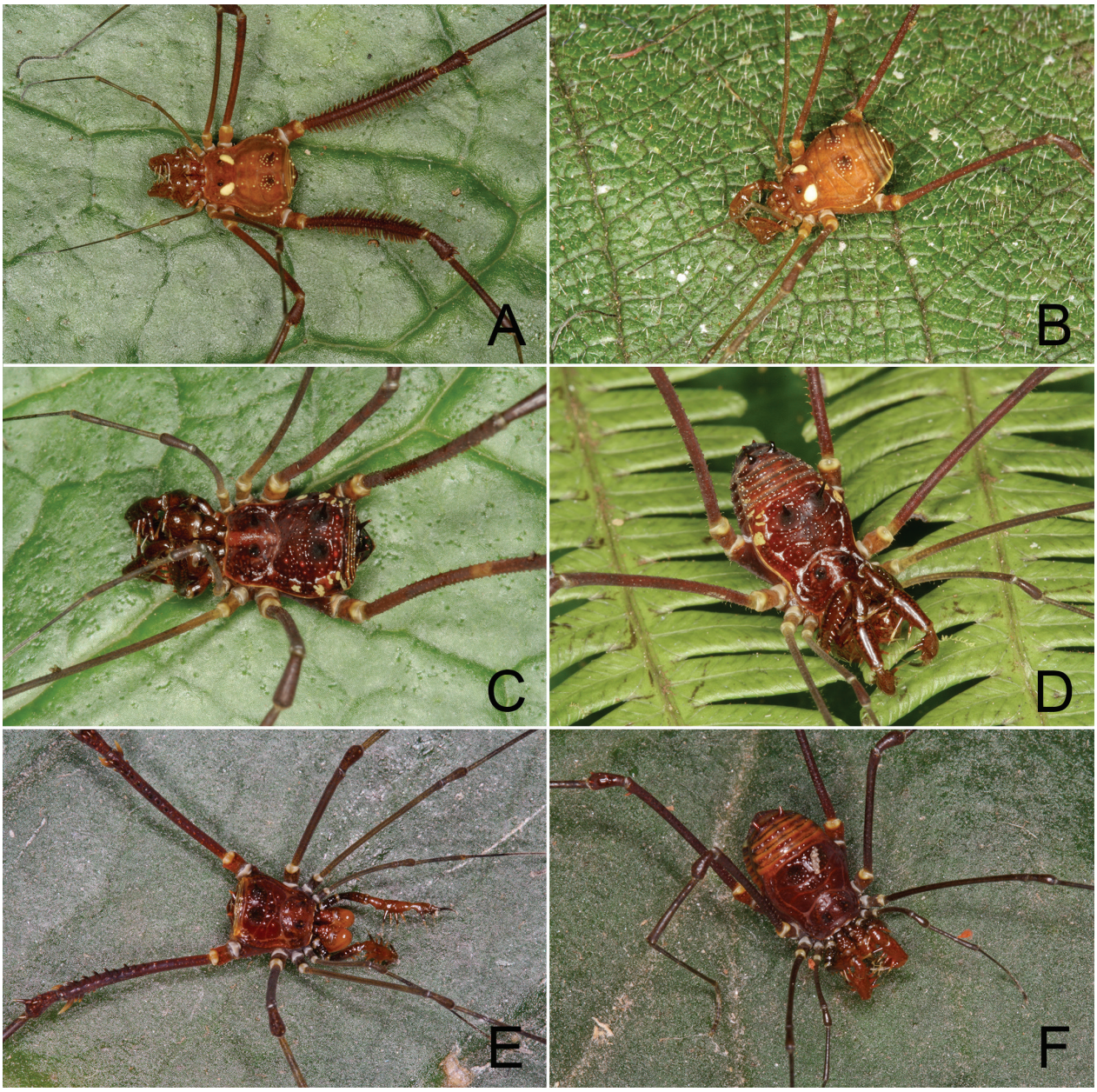

Figure 27. Live specimens of *Tschaidicancha*. **A** *T. joseochoai* **sp. nov.**, male; **B** female; **C** *T. chaplini* **sp. nov.**, male; **D** female; **E** *T. weyrauchi* Roewer, 1957, male; **F**: female.

smallest; granules scattered on prolateral surface. Patella with a proapical spine. Tibia: retrolateral iiIIi, prolateral IiIi. Tarsus: retrolateral iIiIi, prolateral IiIi. ***Venter***: Coxa I with a median row of four setiferous tubercles. Coxae II–IV with sparse granules. Rows of tubercles between coxae II–III and III–IV. Smooth genital area. Free sternites with rows of setiferous granules. Anal operculum granulate. ***Legs***: (Figs. 5D, 10E, F) Coxae I–II each with a prolateral and a retrolateral apophysis. Coxa III unarmed. Coxa IV unarmed, with granules along all extension. Trochanters I–III smooth and unarmed. Trochanter IV granular with a long retroapical spiniform apophysis and two small dorsoapical tubercles. Femora I–III unarmed and with few sparse granules. Femur IV swollen, with a retrobasal spiniform apophysis; a retrodorsal row of broad, conical tubercles, decreasing in size apically; a row of granules located prolaterally regarding retrodorsal row of tubercles along basal ½; a prolateral row of tubercles irregularly shaped along basal ½; a proventral row of small conical setiferous tubercles and a retroventral row of tiny granules. Patellae I–IV unarmed and with few granules in greater quantity in the patella IV. Tibiae I–III smooth and unarmed. Tibia IV with a retrolateral row of small tubercles. Tarsal segmentation: (*n*=5) 7–8 (7), 12–13 (?), 9–10 (10), 10–11 (11). ***Penis***: (Fig. 19D–F) VP rectangular; distal margin slightly concave. MS C1–C3 apical long and straight; MS A1 sub basal long and straight (smaller than MS C); MS B1 basal short and straight; MS D1 short and conical, laterally placed, near MS C; MS E1 median short and straight, placed more ventrally than MS C and D. Lateral sacs long and apically tapered, with long T3-like microsetae, with short base. Stylus with broad apex, with apical projections. Dorsal process absent. Promontory convex. — **FEMALE:**

Measurements (*n*=7) DSW: 4.6–5.1; DSL: 4.0–5.0; CL: 1.5–1.9. FIVL: 8.3–9.6. ChL: 1.7–2.5. (Fig. 25D) Chelicerae not swollen. Trochanter IV unarmed. Femur IV with a small tubercle rather than retroapical apophysis present in males; rows of tubercles and granules absent; longer relative length to that of DS than in male. Color similar to small males, in a lighter brown tone. Lateral and posterior margin of DS and free tergites lighter than larger males. Tarsal segmentation: (*n*=7) 7, 12–14, 10–11, 11–12.

Diagnosis. Differs from other species of the genus by having femur IV swollen and with a long retrobasal apophysis; trochanter IV with long retroapical spiniform apophysis (Fig. 10E, F).

Remarks. See the remarks on section 3.39 for an observation on the recent taxonomic history of the species. Considering that the type material is formed from syntypes, we chose the SMF specimen as the lectotype, in accordance with article 74 of the ICZN. The MNHN material is designated as a paralectotype.

Distribution. (Fig. 31) BOLIVIA. La Paz. Coroico. La Paz. Yanacachi.

Material examined. ***Type material*: Lectotype** ♂, 'BOLIVIA, La Paz. Without date and collector data.' (SMF 1006 / SMF 1467/11); **paralectotype** ♂, **'**Without date and collector data.' (MNHN; male not examined). ***Additional material*:** 1 ♂, 2 ♀ 'BOLIVIA, La Paz, Road La Paz–Coroico, 16º12′57″S 67º49′24.7″W, 30/XI/2010, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & A. Saravia leg. (CBF); 2 ♂, 2 ♀, 'ditto' (MZSP 36985). 1 ♂, 1 ♀ 'BOLIVIA, La Paz, Yanacachi, 16º23′54.5″S 67º44′11.6″ W, 12/XII/2010, R. Pinto-da-Rocha, A. Benedetti & A. Saravia leg. (CBF); 1 ♂, 2 ♀, 'ditto' (MZSP 36986).

3.44. *Metasarcus fellinii* sp. nov.

http://zoobank.org/75172FD0-09A4-48A1-B0C3-78C56656C27D

Figs. 5E, 10G, H, 19G–I, 25E, F, 31

Description. MALE: ***Measurements*** (*n*=5) DSW: 4.0–4.7 (4.7); DSL: 3.8–4.3 (4.3); CL: 1.5–1.7 (1.7). FIVL: 7.4–9.0 (9.0). ChL: 1.5–1.6 (1.6). ***Coloration***: (Fig. 25E) Most body brown. Apophysis of tergite III dark, almost black. Lateral margins of DS dark brown. Trochanters yellowish brown. Area III armature and granules of DS and free tergites I–III orange. ***Dorsum***: (Fig. 5E) Gamma-type DSS, with concave posterior margin of DS. Anterior margin of carapace with a median elevation, covered with irregular row of granules. Ocularium slightly medially depressed, unarmed, covered with granules. Carapace densely covered with granules of different sizes along its entire length. Areas I–IV densely covered with granules of different sizes. Area I divided by a longitudinal groove; with a median pair of acuminate tubercles. Areas II and IV unarmed. Area III armed with a pair of median spines. Lateral margins of DS densely granular, the granules being slightly more robust to those of carapace and areas. Posterior margin of DS and free tergites I–II with a row of granules similar to those on lateral margins of DS. Free tergite III with a large arched apophysis, apically forked, directed posteriorly, covered with small granules at base. ***Chelicerae***: (Fig. 5E) Slightly larger than those of females. Segment I covered with small granules. Segment II with 3–4 small granules; finger with three teeth. Segment III with four teeth. ***Pedipalpus***: With granules irregularly distributed over the entire length, except tibia and tarsus. Trochanter with a ventroapical spine. Femur with a small ventroapical setiferous tubercle; a ventral row of four spines along its length and a proapical spine. Patella with a proapical spine. Tibia retrolateral IiII, prolateral iIIIi/iiIi. Tarsus: retrolateral Iii/iIiIi/iiII, prolateral II. ***Venter***: Coxae I–IV densely covered of granules. Coxa I with a median row of 3–4 small setiferous tubercles. Genital area with a few sparse granules. Free sternites I–IV with a row of small tubercles. ***Legs***: (Figs. 5E, 10G, H) Coxae I–II each with a prolateral and a retrolateral apophysis. Coxa III with a prolateral apophysis. Coxa IV with a dorsoapical row of seven small tubercles; two small retrolateral tubercles and granules of varied sizes throughout its extension. Trochanters I–II smooth. Trochanters III–IV with a dorsoapical wide base blunt tubercle. Femora I–III straight and unarmed, with small granules. Femur IV slightly curved and unarmed, granular. Tarsal segmentation: (*n*=5) 6–8 (8), 9–11 (11), 7–8 (8), 8–9 (8). ***Penis***: (Fig. 19G–I) VP subrectangular, with parallel sides; distal margin straight; straight in lateral view; VP with two distal lateroventral depressions. MS C1–C4 apical long and straight; MS A1 median long and straight (about half the length of the MS C); MS B1–B2 sub basal short and straight (MS B2 longer than MS B1); MS D1 short and straight, dorsally placed, near MS C4. Lateral sacs short, with short T3-like microsetae. Stylus with projections at the apex and an armed projection directed ventrally. Dorsal process short and blunt. Promontory truncated. — **FEMALE:** ***Measurements*** (*n*=10) DSW: 3.5–4.0; DSL: 3.5–4.1; CL: 1.2–1.5. FIVL: 6.6–7.2. ChL: 1.2–1.8. (Fig. 25F) Chelicerae slightly smaller. Granules in dorsal scutum denser concentrated than in male. Apophysis of free tergite III short, spiniform. Tarsal segmentation: (*n*=10) 6, 7–11, 7–9, 8–9

Diagnosis. It differs from other species of the genus because males present an extremely long apophysis in free tergite III with forked apex (Fig. 5E). The females have short and simple apophysis, and are similar to *Metasarcus bolivianus* (whose male is unknown). It differs from *M. bolivianus* to present a greater density of granules in the dorsal scutum (Fig. 25F) and being smaller.

