


GUAJIRUS SERPENTINICUS: A NEW GENUS AND SPECIES OF MINUTE GRASSHOPPERS (ORTHOPTERA: ACRIDIDAE: OMMATOLAMPIDINAE) FROM CUBA

Guajirus serpentanicus: un nuevo género y especie de diminutos saltamontes (Orthoptera: Acrididae: Ommatolampidinae) de Cuba

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ABSTRACT

Guajirus serpentanicus **gen. nov., sp. nov.**, is described from the serpentine plant communities of Matanzas province located less than 100 km east of Havana, Cuba. The genus can be distinguished by its distinctive combination of characters: very small size (<10 mm), compact body, variegated coloration, large rounded eyes in a small head, relatively long and tongue-like remnants of the tegminae, tympanum present, furculae barely present and male subgenital plate with a wide rounded concavity. These small grasshoppers appear adapted to the special conditions of living in the serpentine communities of western Cuba.

Keywords: Ommatolampidinae, taxonomy, Greater Antilles, West Indies.

RESUMEN

Se describe *Guajirus serpentanicus* **gen. nov., sp. nov.**, de las comunidades de serpentina en la provincia de Matanzas localizadas a menos de 100 km al este de La Habana. El género puede distinguirse por su distintiva combinación de caracteres: tamaño muy pequeño (<10 mm), cuerpo compacto, coloración variegada, ojos grandes y redondeados en una cabeza pequeña, remanentes de las tegminas relativamente largos y en forma de lengua, tímpano presente, fúrculas apenas presentes y placa subgenital del macho con concavidad redondeada. Estos pequeños saltamontes parecen adaptados a vivir en las condiciones especiales de las comunidades de serpentina del oeste de Cuba.

Palabras clave: Ommatolampidinae, taxonomía, Antillas Mayores, Indias Occidentales.

INTRODUCTION

The taxonomic study of the grasshopper fauna of Cuba started in the 19th century with the works of Stål (1878), Bolívar (1888) and Gundlach (1891). Until recently, only 15 species of Acrididae classified in 11 genera and 5 subfamilies (Copiocerinae, Cyrtacanthacridinae, Gomphocerinae, Leptysminae and Oedipodinae) were reported in the zoological literature from Cuba (Yong & Perez-Gelabert, 2014). Most recently, one species of the genus *Acridurus* Perez-Gelabert *et al.* (Yong, 2017) and several *Dellia* Stål (Yong, 2018) were added to the fauna. The superficial exploration of many environments in this island and the haphazard form of taxonomic study has resulted in significant gaps in the inventorying of its Orthoptera fauna. In 2013 several undescribed species of acridid grasshoppers were discovered upon examining the holdings of the entomological collections of the

Instituto de Ecología y Sistemática (IES) in Havana. In this paper, I describe one new genus and one new species of very minute grasshoppers that may specifically inhabit the serpentine plant communities not far to the east of the city of Havana. Its distinguishing features are diagnosed and illustrated.

OBJECTIVE

- To provide the taxonomic description of a new genus and species of Ommatolampidinae grasshoppers from the serpentine communities of western Cuba.

MATERIALS AND METHODS

The pinned specimens were studied under 10–60X magnification and photographed using the Visionary Digital (TM) BK Lab imaging system outfitted with a Canon Mark II 5D. The specimens were directly compared to examples of all other Antillean grasshopper genera belonging to the Ommatolampidinae. Measurements were taken with an ocular micrometer and are given in millimeters.

The two specimens studied in this paper were loaned to the author for study and will be deposited in the entomological collection of the Instituto de Ecología y Sistemática (IES), Havana, Cuba, present curator in charge is Betina Neyra. To preserve the integrity of this type material, I decided not to dissect the male genitalia. An attempt to secure additional material was made by providing collecting money to a local who proved to be unreliable and dishonest. No other specimens resulted from this effort.

