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Unpublished species of aquatic beetles of the genus *Anacaena* in the Upper Apure, Venezuela (Hydrophilidae: Chaetarthriinae: Anacaenini)

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RESUMEN

Se describen siete nuevas especies del género *Anacaena* Thomson, 1859, provenientes del Alto Apure, Venezuela: *A. crenituloides* **sp**. **n**., *A. hospesa* **sp**. **n**., *A. llanera* **sp**. **n**., *A. mantecala* **sp**. **n**., *A. pallida* **sp**. **n**., *A. paulincarmenae* **sp**. **n**. y *A. samana* **sp**. **n**., estrechamente relacionadas morfológicamente, representando un nuevo grupo de especies dentro del género *Anacaena* Neotropical. Todas ellas se encuentran asociadas a un mismo ambiente léntico, habitando los sedimentos lodosos de cuerpos de agua someros. Se presentan ilustraciones detalladas de los ejemplares tipo, incluyendo *habitus* y genitales, así como una imagen satelital que localiza los puntos de recolección en el troncal 19 de la carretera Barinas-Apure.

Palabras claves: *Anacaena*, Alto Apure, coleoptero acuático, nueva especie, Llanos occidentales.

Inéditas especies de escarabajos acuáticos del género *Anacaena* en el Alto Apure, Venezuela (Hydrophilidae: Chaetarthriinae: Anacaenini)

ABSTRACT

Seven new species of the genus *Anacaena* Thomson, 1859 are described from region of Alto Apure, Venezuela: *A. crenituloides* **sp**. **n**., *A. hospesa* **sp**. **n**., *A. llanera*

sp. **n**., *A. mantecala* **sp**. **n**., *A. pallida* **sp**. **n**., *A. paulincarmenae* **sp**. **n**. and *A. samana* **sp**. **n**., closely related morphologically, representing a new group of species within the Neotropical genus *Anacaena*. All of them are associated with the same lentic environment, inhabiting the muddy sediments of shallow water bodies. Detailed illustrations of the type specimens are presented, including *habitus* and genitalia, as well as a satellite image that locates the collection points in the trunk 19 of the Barinas-Apure highway.

Key words: *Anacaena*, Alto Apure, aquatic coleoptera, new species, western plains

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INTRODUCTION

In this study, we highlight the identification of a group of species belonging to the genus *Anacaena* Thomson, 1859, which share a unique microhabitat. Unlike other previously described species within this genus (Garcia 2019, Komarek 2005), these new species were found buried in the muddy sediments of the banks of turbid water pools, cohabiting with species of the genus *Crenitulus* Winter, 1926. This group of species is distinguished by its pale yellowish coloration, and by the presence of a characteristic longitudinal black band on the head extending from the vertex to the clypeus and a dark triangular macula on the pronotal disc. These characteristics, together with the homogeneity observed in the morphology of their ventral sclerites, differentiate them markedly from the rest of the species of the genus. The main objective of this study is to describe seven new species of the genus *Anacaena* and to establish a new taxonomic group composed of these species, which share the characteristic of inhabiting muddy sediments. With this finding, the total number of species of the genus *Anacaena* reported for Venezuela is eight.

MATERIALS AND METHODS

The study focused on two extensive lagoons, located adjacent to troncal Highway 19, near the towns of Mantecal, Samán de Apure, Apurito and Achaguas, in the Achaguas municipality of Apure State (Fig. 1).

Figure 1. Satellite image showing the collection points of the eleven species of *Anacaena* on Troncal Road 19, between the towns of Mantecal-Achaguas, which are marked by two black circles, in Apure State, Venezuela.

The collection was carried out in two stages. The first, in 1997, took place between Apurito and Achaguas (7° 50'11.69“ N, 68° 18'03.37” W, 62 m.). The second stage took place in 1998 between Mantecal and Samán de Apure (7° 49'20.90“ N, 68° 51'21.80” W, 74 m).

The analyzed microhabitats are characterized by being hydroecological systems of stagnant freshwater (lentic), conformed by temporary pools, previous observations by García *et al*. (2016) and García (2017). The formation of these pools is directly related to the rainfall pattern of the region. They are specifically located on the edges of the Troncal 19 highway, in the section that connects San Fernando with Bruzual, an area known as the Alto Apure.