Derivation nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the Italian filmmaker and screenwriter Federico Fellini (1920–1993).

Distribution. (Fig. 31) BOLIVIA. Tarija. Near Entre Ríos.

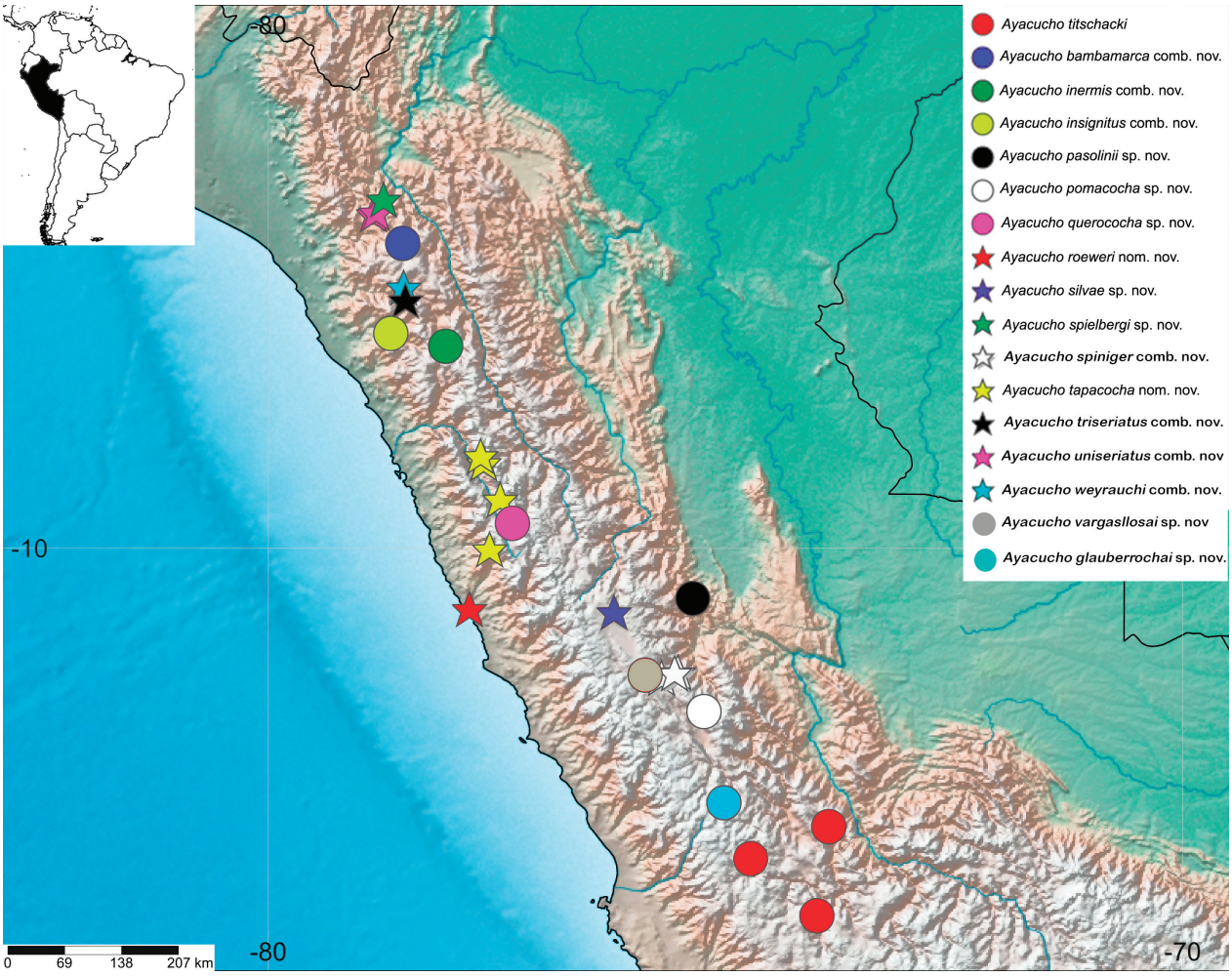

Figure 28. Distribution of *Ayacucho* spp. in Peru

Material examined. ***Type material*: Holotype** ♂, 'BOLIVIA, Tarija, near Entre Ríos, Paraíso del Tordo, 21º35′54.7″S 64º08′58.4″W, 05/XII/2010, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & A. Saravia leg. (CBF) – **Paratypes** 1 ♂, 5 ♀, 'ditto' (CBF); **Paratypes** 3 ♂, 5 ♀, 'ditto' (MZSP 36987).

3.45. *Metasarcus kurosawai* sp. nov.

http://zoobank.org/A6807DAE-452C-48FF-BE7A-23B8E5E3E383

Figs. 5F, 10I, J, 14E, F, 25G, H, 31

Description. MALE: ***Measurements*** (*n*=2) DSW: 4.0; DSL: 4.0–4.5 (4.5); CL: 1.5 FIVL: 9.2–10.0 (9.2). ChL: 3.3–3.8 (3.8). ***Coloration***: (Fig. 25G) Chelicerae, trochanter IV and basal portion of femur IV orange. Pedipalpus, legs I–III, remaining parts of leg IV and dorsal scutum black. ***Dorsum***: (Fig. 5F) Kappa-type DSS, with straight posterior margin of DS; constriction I shallow, constriction II absent, mid-bulge slightly larger than carapace and coda undefined, coalescing with mid-bulge. Sparse row of granules on the anterior margin of DS, including the median elevation. Clusters of granules concentrated on the lateral of the carapace and the posterior region to ocularium. Ocularium with depression well marked, unarmed and with granules concentrated near the eyes. Areas I–IV with a few scattered granules. Area I divided by the scutal grooves I and II; with a pair of median tubercles. Area II invading the area I; unarmed. Area III with a median pair of large spines, whose base elevation is irregularly covered by small tubercles. Area IV unarmed. Lateral margins of DS covered with granules. Posterior margin of DS and free tergites I–III with a row of granules. ***Chelicerae***: (Fig. 5F) Swollen. Segment I with few granules. Segment II with small setiferous granules; finger with twelve small teeth. Segment III with five teeth. ***Pedipalpus***: Trochanter with a long ventroapical acuminate setiferous tubercle. Femur with a ventral row of six setiferous tubercles of irregular size, most long and two short. Patella with a proapical small tubercle, whose base is wider than tall. Tibia: retrolateral iIiIii, prolateral IiIi. Tarsus: retrolateral iIiIi, prolateral IiIii. ***Venter***: Coxa I with a median row of five setiferous tubercles. Coxa II with a row of 5–6 setiferous tubercles in the basal portion. Coxae III–IV with small sparse granules. Genital area, free sternites and anal operculum with scattered granules. ***Legs***: (Figs. 5F, 10I, J) Coxae I–III each one with a prolateral and a retrolateral apophysis. Coxa IV covered with setiferous granules. Trochanters I–IV unarmed and granular. Femora–patellae I–IV

unarmed and with few small granules. Tibiae I–IV unarmed, with sparse granules. Tarsal segmentation: (*n*=2) 8, 15–17 (17), 10, 10–12 (12). ***Penis***: (Fig. 14E, F) VP rectangular, with distal margin straight; straight in lateral view. MS C1–C3 (sub)apical long and straight; MS A1 median long and straight (smaller than MS C and MS B); MS B1 basal long and straight; MS D1 very short, near MS C3, placed more ventrally; MS E1 very short, near MS C1, placed more ventrally. Lateral sacs short and robust, with short T3-like microsetae. Stylus long with truncated apex and small apical projections. Dorsal process absent. Promontory truncated/straight. — **FEMALE:** ***Measurements*** (*n*=2) DSW: 4.0; DSL: 4.2–4.3; CL: 1.4; FIVL: 8.6–9.0; ChL: 1.0–1.7 (Fig. 25H). Chelicerae small, not swollen. Tarsal segmentation: (*n*=2) 7, 15, 10, 11.

Diagnosis. Similar to *Metasarcus beni* **sp. nov.** because the ocularium is unarmed, area I divided, a pair of spines in the area III (Fig. 5F) and male femur IV slender and without major rows of tubercles (Fig. 10I, J). It differs from *M. beni* **sp. nov.** because kappa type DSS, coxa III with two apophyses (Fig. 5F), femur IV without a distal retrodorsal small apophysis (Fig. 10I, J) and by having chelicerae orange colored (Fig. 25G).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the Japanese filmmaker, producer and screenwriter Akira Kurosawa (黒澤明; 1910–1998).

Distribution. (Fig. 31) BOLIVIA. La Paz. Zongo.

Material examined. ***Type material*: Holotype** ♂, 'BOLIVIA, La Paz, Zongo, 16º10′32.4″S 68°08′11.9″W, 10/XII/2010, R. Pinto-da-Rocha, A. Benedetti & A. Saravia leg. (CBF) – **Paratype** ♀, 'ditto' (CBF). **Paratype** ♀, 'ditto' (MZSP 76551). **Paratype** 1 ♂ 'BOLIVIA, La Paz, Road La Paz–Coroico, 16º12′57″S 67º49′24.7″W, 30/XI/2010, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & A. Saravia leg. (MZSP).

3.46. *Metasarcus limachii* sp. nov.

http://zoobank.org/DD6B9FC9-7490-4502-8EA9-F4C-C949918C6

Figs. 5G, 10K, L, 14G, H, 26A, B, 31

Description. MALE: ***Measurements*** (*n*=1) DSW: 6.1; DSL: 6.8; CL: 1.4. FIVL: 14.2. ChL: 2.4. ***Coloration***: (Fig. 26A) Yellow background with black spots covering virtually the entire DS; scutal area III, pedipalpus, chelicerae and legs I–III brown. Leg IV black. ***Dorsum***: (Fig. 5G) Gamma-P-type DSS, with strongly concave posterior margin of DS. Median elevation of anterior margin of DS with some scattered granules. Ocularium with median depression well marked with large and small granules around the eyes, and in lower concentrations in depression. Carapace with sparse granules. Areas I–IV with small-scattered granules. Area I undivided; with a pair of median tubercles. Areas II unarmed. Area III with a median pair of spines. Area IV with a pair of median tubercles. Lateral margins of DS with a denser concentration of granules. Posterior margin of DS and free tergites I–III with a row of granules. Free tergite III with a long spiniform apophysis, curved laterally and with a ventral short and sharp projection (This curvature is probably an individual anomaly. Furthermore, the first author has already had the opportunity to examine a photograph taken by Dr. Arthur Anker of a live male specimen whose apophysis was straight). ***Chelicerae***: (Fig. 5G) Not swollen. Segment I smooth. Segment II with granules concentrated near the fixed finger; finger with three teeth. Segment III with four teeth. ***Pedipalpus***: Trochanter with a ventroapical setiferous tubercle. Femur with two small ventrobasal spines; a ventral row of large spines and a proapical spine. Patella with a proapical spine. Tibia retrolateral iiiIi, prolateral IiIi. Tarsus: retrolateral iIiI, prolateral IiIi/iIiIi. ***Venter***: Coxa I with a median row of 5–6 small setiferous tubercles near the apex. Coxae II–IV with sparse granules. Coxa IV with the lower granules. Genital area with few granules. Free sternites with rows of larger granules. Anal operculum with granules, concentrated in the apical part. ***Legs***: (Figs. 5G, 10K, L) Coxa I–II each one with a retrolateral and a prolateral apophysis. Coxa III with dorsal small tubercles. Coxa IV with sparse granules; with 4–5 dorsoapical tubercles; a retrolateral short apophysis, with a tubercle at the base of apophysis, and a retolateral tubercle located more ventrally than apophysis. Trochanters I–III with sparse granules. Trochanter IV with a small probasal spiniform apophysis; a retrobasal and large retroapical spiniform apophyses. Femora I–III unarmed, granular. Femur IV slightly sigmoid, with a large dorsoapical tubercle; granular. Patellae I–IV unarmed. Tarsal segmentation: (*n*=1) 8, 16, 10, 11. ***Penis***: (Fig. 14G, H) VP rectangular, with distal margin straight; straight in lateral view. MS C1–C3 apical long and straight; MS A1 median long and slightly curved; MS B1 sub basal long and slightly curved. Lateral sacs short, apically tapered, with short T3-like microsetae. Stylus with inflated apex, with an elongated ventral projection and tiny projections in the apical portion. Dorsal process long. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=2) DSW: 5.6–5.7; DSL: 5.3–5.7; CL: 1.1–1.2. FIVL: 11.2–14.0. ChL: 2.0–2.3. (Fig. 26B) Areas I–II with three pairs of small tubercles. Area III with a paramedian pair of small spines. Trochanter IV unarmed. Apophysis of free tergite III shorter and without ventral projection. Coloration with less brown spots, highlighting the most yellow body, resulting in a spotty pattern. Area IV with brown pigmentation more obvious. Tarsal segmentation: (*n*=2) 7–8, 13–15, 9–11, 7–10.