RESULTS

Taxonomy

Superfamily Acridoidea

Family Acrididae

Subfamily Ommatolampidinae

Guajirus Perez-Gelabert, **gen. nov.**

Diagnosis. Very small grasshoppers with compact body, both sexes 8–10 mm, the female only slightly larger than the male. Integument generally smooth with little pilosity, variegated green, black and brown with many dark spots. Head small, with relatively large and rounded eyes. Interocular space narrower than tibia-1 width. Brachypterous, with only small remnants of tegminae. Pronotum not saddle-shaped, slightly widened posteriorly, with anterior and posterior margins nearly parallel, with superficial sulci and medial line not strongly marked. Tympanum rounded and large. Abdomen short, abdominal segments with a pronounced medial carina. Male subgenital plate 2x wider than long, with wide rounded concavity on posterior margin. Female ovipositor very short and small. Female subgenital plate longer than wide with a small medial projection distally.

Diagnosis. Saltamontes muy pequeños con cuerpo compacto, ambos sexos 8–10 mm, la hembra solo ligeramente más grande que el macho. Integumento generalmente liso con poca pilosidad, variegado verde, negro y castaño con muchos puntos oscuros. Cabeza pequeña con ojos relativamente grandes y redondeados. Espacio interocular más estrecho que el ancho de la tibia-1. Braquípteros, solo con remanentes de las tegminas. Pronoto no en forma de silla, ligeramente ensanchado posteriormente, con márgenes anteriores y posteriores paralelos, con sulcos superficiales y línea media poco marcada. Tímpano grande y redondeado.

Abdomen corto, segmentos abdominales con una pronunciada carina medial. Placa subgenital del macho 2x más ancha que larga, con concavidad redondeada en su margen posterior. Ovipositor de la hembra muy corto y pequeño. Placa subgenital de la hembra más larga que ancha, posteriormente con una proyección medial.

Type species. Guajirus serpentinus sp. nov.

Etymology. The generic name is derived from the latinized word “Guajiro”, a name for the Cuban peasants. The gender of *Guajirus* is masculine.

***Guajirus serpentinus* Perez-Gelabert, sp. nov.**

Figs. 1–17

Type material. Holotype ♂: “Valle del Yumurí Cuabal de Galindo vi-1970 Matanzas CUBA Col. I. Garcia”. Deposited at IES entomological collection, La Habana, Cuba.

Allotype ♀: *Same collecting data as holotype.* Both specimens will be deposited at the IES entomological collection, Havana, Cuba. Despite being collected 50 years ago, the state of preservation of both specimens is perfect.

Description

Morphology. Male.

Head. Slightly globose, with very large rounded eyes that cover most of head, their internal margins nearly touching; interocular space narrower than tibia-1 width (Figs. 1–3). Head vertex slightly below eye level, not protruding anteriorly. Posterior margin of head smooth with very small indentation at middle. Frontal ridge protruding from face, with sides nearly parallel (Fig. 6). Two large lateral ocelli at middle-upper expansion of frontal ridge near antennal insertions, central ocellus at middle of frontal ridge. Face smooth. Palps short. Antennae filiform, more than 2x longer than head and about the length of head plus pronotum, consisting of about 21 cylindrical antennomeres of variable length.

Pronotum. Not saddle-shaped, widening posteriorly 1.2x as wide as anterior margin, about 1.5x longer than head. Dorsally marked by three very shallow sulci that cut slightly deeper at sides. Lateral margin rounded and posterior angle with very small and rounded lobe. Posterior pronotal margin smooth, emarginated, with very small concavity at middle marking a not too sharply defined medial line (Figs. 2–3).

Wings. Remnants of tegminae present, tongue-like, nearly equal to head length. Their surface covered by rough venation, reaching near posterior margin of third abdominal segment (Fig. 3).

Abdomen. Abdominal segments with a more strongly defined dorso-medial carina, becoming gradually shorter and narrower posteriorly. Epimera large and smooth. Large round tympanum on side of third abdominal segment, partially covered by tegmina. Furculae barely present as very small rounded knobs at posterior margin of tenth segment. Prosternum bearing a conical spine.

External genitalia. Supragenital plate or epiproct relatively large, widely triangular with a raised and flattened center. Cerci simple, relatively long without protruding from body, slightly curving inwards and sharply pointed. Abdominal end roundly bulgy, somewhat pilose at lower sides (Figs. 4–5). Subgenital plate rectangular, about 2x as wide as long, with a large rounded concavity at center (Fig. 8).

Legs. Relatively robust with little pilosity. Anterior and middle femora cylindrical and strong. Anterior tibia bearing two rows of small spines on ventral surface. Posterior femora very robust, their length about 2/3 of the body length (Figs. 1–2, 7). External face with a strongly marked superior carina. Dorsal carina of posterior femora perfectly smooth. Posterior tibia with 9 external and 9 internal spines. First tarsus about 2x as long and thick as second.