The collected material is properly preserved in the collections of the Museo de Artrópodos de la Universidad del Zulia (MALUZ). For the identification, classification and preparation of the specimens, especially the genitalia, the same techniques and protocols described in the study by García (2018) and in subsequent research were used, thus ensuring consistency and comparability of the results.

RESULTS

Taxonomic

Hydrophilidae Latreille, 1802
Chaetarthriinae Bedel, 1881
Anacaenini Thomson, 1859
Anacaena Thomson, 1859
Creniphilus Motschulsky, 1845*
Crenophilus Agassiz, 1847*
Crenyphilus Motschulsky, 1845*
Cryniphilus Motschoulsky, 1845*
Enigmata Hansen, 1999
Gentilina Hebauer, 2003
Grodum Hansen, 1999
Hebauerina Gentili, 2002
Laccobiellus Abeille, 1901**
Paranacaena Blackburn, 1889
*ICZN (1960).
** Everts, Edouard Jacques Guillaume (1898-1922)

Species group Crenituloides

Coloration yellowish brownish with a dark triangular patch on pronotal disc, head deflexed to very deflexed, broader than long, black with a brownish patch below each eye, labrum short and broad, anterior margin of labrum slightly arched to straight, chin subquadrate, palps slender and long, antenna with nine antennomeres, last antennomere of malleus concave. Mesoventral process elevated, widened at base cone-shaped with rounded apex, transversely carinate, posterior surface slightly arcuate in apical half, with a projected elevation from mesoventral base covering basal half, mesoventral base forming a fork.

Anacaena crenituloides García y Briceño, **sp**. **n**.
(Figs. 2, 8, 15, 16, 17, 18a-18b, 19).

Diagnosis. It has a marked dorsal convexity, slightly interrupted between the cephalic margin and the pronotum. The elytral ventral latero-ventral margin is rectili-

near, but is widely disjunct from the pronotal ventral latero-ventral margin. The head is very broad, almost twice its length, labrum upright, lower margin of the eye widened adopting an angled lateral shape.

Locality type. Samán de Apure-Mantecal, Achaguas, Alto Apure, Apure, Venezuela.

Material type. Holotype ♂, of Venezuela, Apure, Alto Apure, Achaguas, troncal 19 Mantecal-Samán de Apure, 06.vii.1997, M. García coll., (7° 49'20.90“ N and 68° 51'21.80” W), 74 m (MALUZ06661). Paratype ♀, same data as holotype (MALUZ06668).

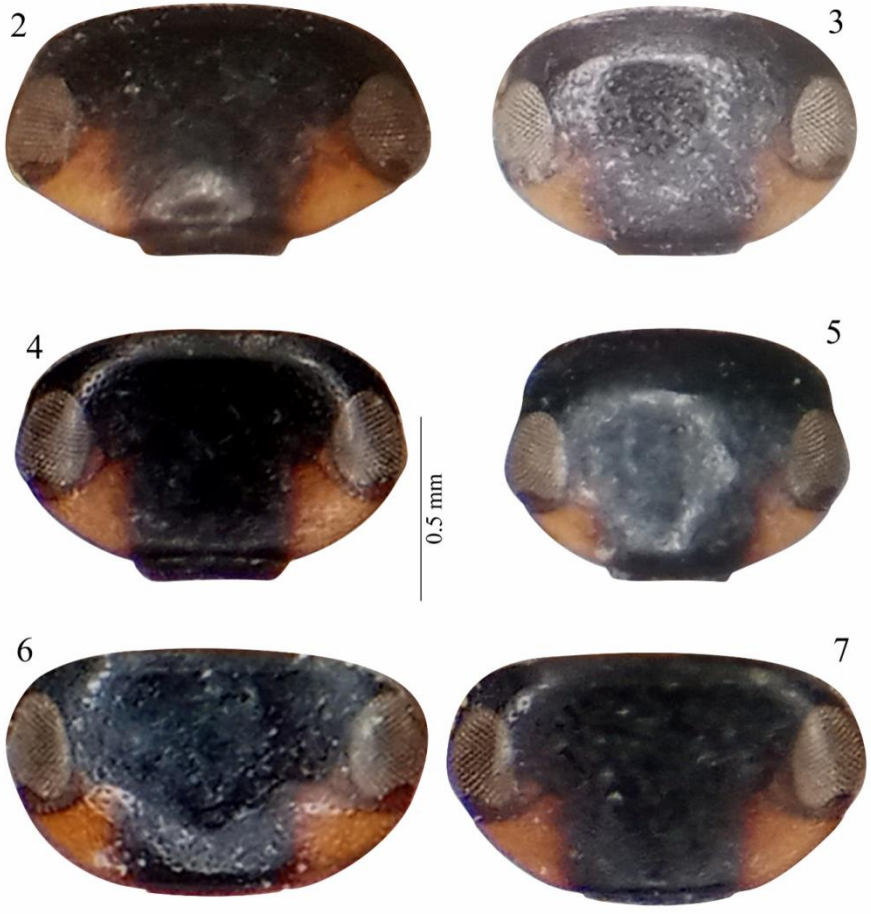
Description. Body shape elongate oval elongate very convex; anterior and posterior margin rounded; head, pronotum and elytra with discontinuous margins. In lateral view dorsum with deflexed head discontinuous with pronotum (Figs. 2, 8); lateral clipeal margin curved; pronotal lateral margin straight between angular margins and strongly discontinuous with elytral margin. 1.0 mm long and 0.6 mm wide, widest at humeral margin. Body coloration earthy brown, with black head except below each eye and pronotum with a dark triangular patch on central disc. Ventrally with brownish palps and antennae; mentum, submentum, proventrite, mesoventrite and metaventrite, black, abdomen brownish; legs brownish-yellowish. Head very broad, almost twice its length, greater width at the level of the lower margin of eyes. Cephalic surface shiny, thick and punctuated. Eyes large, spaced 3.5x their diameter.