Diagnosis. It differs from other species of the genus because by having area I undivided; long spiniform apophysis on free tergite III (Fig. 5G); trochanter IV with a probasal, a retrobasal and a retroapical apophyses (Fig. 10K, L); DS with yellow background with black spots (Fig. 26A).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated Miguel Limachi, from Coleccíon Boliviana de Fauna (CBF), who provided invaluable help with all formalities for collecting in Bolivia.

Distribution. (Fig. 31) BOLIVIA. La Paz. La Paz–Coroico; Yanacachi.

Material examined. ***Type material*: Holotype** ♂, 'BOLIVIA, La Paz, Yanacachi, 16º23′54.5″S 67º44′11.6″W, 12/XII/2010, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & A. Saravia leg. (CBF) – **Paratype** ♀, 'ditto' (MZSP 36991). **Paratype** ♀, 'BOLIVIA, La Paz, road La Paz–Coroico, 16º13′45″S 67º49′17.1″W, 30/XI/2010, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & A. Saravia leg. (MZSP 36992).

3.47. *Metasarcus trispinosus* sp. nov.

http://zoobank.org/BF7B012B-E2DB-4F64-B397-E1C6EE5D418C

Figs. 5H, 10M, N, 20A–C, 26C, D, 31

Description. MALE: ***Measurements*** (n=5) DSW: 6.5–7.7 (7.6); DSL: 6.4–7.0 (7.0); CL: 2.3–2.8 (2.6). FIVL: 10–12 (11.5). ChL: 2.5–3.0 (3.0). ***Coloration***: (Fig. 26C) Red, with elongated spots of dark pigmentation throughout the carapace, DS and coxa IV. Posterior margin of DS, free tergites and coxa IV apex black. Apophysis of the free tergite III black. Chelicerae, pedipalpus and legs (except the coxa IV) black. Arthrodial membrane between the posterior margin of DS and free tergites I–III green. ***Dorsum***: (Fig. 5H) Gamma-P-type DSS, with strongly concave posterior margin of DS. Anterior margin of the carapace with median elevation partially covered with sparse granules. Ocularium unarmed, with few small granules in the depression and a higher concentration of larger granules close to the eyes. Carapace with granules sparsely distributed throughout its length. DS with slightly conspicuous grooves, not being possible to notice the existence of a fourth area in some specimens. Area I undivided or with an extremely shallow longitudinal groove, practically inconspicuous. Areas I–III with small sparse granules. Area III with a median pair of setiferous tubercles. Lateral margins of DS with granules distributed throughout their length. Posterior margin of DS and free tergites I–II with rows of small granules. Free tergite III with a large trifurcated and acuminate apophysis, robust, smooth, with a broad base, median branch larger than lateral ones. ***Chelicerae***: (Fig. 5H) Not swollen. Segment I covered by small granules. Finger of segment II with two teeth. Segment III with six teeth. ***Pedipalpus***: Trochanter with a ventrodistal setiferous tubercle. Femur with a ventrobasal row of three small spines; a retroventral row of three large spines; and a prodistal spine. Patella with a prodistal spine. Tibia: prolateral (i)iiIi, retrolateral IiIi. Tarsus: prolateral iiIii/iiIiii/iIiIi/iIiI, retrolateral iIiIi/iIiiIi. ***Venter***: Coxae I–IV with small sparse granules. Coxa I with a median row of 5–7 small setiferous tubercles. Smooth genital area. Free sternites with few granules. ***Legs***: (Figs. 5H, 10M, N) Coxae I–II each one with a prolateral and a retrolateral apophysis. Coxa III with a prolateral apophysis. Coxa IV with small sparse granules. Trochanters I–IV smooth. Femora I–II straight. Femur III slightly curved at the apex and base. Femur IV slightly sigmoid; with few granules and a retrodistal spiniform apophysis. Patella-tibiae I–IV granular. Tarsal formula: (*n*=5) 7–8 (8) / 13–16 (16) / 9–10 (9) / 10–12 (10). ***Penis***: (Fig. 20A–C) VP subrectangular, with diverging lateral margins at the apex, resulting in a narrower base than the apex; distal margin straight; straight in lateral view. MS C1–C2 subdistal long and curved; MS A1 long and straight; medially placed; MS A2 sub basal long and straight (longer than MS A1 and MS C); MS B1 basal very short (near lateral sacs); MS D1 long and straight (half the length of MS C), dorsally placed, near MS C2. Lateral sacs long and apically blunt; with short T3-like microsetae. Stylus with a serrated inflated apex and a ventral projection. Dorsal process rounded, bag-shaped. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=6) DSW: 5.5–6.0; DSL: 5.5–6.5; CL: 1.8–2.6. FIVL: 9.0–9.5. ChL: 2.0–2.6. (Fig. 26D) Denser granulation in ocular depression and in the anterior part of the carapace. Femora III–IV straight. Femur IV without retrodistal apophysis. Apophysis of the free tergite III shorter and unbranched, smaller and less wide than the males. Tarsal segmentation: (*n*=6) 7–8, 12–14, 9–10, 10–11.

Diagnosis. It differs from other species of the genus by a trifurcated and acuminate apophysis in free tergite III (Fig. 5H); male femur IV with a retrodistal spiniform apophysis (Fig. 10M, N); scutal grooves almost inconspicuous (Fig. 5H); red (Fig. 26C).

Derivatio nominis. The specific epithet, an adjective in nominative singular, formed by Latin prefix *tri-* + Latin *spīnōsus*, *a*, *um* (thorny), in reference to the trifurcated apophysis of free tergite III.

Distribution. (Fig. 31) BOLIVIA. Cochabamba. Road to Corani.

Material examined. ***Type material*: Holotype** ♂, 'BOLIVIA, Cochabamba, road to Corani, 17º11′18.9″S 65°53′49.2″W, 01/XII/2010, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & A. Saravia leg. (CBF) – **Paratypes** 1 ♂, 3 ♀, 'ditto' (CBF); **Paratypes** 3 ♂, 3 ♀, 'ditto' (MZSP 36997).

3.48. *Metasarcus vacafloresae* sp. nov.

http://zoobank.org/F5FBCDD8-83CA-405F-9822-26FFF579641D

Figs. 5I, 10O, P, 20D–F, 26E, F, 31

Description. MALE: ***Measurements*** (n=4) DSW: 4.2–4.9 (4.7); DSL: 5.1–5.4 (5.4); CL: 2.1–2.5 (2.5). FIVL: 13.0–14.2 (14.2). ChL: 2.9–4.2 (3.6). ***Coloration***: (Fig.

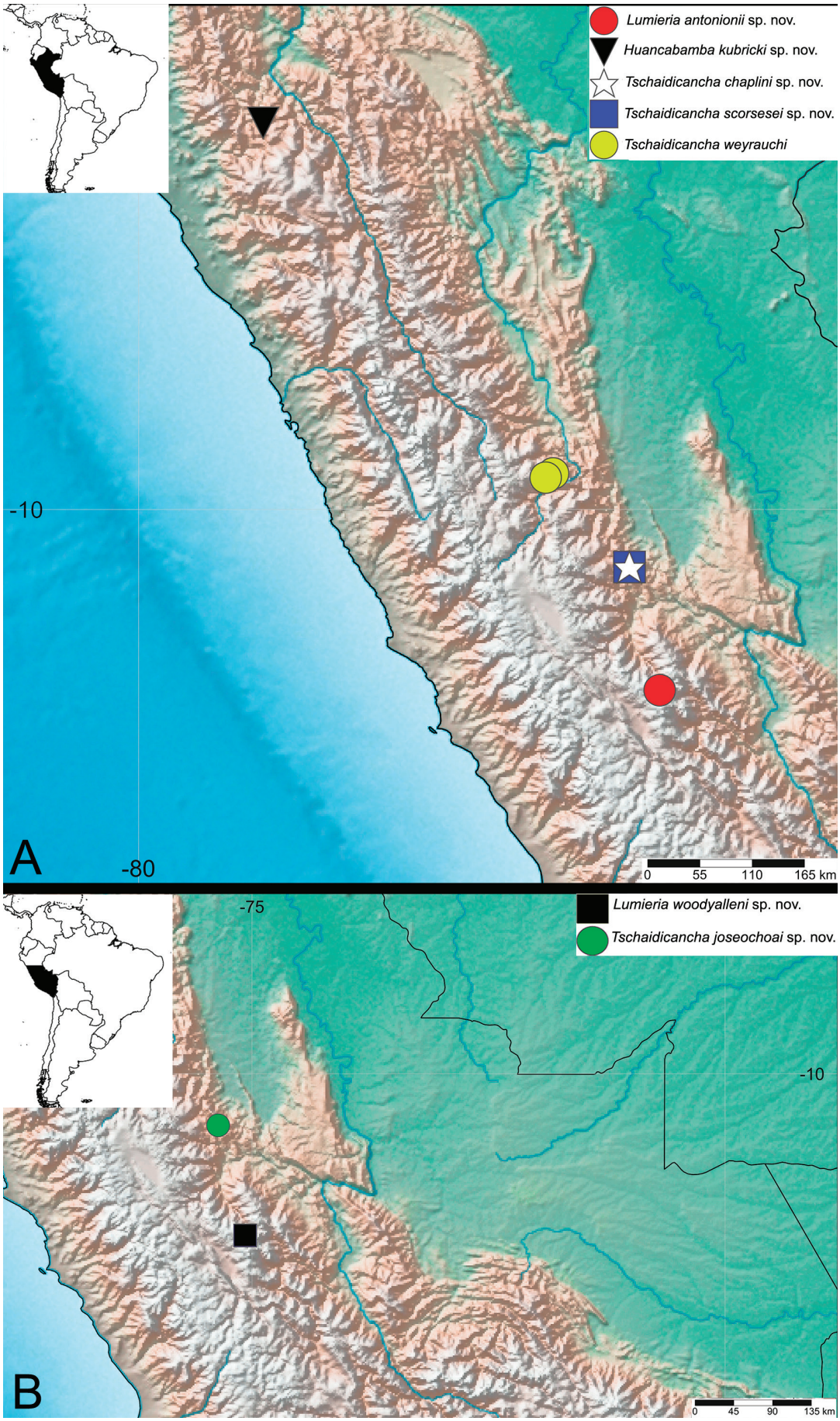

Figure 29. Distribution of *Huancabamba* **gen. nov.**, *Lumieria* **gen. nov.** and *Tschaidicancha* in Peru. **A** *H. kubricki* **gen. et sp. nov.**, *L. antonionii* **gen. et sp. nov.**, *T. chaplini* **sp. nov.**, *T. scorsesei* **sp. nov.**, *T. weyrauchi*; **B** *L. woodyalleni* **gen. et sp. nov.**, *T. joseochoai* **sp. nov.**