Coloration. Overall variegated brown, green and black-spotted grasshoppers. Dorsally lighter brown combined with olive green, black and dark spots. Head combining shades of brown with a blotched black area that marks the center of vertex. Face uniformly light brown, eyes darker brown. Pronotum with hourglass-shaped olivaceous green area dorsally, flanked by light cream bands, followed by wide black bands at sides. Wide black band and light cream band extending to head behind the eyes. Lower side of pronotum light cream. Epimera combining dark and orange hues, especially epimeron-3 which bears a large not well-defined orange blotch. Anterior portion of abdomen marked by two conspicuous black blotches at sides of medial line. Tegminae colored light brown on upper 2/3, its lower third black. Abdomen and ventral surfaces mostly olivaceous green and yellowish brown, dorsally colored with multiple large and not well-defined black blotches and small black dots. External genitalia brown. Legs olivaceous green, especially on anterior and middle femora, with light brown and black blotches interspersed with brown. Hind femora brighter green on most of surface, with some light cream and large black blotches. Knees black. Hind tibiae greenish with spines black, tarsi cream brown.

Female morphology (Figs. 9–16). Not very different from that of males. Antennae shorter with more compact antennomeres; head not as globose with smaller and less rounded eyes; frontal ridge more protruding. Pronotum similarly shaped, widening posteriorly. Remnants of tegminae smaller, shaped as short scaly pads that do not surpass second abdominal segment, remnants of second pair of wings also visible underneath and smaller than tegminae. In the external genitalia, the valves of ovipositor are very short and small, the upper valves lacking teeth on their dorsal edges. Subgenital plate longer than wide, ending posteriorly with a small medial projection.

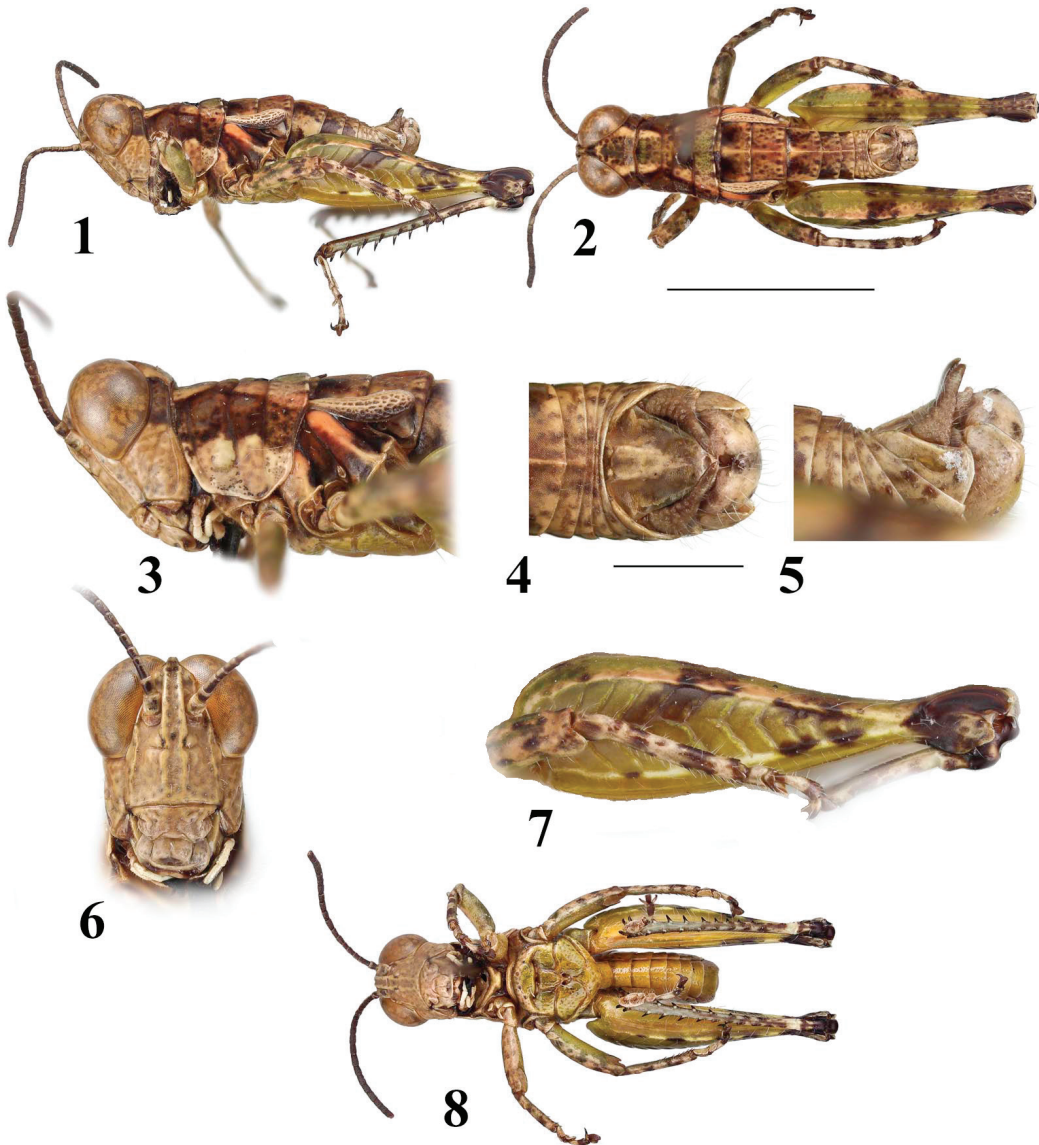
Female coloration. Very similar to the male coloration but darker brown and black, generally with a higher density of dark spotting. Face with more greenish tinge than in male, black to dark brown on frontal ridge. Upper portion of second epimeron with a pale area corresponding to that tinged with orange in male. Abdominal dorsum and sides covered by a high density of dark brown spots. Hind femora generally green marked by two little defined wide black bands not found in the male.