Labrum broad and short with slightly curved anterior and posterior margins. Pronotum long 1.25x cephalic length; surface smooth; posterior angular margin very broad and rounded. Scutellum short triangular. Elytral surface thick and densely punctate; ventral latero-ventral margin straight; commissural striae beginning at end of first third elytral. Antenna with nine antennomeres, apical segment rounded and broad with concave surface (Fig. 15). Maxillary palps long with very long fourth palpomere with beveled apex and labial palps long and slender, with very long third palpomere with an apical style (Fig. 16). Mentum subquadrate (Fig. 17). Proventrite short. Mesoventrite with elevated mesoventral process, transversely carinate with slight rounded apex; posterior surface gently arched with fine striations; from basal mesoventral margin projects an elevation covering basal half of process (Figs. 18a and

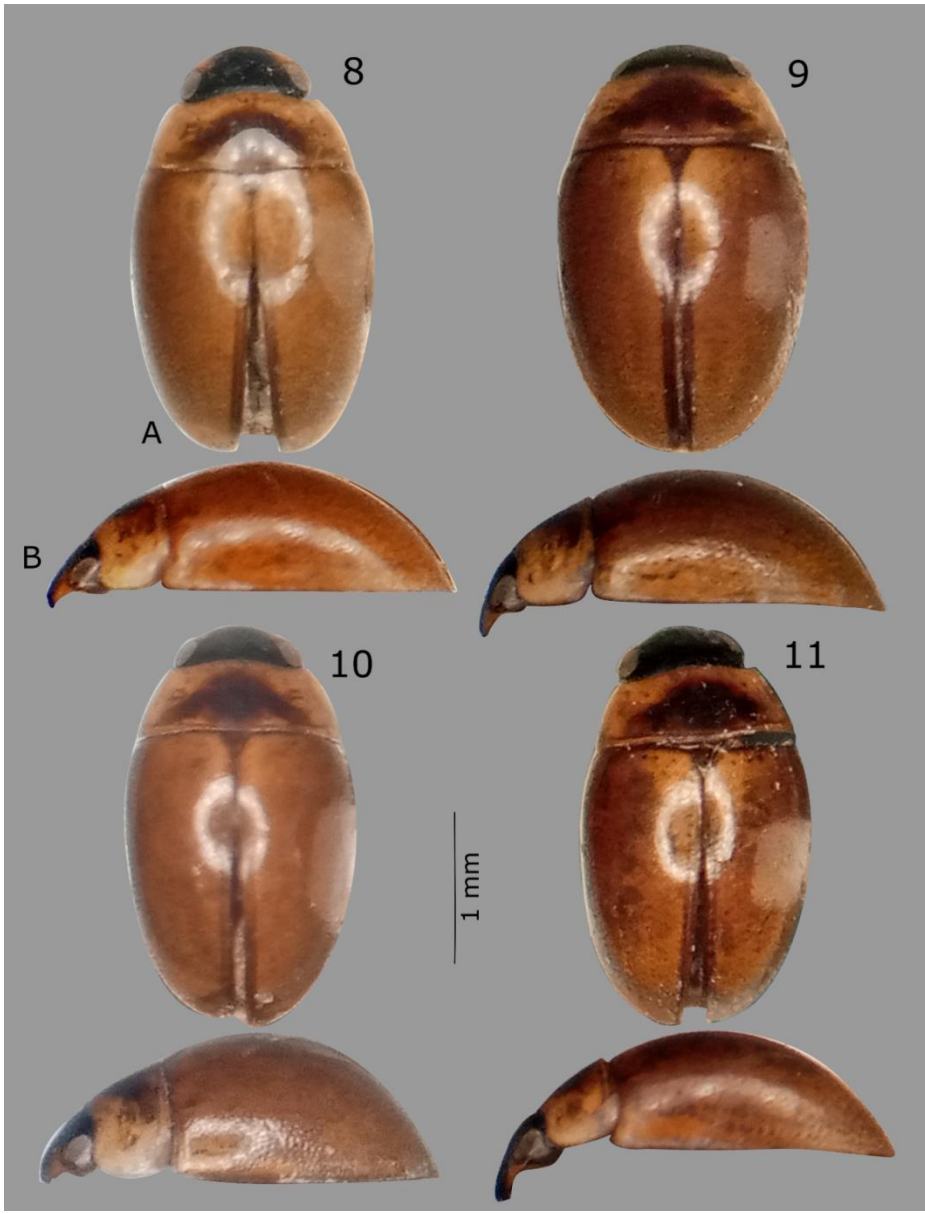
18b). Metaventrite pubescent on disc with a thin central longitudinal glabrous oval. Abdominal ventrites pubescent. Edeagus with robust striate parameres, robust median lobe; falobase broad with curved apex and apical manubrium (Fig. 15).

