

Grasshoppers of the Andes: new Melanoplinae and Gomphocerinae taxa (Insecta, Orthoptera, Acrididae) from Huascarán National Park and Callejón de Huaylas, Ancash, Peru

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ABSTRACT

The grasshopper fauna from Huascarán National Park and the valleys of “Callejón de Conchucos” and “Callejón de Huaylas”, Perú, has been sampled during two surveys of the area in 2004 and 2008. In this paper, two new genera (*Tiyantiyana* n. gen. and *Huaylasacris* n. gen.) and six new species collected during the surveys are described: *Tiyantiyana sunipenis* n. gen, n. sp., *Huaylasacris maxicerci* n. gen, n. sp., *Maeacris chilikuti* n. sp., *M. saytu* n. sp., *M. ayasqa* n. sp. of the subfamily Melanoplinae and *Orphulella chumpi* n. sp. of the subfamily Gomphocerinae. Previous records on the highland grasshoppers of the Peruvian Andes were almost nonexistent. The new acridids described here were collected at the high-altitude puna grassland, between 3182 and 4660 m a.s.l. Puna is one of the most heavily modified natural regions of Peru. Since grasshoppers are a useful group for bioindication, it is important to acquire knowledge on their diversity in such environmental conditions.

This paper includes many embedded links to images of type specimens, maps based on geo-referenced specimen data, and keys to species, all available at Orthoptera Species File Online (<http://orthoptera.speciesfile.org>).

KEY WORDS

Insecta,
Orthoptera,
Acridoidea,
Acrididae,
grasshoppers,
Andes,
Huascarán National Park,
puna,
“Orthoptera Species File
online”,
new genera,
new species.

RÉSUMÉ

Sauterelles des Andes : nouveaux taxons de Melanoplinae et Gomphocerinae (Insecta, Orthoptera, Acrididae) du parc national Huascarán et Callejón de Huaylas, Ancash, Pérou.

La faune des acridiens du parc national de Huascarán et des vallées de « Callejón de Conchucos » et « Callejón de Huaylas », Pérou, a été échantillonnée au cours de deux missions biologiques pendant les années 2004 et 2008. Nous décrivons ici deux nouveaux genres (*Tiyantiyana* n. gen. et *Huaylasacris* n. gen.) et six nouvelles espèces collectées lors des ces missions : *Tiyantiyana sunipenis* n. gen, n. sp., *Huaylasacris maxicerci* n. gen, n. sp., *Maeacris chilikuti* n. sp., *M. saytu* n. sp., *M. ayasqa* n. sp. de la sous-famille Melanoplinae et *Orphulella chumpi* n. sp. de la sous-famille Gomphocerinae. La distribution des espèces d'acridiens d'altitude dans les Andes péruviennes était très peu documentée jusqu'à présent. Les acridiens décrits ici ont été collectés dans des prairies de haute altitude (puna), entre 3182 et 4660 m d'altitude. La puna est l'une des régions naturelles les plus fortement modifiées du Pérou. Les acridiens étant de bons indicateurs biologiques, il est donc important de connaître leur diversité dans de telles conditions environnementales.

Cet article a été formaté avec de nombreux liens intégrés aux images des spécimens type, des cartes basées sur les données de spécimens géo-référencées et des clés d'espèces disponibles sur le site en ligne « Orthoptera Species File online » (<http://orthoptera.speciesfile.org>).

MOTS CLÉS

Insecta,
Orthoptera,
Acridoidea,
Acrididae,
sauterelles,
Andes,
parc national de
Huascarán,
puna,
« Orthoptera Species
File online »,
genres nouveaux,
espèces nouvelles.

INTRODUCTION

The Huascarán National Park (3400 km²) covers the length of the Cordillera Blanca range in the central Andes of Peru. Extending 158 km from north to south and 20 km from the valleys of “Callejón de Conchucos” in the east to the “Callejón de Huaylas” in the west, the park contains 60 peaks with altitudes surpassing 5700 m, the highest being Huascarán at 6768 m. Most of the terrain below 4800 m is characterized by high altitude grassland (puna) with *Polylepis* forest remnants located on the upper, inner valley slopes (Byers 2000). The puna is a unique ecosystem that clearly shows the struggle of plant and animal life against extreme cold and solar radiation (Vuilleumier & Monasterio 1987). Human activities severely limit biodiversity in this ecosystem by threatening the survival of many yet unnamed species, while global warming causes retraction and sometimes disappearance of these montane life zones identified as highest

priority for biodiversity conservation (Dinerstein *et al.* 1995; Vilimek *et al.* 2005; Bury *et al.* 2011). The grasshopper fauna from these highlands is represented mostly by two Acridoidea families (Tristiridae Rehn, 1906 and Acrididae MacLeay, 1821) that could be used, besides other sensitive groups (Proscopioidea), as bio-indicators for the condition of the puna ecosystem.

The Cordillera Blanca forms a mountain island above the surrounding valleys where the use of inappropriate agriculture and livestock methods combined with high population growth has destroyed the original vegetation cover, leaving few remnants of native forest and many invasive exotics (Bartle 1993; Young & Lipton 2006; Young 2009). The biodiversity crisis that affects most regions of the globe makes descriptions of new taxa an urgent matter. Describing them provides not only a record of their existence, but also scientific rationale for the protection of areas rich in endemic organisms with interesting life histories. The main objective of this

paper is the description of new taxa of Acrididae and to report on the grasshopper fauna of Huascarán National Park and its surroundings.

MATERIAL AND METHODS

Terminology for external morphology and male genitalia follows Otte (1981) and Amédégnato (1976), respectively. Measurements are given in millimeters; body length is measured from the apex of fastigium to the apex of hind femur. The specimens measured correspond to the material designated as holotypes, allotypes, paratypes and other material examined.

Museum specimens were relaxed in a humid chamber and the abdominal terminalia were moistened with ammonia (Cigliano & Lange 2007). Genitalia were then pulled from the body using a finely hooked pin, cleared in potassium hydroxide, and stored in glycerine.

Descriptions of Melanoplinae species are mostly based on male specimens because many females are difficult to discriminate and thus the identification is usually done by association with males collected at the same time and place.

Photographs of the phallic complex were taken with a Micrometrics digital camera attached to a Nikon stereomicroscope. Photographs of the habitus were captured with a Canon Eos Rebel digital camera. The program Combine Z5.3 (Hadley 2006) was used for focus stacking (a technique which combines multiple images taken at different focus distances to give a resulting image with a greater depth of field than any of the individual source images). Illustrations were made as pencil sketches using a camera lucida.

Specimens examined are deposited at Museo de La Plata, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, Argentina (MLPA) and at the Muséum national d'Histoire naturelle, Paris (MNHN).

The pdf edition of this paper has been formatted with embedded links to images of type specimens, keys, maps based on geo referenced specimen data in the Orthoptera Species File (OSF) online (<http://orthoptera.speciesfile.org>) (Eades *et al.* 2011).

SYSTEMATICS

Family ACRIDIDAE MacLeay, 1821

Subfamily MELANOPLINAE

Scudder S.H., 1897

Genus *Tiyantiyana* n. gen.

TYPE SPECIES. — *Tiyantiyana sunipenis* n. gen., n. sp.

ETYMOLOGY. — “Tiyantiyana” means cricket in Quechua native language. In the Huascarán region, grasshoppers are called crickets.

DISTRIBUTION. — Peru, Ancash (see [distribution in OSF](#)).

DIAGNOSIS. — Among the South American Melanoplinae, *Tiyantiyana* n. gen. is characterized by the unique shape of the aedeagus with the ventral valves very long, protruding beneath the pallium, highly surpassing the level of the epiproct, sheath of aedeagus with numerous spines (Figs 1I-L; 4C-D).

DESCRIPTION

Small sized apterous insects. Body colour highly variable with multiple short carinulae on tegument.

Males

Head globed-shape, fastigium declivent, with lateral carinae weakly indicated, rounded at the joint of frontal costa; eyes subcircular (Figs 1A-C; 4A). Lateral foveolae of fastigium visible from above (Fig. 1C). Antennae short, shorter than head and pronotum, with flattened segments (Fig. 1A; 4A). Pronotal disk flat, trapezoidal, weakly constricted at the middle; lateral and mid longitudinal carinae weakly indicated; transverse sulci not indicated on pronotal disk, only evident on lateral lobes of pronotum; hind margin emarginated (Fig. 1C). Meso, metanoto and abdominal tergites with lateral carinulae at the sides of mid longitudinal carina. Prosternal process collar-shaped. Cerci conical, width tapering towards the apex, barely reaching the tip of epiproct (Fig. 1D, E). Epiproct triangular; furculae not developed (Fig. 1D). Abdominal terminalia swollen and upcurved. Pallium thick, highly elevated (Fig. 1E). Subgenital plate short, with rounded distal margin, with the apex surpassing the tip of epiproct. Legs with femora robust, mostly the hind ones (Figs 1A; 4A). Phallic complex (Figs 1I-M;