26E) Orange brown. Brown spots on the carapace and on the lateral margins of DS. Free tergites I–III and anal operculum dark brown. Reddish brown legs, except for the coxae and trochanters, in a lighter shade of orange brown. ***Dorsum***: (Fig. 5I) Kappa-type DSS, with straight posterior margin of DS; constriction II present, coda long. Anterior margin of the carapace with median elevation, with few granules. Ocularium with very subtle median depression, almost inconspicuous. Carapace with sparse granules. DS with four areas covered by few granules, unarmed. Area I undivided. Lateral margins of DS with rows of granules in greater density than in the dorsal areas of the DS and carapace. Posterior margin of DS and free tergites I–III unarmed and with few granules. ***Chelicerae***: (Fig. 5I) Swollen in large males (as in the holotype), similar to females in the small males. Segment I with sparse small granules. Segment II smooth, swollen in some males, finger with one tooth. Segment III with two teeth. ***Pedipalpus***: Sparse granules throughout the appendage, less numerous on the ventral surfaces. Coxa with a small retrobasal tubercle. Trochanter with two ventroapical setiferous tubercles, the apical one being smaller. Femur with a row of five ventral setiferous tubercles, two more basal and three median and a proapical spine. Patella smooth. Tibia: prolateral iIiIIi, retrolateral IIii. Tarsus: prolateral iiIiIii, retrolateral iIiIi. ***Venter***: Coxa I with a median row of five setiferous tubercles, a parallel row of small tubercles and scattered granules. Coxa II covered with sparse granules; with an apical row of two–three setiferous tubercles. Coxa III with a proventral row of five tubercles and a retroventral row of eight. Coxa IV with sparse granules. Smooth genital area. Free sternites and anal operculum with few granules. ***Legs***: (Figs. 5I, 10O, P) Coxa I with a retrolateral apophysis. Coxa II with one prolateral and two retrolateral apophyses. Coxa III unarmed. Coxa IV with sparse small granules. Trochanters with sparse granules. Femora I–IV straight, unarmed and with granules. Tarsal formula: (*n*=4) 8, 17–18 (18), 10–11 (10), 12–13 (13). ***Penis***: (Fig. 20D–F) VP subrectangular, long, with apex narrower than the base; convex distal margin; curved in lateral view. MS C1–C3 subdistal long and straight (or slightly curved); MS A1 sub basal long and straight (slightly shorter than MS C); MS B1 basal (near lateral sacs) long and straight (or apically curved); MS D1 short and straight, medially placed; MS E1–E2 very short, ventrally placed (MS E1 between MS C2 and MS C3; MS E2 near MS D1). Lateral sacs long and tapered; with long T3-like microsetae. Stylus with wide apex and projections. Dorsal process long and apically tapered. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=5) DSW: 4.1–4.5; DSL: 5.0–5.7; CL: 2.1–2.3. FIVL: 12.7–14.6. ChL: 2.3–2.6. (Fig. 26F) Chelicerae smaller than in males. Tarsal segmentation: (*n*=5) 7–8, 14–16, 10–11, 11–13.

Diagnosis. It differs from other species of the genus by the following set of characteristics: alpha type DSS; scutal area I undivided; areas I–IV unarmed (Fig. 5I); male femur IV unarmed (Fig. 10O, P); body orange brown (Fig. 26E); VP subrectangular and long; dorsal process present (Fig. 20D–F).

Derivatio nominis. The specific epithet of feminine gender, in the genitive form, in honor to Maria René Vacaflores, from Coleccíon Boliviana de Fauna (CBF), who provided invaluable help with all formalities for collecting in Bolivia.

Distribution. (Fig. 31) BOLIVIA. La Paz. Zongo.

Material examined. ***Type material*: Holotype** ♂, 'BOLIVIA, La Paz, Zongo, 16°10′32.4″S 68°08′11.9″W, 10/XII/2010, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & A. Saravia leg. (CBF) – **Paratypes** 2 ♂, 5 ♀, 'ditto' (CBF); **Paratypes** 4 ♂, 6 ♀, 'ditto' (MZSP 36998).

3.49. *Tschaidicancha* Roewer, 1957

Figs. 6C–F, 11G–N, 14I–L, 21, 27, 29A, B

Tschaidicancha Roewer, 1957: 80 (desc); Soares, Soares and Jim 1992: p.12 (rdesc); Kury and Maury 1998: p.145 (syst); Kury 2003: p.145 (cat); Mendes 2011: 441, 446 and 483 (syst). **Type-species**: *Tschaidicancha weyrauchi* Roewer, 1957 (by original designation).

Diagnosis. *Tschaidicancha* can be distinguished from all other Metasarcidae genera by the combination of following: Kappa-type or gamma-P-type DSS; ocularium low, with two pairs of high spines; area III with two pairs of high spines; long leg IV (femur IV length/DS length > 1.6); male coxa IV apex reaching posterior margin; penis VP subrectangular, with distal-lateral projections (in most species), thin thickness; with less than five MS C; stylus laterally flattened, with apex inflated; dorsal process present.

Redescription. Kappa-type, with straight posterior margin of DS; carapace long and wide; constriction I well marked, constriction II absent, mid-bulge slightly larger than carapace and coda undefined, coalescing with mid-bulge (*T. chaplini* **sp. nov.**, *T. scorsesei* **sp. nov.** and *T. weyrauchi*; Fig. 6C, E, F) or gamma-P-type DSS (*T. joseochoai* **sp. nov.**; Fig. 6D). Ocularium low, medially depressed. Ocularium with two high spines. Areas of DS small to moderately tuberculate (Fig. 6C–F). Area I undivided (*T. chaplini* **sp. nov.**, *T. joseochoai* **sp. nov.**, *T. weyrauchi*; Fig.6C, D, F) or divided in two halves (*T. scorsesei* **sp. nov.**; Fig. 6E). Area III armed with two high spines. Posterior margin unarmed. Coxa IV reaching area IV or posterior margin. Coxa IV unarmed (Fig. 6C–F). Femur IV much longer than DS length (Figs. 11G–N, 27). Penis VP subrectangular, with distal-lateral projections (except *T. scorsesei* **sp. nov.**) thin thickness (Figs. 14I–L, 21); with less than five MS C; MS B1 sub basal long and straight; lateral sacs long and apically blunt (shorter in *T. weyrauchi*); stylus laterally flattened, with apex inflated; dorsal process present.

Distribution. (Fig. 29) PERU. Huánuco and Pasco.

Species composition. *Tschaidicancha chaplini* **sp. nov.**; *Tschaidicancha joseochoai* **sp. nov.**; *Tschaidicancha scorsesei* **sp. nov.**; *Tschaidicancha weyrauchi* Roewer, 1957.

Remarks. Mendes (2011) in her phylogeny and taxonomic revision of Heteropachylinae cited *Tschaidicancha acanthoma* as an outgroup (cf. Mendes' fig. 1–2 and data matrix; although she cited *T. weyrauchi* in table 1 [p.439]). However, this species has never been properly described, which consequently results in a *nomen nudum.*

3.50. *Tschaidicancha chaplini* sp. nov.

http://zoobank.org/7D66C597-948E-4EAC-AA0C-22B46C84B3DE

Figs. 6C, 11G, H, 21A–C, 27C, D, 29A

Description. MALE: ***Measurements*** (*n*=5) DSW: 4.4–4.7 (4.6); DSL: 4.6–5.5 (5.5); CL: 1.9–2.4 (2.2). FIVL: 14.1–14.7 (14.7). ChL: 2.9–4.5 (4.5). ***Coloration***: (Figs. 27C) Reddish brown. Chelicerae, pedipalpus and trochanters I–IV pale brown. White spots on the lateral margins of the DS. ***Dorsum***: (Fig. 6C) Kappa-type DSS. Anterior margin of carapace with median elevation, with granules sparsely distributed. Ocularium with one pair of parallel spines. Carapace with few sparse granules. Areas I–IV with sparse granules (lower density in area III). Area I undivided longitudinally. Area III with two parallel spines, directed posteriorly, located at elevations of integument, totally granulate. Posterior margin of DS with a row of few granules. Lateral margins of DS with sparse granules. Free tergites I–II with a row of granules. Free tergite III with two median spiniform tubercles, longer than the length of this tergite. ***Chelicerae***: (Fig. 6C) Swollen. Segment I with three granules. Segment II with few granules; finger with two teeth. Segment III with three teeth. ***Pedipalpus***: With very few granules on the dorsal surface of the femur, tibia and patella. Trochanter with a ventroapical setiferous tubercle. Femur with a ventral row of eight setiferous tubercles, larger in the median portion, distributed throughout the length of femur except the apex; one large proapical spine. Patella with a proapical tubercle. Tibia: retrolateral iiIi, prolateral IiIi. Tarsus: prolateral iIiIi, retrolateral iIiIi. ***Venter***: Coxae I–II with a median row of 4–6 tubercles. Coxae III–IV with granules and setae scattered. Genital area slightly granulate. Free sternites with few granules. Anal operculum few granulate. ***Legs***: (Figs. 6C, 11G, H) Coxae I–II each one with a prolateral and a retrolateral apophysis. Coxa III with a prolateral apophysis. Coxa IV with sparse setiferous granules. Trochanters I–IV granulate and unarmed. Femora I–III unarmed, with small granules. Femur IV with granules sparsely distributed in higher density on the ventral side; a row of retrolateral small 36–39 acuminate tubercles. Patellae I–III with few granules. Patella IV with three tiny retroapical tubercles. Tibiae I–III unarmed and few granulate. Tibia IV with a retrolateral row of 16–19 small acuminate tubercles along the basal ½. Tarsal segmentation: (*n*=3) 8–9 (9), 18, 10–12 (12), 10–14 (14). ***Penis***: (Fig. 21A–C) VP subrectangular, long; distal margin slightly convex, with distal-lateral projections; slightly curved in lateral view. MS C1–C3(4) subdistal long and slightly curved; MS A1 long and straight (slightly shorter than MS C and MS B), medially placed; MS B1 sub basal long and straight; MS D1 short and straight, placed near MS C3. Lateral sacs long and apically blunt; with long T3-like microsetae. Stylus laterally flattened, apex slightly inflated, with several apical projections. Dorsal process laterally flattened, with slender apex. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=3) DSW: 4.5–4.7; DSL: 4.7–5.3; CL: 1.8–2.0. FIVL: 13.8–14.2. ChL: 1.5–1.7. (Fig. 27D) Chelicerae smaller than in smaller males. Femur IV unarmed. Tarsal segmentation: (n=3) 8, 16–17, 11–12, 12–14.

Diagnosis. Similar to *Tschaidicancha scorsesei* **sp. nov.** by the set of the following characteristics: reddish-brown coloration (Fig. 27C); femur IV with a retrolateral row with more than 30 small tubercles; tibia IV with a retrolateral row with more than ten small tubercles (Fig. 11G, H). Differs from *T. scorsesei* **sp. nov.** by the set of the following characteristics: the area I undivided longitudinally; free tergite III with a pair of spiniform tubercles (Fig. 6C); tibia IV with more than 15 retrolateral tubercles (Fig. 11G, H); VP with distal-lateral projections (Fig. 21A–C).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the English actor, composer, director and producer Sir Charles Spencer Chaplin (1889–1977), a worldwide icon in the era of silent film through his screen persona "The Tramp".

Distribution. (Fig. 29A) PERU. Pasco. Oxapampa. Parque Nacional Yanachaga-Chemillén.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Pasco, Oxapampa, Parque Nacional Yanachaga-Chemillén, 10º32′42.1″S 75°21′24.4″W, 22/IV/2011, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUBI) – **Paratype** 1 ♀, 'ditto' (MUBI); **Paratypes** 1 ♂, 1 ♀, 'ditto' (MUSM); **Paratypes** 3 ♂, 3 ♀, 'ditto' (MZSP 36984).