Measurements. Male. Body length = 8.25; pronotum length = 1.88; head length = 0.88; posterior femur length = 5.75; tegmina length = 1.50. Female. Body length = 9.50; pronotum length = 2.25; head length = 0.75; posterior femur length = 6.25; tegmina length = 0.90.

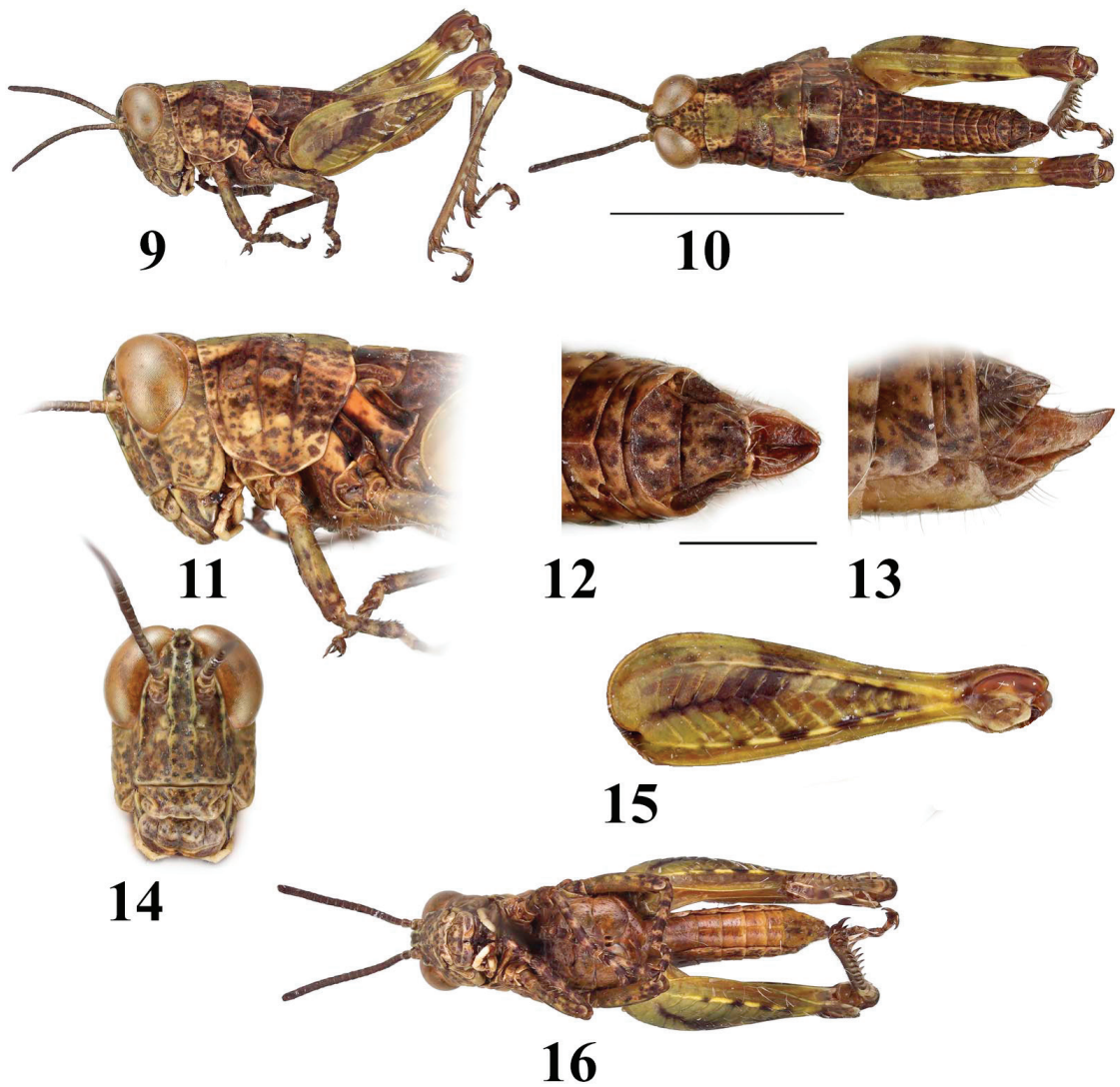
Etymology. The specific epithet *serpentinicus* is a name in apposition to highlight the habitat of these grasshoppers among the Cuban serpentine plant communities.

