First record of the genus *Acridurus* Perez, Dominici, Hierro and Otte, 1995 from Cuba, with description of a new species (Orthoptera: Acrididae: Ommatolampidinae)

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Abstract

The genus *Acridurus* Perez, Dominici, Hierro & Otte, 1995 is herein recorded for the first time from Cuba, based on a new species. *Acridurus baracoae* n. sp. is described on the basis of four specimens from three separate localities enclaved in the northeastern mountains of the main island (Holguín and Guantánamo Provinces). The description herein presented is supported by a thorough illustrative complement, which includes a precise map and color photographs of habitus, main morphological diagnostic characters and habitat.

Key words: Acrididae, *Acridurus*, first record, new species, Greater Antilles, Cuba.

Introduction

The genus *Acridurus* Perez, Dominici, Hierro & Otte, 1995 (Acrididae: Ommatolampidinae) was so far known to occur only in the Greater Antillean island of Hispaniola, more specifically in southern Dominican Republic (Perez et al., 1995; Perez-Gelabert, 2008), containing only three poorly diagnosed species: *Acridurus robustus* Perez, Dominici, Hierro & Otte, 1995, *Acridurus yayitas* Perez, Dominici, Hierro & Otte, 1995 and *Acridurus neibanus* Perez, Dominici, Hierro & Otte, 1995.

The apparent absence of *Acridurus* from Cuba has been always intriguing, but otherwise not problematic in view of the very poor and fragmented knowledge of the orthopterofauna of this Greater Antillean island. Recently, Yong & Perez-Gelabert (2014) recorded 15 nominal species of Acrididae from Cuba (six of them national endemics) and recorded for the first time the subfamily Ommatolampidinae Brunner von Wattenwyl, 1893, based on three "unknown genera".

One of these genera was based upon a single female and declared by Yong & Perez-Gelabert (2014) as "Genus unknown 2" [sic]. It was also stated in that paper: "The robustness and morphological features of this specimen [...] suggest some similarity to the Hispaniolan genus *Acridurus*" (Yong & Perez-Gelabert, 2014: 412).

Very recently, the present author was fortunate to obtain three additional adult females of this grasshopper, all of them in perfect state of preservation and with reliable collecting data. The detailed study of this sample demonstrated that it indeed represents the first Cuban member of *Acridurus*. The new species
is herein described and thoroughly illustrated; subsequently also the generic diagnosis is emended to accommodate its new member and to correct a few original inconsistencies of Perez et al. (1995).

Material and Methods

The specimens were studied, measured and photographed under a Zeiss Stemi 2000-C stereomicroscope, equipped with line scale and grid ocular micrometers, and a Canon PowerShot A620 digital camera. The digital images were processed with Adobe Photoshop CS3 only slightly, i.e., optimization of bright and contrast parameters, background removal and plate composition.

Specimen labels are laser-printed in Spanish, but all were transcribed here into English for text coherence purposes. Precise coordinates and altitude of each locality were extracted from updated 1:25 000 military topographic maps in Mapinfo 9.0.

The general terminology follows Fontana et al., 2008 and Aguirre-Segura & Barranco Vega (2015); such diversity of sources is currently unavoidable because none of them covers by itself alone the whole range of structures and terms. Taxonomic arrangements were also verified using the Orthoptera Species File Online (OSF), version 5.0/5.0 (Cigliano et al., 2016). All meristic counts have been given as fractions for left/right sides.

Depositories of specimens examined herein are abbreviated using the following acronyms:
IES: Instituto de Ecología y Sistemática, La Habana, Cuba.
MNHN-SD: Museo Nacional de Historia Natural "Prof. Eugenio de Jesús Marcano", Santo Domingo, Dominican Republic
SY: Private collection of Sheyla Yong, La Habana, Cuba.