3.51. *Tschaidicancha joseochoai* sp. nov.

http://zoobank.org/FC63BBD6-6531-46D8-95BC-1A217C7B9B0B

Figs. 6D, 11I, J, 14I, J, 27A, B, 29B

Description. MALE: ***Measurements*** (*n*=1) DSW: 4,4; DSL: 4,2; CL: 1,7; FIVL: 7,8; ChL: 3,0. ***Coloration***: (Fig. 27A) Predominantly orange brown, with two white spots on the carapace, laterally posterior to the ocularium. Dark brown legs. Chelicerae orange brown (in a shade darker than body). Tubercles of the DS areas, free tergites and lateral margins whitish. ***Dorsum***: (Fig. 6D) Gam-

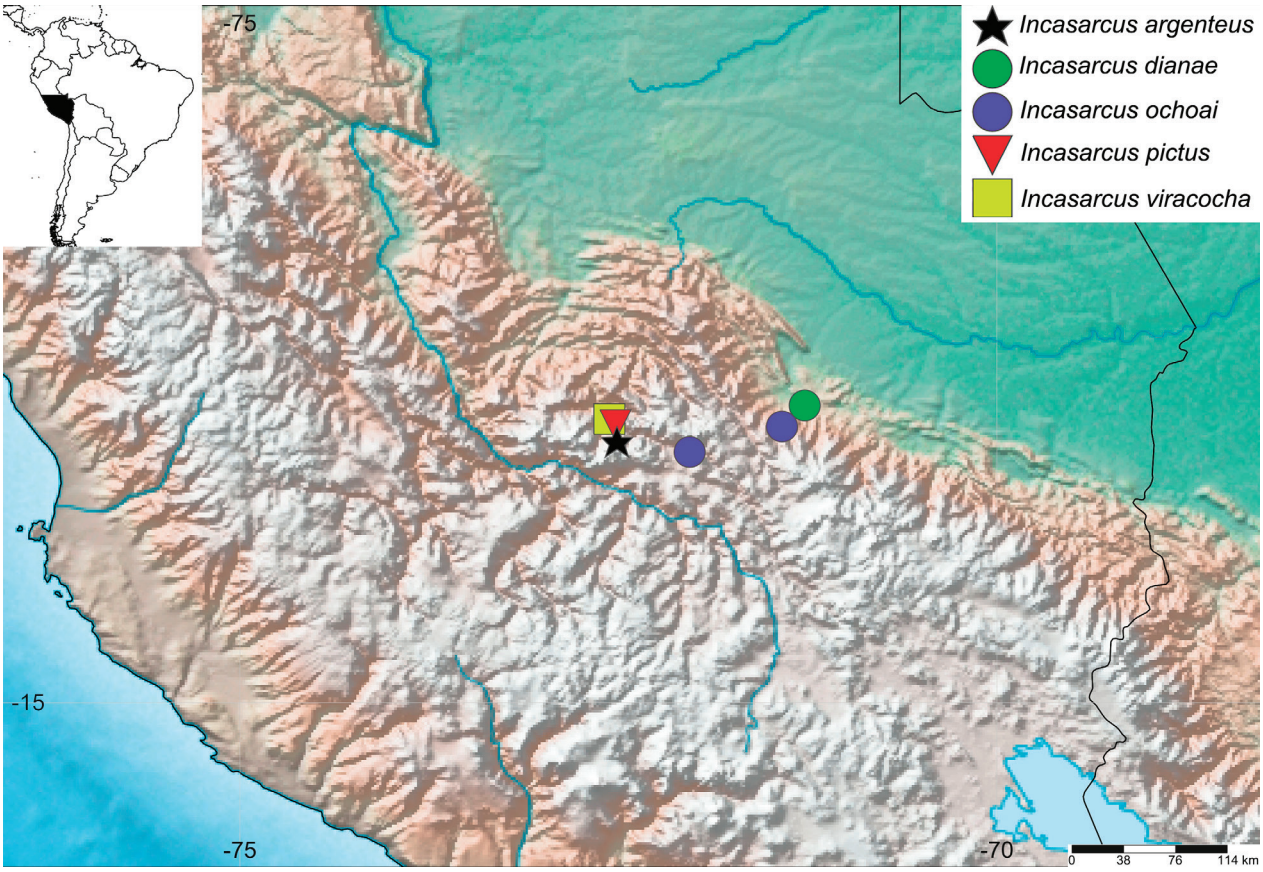

Figure 30. Distribution of *Incasarcus* in Cusco, Peru.

ma-P-type DSS, with concave posterior margin of DS. Anterior margin of the carapace with medium elevation, practically smooth, with few sparse granules. Ocularium with mild median depression; a pair of acuminate spines. Carapace with few granules, distributed mainly in the lateral region. Areas I–IV without granules, except elevation on area III. Area I undivided longitudinally; with a median pair of small tubercles. Area II with a median pair of tubercles and a right lateral tubercle. Area III with two spines, directed posteriorly located in elevations of the integument, very granular. Area IV with a median pair of tubercles. Posterior margin of DS smooth; with a left lateral tubercle. Free tergites I–III smooth. Free tergite I unarmed. Free tergite II with a pair of lateral tubercles. Free tergite III with three tubercles. Lateral margins of DS smooth; seven–nine tubercles in the posterior half, close to areas II–IV and posterior margin of DS. ***Chelicerae***: (Fig. 6D) Swollen. Segments I–II with few granules. Segment II with finger with one tooth. Segment III with 5–6 tiny teeth. ***Pedipalpus***: With sparse granules dorsally in the femur. Trochanter with a ventroapical setiferous tubercle. Femur with a ventrobasal tubercle; a ventral row of four setiferous tubercles, the basal-most being smallest and the remaining three of equal size, distributed throughout the article, except at the apex; a proapical spine. Patella with a proapical tubercle. Tibia: prolateral iiIii, retrolateral IiIi. Tarsus: prolateral iIiii, retrolateral IiIi. ***Venter***: Coxae I–II with rows of four and six tubercles, respectively, those of the coxa I larger. Coxae III–IV with granules. Genital area with few granules. Free sternites with row of granules. Anal operculum granular. ***Legs***: (Figs. 6D, 11I, J) Coxae I–II each one with a prolateral and a retrolateral apophysis. Coxa III with a prolateral apophysis. Coxa IV with 7–10 tubercles, distributed on the prodorsal side. Trochanters I–IV unarmed and with few granules. Femora I–III unarmed and with small granules. Femur IV with dense dorsal granulation; a prolateral row of 29 acuminate tubercles along apcal ⅔; a retrolateral row of 34 acuminate tubercles; a prodorsal row of five acuminate tubercles and three blunt tubercles along basal ⅓, smaller than the other tubercles present in the article; a ventral row of granules. Patellae I–III unarmed, with few granules. Patella IV granular; with three dorsoapical spiniform tubercles. Tibiae I–IV unarmed and densely granular. Tarsal segmentation: (*n*=1) 9 / 16 / 14 / 17. ***Penis***: (Fig. 14I, J) VP subrectangular, long; distal margin slightly convex, with distal-lateral projections; straight in lateral view. MS C1–C3(4) subdistal long (MS C1–C2 shorter than the others) and slightly curved; MS A1 short and straight, medially placed; MS B1 sub basal long and straight. Lateral sacs long and apically blunt; with long T3-like microsetae. Stylus expanded in the shape of a wedge and flattened laterally, with serrated edges; with large projection in the dorsal direction and with several tiny apical projections. Dorsal process subrectangular. — **FEMALE:** ***Measurements*** (*n*=1) DSW: 4.2; DSL: 4.1; CL: 1.5. FIVL: 8.7. ChL: 1.7. (Fig. 27B) Chelicerae smaller than the male. Femur IV unarmed. Patella IV with acuminate tubercles as in the male, but less robust and smaller. Tarsal segmentation: (*n*=1) 8, 15, 14, 17.

Diagnosis. It differs from other species of the genus by the following set of characteristics: gamma-P-type DSS; ocularium with a pair of acuminate tubercles; DS and scutal areas smooth; scutal area I undivided; free tergites I–III unarmed (Fig. 6D); male femur IV with a prolateral row of 29 acuminate tubercles and a retrolateral row of 34 acuminate tubercles (Fig. 11I, J); body predominantly orange-brown with two white spots on the carapace; tubercles of the DS areas, free tergites and lateral margins whitish (Fig. 27A).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated Dr. José Ochoa C. (MUBI), for his great help in fieldwork in Bolivia and Peru.

Distribution. (Fig. 29B) PERU. Pasco. Oxapampa. Parque Nacional Yanachaga-Chemillén.

Material examined. Holotype ♂, 'PERU, Pasco, Oxapampa, Parque Nacional Yanachaga-Chemillén 10º32′42.1″S 75°21′24.4″W, 22/IV/2011, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUBI) — **Paratype** 1 ♀, 'ditto' (MZSP 36988). **Paratype** 1 ♂, 'PERU, Pasco, Oxapampa, Parque Nacional Yanachaga-Chemillén 10º32′42.5″S 75°21′29.8″W, 9–11/IV/2011, S. Cardonel & J. Grados leg. (MUSM); **Paratypes** 3 ♂, 3 ♀, 'ditto' (MZSP 36984).

3.52. *Tschaidicancha scorsesei* sp. nov.

http://zoobank.org/E449D284-1488-49FC-B5DC-3B8A620296B9

Figs. 6E, 11K, L, 21D–F, 29A

Description. MALE: ***Measurements*** (*n*=10) DSW: 4.1–5.5 (5.5); DSL: 4.6–5.6 (5.6); CL: 1.6–2.2 (2.2). FIVL: 11.2–15.0 (12.4). ChL: 2.8–5.2 (5.2). ***Coloration***: Brownish red DS. Chelicerae, pedipalpus and legs brown. ***Dorsum***: (Fig. 6E) Kappa-type DSS. Anterior margin of the carapace with median elevation; with sparse granules. Ocularium with pronounced median depression; with a pair of parallel spines. Carapace with few sparse granules. Areas I–IV with few sparse granules. Area I divided; with a medium pair of acuminate tubercles. Area III with a pair of spines, directed posteriorly, located in tegument elevations, very granular. Area IV short, with a pair of medium tubercles (smaller than those on Area I). Posterior margin of DS and free tergites I–III with a row of granules. Lateral margins of DS smooth. ***Chelicerae***: (Fig. 6E) Swollen on large males (as in the holotype). Slightly larger than female chelicerae in smaller males. Segment I slightly granular. Segment II with few granules; with five teeth. Segment III with two teeth. ***Pedipalpus***: Trochanter with a ventroapical setiferous tubercle. Femur with a ventral row of 8–9 large tubercles (the middle ones largest) along the basal ⅔; one large prosubapical spine. Patella with a proapical tubercle. Tibia: retrolateral iIiIi, prolateral IiIi. Tarsus: retrolateral iiIiIi, prolateral iIIIi. ***Venter***: Coxa I with a row of 4–5 tubercles. Coxae II–IV with granules throughout their surface. Genital area with few granules. Free sternites smooth. Anal operculum with few granules. ***Legs***: (Figs. 6E, 11K, L) Coxae I–II each one with an anterior and a posterior apophysis. Coxa III unarmed. Coxa IV with sparse setiferous granules. Trochanters I–III unarmed and slightly granular. Trochanter IV with few granules and a retroapical small tubercle. Femora I–III unarmed and with small granules. Femur IV with sparse granules; a retrolateral row of 33–35 small acuminate tubercles, except at the apex. Patellae I–III unarmed, with few granules. Patella IV with three retroapical small tubercles. Tibiae I–III unarmed and with few granules. Tibia IV with a retrolateral row of 11–12 small acuminate tubercles along the basal ½. Tarsal segmentation: (*n*=10) 9–10 (10), 16–23 (23), 11–13 (12), 13–14 (14). ***Penis***: (Fig. 21D–F) VP subrectangular, long; distal margin straight; slightly curved in lateral view. MS C1–C2(3) subdistal long and slightly curved; MS A1 long and straight (slightly shorter than MS C and MS B), medially placed; MS B1 sub basal long and straight; MS D1 short and straight, placed below MS C. Lateral sacs long and apically blunt; with long T3-like microsetae. Stylus with several apical projections. Dorsal process present. Promontory convex. — **FEMALE:** ***Measurements*** (*n*=5) DSW: 3.8–5.0; DSL: 4.3–5.6; CL: 1.5–2.2. FIVL: 10.5–15.3. ChL: 2.0–2.7. Chelicerae slightly smaller than that of small males and not swollen as in large males. Femur IV unarmed. Tarsal segmentation: (*n* = 5) 7–9/15–17/11–14/12–14.