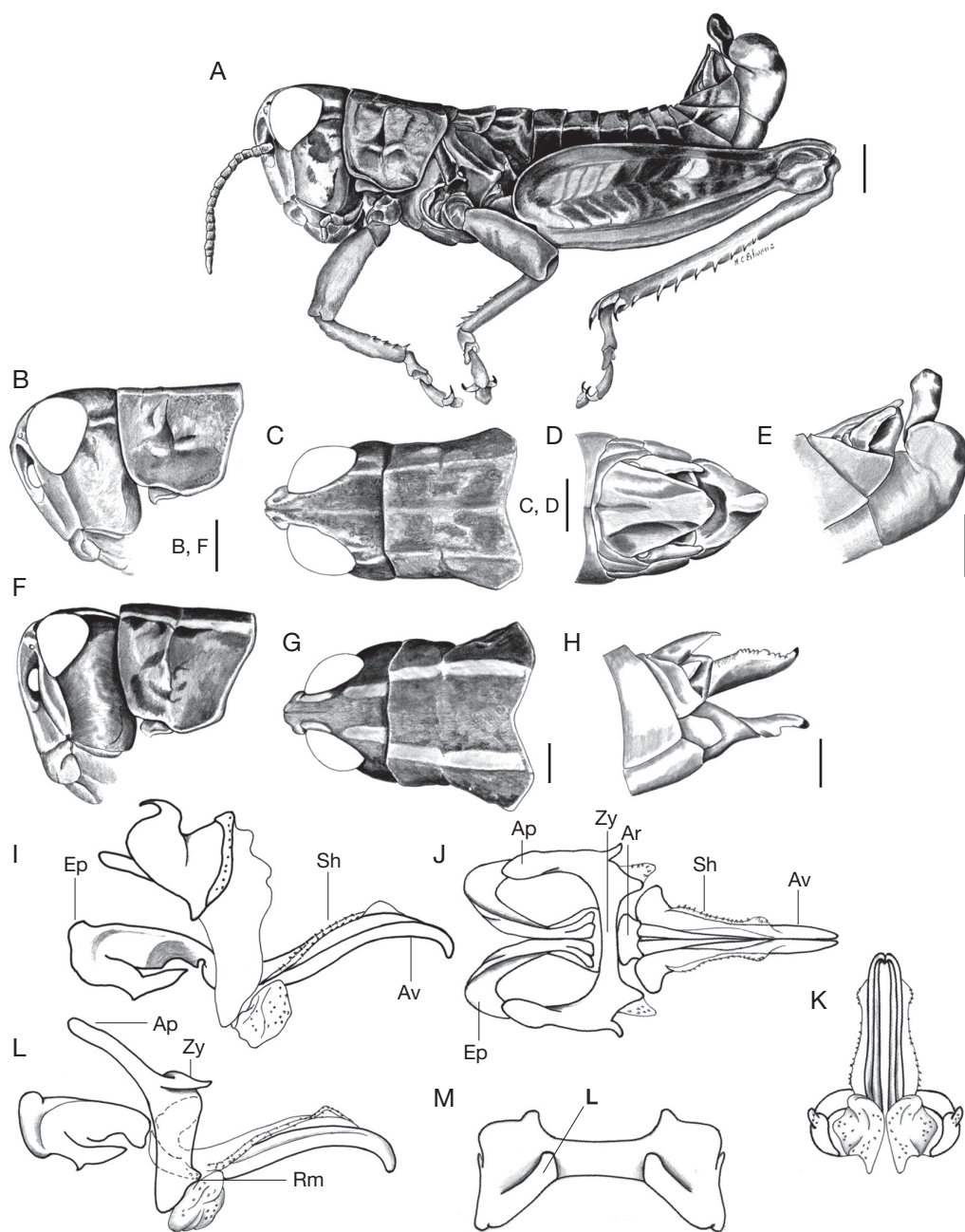


FIG. 1. — *Tiyantiyana sunipenis* n. gen, n. sp.: **A**, male habitus, lateral view; **B**, **C**, male head and pronotum, lateral and dorsal views; **D**, **E**, male distal abdominal segments, dorsal and lateral views; **F**, **G**, female head and pronotum, lateral and dorsal views; **H**, female ovipositor valves; **I**, phallic complex, lateral view; **J**, **L**, endophallic plates, cingulum and aedeagal valves with sheath, dorsal and lateral views; **K**, distal portion of aedeagus and aedeagal valves, ventral view; **M**, epiphallus, dorsal view. Abbreviations: **Ap**, apodemes of cingulum; **Ar**, arch of aedeagus; **Av**, aedeagal valves; **Ep**, endophallic plates; **L**, lophi of epiphallus; **Rm**, rami; **Sh**, sheath of aedeagus; **Zy**, zygoma. Scale bars: 1 mm.

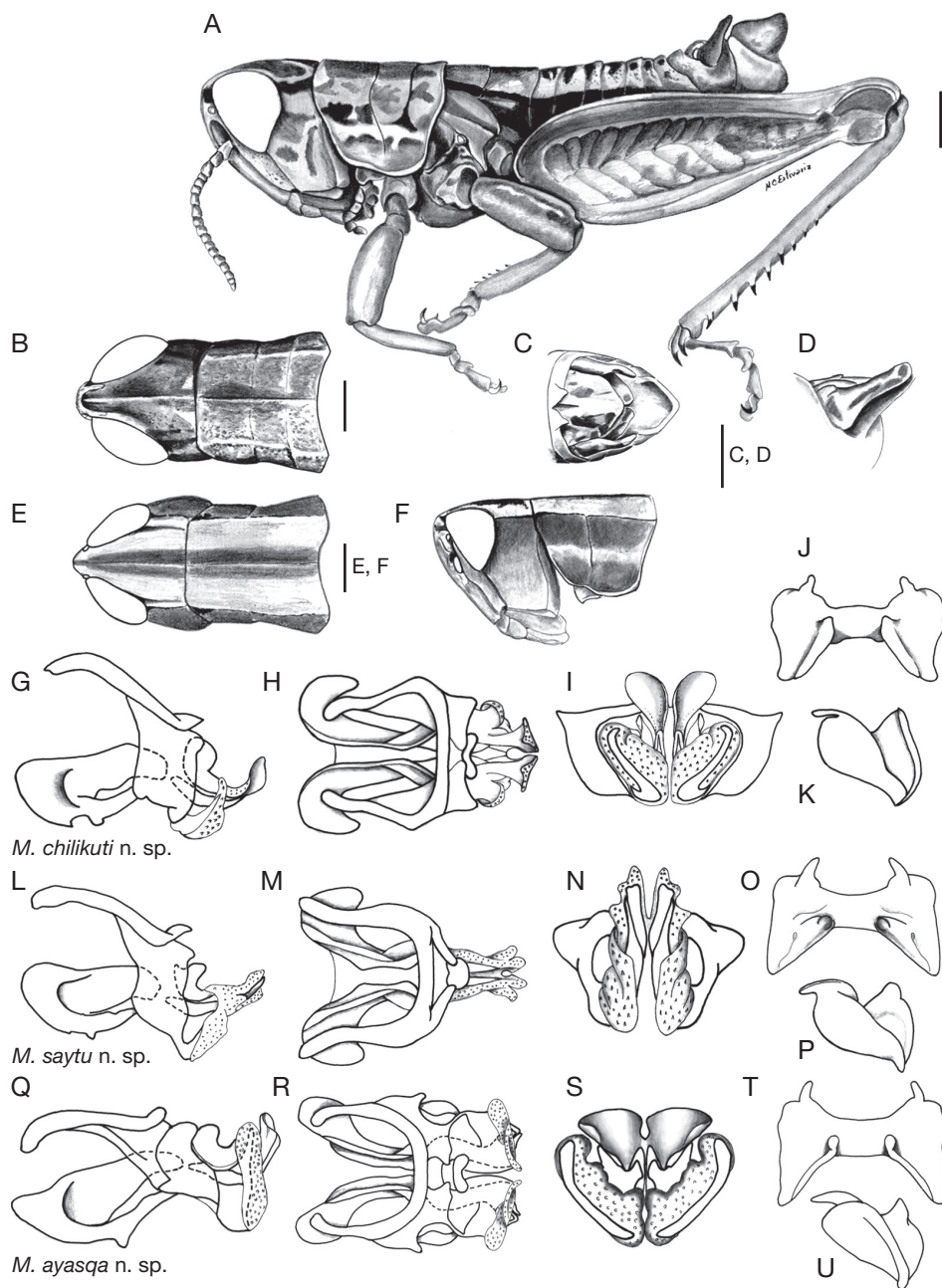


FIG. 2. — **A–K**, *Maeacris chilikuti* n. sp.; **A**, male habitus, lateral view; **B**, male head and pronotum, dorsal view; **C**, **D**, male distal abdominal segments, dorsal and lateral views; **E**, **F**, female head and pronotum, dorsal and lateral views; **G–U**, phallic complex of *Maeacris*, species as indicated; **G**, **L**, **Q**, endophallic plates, cingulum and aedeagal valves with sheath, lateral view; **H**, **M**, **R**, endophallic plates, cingulum and aedeagal valves with sheath, dorsal view; **I**, **N**, **S**, distal portion of aedeagus and aedeagal valves, ventral view; **J**, **K**, **O**, **P**, **T**, **U**, epiphallus, dorsal and lateral view. Scale bars: 1 mm.

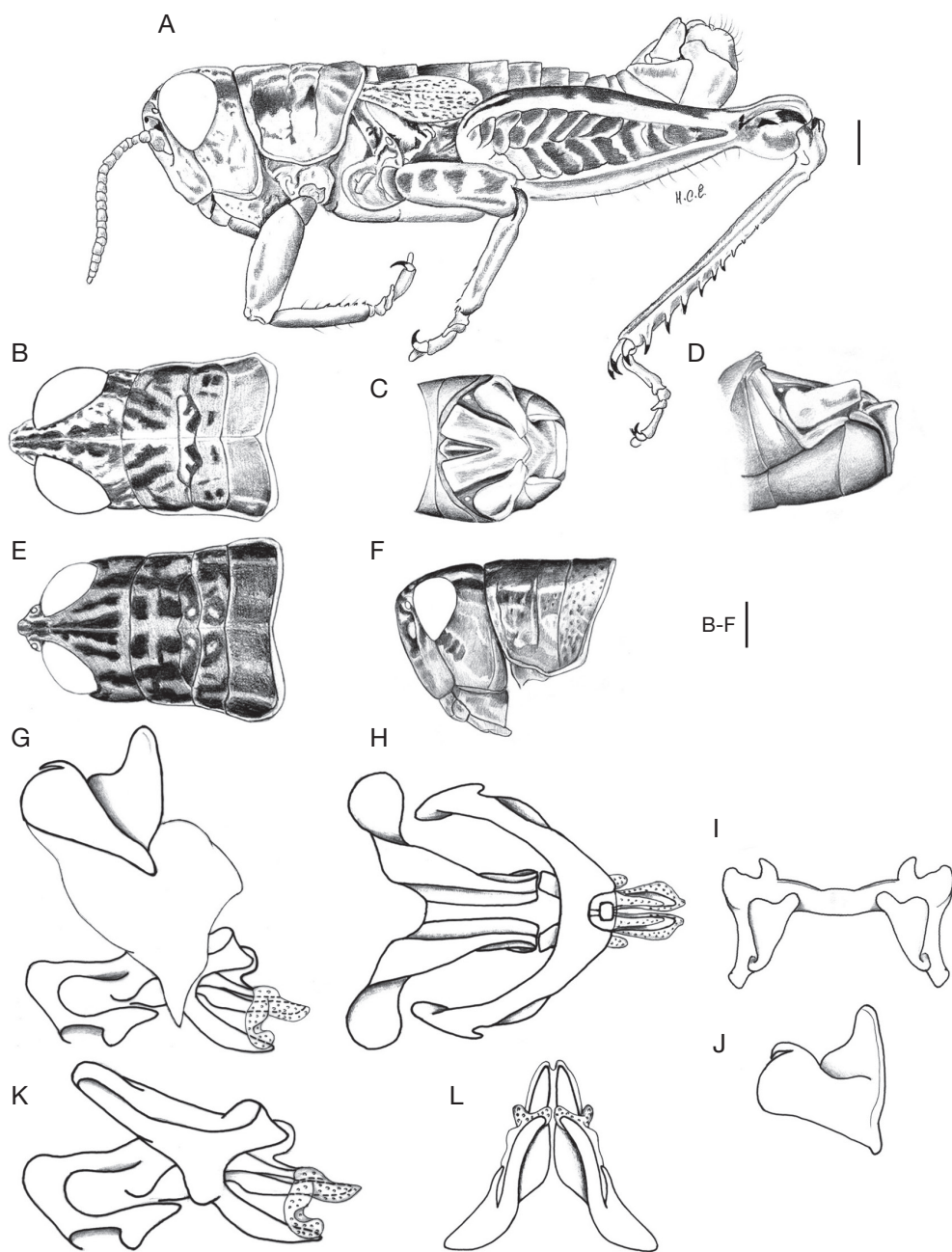


FIG. 3. — *Huaylasacris maxicerci* n. gen., n. sp.: **A**, male habitus, lateral view; **B**, male head and pronotum, dorsal view; **C**, **D**, male distal abdominal segments, dorsal and lateral views; **E**, **F**, female head and pronotum, dorsal and lateral views; **G**, phallic complex, lateral view; **H**, **K**, endophallic plates, cingulum and aedeagal valves with sheath, dorsal and lateral views; **I**, **J**, epiphallus, dorsal and lateral views; **L**, distal portion of aedeagus and aedeagal valves, ventral view. Scale bars: 1 mm.