Systematics

Family Acrididae MacLeay, 1821
Subfamily Ommatolampidinae Brunner von Wattenwyl, 1893
Genus Acridurus Perez, Dominici, Hierro and Otte, 1995

Acridurus baracoae new species
Figures 1–5. Table I

"New species (possibly new genus) of Ommatolampidinae": Yong & Perez-Gelabert, 2014: 408; fig. 1b.
"Genus unknown 2": Yong & Perez-Gelabert, 2014: 412.

Types. Cuba: Holguín Province: Moa Municipality: Ojito de Agua (20°29'07"N - 74°59'25"W, 350 m a.s.l.); on the vegetation; February–March/1993; A. R. Estrada; one adult female holotype (SY, in ethanol 80%). Same locality; 23/June/1987; A. Torres; one adult female paratype (SY, dry pinned). Guantánamo Province: Yateras Municipality: Piedra La Vela (20°25'29"N - 74°57'18"W, 650 m a.s.l.); on bare ground of trail crossing sclerophyll scrub; 12/December/1997; R. Teruel; one adult female paratype (SY, in ethanol 80%). Baracoa Municipality: Cayo Fortuna (20°14'39"N - 74°32'05"W, 330 m a.s.l.); A. R. Estrada; one adult female paratype (IES, dry pinned).

Diagnosis. Micropterous, with tegmina reaching posterior margin of abdominal tergite I. Size large for the genus (24–31 mm). Coloration reddish brown, unstriped.

Etymology. The specific epithet is an eponym derived from Baracoa, the main section of the orographic system, which encloses all known localities of the species (the Sagua-Baracoa Mountains).

Description (adult female holotype).

Size large for the genus (total length 30.65 mm). General coloration reddish brown, without any sharply contrasting patterns, eyes black. See figure 1 and table I.
Table I. Measurements of three female types of *Acridurus baracoae* n. sp. Abbreviations: length (L), width (W), depth (H).

| Measurements                  | Paratype (Piedra La Vela) | Paratype (Ojito de Agua) | Holotype (Ojito de Agua) |
|-------------------------------|---------------------------|---------------------------|--------------------------|
| Head                          | L / W / H                 | 2.90 / 3.55 / 4.80        | 3.65 / 3.90 / 5.05       | 4.00 / 4.00 / 5.00       |
| Interocular distance (anterior)| L                         | 0.40                      | 0.40                     | 0.50                     |
| Interocular distance (posterior)| L                       | 2.75                      | 3.00                     | 3.30                     |
| Scapus                        | L / W                     | 0.75 / 0.65               | 0.60 / 0.60              | 0.90 / 0.60              |
| Flagellomeres (number)        | left / right               | 21 / 21                   | 22 / ?                   | 21 / 21                  |
| Pronotum                      | L / W                     | 5.00 / 5.85               | 5.75 / 6.00              | 6.00 / 6.20              |
| Mesonotum                     | L / W                     | 0.65 / 5.00               | 1.00 / 4.85              | 1.10 / 5.00              |
| Tegminaee                     | L/W                       | 4.00 / 0.90               | 4.35 / 1.00              | 5.00 / 1.00              |
| Metanotum                     | L / W                     | 2.40 / 5.30               | 2.55 / 4.65              | 2.65 / 5.60              |
| Abdomen                       | L                         | 13.05                     | 13.25                    | 16.90                    |
| Segment I                     | L                         | 2.00                      | 2.30                     | 2.30                     |
| Segment II                    | L                         | 1.80                      | 2.00                     | 2.45                     |
| Segment III                   | L                         | 1.55                      | 1.70                     | 2.35                     |
| Segment IV                    | L                         | 1.35                      | 1.50                     | 2.25                     |
| Segment V                     | L                         | 1.20                      | 1.40                     | 1.75                     |
| Segment VI                    | L                         | 0.85                      | 0.95                     | 1.30                     |
| Segment VII                   | L                         | 1.00                      | 0.90                     | 1.05                     |
| Segment VIII                  | L                         | 0.65                      | 0.35                     | 0.55                     |
| Segment IX                    | L                         | 0.45                      | 0.40                     | 0.45                     |
| Segment X                     | L                         | 0.35                      | 0.25                     | 0.65                     |
| Cerci                         | L                         | 0.60                      | 0.75                     | 0.65                     |
| Supranal plate                | L / W                     | 1.85 / 1.35               | 1.50 / 1.30              | 1.80 / 1.50              |
| Subgenital plate              | L / W                     | 2.45 / 1.40               | 2.15 / 1.60              | 3.00 / 1.90              |
| Ovipositor                    | L                         | 1.40                      | 1.75                     | 1.60                     |
| Profemur                      | L                         | 4.00                      | 4.45                     | 4.25                     |
| Protibia                      | L                         | 4.00                      | 4.25                     | 4.25                     |
| Mesofemur                     | L                         | 4.20                      | 4.35                     | 4.25                     |
| Mesotibia                     | L                         | 4.30                      | 4.85                     | 4.90                     |
| Metafemur                     | L                         | 13.65                     | 15.00                    | 15.00                    |
| Metatibia                     | L                         | 12.00                     | 13.30                    | 13.00                    |
| Body (total)                  | L                         | 24.00                     | 26.20                    | 30.65                    |
Figure 1. *Acridurus baracoae* n. sp. Adult female holotype, full-body views: a) dorsal; b) lateral; c) ventral. Scale bar in centimeters, with millimeter subdivisions.
Figure 2. *Acridurus baracoae* n. sp. Adult female holotype, close-up views: a) head, dorsal; b) head, lateral; c) head, ventral; d) pronotum, dorsal; e) pronotum, lateral.