Diagnosis. Similar to *Tschaidicancha chaplini* **sp. nov.** by the set of the following characteristics: reddish brown coloration; femur IV with a retrolateral row with more than 30 small tubercles; tibia IV with a retrolateral row with more than ten small tubercles (Fig. 11K, L). Differs from *T. chaplini* **sp. nov.** by the set of the following characteristics: the area I divided longitudinally; free tergite III unarmed (Fig. 6E); tibia IV with less than 15 retrolateral tubercles (Fig. 11K, L); VP without distal-lateral projections (Fig. 21D–F).

Derivatio nominis. The specific epithet of masculine gender, in the genitive form, dedicated to the American director, producer, screenwriter and cinema historian Martin Charles Scorsese (1942–), an exponent of New Hollywood (American New Wave).

Distribution. (Fig. 29A) PERU. Pasco. Oxapampa. Parque Nacional Yanachaga-Chemillén.

Material examined. ***Type material*: Holotype** ♂, 'PERU, Pasco, Oxapampa, Parque Nacional Yanachaga-Chemillén, 10º32′42.1″S 75°21′24.4″W, 22/IV/2011, R. Pinto-da-Rocha, A. Benedetti, J. Ochoa & D. Silva leg. (MUBI) – **Paratypes** 1 ♂, 1 ♀, 'ditto' (MZSP 36994). ***Additional material*:** 16 ♂, 4 ♀, 'PERU, Pasco, Oxapampa, Parque Nacional Yanachaga-Chemillén 10º32′42.1″S 75°21′24.4″W | 9–11/IV/2011, S. Cardonel & J. Grados leg. (MUSM 0500505).

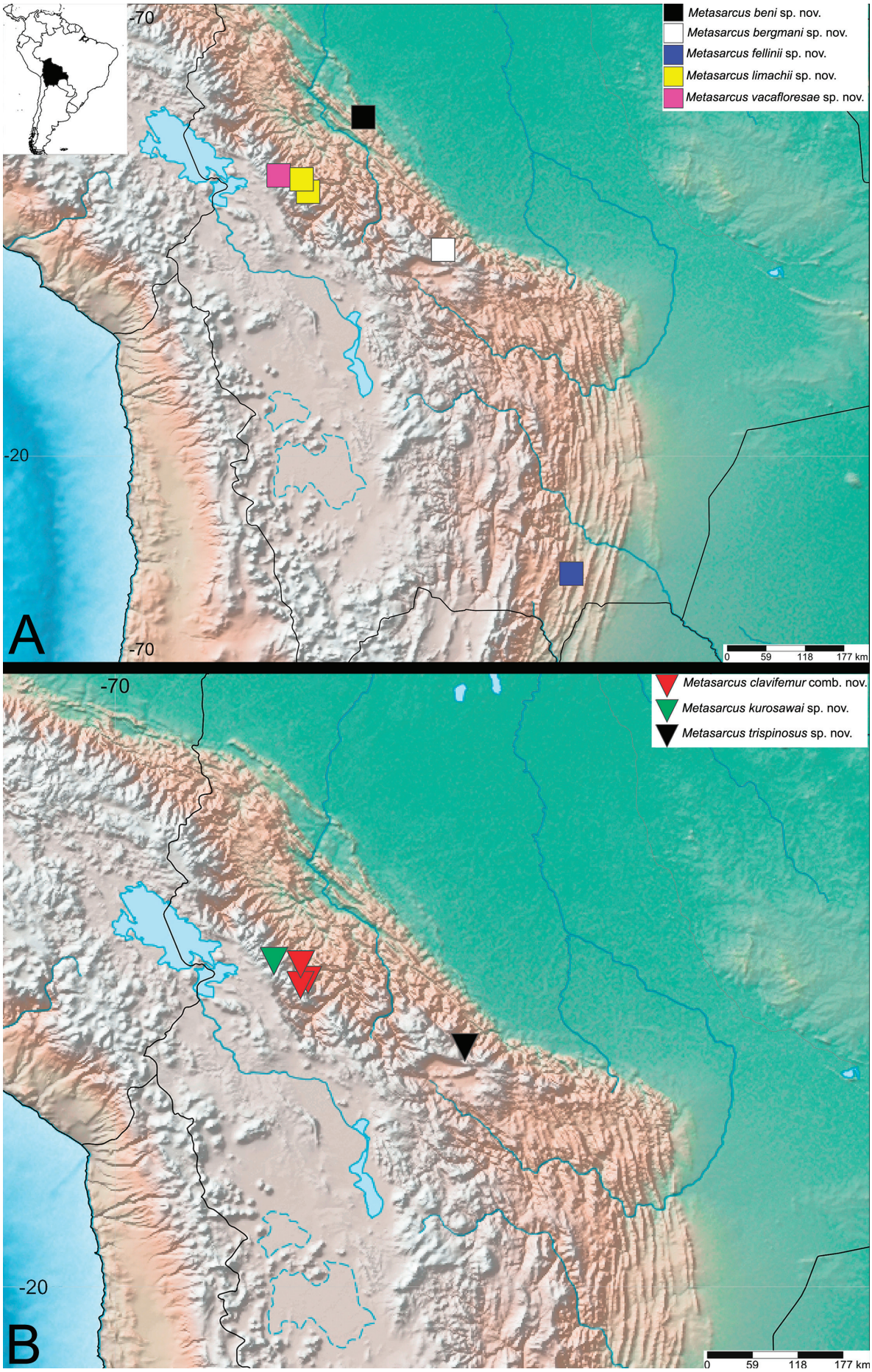

Figure 31. Distribution of *Metasarcus* in Bolivia. **A** *M. beni* **sp. nov.**, *M. bergmani* **sp. nov.**, *M. fellinii* **sp. nov.**, *M. limachii* **sp. nov.**, *M. vacafloresae*; **B** *M. clavifemur*, *M. kurosawai* **sp. nov.**, *M. trispinosus* **sp. nov.**

3.53. *Tschaidicancha weyrauchi* Roewer, 1957

Figs. 6F, 11M, N, 14K, L, 27E, F, 29A

Tschaidicancha weyrauchi Roewer, 1957: 81 (desc.), fig. 11 (female dorsal habitus), 12 (female pedipalpus), 13 (female apical femur–patella IV); Soares, Soares and Jim 1992: 13 (cat.); Kury and Maury 1998: 145 (cit.); Kury 2003: 144 (cat.).

Redescription. MALE: ***Measurements*** (*n*=2) DSW: 3.7–4.0; DSL: 3.7; CL: 1.5–1.6. FIVL: 6.8–7.7. ChL: 2.7. ***Coloration***: (Fig. 27E) Chelicerae orange. Pedipalpus light brown. Dorsal scutum and legs dark reddish brown. ***Dorsum***: (Fig. 6F) Kappa-type DSS. Anterior margin of the carapace with median elevation, with few granules. Ocularium with sharp median depression; a pair of long spines. Carapace with sparse granules, most in the region posterior to the ocularium. Area I undivided longitudinally; with four tubercles. Area II with six tubercles. Area III with 6–7 sparse granules; two long spines facing backwards, located in elevations of the integument, very granulate. Area IV with five tubercles. Posterior margin of the DS with three granules. Free II–I tergites with irregular rows of granules. Free tergite III smooth; with a lateral pair of large spiniform tubercles. ***Chelicerae***: (Fig. 6F) Segment I densely granular; with 2–3 dorsobasal tubercles. Segment II with small granules; finger with four teeth. Segment III with three teeth. ***Pedipalpus***: Trochanter with a long ventroapical setiferous tubercle. Femur with a row of 4–5 long ventral setiferous tubercles and a small proapical tubercle. Patella with a small proapical tubercle. Tibia: retrolateral iIII, prolateral IIII. Tarsus: retrolateral iIiIi, prolateral iIiIi. ***Venter***: Coxa I with a median row of four long tubercles. Coxa II with an apical broad base tubercle. Coxae III–IV with scattered granules. Genital area smooth. Free sternites with row of granules. Anal operculum granular. ***Legs***: (Figs. 6F, 11M, N) Coxae I–II each with a prolateral and a retrolateral apophysis. Coxa III unarmed. Coxa IV with sparse setiferous granules. Trochanters I–III unarmed and granular. Trochanter IV ventrally with few granules; a proapical tubercle. Femora I–III unarmed and with small granules. Femur IV with small sparse granules; a dorsal row 8–9 granules from the base to half of the femur, which gives rise to a row of eight long acuminate tubercles, varying in size, extending to the apex. Ventrally with a retrolateral and prolateral row of granules from the apex to half of the femur, followed by seven tubercles, growing in size apically, which are long and acuminated. Patellae I–III unarmed. Patella IV with a long retrodorsal acuminate tubercle; a median dorsal acuminate tubercle; an apical prodorsal acuminate tubercle; small tubercles spread over the dorsal surface of the patella IV; a median ventral acuminate tubercle. Tibiae I–IV unarmed and smooth. Tarsal segmentation: (*n*=2) 8, 14, 9, 10. ***Penis***: (Fig. 14K, L) VP subrectangular; distal margin straight; with long lateroapical projections; slightly curved in lateral view. MS C1–C2 subdistal long and straight (MS C1 bifid and MS C2 non-branched); MS A1 short and straight, medially placed; MS B1 sub basal short and straight (slightly longer than MS A). Apical region of truncus enlarged. Lateral sacs short, robust and apically blunt; with long T3-like microsetae. Stylus with swollen apex; with a dorsal and a ventral projection. Dorsal process cone-shaped. Promontory straight. — **FEMALE:** ***Measurements*** (*n*=2) DSW: 4.3–4.5; DSL: 4.3–4.5; CL: 1.7. FIVL: 7.7–8.5. ChL: 2.4. (Fig. 27F) Chelicerae slightly smaller than that of male. Femur IV unarmed. Tarsal segmentation: (*n* = 2) 7–8, 14–16, 6–9, 10–11.

Diagnosis. It differs from other species of the genus by the following set of characteristics: kappa-type DSS; ocularium with a pair of long spines; scutal area I undivided; free tergite III with a pair of large spiniform tubercles (Fig. 6F); male femur IV with a dorsoapical row of acuminate tubercles; male patella IV with three long acuminate tubercles (Fig. 11M, N); chelicerae orange and body predominantly dark reddish brown (Fig. 27E). VP with long lateroapical projections (Fig. 14K, L).

Distribution. (Fig. 29A) PERU. Huánuco. Tschaidicancha (near Huánuco); Bosque Carpish (SW Tingo Maria).

Material examined. ***Type material*: Holotype** ♂, ‘PERU, Huánuco, Tschaidicancha, near Huánuco, 2,800 m a.s.l., 2/VIII/1955, Weyrauch leg. (SMF RII 11417/20). ***Additional material*:** 1 ♂, 1 ♀ ‘PERU, Huánuco, Bosque Carpish, southwest Tingo Maria, 2,590 m a.s.l., 09º42′46.6″S 76°05′26.7″W, 23/IV/2011, A. Benedetti, J. Ochoa, R. Pinto-da-Rocha & D. Silva leg. (MZSP 76550).

4. Discussion

4.1. Phylogenetic inference

We chose parsimony analysis to obtain a working phylogenetic hypothesis of Metasarcidae because it minimizes the number of needed *ad hoc* hypotheses of character transformations, thereby maximizing the explanatory power of phylogenetic hypotheses (Kluge and Grant 2006; see also Ospina-Sarria and Cabra-García 2017). Therefore, the MP01 analysis was chosen because it is a total evidence analysis, with a more complete matrix.

Besides using TE under parsimony, we decided to test how the molecular data (most of the data in the total evidence matrix) behaved in an analysis of phylogenetic inference under Maximum Likelihood, a statistical optimality criterion, as well as parsimony. The objective was to observe whether a highly conflicting hypothesis would be recovered, in relation to the DO analysis. Furthermore, a TE dataset was also submitted to the maximum likelihood criterion. We are aware that, since both analyses differ in terms of optimality criterion (and consequently different inference mode), data set (TE *versus* molecular data only) and treatment of molecular data (static and dynamic homology), it is necessary to interpret the comparisons with caution (the differences in topologies resulting

from all analyses are reported in section 3.3 and below in the discussion; additionaly see Grant and Kluge 2003 for a critique of methodological congruence).