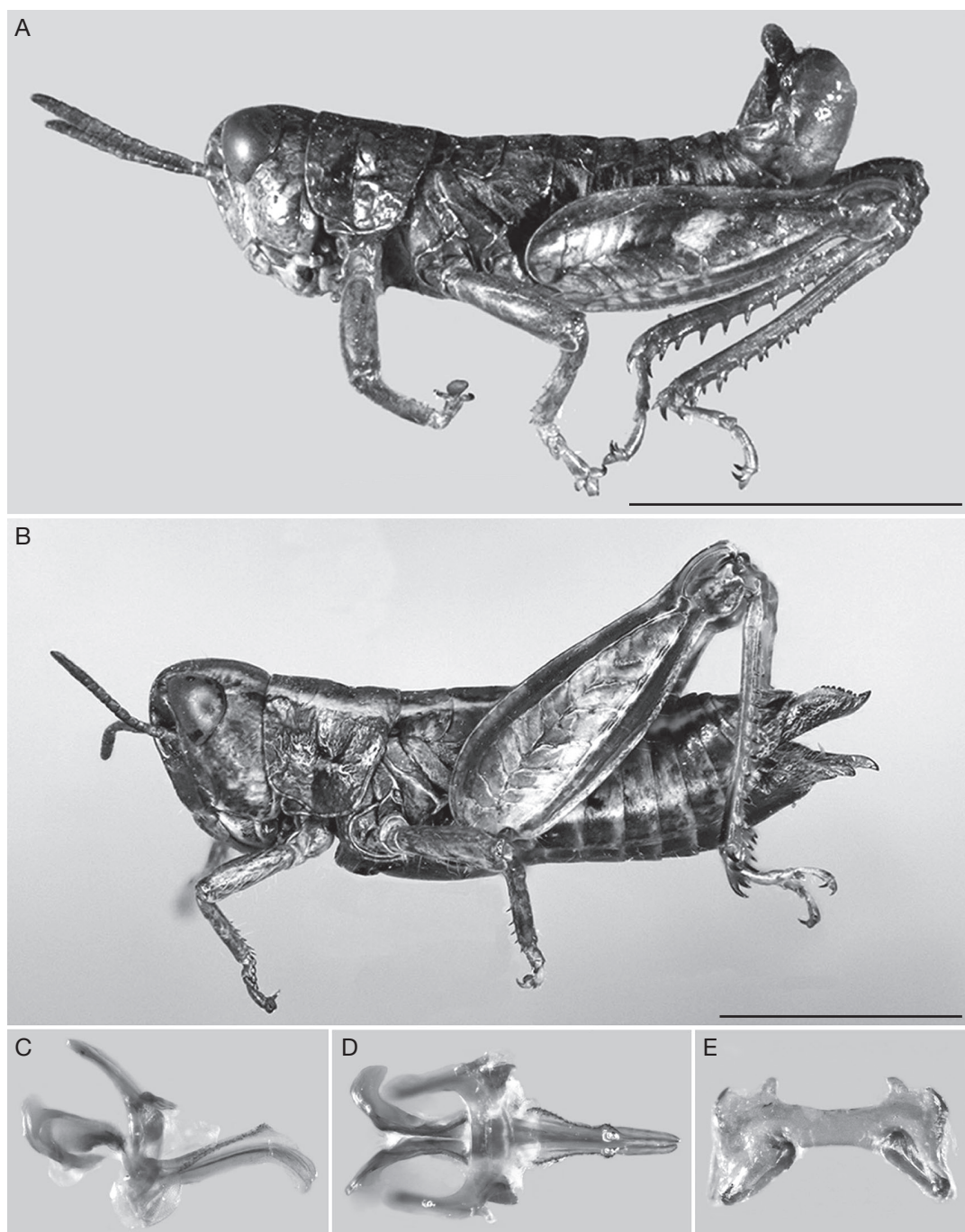


FIG. 4. — *Tiyanityana sunipenis* n. gen., n. sp.: **A**, male habitus, lateral view; **B**, female habitus, lateral view; **C**, **D**, endophallic plates, cingulum and aedeagal valves with sheath, lateral and dorsal views; **E**, epiphallus, dorsal view. Scale bars: 5 mm.

4C-E): cingulum with reduced rami, zygoma and apodemes well developed. Basal endophallic plates barely developed comparatively to the apical plates. Valves of aedeagus very long, protruding beneath the pallium, highly surpassing the level of the epiproct, apex bent downwards; sheath of aedeagus covering $\frac{2}{3}$ of the valves of aedeagus with numerous spines; arch of cingulum large. Epiphallus with lophi widely developed horizontally.

Females

Similar to males, but more robust and with the pronotum constricted at the middle. Tegument with clearly indicated carinulae (Fig. 4B). Head with fastigium more prominent; eyes subtrigonal (Figs 1F; 4B). Ovipositor valves strong and long, with serrate margins (Fig. 1H).

RELATIONSHIPS

Despite the lack of the spur on the prosternum (that may be related to the apterism condition), *Tiyantiyana* n. gen. shares the remaining diagnostic characters of the subfamily Melanoplinae: frons convex, profile of face and fastigium united in the same curve; male abdominal terminalia swollen and upcurved, palium coriaceous; male phallic complex with the middle part of the endophallic sclerites constituted by one dorso-lateral piece; cingulum with arch clearly developed. Based on the morphological evidence it was not possible to assign the genus to any of the three tribes described for the South American Melanoplinae (Amédégnato *et al.* 2003; Carbonell *et al.* 2006): Jivarini Hebard, 1924, Dichroplini Rehn & Randell, 1963 and Parascopini Ronderos, 1983. However, molecular analyses currently underway have shown that *Tiyantiyana* n. gen. is grouped with the remaining Andean melanoplines genera (unpublished observations).

Tiyantiyana sunipenis n. gen., n. sp. (Figs 1; 4; 10)

TYPE MATERIAL. — Peru, Ancash, Pque. Nac. Huascarán, Sector Carpa, 5 km before Nevado Pastoruri, 4660 m, 09°53'00"S, 77°12'04.2"W, 14.V.2004, Cigliano & Lange, holotype ♂ and allotype ♀ (MLPA).

PARATYPES. — Peru, Ancash, 3 km from detour to Chiquián to Conococha, 4226 m, 10°04'53.3"S, 77°12'53.8"W, 1.III.2008, Cigliano & Lange, 2 ♂♂, 2 ♀♀ (MNHN), 3 ♂♂, 8 ♀♀ (MLPA). — Ancash, detour to Chiquián, 4062 m, 10°06'32.1"S, 77°11'08.9"W, 15.V.2004, Cigliano & Lange, 1 ♀ (MLPA). — Ancash, Pque. Nac. Huascarán, Sector Carpa, 5 km before Nevado Pastoruri, 4660 m, 09°53'00"S, 77°12'04.2"W, 14.V.2004, Cigliano & Lange, 2 ♂♂, 4 ♀♀ (MNHN), 6 ♂♂, 20 ♀♀ (MLPA). — Ancash, 8 km from Catac on Road to Chavin, 3786 m, 09°45'23.6"S, 77°23.4'48.5"W, 26.II.2008, Cigliano & Lange, 1 ♂, 1 ♀ (MLPA). — Ancash, Abra Yanashallash on road to La Union, 4644 m, 09°52'00.2"S, 77°04'39.5"W, 15.V.2004, Cigliano & Lange, 1 ♀ (MLPA).

OTHER MATERIAL EXAMINED. — Peru, Ancash, 3 km from detour to Chiquián to Conococha, 4226 m, 10°04'53.3"S, 77°12'53.8"W, 1.III.2008, Cigliano & Lange, 1 ♂, 14 ♀♀, 2 nymphs (MLPA). — Ancash, Callejón de Huaylas, Conococha, 4146 m, 10°07'42.2"S, 77°17'52.7"W, 11.V.2004, Cigliano & Lange, 1 ♀ (MLPA). — Ancash, Pque. Nac. Huascarán, Sector Carpa, 5 km before Nevado Pastoruri, 4660 m, 09°53'00"S, 77°12'04.2"W, 14.V.2004, Cigliano & Lange, 3 ♂♂, 19 ♀♀, 3 nymphs (MLPA). — Ancash, 8 km from Catac on Road to Chavin, 3786 m, 09°45'23.6"S, 77°23.4'48.5"W, 26.II.2008, Cigliano & Lange, 1 ♂, 1 ♀ (MLPA).

TYPE LOCALITY. — Peru, Ancash, Pque. Nac. Huascarán, Sector Carpa, 5 km before Nevado Pastoruri, 4660 m, 09°53'00"S, 77°12'04.2"W.

ETYMOLOGY. — "Suní" means long in Quechua native language referring to the length of the valves of the aedeagus.

DISTRIBUTION. — Peru, Ancash (Fig. 10).

HABITAT. — According to our observations, *Tiyantiyana sunipenis* n. gen., n. sp. inhabits puna grassland areas with bunchgrasses of *Festuca* and *Poa* forming tussocks. Spaces around the tussocks filled by numerous cushion and rosette herbs, including non-tussock-forming grasses and sedges, prostrate or low-growing forbs.

DIAGNOSIS. — Very small species (from 9 mm in the smaller males to 15.5 mm in the largest females), with variable ground coloration mostly in females.

DESCRIPTION

Males

Body dorsally brown-grey, head brown with grey face. Lateral lobes of pronotum green. Hind femur

with dorsal marginal area green, outer face dark brown with two transverse whitish coloured bands; internal face whitish with two transverse dark brown bands; ventral area of hind femur and hind tibiae purple or pinkish. Phallic complex (Figs 1I-M; 4C-E): valves of aedeagus very long, protruding beneath the pallium, highly surpassing the level of the epiproct, apex bent downwards; sheath of aedeagus covering $\frac{2}{3}$ of the valves of aedeagus with numerous spines; arch of cingulum large. Epiphallus with lophi widely developed horizontally and reduced anchorae.

Measurements (in mm): body length to end of hind femur: 10.26 (9-11.5); hind femur length: 5.95 (5.5-6.5).

Females

Similar to males, but more robust and with the pronotum constricted at the middle and with the carinulae on tegument clearly indicated (Fig. 1G). Head with fastigium more prominent; eyes sub-trigonal (Figs 1F; 4B). Ovipositor valves strong and long, with serrate margins (Fig. 1H). Body colour highly variable: ground colour green, brown or dark purple almost black; with two longitudinal cream bands running along the lateral carinae of the pronotum, the meso and metanota and along abdominal tergites, in some specimens limited by dark brown bands on the head. Body ventrally purple. Hind femora with dorsal area homogeneously green or with two dark brown cross bands, internal face and ventral area red-orange or purple. Hind tibiae red-orange or purple.

Measurements (in mm): body length to end of hind femur: 13.67 (12-15.5); hind femur length: 7.99 (7-8.5).

Genus *Pediella* Roberts, 1937

TYPE SPECIES. — *Pediella colorata* Roberts, 1937.

DISTRIBUTION. — Venezuela, Mérida (Roberts 1937). Peru, Ancash, Junín, Cajamarca (Cigliano *et al.* 2010) in high altitude paramos and puna habitat (see [geographic distribution from Perú](#), in OSF).