**Head** (figs. 2a–c). Large, exactly as long as wide. Tegument shiny but sparsely and coarsely punctate, essentially glabrous. Vertex moderately convex in lateral view, subtriangular in dorsal view; fastigium prominent, paraboloid in dorsal view, semicircular in lateral view and strongly compressed in frontal view. Eyes large, suboval and prominent; ocelli minute. Genae moderately convex in frontal view. Antennae standard for Acrididae in size and shape, with 21/21 flagellomeres; scapus subcylindrical, depressed, longer than wide (ratio = 1.5), oval in cross-section, essentially glabrous; pedicel about half the length of scapus.

**Thorax** (figs. 2d–e, 3a–b). Tegument essentially glabrous, shiny but densely and coarsely punctate. Pronotum (figs. 2d–e) trapezoidal and strongly tapering anteriorly in dorsal view, only slightly wider than long; anterior margin almost straight, posterior margin coarsely crenulate and shallowly incised medially, lateral margins S-shaped; median keel finely costate, lateral keels coarsely crenulate and deeply incised by the three transverse grooves. Mesonotum 2.4 times shorter than metanotum, wider than long (ratio = 4.5), with tegument smooth and shiny; with a pair of tegmina which are narrow, spatulate and rather short compared to more typical grasshoppers, i.e., reaching posterior margin of abdominal tergite I. Metanotum wider than long (ratio = 2.1), with the same basic sculpturation as pronotum (figs. 3a–b).
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**Figure 3.** Acridurus baracoae n. sp. Adult female holotype, close-up views: a) mesothorax, tegmina, metathorax and abdominal tergite I, dorsal; b) mesothorax, tegmina, metathorax and abdominal tergite I, lateral; c) apex of abdomen, dorsal; d) apex of abdomen, lateral; e) apex of abdomen, ventral.

**Legs** (fig. 1). Covered all over by thin setae. Profemur slender, cylindrical and unarmed; protibiae of exactly the same length as profemur, very slender and straight, ventral surface with 4:4 / 4:4 subapical spines and two medium-sized apical spurs. Mid legs very similar to forelegs, but mesotibiae with 3:4 / 4:3 subapical spines. Metafemur robust, 1.1 times longer than metatibiae, oval in cross-section; metatibiae with 7:7 / 7:7 subapical spines and five apical inward-curved spurs: one laterodorsal (medium-sized), one lateral (medium-sized), two lateroventral ones (large, asymmetrically, right spine larger), and one ventral (large).