Female. Similar to the male but longer.

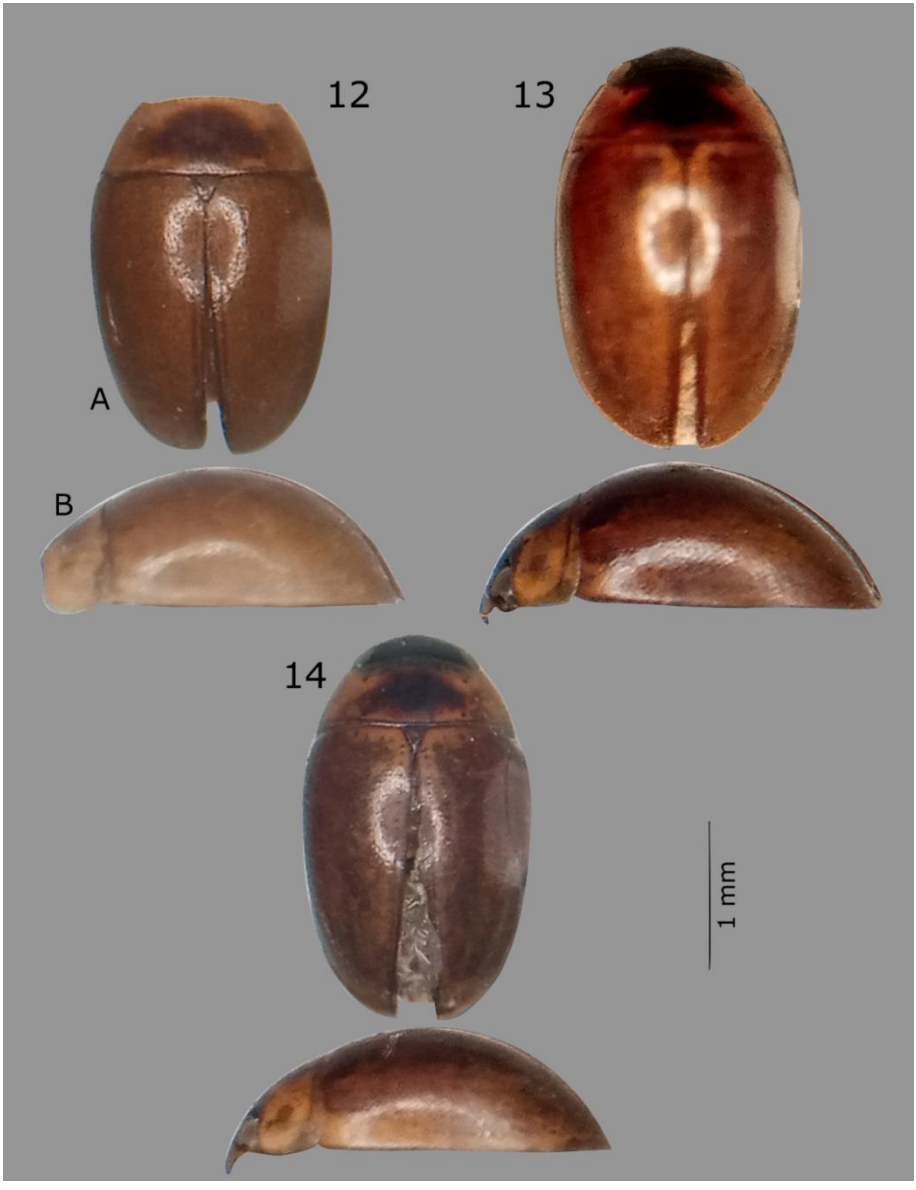
Etymology. The name of this species identifies the similarity to species of the genus *Crenitulus*.