Pediella ancashensis

Cigliano, Amédégato, Pocco & Lange, 2010
(Fig. 10)

MATERIAL EXAMINED. — Peru. Depto. Ancash, 4 km detour to Chiquián, 4062 m, 10°06'32.1"S, 77°11'08.9"W, 15.V.2004, Cigliano & Lange, [holotype](#) ♂, allotype ♀ (MLPA).

PARATYPES. — Peru. Depto. Ancash, Callejón de Huaylas, Laguna Conococha, 4146 m, 10°07'42.2"S, 77°17'52.7"W, 11.V.2004, Cigliano & Lange, 3 ♂♂, 1 ♀ (MLPA). — Ancash, 4 km detour to Chiquián, 4062 m, 10°06'32.1"S, 77°11'08.9"W, 15.V.2004, Cigliano & Lange, 1 ♂, 1 ♀ (MNHN), 2 ♂♂, 2 ♀♀ (MLPA). — Ancash, Cordillera Huayhuash, 1 km E detour Chiquián, 4305 m, 10°05'33.02"S, 77°10'57.4"W, 15.V.2004, Cigliano & Lange, 1 ♀ (MLPA).

REMARKS

Specimens of the recently described *Pediella ancashensis* (Cigliano *et al.* 2010) were collected during the surveys.

Tribe JIVARINI Hebard, 1924

Genus *Maeacris* Ronderos, 1983

TYPE SPECIES. — *Maeacris aptera* Ronderos, 1983

DISTRIBUTION. — Peru, Junín, Lima (Cerro de Pasco) and Ancash departments in high-altitude puna grassland areas (see [geographic distribution in OSF](#)).

The genus *Maeacris* was described by Ronderos (1983) who included only one species, *M. aptera*, from the "Abra de Anticona", Junín, Peru.

DIAGNOSIS. — Among Jivarini, *Maeacris* is characterized by the hind tibiae with the external apical spine reduced or absent.

REDESCRIPTION

Small sized apterous insects. Head conical with subtrigonal, flat eyes; face slanted; fastigium slightly prominent, weakly grooved dorsally, and rounded at the joint of frontal costa (Figs 2A, B, E, F; 5A, B). Antennae short, with flattened segments. Mid-longitudinal carina indicated on pronotal disk and on dorsum of abdomen. Pronotal disk short, trapezoidal with lateral carinae weakly indicated

all throughout; hind margin emarginated (Figs 2B, E). Transverse sulci only indicated on lateral lobes (Figs 2A, F; 5A, B). Prosternum with lamelliform process. Hind femur robust (Figs 2A; 5A, B). Apical external spine of hind tibiae when present extremely reduced. Male subgenital plate short, with blunt apex, open dorsally (Fig. 2A, C). Epiproct with triangular apex, with mid longitudinal sulcus. Furculae prominent (Fig. 2C). Male cerci tapering towards the compressed distal portion; apex rounded (Fig. 2D). Phallic complex (Figs 2G-U; 6): ectophallic membrane with plastron; cingulum with large zygoma, apodemes with the tips down-curved, rami short, arch well developed; valves of aedeagus upcurved, with triangular sclerotized apex in ventral view or straight; sheath of aedeagus wide, bilobed. Epiphallus with lophi widely developed, obliquely placed in relation to the bridge; ancorae fingerlike.

Maeacris chilikuti n. sp.

(Figs 2A-K; 5A, B; 6A-C; 10)

TYPE MATERIAL. — **Peru.** Ancash, 8 km from Catac to Chavin, 3786 m, 09°45'23.6"S, 77°23.4'48.5"W, 26.II.2008, Cigliano & Lange, **holotype** ♂, **allotype** ♀ (MLPA).

PARATYPES. — **Peru.** Ancash, Callejón de Huaylas, 65 km S Huaraz, Puente Ucushaca, 3933 m, 09°59'0.2"S, 77°20'33.9"W, 23.II.2008, Cigliano & Lange, 1 ♀ (MLPA). — Ancash, 2 km from Catac to Chavin, 3571 m, 09°46'49.5"S, 77°25'08.8"W, 26.II.2008, Cigliano & Lange, 3 ♂♂, 1 ♀ (MLPA). — Ancash, 5 km from Conococha on road to Barranca, 3928 m, 10°09'10.6"S, 77°19'05.4"W, 1.III.2008, Cigliano & Lange, 3 ♂♂, 2 ♀♀ (MNHN), 10 ♂♂, 2 ♀♀ (MLPA). — Ancash, Pque. Nac. Huascarán, Laguna Querococha on road to Chavin, 4168 m, 09°43'06.3"S, 77°18'55.2"W, 15.V.2004, Cigliano & Lange, 1 ♂ (MLPA). — Ancash, 8 km from Catac on road to Chavin, 3786 m, 09°45'23.6"S, 77°23.4'48.5"W, 26.II.2008, Cigliano & Lange, 2 ♂♂, 1 ♀ (MLPA). — Ancash, 17 km S Paso Abra Yanashallash on road to La Union, 09°56'41.6"S, 77°05'28.2"W, 15.V.2004, Cigliano & Lange, 1 ♂, 1 ♀ (MLPA). — Ancash, Pque. Nac. Huascarán, Sector Carpa, 5 km before Nevado Pastoruri, 4660 m, 09°53'00"S, 77°12'04.2"W, 14.V.2004, Cigliano & Lange, 1 ♂, 10 ♀♀ (MLPA), 1 ♂, 3 ♀♀ (MNHN).

OTHER MATERIAL EXAMINED. — **Peru.** Ancash, 8 km from Catac on road to Chavin, 3786 m, 09°45'23.6"S, 77°23.4'48.5"W, 26.II.2008, Cigliano & Lange, 5 ♂♂, 10 ♀♀, 5 nymphs (MLPA). — Ancash, 2 km from Catac to Chavin, 3571 m, 09°46'49.5"S, 77°25'08.8"W, 26.II.2008, Cigliano & Lange, 1 ♂, 6 ♀♀ (MLPA). — Ancash, Pque. Nac. Huascarán, Sector Carpa, 5 km before Nevado Pastoruri, 4660 m, 09°53'00"S, 77°12'04.2"W, 14.V.2004, Cigliano & Lange, 1 ♂, 1 ♀, 1 nymph (MLPA). — Ancash, 17 km S Paso Abra Yanashallash on road to La Union, 09°56'41.6"S, 77°05'28.2"W, 15.V.2004, Cigliano & Lange, 1 ♂, 4 ♀♀ (MLPA). — Ancash, 5 km from Conococha on road to Barranca, 3928 m, 10°09'10.6"S, 77°19'05.4"W, 1.III.2008, Cigliano & Lange, 14 ♂♂, 4 ♀♀ (MLPA). — Ancash, Pque. Nac. Huascarán, Laguna Querococha on road to Chavin, 4168 m, 09°43'06.3"S, 77°18'55.2"W, 15.V.2004, Cigliano & Lange, 2 ♂♂, 8 ♀♀ (MLPA). — Ancash, Callejón de Huaylas, 65 km S Huaraz, Puente Ucushaca, 3933 m, 09°59'0.2"S, 77°20'33.9"W, 23.II.2008, Cigliano & Lange, 2 ♀♀ (MLPA). — Ancash, 4 km E detour to Chiquian, 4062 m, 10°06'32.1"S, 77°11'08.9"W, 1.III.2008, Cigliano & Lange, 1 ♀, 8 nymphs (MLPA). — Ancash, 1 km after Paso Tunel Kawish on road to Chavin from Catac, 4315 m, 09°41'24.2"S, 77°14'39.8"W, 26.II.2008, Cigliano & Lange, 2 ♀♀ (MLPA). — Ancash, Parque Nacional Huascarán, Laguna Querococha, 4045 m, 09°43'44.0"S, 77°19'53.9"W, 26.II.2008, Cigliano & Lange, 1 ♀ (MLPA). — Ancash, Pque. Nac. Huascarán, to Chavin from Catac, Paso Puente Tunel Kawish, 4455 m, 09°41'23.0"S, 77°15'23.5"W, 26.II.2008, Cigliano & Lange, 1 nymph (MLPA).

TYPE LOCALITY. — Peru, Ancash, 8 km from Catac to Chavin, 3786 m, 09°45'23.6"S 77°23.4'48.5"W.

ETYMOLOGY. — "Ch'ilikuti" means small in native Quechua language and it refers to the smaller size of this species compared to *Maeacris aptera*.

DISTRIBUTION. — Peru, Ancash (Fig. 10).

HABITAT. — In puna grassland areas with bunchgrasses of *Festuca* and *Poa* forming tussocks. Spaces around the tussocks filled by numerous cushion and rosette herbs, including non-tussock-forming grasses and sedges, prostrate or low-growing forbs.

DIAGNOSIS. — *Maeacris chilikuti* n. sp. is distinguished from the type species based on characters of the phallic complex (Fig. 2G-K) and the following characters of the external morphology: smaller size (*M. aptera*: males: 13-14.3 mm; females: 15,5-17mm); fastigium more prominent; pronotum not constricted at the middle; male epiproct wider than long; external apical spine absent; ovipositor without pre-apical tooth.

DESCRIPTION

Males

In addition to the features of the genus, body ground colour variable; both sexes show green-brown variation, with some specimens being mainly greenish on top of the body and others brownish. Body with two longitudinal light coloured bands (cream in green morphs; grey-brownish in brown morphs) extending from the fastigium along the body dorsally. Pronotal lobes with dark green or dark brown post-ocular band, limited by a longitudinal cream stripe. Hind femur with dorsal area brownish (brown morphs) or greenish (green morphs), outer face brown, ventral area cream or yellowish, inner face brownish at upper half and cream at bottom half; hind tibiae light green to cream. Venter of abdomen cream. In some females, the ventral area of hind femur and hind tibia is reddish. Hind tibia without external apical spine. Male epiproct triangular and wider than long, with a pair of distal tubercles (Fig. 2C). Phallic complex (Figs 2G-K; 6A-C): cingulum widely developed dorsally; arch of cingulum bilobed; valves of aedeagus up curved, obliquely truncated in dorsal view, concave in ventral view; sheath of aedeagus with median deep excision and with a pair of basal lobes.

Measurements (in mm): body length to apex of hind femur: 11.93 (10.5-13); hind femur length: 6.59 (5.5-7).

Females

Similar to males (Fig. 2E, F), but larger; head with fastigium more prominent; eyes subtrigonal and ovipositor valves long, slender, without pre-apical tooth.

Measurements (in mm): body length to apex of hind femur: 13.91 (12-16.5) female; hind femur length: 8.40 (7.5-9.5).

Maeacris saytu n. sp.

(Figs 2L-P; 6D-F; 10)

TYPE MATERIAL. — **Peru.** Ancash, 17 km N Conococha, 3947 m, 09°59'48.0"S, 77°20'11.8"W, 29.II.2008, Cigliano & Lange, **holotype** ♂, allotype ♀ (MLPA).

PARATYPES. — **Peru.** Ancash, 17 km north of Conococha, 3947 m, 09°59'48.0"S, 77°20'11.8"W, 29.II.2008,

Cigliano & Lange, 2 ♂♂, 1 ♀ (MNHN), 3 ♂♂, 2 ♀♀ (MLPA). — Ancash, Pque. Nac. Huascarán, Laguna Querococha, 4168 m, 09°43'06.3"S, 77°18'55.2"W, 15.V.2004, Cigliano & Lange, 1 ♂ (MLPA). — Ancash, Pque. Nac. Huascarán, Sector Carpa, 5 km before Nevado Pastoruri, 4660 m, 09°53'00"S, 77°12'04.2"W, 14.V.2004, Cigliano & Lange, 1 ♂ (MLPA).