**Abdomen.** Large and slender (conspicuously narrower than pronotum), subcylindrical and evenly tapering posteriorly. Tegument smooth and shiny, with small scattered setae. Tympanic organ oval-elongate, located laterally on segment I. Supra-anal plate (fig. 3c) longer than wide (ratio = 1.2), paraboloid, sparsely setose. Cerci very short, conical and densely covered by thin setae. Subgenital plate (fig. 3e), longer than wide (ratio = 1.6), paraboloid; anterior margin shallowly concave, lateral margins shallowly convex, posterior margin convex and with a strong spade-shaped median projection, basally flanked on each side by deep notches. Ovipositor in lateral view: each valve of the dorsal pair with dorsal surface convex, with five small dorsal crenulations, and apically curved upwards; each valve of the ventral pair with ventral surface convex, with one small ventral crenulation and apically curved downwards. See figures 1, 3c–e and table I.

**Male:** Unknown.
Variation. Size varies from 24.00–30.65 mm in the types, with slight variations in proportions and relative measurements of several structures (tab. 1).

Coloration is essentially identical in the four types. The few minor differences are all artifacts of differential preservation.

The number of antennal flagellomeres is 21/21 except in the paratopotype, with 22 in its single preserved antenna (left).

The subgenital plate in the paratypes from Ojito de Agua and Piedra La Vela differs from holotype: the median projection of the posterior margin is lanceolate to triangular and lacks both laterobasal notches.

Comparisons. *A. baracoae n. sp.* is easily distinguished from the three Hispaniolan members of the genus by the following characters: 1) Size larger. 2) Coloration unstriped reddish brown. 3) Tegmina present.

Distribution (fig. 4). This species is known from three localities, scattered across the Sagua-Baracoa Mountains of northeastern Cuba.

Ecological notes. According to its original label, the holotype of *A. baracoae n. sp.* was captured on the vegetation.

The paratype from Piedra La Vela is the only specimen with complete ecological data. According to the field notes provided by its collector (R. Teruel, pers. comm.), it was found at early afternoon in a sunny but cold winter day, on the bare ground of a trail crossing the core of a sclerophyll scrub (locally known as...
"charrascal"), which is a very peculiar vegetation type endemic to the Sagua-Baracoa Mountains (fig. 5). Despite receiving more than 2,000 mm of annual rainfall, it is hot, dry and xerophytic due to the edaphic drought (the water does not penetrate the hardened laterite and serpentinite soil and evaporates quickly).

The three known collecting sites are located deep inside intramontane valleys (fig. 4b), at medium altitudes ranging from 300–700 m a.s.l. According to Reyes & Acosta Cantillo (2005), three main adjacent vegetation types are dominant in these mountains: pine forest, rainforest and sclerophyll scrub (fig. 5).

Figure 6. Hispaniolan specimens of the genus examined for comparison, male (left) and female (right), full-body dorsal views: a) *Acridurus neibanus*, paratypes; b) *Acridurus robustus*, paratypes; c) *Acridurus yayitas*, not types (see wrong paratype labels and origin distinct from type-locality). Plate composed from original photos courtesy Solanlly Carrero.
General remarks

This new species fits the current diagnosis of Acridurus in all characters given by Perez et al. (1995), with the single exception of possessing tegmina (absent in the three Hispaniolan species). This character alone does not support the separation of the single Cuban species into a distinct genus as previously suggested by Yong & Perez-Gelabert (2014: 412), because it is obviously useless at this taxonomic level. It is well-known that the complete range of variation from entirelyapterous to full-winged occurs in many American genera of Acrididae, e.g., Boopedon Thomas, 1870, Melanoplus Stål, 1873, Orphulella Gigli-Tos, 1894, Phaedrotettix Scudder, 1897, Philocleon Scudder, 1897 and Proctolabus Saussure, 1859 (Fontana et al., 2008; S. Yong pers. obs.). During this study were also examined paratypes of both sexes of all Hispaniolan species of Acridurus (see below), and females were found to differ from A. baracoae n. sp. only in standard species-level characters such as size, coloration and minor body proportions.