4.2. The monophyly and biodiversity of Metasarcidae

Metasarcidae was recovered as a monophyletic group in previous analyses and as the sister group of Cosmetidae (see Yamaguti and Pinto-da-Rocha 2009; Pinto-da-Rocha et al. 2014). *Napostygnus bispinosus*, classified in Metasarcinae until 2012, does not form a monophyletic group with the rest of the family (as in Pinto-da-Rocha et al. 2012, 2014), now in Nomoclastidae (Pinto-da-Rocha and Bragagnolo 2017). Our phylogenetic analysis corroborates metasarcids as an independent family not closely related to the Gonyleptidae, as originally proposed (Kury 1994; Kury and Maury 1998). The assignment of metasarcids as subfamily of Gonyleptidae had been previously questioned by the morphological study of Yamaguti and Pinto-da-Rocha (2009) and biological data of Caetano and Machado (2013). Pinto-da-Rocha et al. (2014), in a molecular study, found that metasarcids are closely-related to Cosmetidae rather than gonyleptid subfamilies, and elevated the group to family level (see p. 532 at their paper to a further discussion). The family rank was corroborated by Kury and Villarreal (2015) in a morphological phylogenetic analysis and by Benavides et al. (2021) using transcriptomes. However, the studies mentioned above were based on a small taxon sampling. Therefore, our study is the first comprehensive test of the monophyly of Metasarcidae, in terms of family representativeness. The finger-like sac projecting from the lateral base of the ventral plate is a unique feature among Opiliones and was recovered as an exclusive unambiguous synapomorphy, supported by additional synapomorphies (see section 3.3) that had not been previously recognized. The finger-like sac projection is similar to the bump-like sac of cosmetid genus *Metalibitia* (see Coronato-Ribeiro and Pinto-da-Rocha 2017), but it can be differentiated because the structure in *Metalibitia* is a folded projection occupying the base to the median region of the lateral part of the VP, whereas in Metasarcidae it is spiny-like and is restricted to the base. Besides that, is a derived genus within cosmetid family (Medrano et al. 2021). Considering that they are unique structures among harvestmen, as well as the differences pointed out, we chose to consider them as independent structures.

The family Metasarcidae includes six genera and 38 species, of which two new genera and 20 new species were described here. The high proportion of newly described taxa reflects the fact that South American harvestmen are poorly known and suggests that we need more diversity studies to uncover the true species richness of this family. Arachnologists have been working at Argentinean and Brazilian museums since last century and have been responsible for most of what we know about the diversity and distribution of the Opiliones in the Brazilian Atlantic Rain Forest (Pinto-da-Rocha et al. 1995), Argentina (Acosta 2002) and Chile (Kury 2003) where harvestmen have been more intensely investigated. Argentinean and Brazilian museums with permanent arachnologists since last century are responsible for much of the knowledge of above-mentioned areas. The absence of museums/experts in the very narrow distribution range of metasarcids (Peru and Bolivia, see Figs. 28, 29) and short-range endemicity of these arachnids (see map) are in part responsible for the fact that 20 new species were discovered in only six weeks of collecting in Bolivia and Peru by the authors. The Central and Northern Andes may be as diverse as the Brazilian Atlantic Rain Forest (see Pinto-da-Rocha et al. 2005, DaSilva et al. 2017) due to their dynamic geomorphological evolution and complexity of habitats.

Our phylogenetic analyses based on molecular and morphological markers resulted in a new classification with several new combinations proposed for Metasarcidae. The only genus that remained unchanged was *Incasarcus* Kury & Maury, 1998. The drastic reorganization within Metasarcidae is consistent with what has happened to other Neotropical harvestmen that were revised more recently, continuing to prove that the Roewerian system is flawed (e.g. Pinto-da-Rocha 1997; Yamaguti and Pinto-da-Rocha 2009; DaSilva and Gnaspini 2010; Mendes 2001; Kury et al. 2022 and other subfamily reviews). New morphological characters from the penis, body shape, and leg armature served to corroborate the support of new clades, contrasting with Roewer's limited features such as armature of ocularium and dorsal scutum, and number of tarsomeres. *Metasarcus*, hitherto known only by the obscure *Metasarcus bolivianus* and *Metasarcus armatipalpus* (both known only from female holotypes) and *Metasarcus clavifemur* (included in the genus without any justification by Townsend et al. 2019), now comprised more broadly, with seven new species. *Metasarcus* is sister to *Incasarcus*, forming a clade with the largest metasarcid in terms of body and legs, found in moist forests (in all four analyses). Both are sister to the *Tschaidicancha* and *Ayacucho* clade, being the *Ayacucho* a clade with small heavy tuberculated metasarcids found in open areas with shrubs and low trees. The internal relationships of the clade *Tschaidicancha* + *Ayacucho* vary across all four analyses, with the clade being most dependent on the data used and the assumptions (optimality criterion, alignment, etc) made in each analysis. The most sensitive point being, certainly, the position of *Tschaidicancha chaplini* **sp. nov.** (see discussion below).

4.3. Taxonomy and systematics of Metasarcidae genera

Since the choice of ingroup taxa for the total evidence analysis was based on the availability (see section 2.5) of specimens, it was necessary to adopt a strategy that would combine the results of the phylogenetic hypothesis with the results of the classical taxonomy (or α-taxonomy) and achieve a new classification of the Metasarcidae that reflects its evolutionary history. The role of α-taxonomy, in this case, is fundamental to expand the knowledge

of the biodiversity of the target group (see Martens and Segers 2005; Decreamer and Backeljau 2015).

Analysis of the type-material of all described species ensured that we would be able to reliably recognize the new species from Bolivia and Peru. Considering the large number of new species and the large number of monotypic genera of Metasarcidae established within the context of the Roewerian system (see Introduction), the strategy mentioned in the previous paragraph was very useful for the new supraspecific classification of Metasarcidae (see section 2.5).

Of the six genera of Metasarcidae recognized in this study, *Huancabamba* **gen. nov.** (monotypic) and *Lumieria* **gen. nov.** (two species) are described for the first time. The establishment of these two genera resulted from the phylogenetic analysis, since both were recovered in a clade at the base of the tree chosen to represent the phylogeny of the family (MP01; and also in MP02 and ML01). Only in ML02 the two genera do not form a clade, being the two most basal lineages of Metasarcidae. The choice to describe two distinct genera, even if they are sister groups in the working hypothesis, is due to the evident morphological differences (see below), especially those related to the stylus' format and the number of MS C of the penis. As *Huancabamba* **gen. nov.** has only one species known, the autopomorphies of *H. kubricki* **gen. et sp. nov.** mentioned in section 3.3 are the putative morphological synapomorphies of the genus. Furthermore, an important diagnostic feature, penial VP with more than 13 MS C, may be another putative synapomorphy of this monotypic genus, since no other Metasarcidae has that many MS C. Additionally, very short VP lateral sacs is another important diagnostic feature, even though it is plesiomorphic and homoplastic (it occurs in a few other species of the family, e.g. *Metasarcus fellinii* **sp. nov.,** and also in the cosmetid *Metalibitia paraguayensis*).

Lumieria **gen. nov.** was represented in the analysis by one of the two described species. The autapomorphies of *L. antonionii* **gen. et sp. nov.** were listed in section 3.3. The first autapomorphy listed [20:2] is not found in the other species of the genus (*Lumieria woodyalleni* **gen. et sp. nov.**), but the second [64:2], related to the penial stylus is shared by both. The broad and sturdy penis stylus shape of *Lumieria* **gen. nov.** species are completely different from all other Metasarcidae. Therefore, the character state of the penis stylus can be understood as an important morphological putative synapomorphy of *Lumieria* **gen. nov.** Furthermore, the homoplastic autapomorphy of *L. antonionii* **gen. et sp. nov.,** retrolateral row of acuminate tubercles on tibia IV [52:1], also present in *L. woodyalleni* **gen. et sp. nov.**, is not included in the analysis due a lack of fresh samples and may be another putative synapomorphy of the genus. These characteristics mentioned allow the classification of *L. woodyalleni* **gen. et sp. nov.** in this genus.

Incasarcus was well represented in the analysis with four of its five known species (*I. pictus* is not represented). This is the first time that the monophyly of *Incasarcus* was tested since Kury and Maury (1998) described the genus, and it is well supported in our results. Some of the diagnostic features of *Incasarcus* pointed out by Kury and Maury (1998) were recovered in our analysis as synapomorphies for the group (exclusive or homoplastic, see section 3.3).

Before this study, *Metasarcus* included three species: *M. bolivianus* Roewer, 1913 and *M. armatipalpus* (Roewer, 1929) from Bolivian Chaco, which were synonymized here (see section 3.42) and *M. clavifemur* from department of La Paz, Bolivia. The type-species of *Metasarcus* is known only from a female holotype (1913) (plus the female holotype of *M. armatipalpus*, here established as its junior synonym) and consequently the species was not included in our phylogenetic analysis. Both holotypes are extremely similar, which justified the synonymization of both species. In addition, due to the presence of a spiniform apophysis on free tergite III, these females are very similar to females of *M. fellinii* **sp. nov.**, another species from the Bolivian Chaco, collected near Entre Ríos, Department of Tarija. The similarity of the females indicates that they are closely related species, which supports the allocation of *M. fellinii* **sp. nov.** within this genus. Despite their similarity, they are clearly different species, due to the large difference in size and in the density of the granulation throughout the dorsal scutum. *Metasarcus clavifemur* was included in the genus without any justification and without a discussion of *Metasarcus* after the inclusion of the species (Townsend et al. 2019; see also remarks on section 3.39). Our study, based on new evidence, corroborates the synonymy of *Chacoikeontus* with *Metasarcus*, which is expanded (see diagnosis in section 3.39) to include seven new species. The new delimitation of *Metasarcus* encompasses a greater variation of morphological characteristics (e.g. DSS, presence or absence of apophysis in free tergite III and femoral IV armature) and groups all Bolivian species. This expanded delimitation is justified as a way to avoid the description of several new monotypic genera and because they form a strongly supported clade.

Of the three new species not included in the phylogenetic analyses, *M. limachii* **sp. nov.** is most similar to the species of the clade (*M. trispinosus* **sp. nov.** (*M. bergmani* **sp. nov.** + *M. fellinii* **sp. nov.**)) due to the presence of the spiniform apophysis in the free tergite III of male and female. *Metasarcus kurosawai* **sp. nov.** resembles *M. clavifemur* in their DSS and scutal area I shape.

The internal relationships of *Incasarcus* and *Metasarcus* are identical in all analyses, as well as the relationship of the two genera as sister groups.

We were not able to test the monophyly of *Tschaidicancha*. The genus was monotypic prior to this work and the type-species, *Tschaidicancha weyrauchi*, is known only from a few specimens. It was not possible to extract its DNA due to tissue old age. Additionally, we were not able to include two of the three new species in our analysis. Among the autapomorphies of *T. chaplini* **sp. nov.** listed in section 3.3, only one is shared by the other species of the genus: scutal area II with a pair of tubercles. This characteristic is also present in *Ayacucho querococha* **sp. nov.** + *Ayacucho tapacocha* **nom. nov.**

clade among the Metasarcidae. Amidst the four species of the genus (*sensu hoc*), *T. chaplini* **sp. nov.** and *T. scorsesei* **sp. nov.** are very similar morphologically, especially in the DSS and armature pattern of femur IV (see diagnosis in sections 3.50 and 3.52). *Tschaidicancha joseochoai* **sp. nov.** resembles *T. weyrauchi* **sp. nov.** in having a more robust armature on femur IV of male (although the armature pattern is totally different), but it has a series of characteristics that are distinct from the other species of the genus (see diagnosis in section 3.51). The four *Tschaidicancha* species are quite distinct from most *Ayacucho* species (granulation; legs/DS ratio; presence of a proapical spine on pedipalpus femur in males, etc). The *Tschaidicancha* species superficially resembles the *Incasarcus*, *Metasarcus*, *Lumieria* species more than the *Ayacucho* species. When using morphological data in the analyses (MP01; ML01), *T. chaplini* **sp. nov.** is recovered as a sister group of the *Ayacucho*, which does not occur in analyses with only molecular data, in which it is retrieved nested in *Ayacucho* (MP02; ML02). This demonstrates that, morphologically, there is a distinction between this species and the *Ayacucho* (even taking into account that *A. spielbergi* **sp. nov.** also differs morphologically from the other *Ayacucho*, see below). Even considering that, the monophyly of the genus has not been tested and none of the diagnostic characteristics of the genus (see section 3.49) are exclusive, we have chosen to tentatively allocate the three new species in *Tschaidicancha*. We made this decision while keeping in mind that we wanted to avoid describing new monotypic genera that did not result from a phylogenetic analysis.