TYPE LOCALITY. — Peru, Ancash, 17 km N Conococha, 3947 m, 09°59'48.0"S 77°20'11.8"W.

ETYMOLOGY. — "Sayt'u" means long, slender, rectangular shape in native Quechua language, and it refers to the shape of the valves of the aedeagus.

DISTRIBUTION AND HABITAT. — Same as described for *Maeacris chilikuti* n. sp. (Fig. 10).

DIAGNOSIS. — Similar to *Maeacris chilikuti* n. sp. from which it is distinguished by characters of the phallic complex (Figs 2L-P; 6D-F).

DESCRIPTION

Males

Similar to those of *Maeacris chilikuti* n. sp. from which they can only be distinguished by the following characters of the phallic complex: aedeagal valves straight in lateral view (Fig. 2L), with blunt apex (Fig. 2N); arch of cingulum entire (Fig. 2M); sheath of aedeagus with longitudinal median excision without basal lobes.

Measurements (in mm): body length to apex of hind femur 10.75 (10-11); hind femur length: 5.8 (5.5-6).

Females

Similar to males but with fastigium more prominent; eyes subtrigonal; ovipositor valves long, slender, without pre-apical tooth.

Measurements (in mm): body length to apex of hind femur: 13.5 (13-14); hind femur length: 7.25 (7-7.5).

Maeacris ayasqa n. sp.

(Figs 2Q-U; 6G-I; 10)

TYPE MATERIAL. — **Peru.** Ancash, 3 km from detour to Chiquian on road to Conococha, 4226 m, 10°04'53.3"S 77°12'53.8"W, 1.III.2008, Cigliano & Lange, **holotype** ♂, allotype ♀ (MLPA).

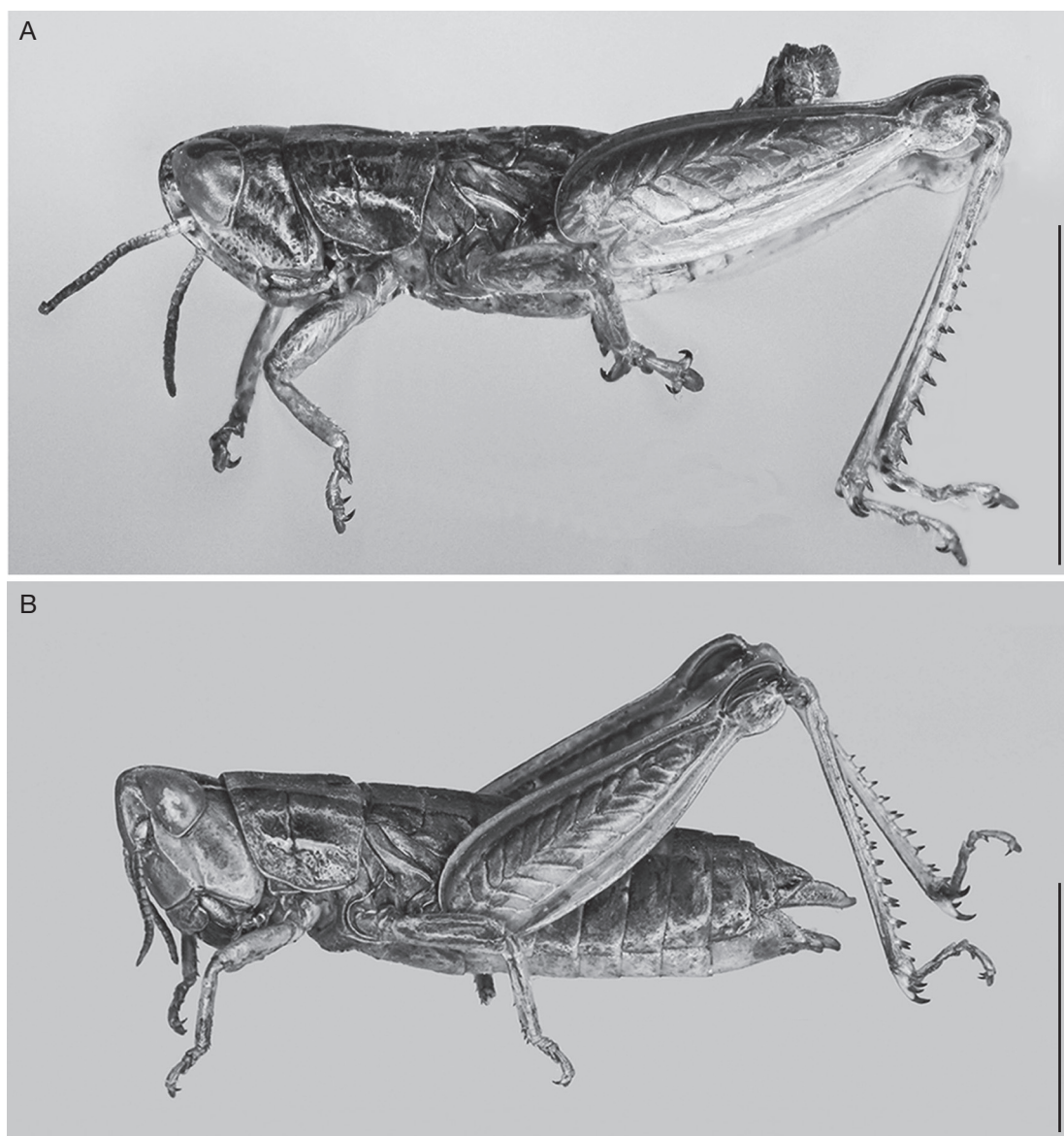


FIG. 5. — *Maeacris chilikuti* n. sp.: **A**, male habitus, lateral view; **B**, female habitus, lateral view. Scale bars: 5 mm.

PARATYPES. — Ancash, 3 km from detour to Chiquian on road to Conococha, 4226 m, 10°04'53.3"S 77°12'53.8"W, 1.III.2008, Cigliano & Lange, 2 ♂♂, 4 ♀♀ (MNHN), 3 ♂♂, 4 ♀♀ (MLPA).

OTHER MATERIAL EXAMINED. — **Peru**. Ancash, 3 km from detour to Chiquian on road to Conococha, 4226 m,

10°04'53.3"S 77°12'53.8"W, 1.III.2008, Cigliano & Lange, 9 ♀♀ (MLPA).

ETYMOLOGY. — "Ayasqa" means ear-shaped in native Quechua language and it refers to the shape of the valves of the aedeagus.

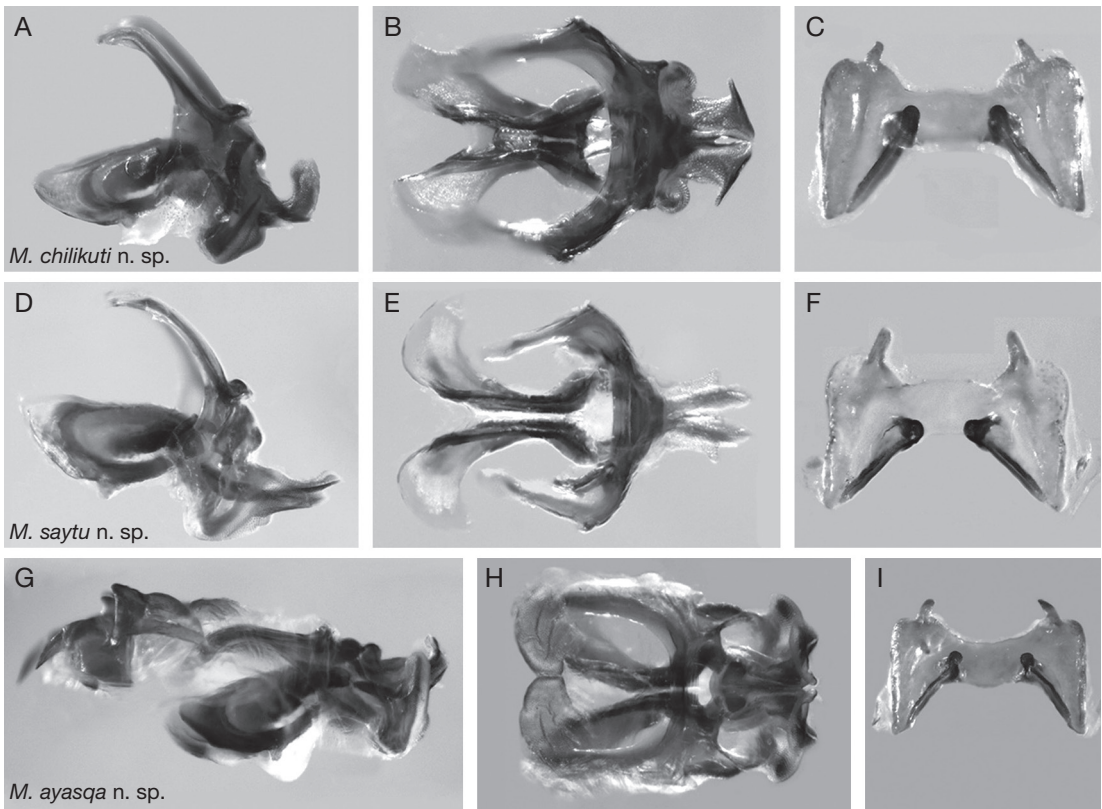


FIG. 6. — Phallic complex of *Maeacris*, species as indicated: **A, D**, endophallic plates, cingulum and aedeagal valves with sheath, lateral view; **B, E**, endophallic plates, cingulum and aedeagal valves with sheath, dorsal view; **G, H**, phallic complex, lateral and dorsal views; **C, F, I**, epiphallus, dorsal view.

DISTRIBUTION AND HABITAT. — Same as described for *Maeacris chilikuti* n. sp. (Fig. 10).

DIAGNOSIS. — Similar to *M. chilikuti* n. sp. from which it can only be distinguished by characters of the phallic complex (Figs 2Q–U; 6G–I).

DESCRIPTION

Males

Similar to those of *M. chilikuti* n. sp. from which they are distinguished by the following characters of the phallic complex: aedeagal valves upcurved (Fig. 2Q), diverging caudally, strongly convex in ventral view (Fig. 2S); arch of cingulum bilobed (Fig. 2R).

Measurements (in mm): body length to apex of hind femur: 11.51 (11.3–12), hind femur length: 5.86 (5–6.5).

Females

Similar to males but with fastigium more prominent; eyes subtrigonal; ovipositor valves long, slender, without pre-apical tooth.

Measurements (in mm): body length: 12.75 (12–14); hind femur length: 7.26 (7–8).

Tribe DICHROPLINI

Rehn J. A. G. & Randell, 1963

Genus *Huaylasacris* n. gen.

TYPE SPECIES. — *Huaylasacris maxicerci* n. gen., n. sp.

ETYMOLOGY. — *Huaylasacris* n. gen. referring to the Callejón de Huaylas; *akris* (Greek): locust, grasshoppers.

DISTRIBUTION. — Peru, Ancash (see [geographic distribution in OSF](#)).