Habitat. The Cuabal de Galindo is situated in Matanzas province in the northern part of Cuba only about 83 km east of the city of Havana (Fig. 17). Cuabales are thorny xerophytic vegetation characteristic of areas of serpentine rock in northern Cuba. Elevations in the area are lower than 300 m. The very small and compact body of *Guajirus* **gen. nov.** is likely to be an adaptation to the unique conditions of the serpentine community it inhabits. Serpentinites are a group of minerals formed by hydration and metamorphic transformation of igneous rocks with high content of iron and low content of silica and potassium. These soils are poor in calcium and other plant nutrients but rich in elements toxic to plants such as chromium and nickel.

Plants growing on these soils are highly adapted to such conditions and for this reason the flora of the area is highly endemic. A floristic characterization of the serpentine community in the Cuabal de Galindo (González Robledo *et al.*, 2010) found that the most diverse plant families in the area are Rubiaceae, Euphorbiaceae and Mimosaceae.



Figures 1–8. Morphological features of the male *Guajirus serpentinus* **gen. nov., sp. nov.** 1, habitus (lateral). 2, habitus (dorsal). 3, head and pronotum (lateral). 4, abdominal end and epiproct (dorsal). 5, abdominal end and male cerci (lateral). 6, face (frontal). 7, posterior femur (lateral). 8, habitus (ventral).



Figures 9–16. Morphological features of the female *Guajirus serpentinus* **gen. nov., sp. nov.** 9, habitus (lateral). 10, habitus (dorsal). 11, head and pronotum (lateral). 12, abdominal end and female ovipositor (dorsal). 13, abdominal end and female ovipositor (lateral). 14, face (frontal). 15, posterior femur (lateral). 16, habitus (ventral).