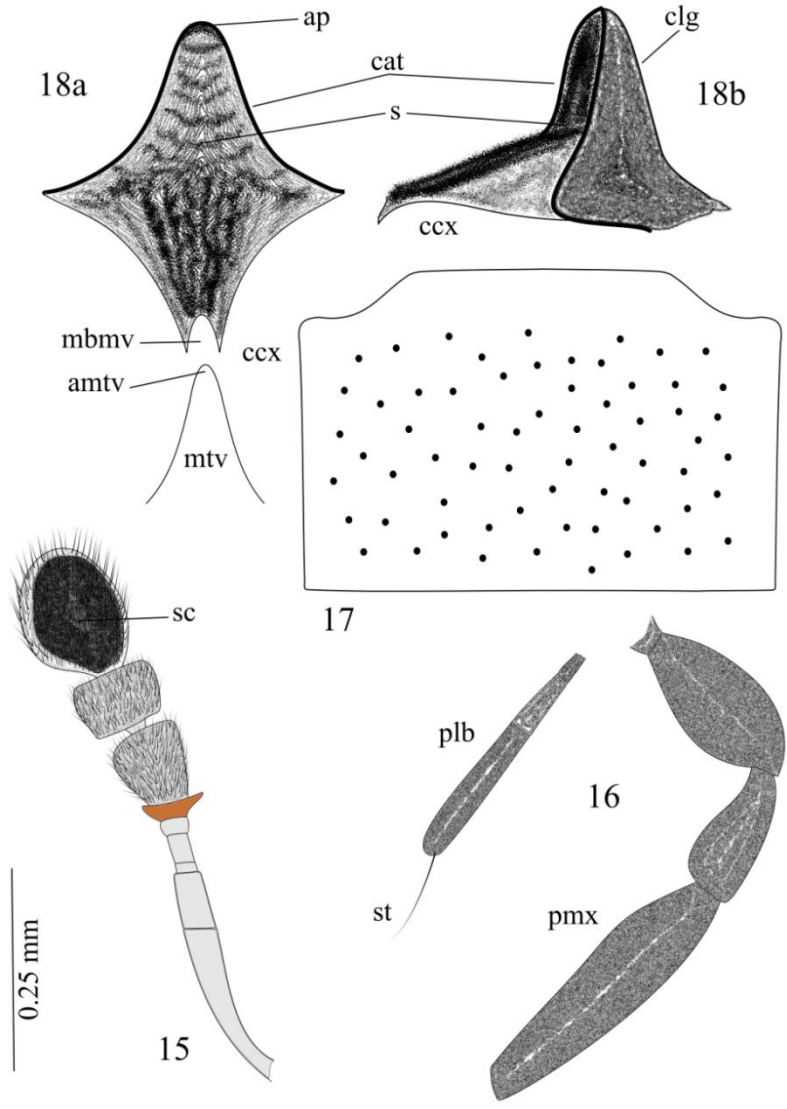
Figures (2-7). Cephalic sclerites of *Anacaena* species: 2. *A. crenituloides* **sp**. **n**., 3. *A. hospesa* **sp**. **n**., 4. *A. llanera* **sp**. **n**., 5. *A. mantecala* **sp**. **n**., 6. *A. paulinacarmenae* **sp**. **n**., y 7. *A. samana* **sp**. **n**.