DIAGNOSIS. — Easily identified from any other genera of Dichroplini by the unique shape of the male cerci widely developed, embracing the paraprocts (Fig. 3C, D) and the large lophi of the epiphallus (Figs 3I; 7E).

DESCRIPTION

Males

Small sized brachypterous insects. Head sub-globose, with fastigium slightly declivent with lateral carinae evident; face subvertical. Antennae filiform; eyes sub-circular (Figs 3A; 7A). Prosternum with wide triangular process (spur throated). Pronotum short, without lateral carinae; transverse sulci indicated on disk; mid-longitudinal carina not indicated on pronotum; hind margin emarginated (Fig. 3B, E). Tegmina lobiform, with rounded apex, barely reaching the third abdominal segment. Legs with femora robust, specially the hind one (Fig. 3A). Subgenital plate (Fig. 3C, D) very short, with dorsal margin openly rounded; pallium thick with internal lobes reduced. Epiproct triangular with rounded apex, with deep mid-longitudinal sulcus on proximal area. Furculae very short (Fig. 3C). Cerci widely developed, embracing the paraprocts, apex blunt, with a notch (Fig. 3C, D). Phallic complex (Figs 3G-L; 7C-E) with epiphallus large, highly developed lophi, bridge narrow. Cingulum capsule like with long rami, wide apodemes and widely developed zygoma. Valves of aedeagus short and straight, arch of cingulum developed; sheath of aedeagus bilobed.

Females

Similar to males with pronotum constricted at the middle (Fig. 3E); eyes subtrigonal (Fig. 3F); ovipositor valves short and robust with acute apex (Fig. 7B).

RELATIONSHIPS

Based on the characteristics of the external morphology and phallic complex, *Huaylasacris* n. gen. seems to be related to the Dichroplini genus *Chibchacris* Hebard, 1923 from which it is distinguished by the shape of the tegmina not touching each other dorsally, the pronotum with hind margin emarginate, male cerci embracing the paraprocts and differences in the phallic complex.

Huaylasacris maxicerci n. gen., n. sp. (Figs 3A-L; 7; 10)

TYPE MATERIAL. — **Peru.** Ancash, Callejón de Huaylas, Yungay, road to Pque. Nac. Huascarán, 17 km W Lagunas Llanganuco, 3379 m, 09°06'26.0"S, 77°41'16.2"W, 12.V.2004, Cigliano & Lange, **holotype** ♂, **allotype** ♀, MLPA.

PARATYPES. — **Peru.** Ancash, Cordillera Huayhuash, 1 km E detour Chiquian, 4305 m, 10°05'33.0"S, 77°10'57.4"W, 15.V.2004, Cigliano & Lange, 3 ♂♂, 3 ♀♀ (MNHN), 10 ♂♂, 15 ♀♀ (MLPA). — Ancash, Pque. Nac. Huascarán, Laguna Querococha on road to Chavin, 4168 m, 09°43'06.3"S, 77°18'55.2"W, 15.V.2004, Cigliano & Lange, 1 ♂ (MLPA). — Ancash, Callejón de Huaylas, Yungay, on road to Pque. Nac. Huascarán, 17 km W Lagunas Llanganuco, 3379 m, 09°06'26.0"S, 77°41'16.2"W, 12.V.2004, Cigliano & Lange, 2 ♂♂, 2 ♀♀ (MNHN), 6 ♂♂, 10 ♀♀ (MLPA). — Ancash, Callejón de Huaylas, Conococha, 4146 m, 10°07'42.2"S, 77°17'52.7"W, 11.V.2004, Cigliano & Lange, 1 ♂, 1 ♀ (MLPA). — Ancash, Callejón de Huaylas, 7 km S Huaraz, 3182 m, 09°36'17.5"S, 77°30'33.8"W, 23.II.2008, Cigliano & Lange, 1 ♂ (MLPA). — Ancash, 4 km detour to Chiquian, 4062 m, 10°06'32.1"S, 77°11'08.9"W, 15.V.2004, Cigliano & Lange, 2 ♂♂, 2 ♀♀ (MNHN), 8 ♂♂, 2 ♀♀ (MLPA).

OTHER MATERIAL EXAMINED. — **Peru.** Ancash, Callejón de Huaylas, 7 km S Huaraz, 3182 m, 09°36'17.5"S, 77°30'33.8"W, 23.II.2008, Cigliano & Lange, 15 ♂♂, 16 nymphs (MLPA). — Ancash, 4 km detour to Chiquian, 4062 m, 10°06'32.1"S, 77°11'08.9"W, 15.V.2004, Cigliano & Lange, 2 ♂♂, 4 ♀♀ (MLPA). — Ancash, Cordillera Huayhuash, 1 km E detour Chiquian, 4305 m, 10°05'33.0"S, 77°10'57.4"W, 15.V.2004, Cigliano & Lange, 4 ♂♂, 3 ♀♀ (MLPA). — Ancash, Callejón de Huaylas, Conococha, 4146 m, 10°07'42.2"S, 77°17'52.7"W, 11.V.2004, Cigliano & Lange, 11 ♂♂, 8 ♀♀ (MLPA). — Ancash, Callejón de Huaylas, Yungay, on road to Pque. Nac. Huascarán, 17 km W Lagunas Llanganuco, 3379 m, 09°06'26.0"S, 77°41'16.2"W, 12.V.2004, Cigliano & Lange, 1 ♂, 4 ♀♀ (MLPA). — Ancash, Pque. Nac. Huascarán, Laguna Querococha on road to Chavin, 4168 m, 09°43'06.3"S, 77°18'55.2"W, 15.V.2004, Cigliano & Lange, 6 ♂♂, 4 ♀♀ (MLPA).

TYPE LOCALITY. — **Peru.** Ancash, Callejón de Huaylas, Yungay, road to Pque. Nac. Huascarán, 17 km W Lagunas Llanganuco, 3379 m, 09°06'26.0"S 77°41'16.2"W.

ETYMOLOGY. — "Maximus" (Greek), greatest; referring to the large size of the male cercus.

DISTRIBUTION. — Peru, Ancash (Fig. 10).

HABITAT. — In puna grassland areas with a resilient mat of high grass and tussock species of *Festuca*, *Calamagrostis* and *Stipa* with occasional islands of scrubby elfin woodland of *Polylepis* (queñua) and along the grassland valleys in areas with traditional subsistence farming.

DIAGNOSIS. — Male cerci widely developed, embracing the paraprocts, apex blunt, with a notch (Fig. 3C,D). Phallic complex with epiphallus large with highly developed lophi (Fig. 3I, J).

DESCRIPTION

Males

In addition to the features of the genus, body ground colour green, chestnut or burgundy with a wide cream mid-longitudinal dorsal stripe on the abdomen, on some specimens this stripe continues on the pronotum. Tegmina with mid-dorsal portion cream. Hind femur with the dorsal marginal area cream, ventral marginal area yellow. Venter of abdomen yellow or burgundy or bright orange. Hind tibiae orange or purple.

Measurements (in mm): body length to end of hind femur: 12.5 (11.5–13.5); hind femur length: 7.41 (6.8–8).

Females

Similar to males (Figs 3E, F; 7B), body ground colour mostly chestnut or burgundy with a whitish stripe on dorsum of body occurring as in males. Pronotum constricted at the middle; eyes sub-trigonal; ovipositor valves short and robust with acute apex.

Measurements (in mm): body length to end of hind femur: 16.01 (15–18); hind femur length: 10 (8.7–11.5).

Subfamily GOMPHOCERINAE Fieber, 1853

Tribe ORPHULELLINI Otte, 1979

Genus *Orphulella* Giglio-Tos, 1894

TYPE SPECIES. — *Orphulella gracilis* Giglio-Tos, 1894.

DISTRIBUTION. — The genus *Orphulella* is distributed from Canada to Argentina, with four species known to occur in the Peruvian Andes, *O. losamattensis* Caudell, 1909, *O. punctata* (De Geer, 1773), *O. concinnula* (Walker, 1870) and *O. fluvialis* Otte, 1979 (see [geographic distribution in OSF](#)).

Orphulella chumpi n. sp.

(Figs 8; 10)

TYPE MATERIAL. — **Peru.** Ancash, 19 km S from Conococha on road to Barranca, 3275 m, 10°08'59.1"S, 77°21'42.8"W, 22.II–02.III.2008, Cigliano & Lange, [holotype](#) ♂ (MLPA). — Ancash, Callejón de Huaylas, 7 km S from Huaraz, 3182 m, 09°36'17.5"S, 77°30'33.8"W, 23.II.2008, Cigliano & Lange, [allotype](#) ♀ (MLPA).

PARATYPES. — Ancash, Callejón de Huaylas, 7 km S of Huaraz, 3182 m, 09°36'17.5"S 77°30'33.8"W, 23.II.2008, Cigliano & Lange, 1 ♀ (MLPA); 1 ♀ (MNHN).

ETYMOLOGY. — “Chumpi” means brown in native Quechua language and it refers to the general body colour.

DISTRIBUTION. — Peru, Ancash (Fig. 10).

HABITAT. — As with most species of the genus, *Orphulella chumpi* n. sp. is found in grassy areas in the valley of “Callejón de Huaylas”.

DIAGNOSIS. — Similar to *Orphulella fluvialis*, from which it differs mainly in the following features: hind femora with stridulatory pegs (without stridulatory pegs in *O. fluvialis*), lateral carinae of pronotal disk distinct in central part (usually indistinct in *O. fluvialis*) and cut by one sulcus (cut by two or three sulci in *O. fluvialis*); posterior margin of pronotum slightly angulate (rounded in *O. fluvialis*).

DESCRIPTION

Males

Body colour light brown on top, brown-gray on sides and brown ventrally. Hind femora with few dark markings on the outer faces. Hind knees dark brown. Hind tibia brown. Lateral foveolae of the fastigium barely visible from above. Antennae short and slightly ensiform, light brown proximally and dark brown distally. Pronotum with a black band on lateral lobes, just beneath the lateral carinae (Fig. 8A). Posterior margin of pronotal disk angulate, slightly rounded. Mid-longitudinal carina on pronotum prominent and cream colour; lateral carinae distinct throughout their length, nearly parallel on the prozona, constricted in center, diverging on the metazona and cut by one transverse sulcus (Fig. 8C). Hind femora in males with stridulatory pegs. Wing length barely reaching the end of the abdomen (Fig. 8A). Like other gomphocerines, species in the genus *Orphulella* do not show diagnostic characters in the phallic complex (Fig. 8E, F).