It is worth mentioning here that the current generic diagnosis of Acridurus is not at all satisfactory and needs a thorough revision, which is already in progress (S. Yong, in preparation). Perez et al. (1995: 162–163) based the genus on nine characters, but three of them (33%) involve coloration, which is of little validity at this taxonomic level. As discussed above for tegmina, coloration is so highly variable within most genera of Acrididae that it lacks diagnostic value, in some cases even at species level.

Similarly, the distinction of the Hispaniolan species of the genus is not satisfactory either. The 22-year old original descriptions by Perez et al. (1995) still remain the only available, and are very short, incomplete and based on few characters, part of them too weak and difficult to interpret, especially because no thorough study of variability was attempted therein. These problems are especially evident on table 2 of that paper (Perez et al., 1995: 163): it is titled "Comparison of Acridurus species (males)" [sic], but columns pertaining to A. yayitas and A. neibanus are identical for all five characters, thus, their distinction is impossible. Another example is that the original "description and diagnosis" [sic] of A. yayitas explicitly mentions female characters, but the types-series includes only two males and five juveniles (Perez et al., 1995: 164).

Comparative material examined

1. Acridurus neibanus. One adult male and one adult female paratypes (MNHN-SD). Each specimen bears two identical labels. Label # 1 (rectangular, white card): "Hispaniola (D.R.) Independencia Prov. Los Pinos del Eden 3.xii.199 (Perez et al)" [sic, the correct date according to the original description is 23.xii.1993]. Actually: Dominican Republic: Independencia Prov.: beginning of road from La Descubierta to los Pinos del Eden; 23/ May/1993; D. E. Pérez-Gelabert, G. Dominici, B. Hierro (see Perez et al., 1995: 165). Label # 2 (rectangular, white card with yellow stripe along left edge): "PARATYPE Acridurus neibanus Perez et al. 1995". See fig. 6a herein.

2. Acridurus robustus. One adult male and one adult female paratypes (MNHN-SD). Each specimen bears two identical labels. Label # 1 (rectangular, white card): "Hispaniola (D.R.) Pedernales Prov. Parque Nacional Jaragua 200 N of Playa Inglesa S of S end of Laguna de Oviedo 27-28.v.1993 Perez, Dominici & Hierro". Actually: Dominican Republic: Pedernales Province: Parque Nacional Jaragua, rocky cliffs of Playa Inglesa, south of south end of Laguna de Oviedo; 27–28/May/1993; D. E. Pérez-Gelabert, G. Dominici, B. Hierro (see Perez et al., 1995: 163). Label # 2 (rectangular, white card with yellow stripe along left edge): "PARATYPE Acridurus robustus Perez et al. 1995". See fig. 6b herein.

3. Acridurus yayitas. One adult male and one adult female (MNHN-SD). Each specimen bears two identical labels. Label # 1 (rectangular, white card): "Hispaniola (D.R.) Cerca de Ocoa 2 km carr. Los Martinez (D. Perez)“, actually Dominican Republic: Peravia Province: km 2 of road to Los Martinez; 29/September/1996; D. E. Pérez-Gelabert (see Pérez-Gelabert, 2000: 338). Label # 2 (rectangular, white card with yellow stripe along left edge): "PARATYPE Acridurus yayitas Perez et al. 1995" [sic]. Note: both specimens are not part of the type-series of A. yayitas and not even totopotypes. As originally declared in the original description, the holotype male and six paratypes (one male and five juveniles) all have completely different data: Dominican Republic: Azua Province: Las Yayitas; 225 m a.s.l.; 22/May/1993; D. E. Pérez-Gelabert, G. Dominici, B. Hierro (see Perez et al., 1995: 164). See fig. 6c herein.
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