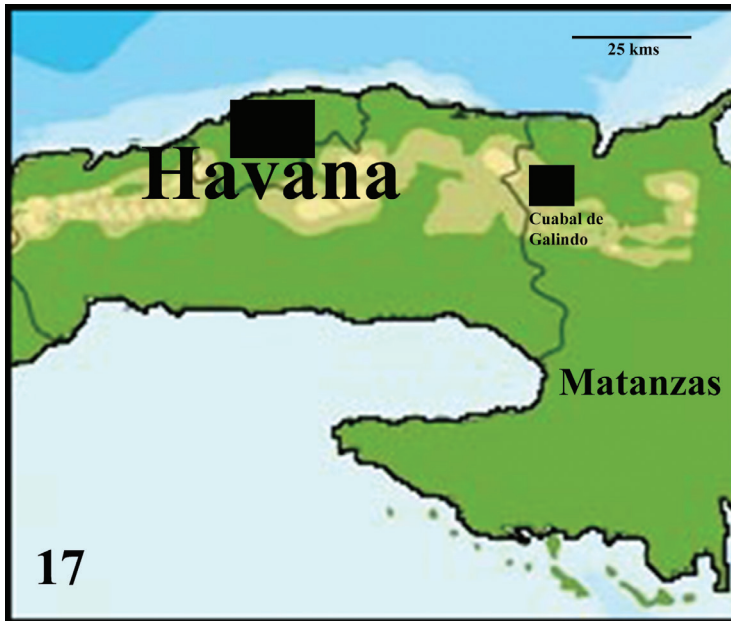


Figure 17. Map showing the general location of the type locality, El Cuabal de Galindo, Matanzas, Cuba.

DISCUSSION

The subfamily Ommatolampidinae is a large, heterogeneous group distributed in the northern part of South America, Central America and some of the Caribbean islands (Perez-Gelabert & Otte, 2003). According to the key presented by Amédégnato (1974) the morphological features distinguishing the Ommatolampidinae are: apterous or winged; male cerci of varied shapes and sizes; mesonotum generally not visible or only its posterior part; ratio of length of posterior femur / length of pronotum = 2.2 to 3.2. *Guajirus* **gen. nov.** is decidedly brachypterous and its ratio of length of posterior femur / length of pronotum = 2.78.

Although little appears exceptional about these grasshoppers, *in toto* they seem to be unique. No other known grasshopper in the Caribbean islands resembles them. The general morphology of *Guajirus* **gen. nov.** seems to associate it with the Hispaniolan genus *Hispanotettix* Perez-Gelabert *et al.*, 1995 more closely than with any other known West Indian grasshoppers (Table I). Elucidation of their affinities and true phylogenetic relationships will most likely require the examination of molecular traits. *Hispanotettix* inhabits the forest floor in semi-dry areas of low-medium elevation in southwestern and northwestern Hispaniola. *Hispanotettix* are larger (10–15 mm) and not so compact grasshoppers that differ from *Guajirus* **gen. nov.** in many details. Another small-sized grasshopper genus that inhabits high elevations of the Dominican Cordillera Central is *Duartettix* Perez-Gelabert & Otte, 2000. However, *Duartettix* is classified as a Melanoplineae (Perez-Gelabert & Otte, 2000). This endemic Hispaniolan genus was found to be more closely related to the North American melanoplines through molecular analyses (Chapco, 2006).

The Caribbean Ommatolampidinae have only recently received some taxonomic attention on Hispaniola and Cuba and four newly described genera containing 11 species have been assigned to this subfamily (Perez-Gelabert *et al.*, 1995; Perez-Gelabert & Otte, 2000, 2003; Yong, 2017). Including the one described here, a total of 8 genera (*Guajirus* **gen. nov.**, *Acridurus*, *Hispanacris*, *Hispanotettix*, *Tergoceracris*, *Abracris*, *Caletes*, and *Vilerna*) including 16 species of Ommatolampidinae grasshoppers are now known from the West Indies.

Table I. Comparison of morphological features in *Guajirus* **gen. nov.**, *Hispanotettix* and *Hispanacris*

	<i>Guajirus</i> gen. nov.	<i>Hispanotettix</i>	<i>Hispanacris</i>
Body size	8-10 mm	10-15 mm	15-20 mm
Margins of frontal ridge	Nearly parallel	Parallel	Parallel
Space between eyes relative to tibia-1 width	Less than	Less than	Less than
Head length relative to pronotum	Shorter	Shorter	Nearly equal
Pronotum size compared to head	Large	Large	Small
Pronotum shape	Not saddle-shaped	Not saddle-shaped	Slightly saddle-shaped
Forewings	Very small	Very small	Longer than pronotum
Furculum	Barely present, rounded, narrow gap	Short, rounded, separated by narrow gap	Long, narrow, very narrow gap
Epiproct	Triangular	Triangular	Triangular
Auditory tympanum	Present	Absent	Present

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