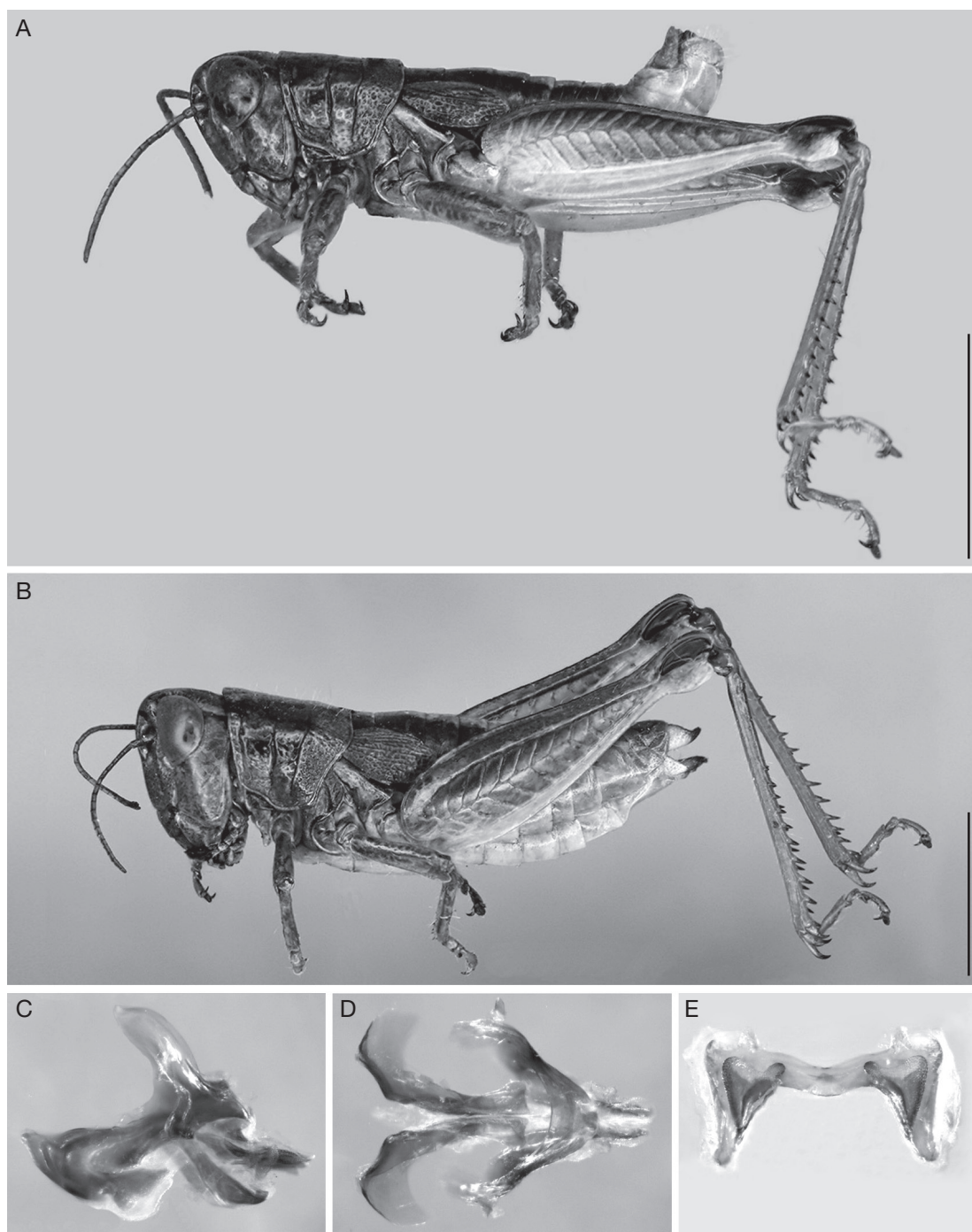


FIG. 7. — *Huaylasacris maxicerci* n. gen, n. sp.: **A**, male habitus, lateral view; **B**, female habitus, lateral view; **C**, **D**, endophallic plates, cingulum and aedeagal valves with sheath, lateral and dorsal views; **E**, epiphallus, dorsal view. Scale bars: 5 mm.

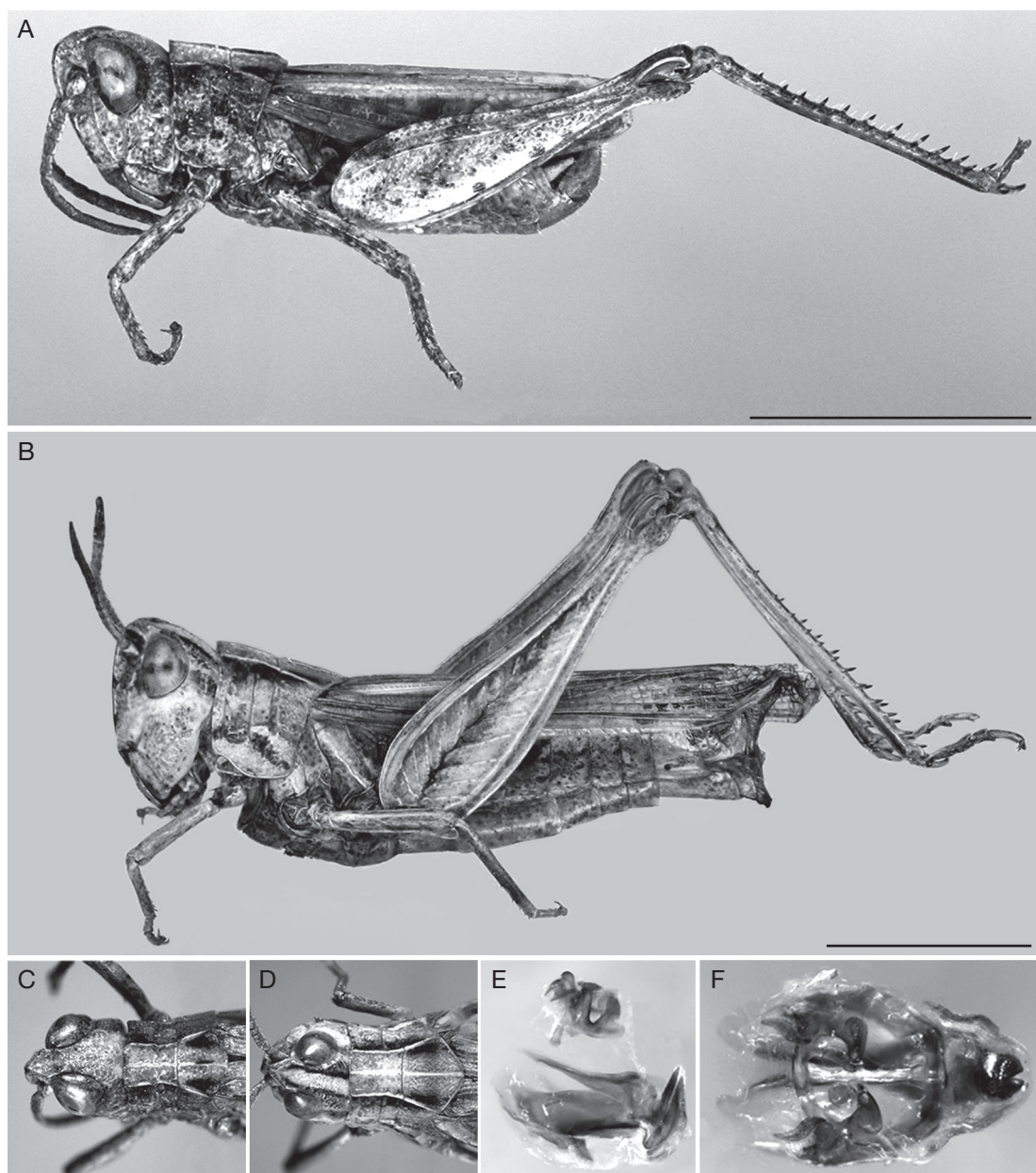


FIG. 8. — *Orphulella chumpi* n. sp.: **A**, male habitus, lateral view; **B**, female habitus, lateral view; **C**, male head and pronotum, dorsal view; **D**, female head and pronotum, dorsal view; **E**, **F**, phallic complex, lateral and dorsal views. Scale bars: 5 mm.

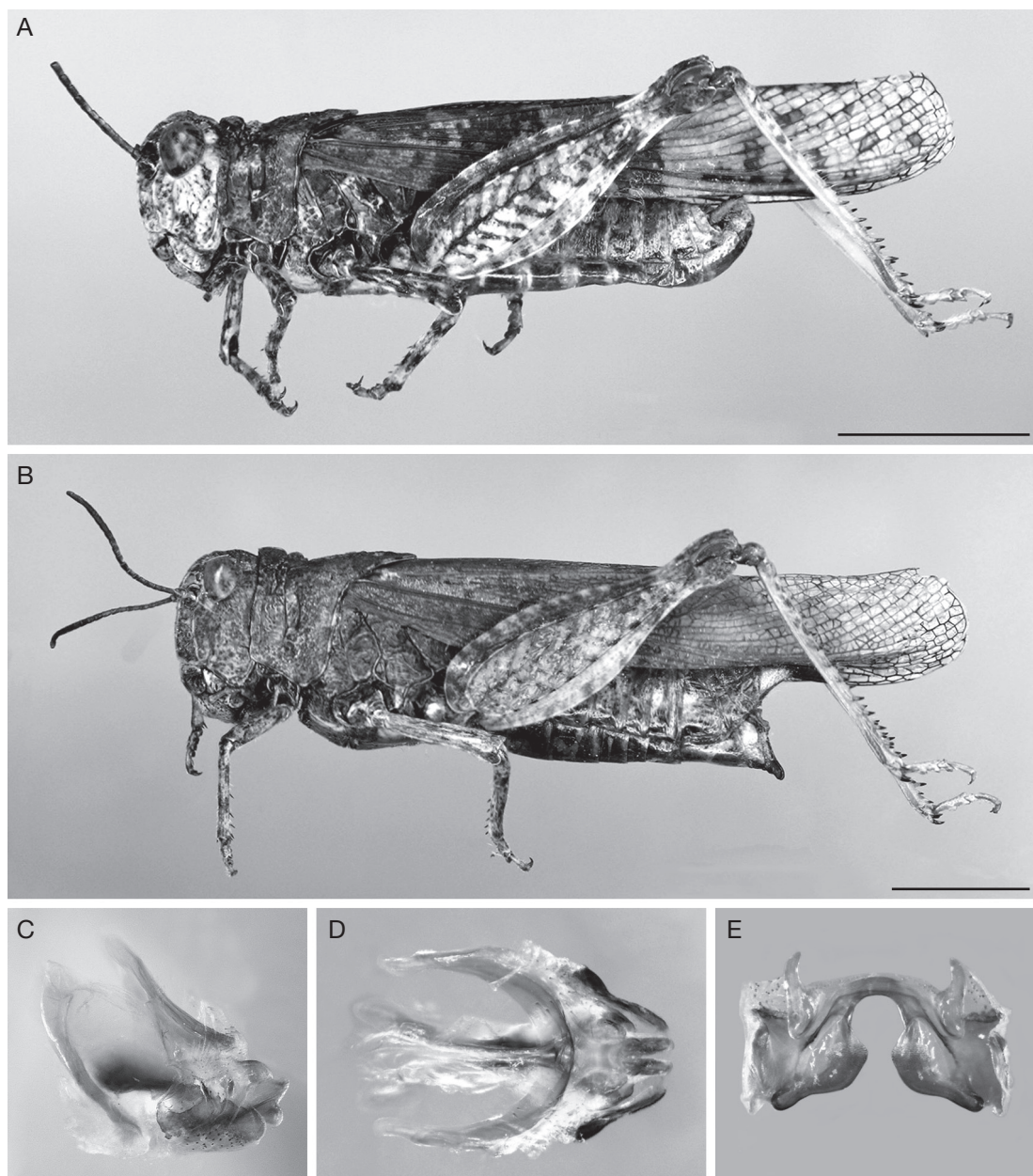


FIG. 9. — *Trimerotropis andeana* Rehn, 1939: **A**, male habitus, lateral view; **B**, female habitus, lateral view; **C**, **D**, endophallic plates, cingulum and aedeagal valves, lateral and dorsal views; **E**, epiphallus, dorsal view. Scale bars: 5 mm.