Figures (8-11). *Habitus* dorsal and lateral of *Anacaena*: 8. *Anacaena crenituloides* **sp**. **n**., 9. *A. hospesa* **sp**. **n**., 10. *A. llanera* **sp**. **n**., 11. *A. mantecala* **sp**. **n**.



Figures (12-14). *Habitus* dorsal and lateral of *Anacaena*: 12. *Anacaena pallida* **sp**. **n**., 13 *A. paulina carmenae* **sp**. **n**., y *A. samana* **sp**. **n**.



Figures (15-18). Ventral sclerites of Crenituloides spp. species group n.: 15. Antenna, 16. palps, 17. Mentum, 18a. Mesoventral process in frontal view and 18b. Mesoventral process in lateral view, sc = concave surface, plb= labial palp, st= style, pmx = maxillary palp, ap = apex, cat = transverse carina, s = posterior surface, clg = anterior longitudinal carina, mbmv = mesoventral basal margin, amtv= metaventral apex, ccx = mesocoxal cavity, mtv = metaventrite.

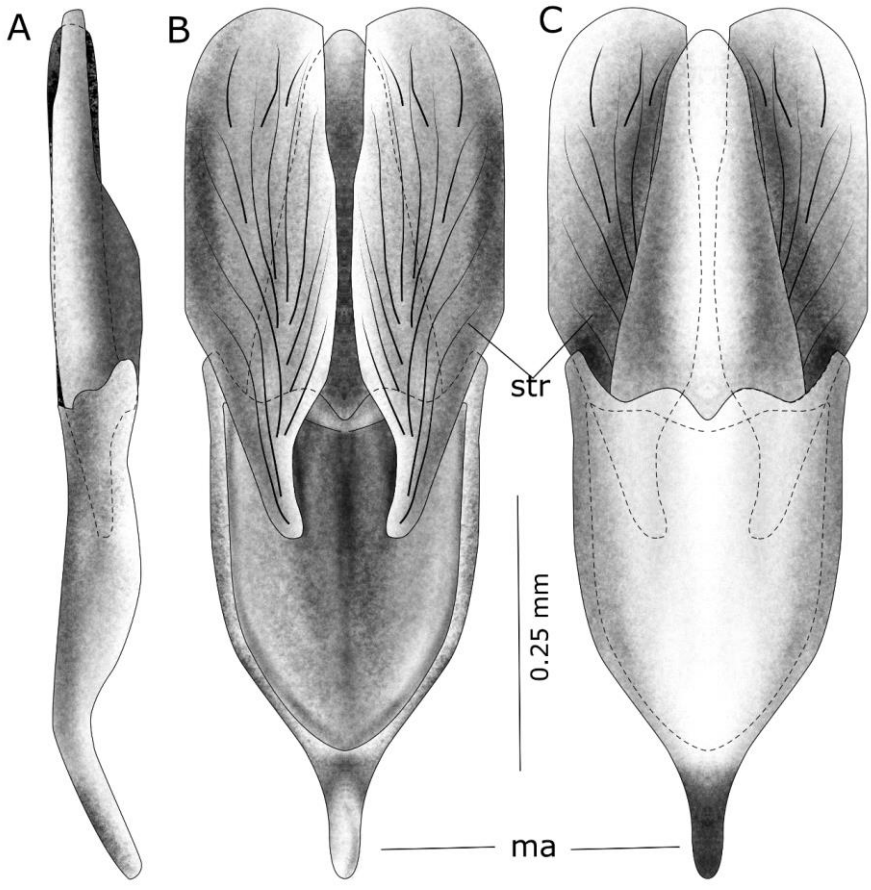


Figure 19. Views of the edeagus of *Anacaena crenituloides* **sp**. **n**. A. Lateral, B. Dorsal y C. Ventral: ma = manubrium y str = parameral striae.

Habitalogy. The species was collected manually in the muddy margin of a temporary roadside pond. The specimen was found buried in the mud, microhabitat ramentum (Garcia *et al*. 2016).

Distribution. The species is restricted to the riparian corridor of the Apure River, between the town of Mantecal and Samán de Apure in Apure State (Fig. 1).

Anacaena hospesa García y Briceño **sp**. **n**.
(Figs. 3, 9, 15, 16, 17, 18a-18b, 20).