Prior to this revision, *Ayacucho* contained only its type-species from Ayacucho, south-central Peru. We expanded the delimitation of the genus and included the northern Peruvian genera *Cajamarca* (4 spp.), *Cargaruaya* (1 spp.), *Cajacaybia* (1 spp.) and *Tapacochana* (1 spp.); Central Peruvian genus *Palcares* (2 spp.); and seven new species. The resulting clade consists of *A. titschacki* (type-species), *A. uniseriatus* **comb. nov.** (previously in *Cajamarca*), *A. spiniger* **comb. nov.** (previously in *Palcares*), *A. tapacocha* **nom. nov.** (previously in *Tapacochana*), and six new species (12 terminals representing 10 species; 17 species recognized in this study). The type-species of the monotypic genera *Cargaruaya* and *Cajacaybia* are known only from the female holotypes described in 1956 and 1957 (respectively) and were not included in the analysis. *Tapacochana* and *Palcares* are represented in the ingroup by their type-species, and the type-species of *Cajamarca* is known only from the male holotype (1952) and is not present in the analysis.

The internal relationships of *Ayacucho* differ between the different analyses. The two inner clades. "*silva* clade" and "*spinigera* clade", are recovered as sister groups only in MP01. The "*silva* clade" is monophyletic in all four analyses, but the "*spinigera* clade" is not (only in MP01).

All unambiguous synapomorphies and those recovered only with ACCTRAN are listed in Section 3.3. The slightly flattened, sub cylindrical pedipalpus femur, [8:1] is found in all representatives of *Ayacucho* used in the analysis, except in *Ayacucho spielbergi* **sp. nov.**, which has a subcylindrical and not flattened pedipalpus femur [8:0], similar to all remaining metasarcids. The absence of the proapical spine on pedipalpus femur in males [7:0] is an important homoplastic synapomorphy. This character state is also found in representatives of the outgroup (e.g. *Napostygnus*, *Phareicranaus* [Cranaidae], Cosmetidae genera); all the remaining metasarcids have a proapical spine on pedipalpus femur in males [7:1]. The alpha-type DSS [10:0] is another important homoplastic synapomorphy (also found in *Incasarcus*). Only *Ayacucho spielbergi* **sp. nov.** has a different shape (gamma-type). The presence of a row of tubercles on free tergites II–III [30:1] only occurs in *I. argenteus* and in some representatives of the external group. An exclusive synapomorphy under ACCTRAN optimization, femur IV with a distal row of acuminate tubercles [45:1:] is present only in *Ayacucho silvae* **sp. nov.**, *Ayacucho vargasllosai* **sp. nov.** and *Ayacucho pomacocha* **sp. nov.** Despite the low support (GB = 7), and keeping in mind the morphological differences listed above (e.g. presence of proapical spine on pedipalpus femur in males, dense granulation on DS, length of the femur IV; see also diagnosis in section 3.10) that separate *Ayacucho* from other metasarcids genera, we opted for a broader definition of the genus. *Ayacucho bambamarca* **comb. nov.**, *A. triarmatus* **nom. nov.** and *A. weyrauchi* **comb. nov.**, absent from the phylogenetic analysis, were described together with *A. uniseriatus* **comb. nov.** within the genus *Cajamarca* (Roewer 1952; 1957). They share morphological similarities: mid-bulge more rounded, ocularium with a pair of spines, and male femur IV with rows of acuminated tubercles. Likewise, *A. insignitus* **comb. nov.** and *A. roeweri* **nom. nov.**, known only from females, resemble the females of *A. uniseriatus* **comb. nov.** (and related species) in the DSS and ocularium armature. *Ayacucho inermis* **comb. nov.** is morphologically similar to *Ayacucho spiniger* **comb. nov.** in the armature pattern on male femur IV.

It is important to note that of *Ayacucho pasolinii* **sp. nov.**, which was not included in the phylogenetic analysis, and the previously discussed *A. spielbergi* **sp. nov.**, share a series of morphological features that distinguish them from the other species of the genus: ocularium saddle-shaped (although depression is shallow), low granulation on DS and femur IV long (FIV/DSL = 1.5). The length of the legs (represented by the FIVL/DSL ratio in this study) is especially important to differentiate *Ayacucho* from other genera and for this reason the condition found in *A. spielbergi* **sp. nov.** and *A. pasolinii* **sp. nov.** is especially striking. The DSS of *A. pasolinii* **sp. nov.** (with not so rounded mid-bulge) is similar to the condition found in the "*Ayacucho silvae* **sp. nov.** clade". Although this can indicate proximity, there are important differences such as the presence of a pair of strong spines on area III, ocularium with large spines and male femur IV with a more robust armature. Additionally, the yellowish spots on the lateral margins of the DS are unique among *Ayacucho* species. The working phylogenetic hypothesis of this study supports the inclusion of *A. spielbergi* **sp. nov.** in *Ayacucho*, despite the morphological differences, but the same does not occur with *A. pasolinii* **sp. nov.**, which

is not included in the analysis due to lack of fresh tissues. Considering that *A. spielbergi* **sp. nov.** has a high number of autapomorphies, we have hypothesized that the same could occur with another species. In addition, there is no indication, based on morphology, that the species belong in the other metasarcid genera. Therefore, we opted to include *A. pasolinii* **sp. nov.** in *Ayacucho* because we consider that the morphological characteristics of the species fit this genus

Finally, it is worth mentioning that the "*silvae* clade" is especially noteworthy for presenting an extremely conservative external morphology. Males are very similar (with subtle differences) and females are virtually indistinguishable (see diagnoses of *A. glauberrochai* **sp. nov.**, *A. pomacocha* **sp. nov.**, *A. silvae* **sp. nov.**, *A. titschacki* and *A. vargasllosai* **sp. nov.**). The differentiation among these species strongly relies on the penial morphology.

5. Conclusions

We present a strongly supported, comprehensive phylogenetic hypothesis of Metasarcidae based on morphological and molecular datasets. The family is monophyletic and was recovered as the sister-group of Cosmetidae. Additionally, this contribution increases our knowledge of the taxonomy of the group. The taxonomic acts that derived from this systematic review of the family are compiled below.

The following generic synonymies are proposed: *Ayacucho* Roewer, 1949 = *Cajamarca* Roewer, 1952, *Cargaruaya* Roewer, 1956, *Palcares* Roewer, 1957, *Cajacaybia* Roewer, 1957 and *Tapacochana* Roewer, 1957.

The following new genera are described from Peru: *Huancabamba* **gen. nov.** (type species *Huancabamba kubricki* **gen. et sp. nov.**) and *Lumieria* **gen. nov.** (type species *Lumieria antonionii* **gen. et sp. nov.)**.

The following specific synonymies are proposed: *Cajamarca weyrauchi* Roewer, 1952 = *Cajamarca affinis* Roewer, 1957; *Cajamarca bambamarca* Roewer, 1957 = *Cajamarca triseriata* Roewer, 1957; *Metasarcus bolivianus* Roewer, 1913 = *Chaconatus armatipalpus* Roewer, 1929; *Palcares spiniger* Roewer, 1957 = *Palcares serrifemur* Roewer, 1959.

The following new combinations are proposed: *Ayacucho bambamarca* (Roewer, 1957) **comb. nov.**; *Ayacucho inermis* (Roewer, 1957) **comb. nov.**; *Ayacucho insignitus* (Roewer, 1956) **comb. nov.**; *Ayacucho spiniger* (Roewer, 1957) **comb. nov.**; *Ayacucho uniseriatus* (Roewer, 1959) **comb. nov.** and *Ayacucho weyrauchi* (Roewer, 1952) **comb. nov.**

The following new species are described from Bolivia: *Metasarcus beni* **sp. nov.**, *Metasarcus bergmani* **sp. nov.**, *Metasarcus fellinii* **sp. nov.**, *Metasarcus kurosawai* **sp. nov.**, *Metasarcus limachii* **sp. nov.**, *Metasarcus trispinosus* **sp. nov.** and *Metasarcus vacafloresae* **sp. nov.** The following new species are described from Peru: *Ayacucho glauberrochai* **sp. nov.;** *Ayacucho pasolinii* **sp. nov.;** *Ayacucho pomacocha* **sp. nov.**, *Ayacucho querococha* **sp. nov.**, *Ayacucho silvae* **sp. nov.**, *Ayacucho spielbergi* **sp. nov.**, *Ayacucho vargasllosai* **sp. nov.;** *Huancabamba kubricki* **gen. et sp. nov.**, *Lumieria antonionii* **gen. et sp. nov.**, *Lumieria woodyalleni* **gen. et sp. nov.**, *Tschaidicancha chaplini* **sp. nov.,** *Tschaidicancha joseochoai* **sp. nov.** and *Tschaidicancha scorsesei* **sp. nov.**

The following secondary homonym species names are replaced: *Cajacaybia spinigera* Roewer, 1957 replaced by *Ayacucho roeweri* **nom. nov.**; *Tapacochana insignita* Roewer, 1957 replaced by *Ayacucho tapacocha* **nom. nov.** and *Tapacochana triseriata* Roewer, 1959 replaced by *Ayacucho triarmatus* **nom. nov.**

6. Authors' contributions

A.R.B. and R.P.R. designed the study and contributed to collecting materials. A.R.B. conducted the taxonomic revision and phylogenetic analyses with assistance from R.P.R. A.R.B and R.P.R. discussed the results and drafted and approved the final version of the manuscript.

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Supplementary material 1

Supplementary list

Authors: Benedetti AR, Pinto-da-Rocha (2022)
Data type: .docx
Explanation note: List of outgroups analyzed, with respective vouchers.

Link: https://doi.org/10.3897/asp.80.e73829.suppl1

Supplementary material 2

Figures S1–S5

Authors: Benedetti AR, Pinto-da-Rocha (2022)
Data type: .pdf
Explanation note: **Figure S1**. Phylogenetic hypotheses of Metasarcidae species (Total evidence hypothesis under Maximum Parsimony – IP; MP01) showing the morphological characters optimization (ACCTRAN). Black circles indicate unique transformations, while white circles mean homoplastic transformations. The character number is above each circle, the character state is below. — **Figure S2**. Phylogenetic hypotheses of Metasarcidae species (Total evidence hypothesis under Maximum Parsimony – IP; MP01) showing the morphological characters optimization (ACCTRAN). Black circles indicate unique transformations, while white circles mean homoplastic transformations. The character number is above each circle, the character state is below. — **Figure S3**. Phylogenetic hypotheses of Metasarcidae species. Molecular-only hypothesis under Maximum Parsimony (IP; MP02) of Metasarcidae species, based on five molecular markers (12S, 16S, 28S, COI and H3). Goodman-Bremer support is given near each node. — **Figure S4**. Phylogenetic hypotheses of Metasarcidae species. Total Evidence hypothesis under Maximum Likelihood (ML01) of Metasarcidae species, based on five molecular markers (12S, 16S, 28S, COI and H3) and 68 morphological characters. Bootstrap support is given near each node. — **Figure S5**. Phylogenetic hypotheses of Metasarcidae species. Molecular-only hypothesis under Maximum Likelihood (ML02) of Metasarcidae species, based on five molecular markers (12S, 16S, 28S, COI and H3). Bootstrap support is given near each node.

Link: https://doi.org/10.3897/asp.80.e73829.suppl2