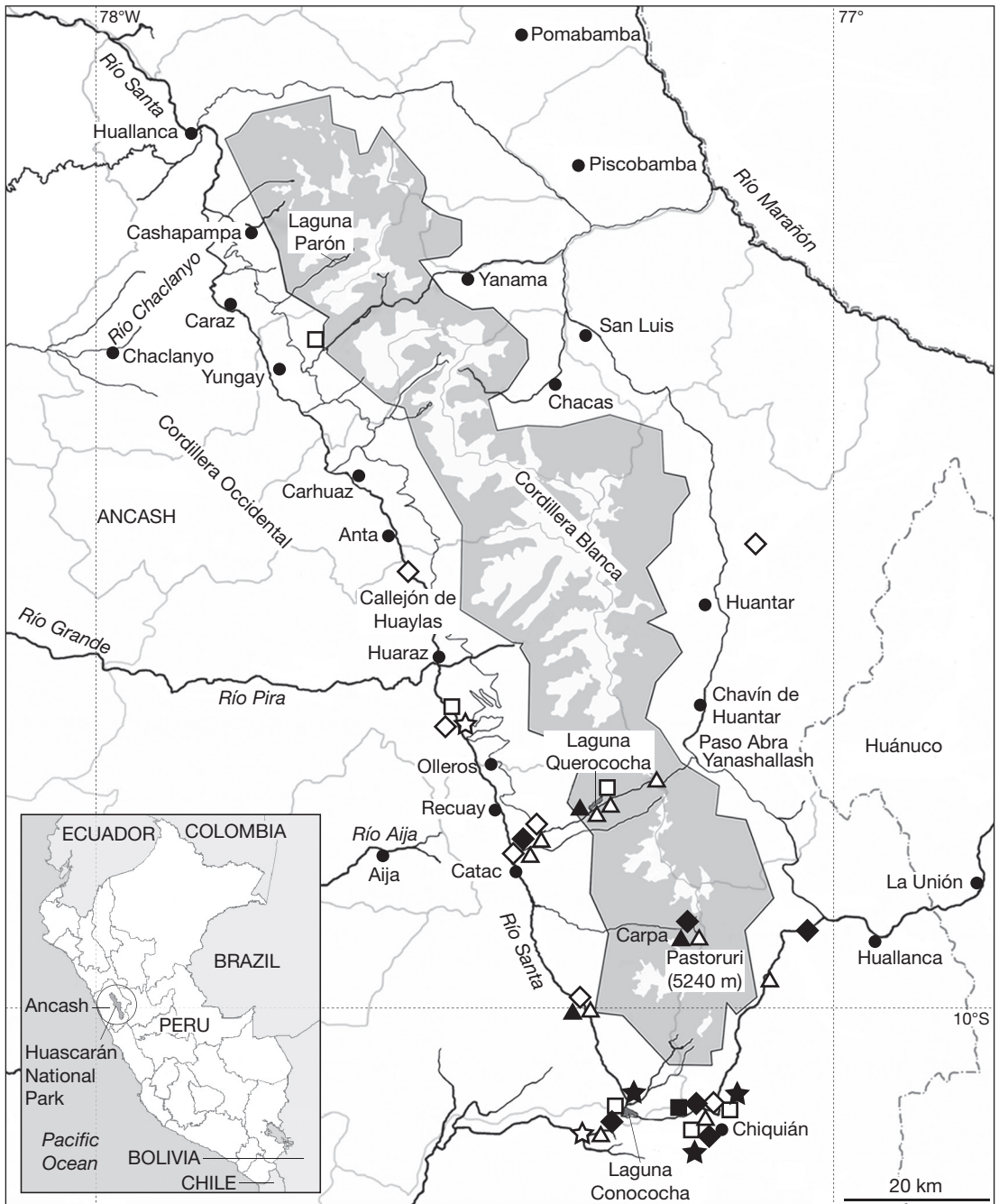


FIG. 10. — Geographic distribution of species collected in this study: *Huaylasacris maxicerci* n. gen., n. sp. (□); *Maeacris ayasqa* n. sp. (■); *M. chilikuti* n. sp. (△); *M. saytu* n. sp. (▲); *Orphulella chumpi* n. sp. (☆); *Pediella ancashensis* Cigliano, Amédégno, Pocco & Lange, 2010 (★); *Trimerotropis andeana* Rehn, 1939 (◇); *Tiyantiyana sunipenis* n. gen., n. sp. (◆).

Measurements (in mm): body length to end of hind femur: 11; hind femur length: 6.8.

Females (Fig. 8B, D)

Similar to males, with body dorsally light brown or pale green and brown on sides. One female with sides of body and abdomen somewhat dark mottled and with two black stripes on top of head.

Measurements (in mm): body length to end of hind femur: 16.6 (15–18); hind femur length: 6.8.

REMARKS

A modified [key](#) to the South American species of *Orphulella* based on Otte's key (1979) including the new species *O. chumpi* was added to OSF.

Subfamily OEDIPODINAE Walker F., 1871

Tribe SPHINGONOTINI Johnston, 1956

Genus *Trimerotropis* Stal, 1873

TYPE SPECIES. — *Locusta maritima* Harris, T.W., by subsequent designation by Rehn (1939).

Trimerotropis andeana Rehn, 1939

(Figs 9; 10)

MATERIAL EXAMINED. — **Peru.** Ancash, Tarica, Mirador Quitapampa, 3853 m, 09°24'59.0"S, 77°34'37.7"W, 29.II.2008, Cigliano & Lange, 8 ♂♂, 8 ♀♀ (MLPA). — Ancash, Callejón de Huaylas, 7 km S of Huaraz, 3182 m, 09°36'17.5"S, 77°30'33.8"W, 23.II.2008, Cigliano & Lange, 2 ♂♂, 5 ♀♀ (MLPA). — Ancash, Masin (from Chavin to Lamellin), 2591 m, 09°22'30.3"S, 77°06'40.4"W, 27.II.2008, Cigliano & Lange, 2 ♂♂ (MLPA). — Ancash, 8 km from Catac to Chavin, 3786 m, 09°45'23.6"S, 77°23'48.5"W, 26.II.2008, Cigliano & Lange, 1 ♂ (MLPA). — Ancash, 2 km saliendo Catac hacia Chavin de Huantar, before Puente Yanayacu, 3571 m, 09°46'49.5"S, 77°25'08.8"W, 26.II.2008, Cigliano & Lange, 2 ♂♂, 3 ♀♀ (MLPA). — Ancash, Cordillera Huayhuash, 1 km E detour Chiquian, 4305 m, 10°05'33.0"S, 77°10'57.4"W, 15.V.2004, Cigliano & Lange, 1 ♂ (MLPA). — Ancash, Callejón de Huaylas, 65 km S of Huaraz, Puente Ucushaca, 3933 m, 09°59'0.2"S, 77°20'33.9"W, 23.II.2008, Cigliano & Lange, 5 ♂♂ (MLPA) (see [geographic distribution](#)).

REMARKS

Trimerotropis pallidipennis (Burmeister, 1838) (type locality Furnace Creek, Death Valley, California, USA) is the most widely distributed oedipodine in the Americas. It ranges from southwestern Canada to south Argentina (Otte 1984). Rehn (1939) described the subspecies of *T. pallidipennis andeana* from the high puna areas of Peru, and Otte (1995) in his catalogue of Acridomorpha grasshoppers listed it with specific status. However, Carbonell (2010) still considers it as a subspecies. Rehn (1939) distinguishes *T. pallidipennis andeana* from *T. pallidipennis pallidipennis* based on several characters (i.e., proportionately more robust build, with the head broader, and genae more inflated, eyes less prominent; median carina of prozona lower with bilobation less evident; wing-band is narrow, weak and incomplete; caudal femora stouter), but it has been difficult for us to separate it from materials of *T. pallidipennis* from Argentina. However, a recent phylogeographic study conducted by Guzman & Confalonieri (2010) based on COI sequences from specimens reported herein and from material of *T. pallidipennis* from Argentina and the USA (in total 28 individuals) showed that the specimens from the surveyed region constitute a different genetically haplotype which is more divergent than the specimens from Argentina (Mendoza, San Luis provinces). Future analyses on larger series of specimens of *Trimerotropis pallidipennis* and *Trimerotropis andeana* all throughout its distribution area is needed to clarify the specific and subspecific status of these taxa.

DISCUSSION

So far, there is no comprehensive study of the grasshopper fauna of Peru, and there are only few records of highland species of the Peruvian Andes. In total, eight species of Acrididoidea MacLeay, 1821 were collected during the two surveys to Huascarán National Park and the wide valleys of the "Callejón de Conchucos" and the "Callejón de Huaylas". Seven of these eight species collected are new to science, including the recently described *Pediella ancashensis* (Cigliano *et al.* 2010). These findings highlight how little we know on the grasshopper fauna from these highlands. The new acridids were collected in the puna formation in altitudes of 3180 to 4660 meters. Puna is a dry ecosys-

tem (Vuilleumier & Monasterio 1987; Luteyn *et al.* 1992), and it is one of the most heavily altered natural regions of Peru. At present, degradation of habitats is mostly related to overgrazing and contamination from mining (Davis *et al.* 1997). Puna is officially protected in three national parks in Peru, including Huascarán National Park, where the vegetation consists almost exclusively of this formation.

The grasshopper fauna from the highlands of the Andes is represented mostly by two families: Acrididae and Tristiridae. Contrary to what was expected ahead of the surveys, no tristirid species was found in the region. This family endemic to South America is known to occur along the Andes of Chile, Argentina and Peru (Cigliano 1989a, b; Cigliano & Lange 2000), with one species, *Punacris peruviana* (Saussure, 1888), being distributed in the Peruvian puna. Six of the eight species registered in the surveyed region are wingless or brachypterous melanoplines. The remaining two species belong to Gomphocerinae, tribe Orphulellini (*O. chumpi* n. sp.), and Oedipodinae (*T. andeana*). The Melanoplineae is the largest subfamily of grasshoppers in the New World, inhabiting a broad range of habitats from Alaska to Patagonia (Cigliano & Otte 2003; Cigliano *et al.* 2000). Melanoplines can be excellent monitors of landscape use, as they are ecologically sensitive and yet sufficiently mobile and abundant to serve as bioindicators (Samways 1997, 2005).

Grasshoppers are a useful group for bioindication because of their sharp reaction to climatic factors and ecological sensitiveness (Samways 1997, 2005; Bazelet 2011). With the help of indicator species, it is possible to measure the quality of certain habitats. The usefulness of Orthoptera to evaluate the quality of high-altitude grasslands could already been proved by studies at Mount Kilimanjaro in Tanzania (Hemp & Hemp 2003; Hemp 2009).

The Andes are characterized by a long list of outstanding features including numerous endemic organisms with interesting life histories. We were only able to scratch the diversity of grasshoppers in a relatively small area. An understanding of critical issues (what species exist where, and where conservation efforts should be focused) is hampered by the scale and complexity of the biodiversity in the Andes. We hope that the new taxa described here will serve as inspiration for research on this biodiversity and its conservation.

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