Differential diagnosis. The cephalic morphology of *A. hospesa* sp. n. is distinguished from *A. crenituloides* sp. n. by a lower cephalic index and a narrower shape. In addition, it lacks the infraocular tuberosity present in *A. crenituloides*. In lateral view, the head of *A. hospesa* sp. n. shows a more accentuated cephalic deflection. The coloration is slightly darker and the humeral angle is more pronounced. The anterior margin of the pronotum is less sinuous and the lateral margin is straight, in contrast to a slight convexity with that of *A. crenituloides.*

Locality type. Mantecal-Samán de Apure, Achaguas, Alto Apure, Apure, Venezuela.

Material type. Holotype ♂, from Venezuela, Apure, Alto Apure, Achaguas, troncal 19 Mantecal-Samán de Apure, 06.vii.1997, M. García coll., (7° 49'20.90" N and 68° 51'21.80 W), 74 m (MALUZ06663). Paratype ♀, same data as holotype (MALUZ06669).

Description. Body shape elongate oval, convex; anterior and posterior margin rounded. Dorsal view, anterior margin of pronotum scarcely sinuous. Lateral view, head and pronotum present a distinct convexity of the elytral and viewed from the side pronotal margin is in a straight line with elytral but very discontinuous. Length 1.0 mm and width 0.6 mm, greater width at humeral margin. Body coloration earthy brown, with black head except below each eye and pronotum with a dark triangular disk-shaped spot. Brown palps and antennae; mentum, submentum, proventrite, mesoventrite, metaventrite blacks and abdomen brownish; legs brownish yellowish. Head one third wider than long, with rounded lateral margins; cephalic surface coarsely punctate. Labrum short with slightly arched anterior margin. Eyes small 3.6x their diameter apart; anterior margin sinuously margined; lateral margin rounded. Inlateral view laterally very deflexed in convexity with pronotum (Fig. 3). Pronotum long 1.2x cephalic length, slightly pronounced on central disc; anteroangular margin rounded and posteroangular margin slight angulate; lateral margin straight, 0.8x its dorsal length, anterior margin weakly arcuate and posterior margin with angular ends straight; surface finely punctate. Scutellum long triangular. Elytra with coarsely punctate surface; pronounced humeral margin.

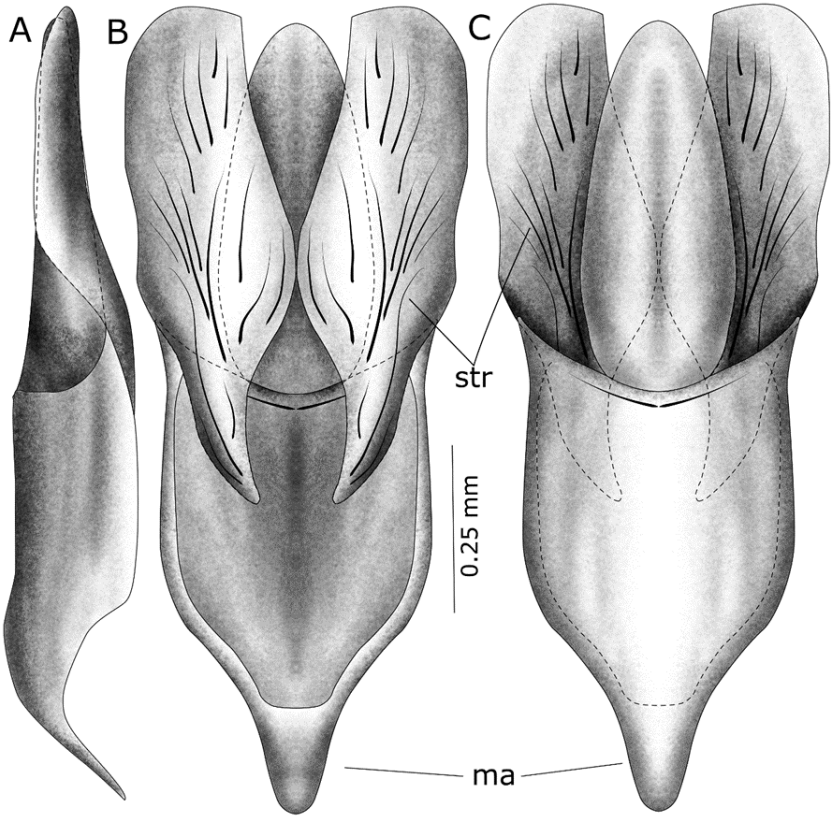


Figure 20. Views of the edeagus of *Anacaena hospesa* **sp**. **n**. A. Lateral, B. Dorsal y C. Ventral: ma = manubrium y str = parameral striae.

Commissural stria initiating in second elytral third. Ventral side margin straight with a slight curvature at apex, and discontinuous convexity with pronotum (Fig. 9). Antenna with nine antennomeres, apical segment rounded and broad with concave surface (Fig. 15). Maxillary palps long with very long fourth palpomere with beveled apex and labial palps long and slender, with very long third palpomere with an apical style (Fig. 16). Mentum subquadrate (Fig. 17). Proventrite short. Mesoventrite with elevated mesoventral process, transversely carinate with slight rounded apex; posterior surface gently arched with fine striations; from basal mesoventral margin projects an

elevation covering basal half of process (Figs. 18a and 18b). Metaventrite pubescent in disc with a thin central longitudinal glabrous oval. Abdominal ventrites pubescent. Anterior and middle femur smooth, except for a series of fine setae distributed on the posterior margin. Hind femur with smooth surface. Edeagus with robust striate parameres, median lobe robust; falobase broad with curved apex and apical manubrium (Fig. 20).

Female. Similar to the male but longer.

Etymology. The name "*hospesa*" is Latin for "host" and identifies the species as a visitor or temporary resident of the mud.

Habitalogy. Similar to the previous species.

Distribution. Similar to the previous species (Fig. 1).

Anacaena llanera García y Briceño, sp. n.
(Figs. 4, 10, 15, 16, 17, 18a-18b, 21).

Differential diagnosis. The cephalic diameter exhibits an intermediate condition in relation to the previous species, being slightly smaller than that of *A. crenituloides* but larger than that of *A. hospesa* sp. n. The morphology of the lateral cephalic margin is characterized by an ocular prominence similar to that observed in *A. crenituloides*, being clearly differentiated from the rounded margin of *A. hospesa*. In lateral view, the dorsal cephalic margin presents a pronounced convexity between the labrum and clipeus, establishing a convex continuity with the pronotum. This condition is less deflexed than that observed in *A. hospesa*, showing greater similarity to *A. crenituloides*. The elytra has a more marked convexity compared to the species mentioned above. The lateral margin of the pronotum, although slightly rounded, exhibits a less pronounced curvature or even a slight angulation compared to related species.

Locality type. Mantecal-Achaguas, Achaguas, Alto Apure, Apure, Venezuela.

Material type. Holotype ♂, from Venezuela, Apure, Alto Apure, Achaguas, troncal 19 Mantecal-Samán de Apure, 06.vii.1997, M. García col., (7°49'20.90“ N and 68° 51'21.80” W), 74 m (MALUZ06661). Paratype ♀, same data as holotype (MALUZ06668); 2 paratypes ♀, trunk 19 Apurito-Achaguas, 28.viii.1998, M. García col., (7° 50'11.69“ N and 68° 18'03.37” W), 62 m (MALUZ06672, MALUZ06675).

Description. Body shape elongated oval, very convex with rounded anterior and posterior margins. Seen laterally head slight discontinuous with pronotum and this discontinuous with very convex elytra. Length 1.1 mm and width 0.6 mm, greater width at the level of the first elytral third. Body coloration earthy brown, with black head except below each eye and pronotum with a dark triangular disk-shaped spot. Brownish palps and antennae; mentum, submentum, proventrite, mesoventrite and metaventrite, black, abdomen brownish; legs brownish yellowish. Head broader than long with lateral margins angled at the level of the lower margin of the eye; surface with scattered scoring punctate. Labrum short and broad with anterior and posterior margin weakly arcuate. Eyes small, spaced 3.1x their diameter, sinuously emarginate anteriorly. Side view it is deflexed and broad with pronounced fronto-clipeal margin (Fig. 4).

Pronotum long 1.5x head length; surface with fine punctate. Pronotal lateral margin 0.9x dorsal length, slight rounded with rounded anteroangular and posteroangular margins discontinuous with elytral margin. Anterior margin sinuate and posterior margin without oblique ends. Scutellum short triangular. Elytra with coarse punctuations. Lateral margin slightly rounded. Commissural striae beginning on the second elytral third (Fig. 10). Antenna with nine antennomeres, apical segment rounded and broad with concave surface (Fig. 15). Maxillary palps long with very long fourth palpomere with beveled apex and labial palps long and slender, with very long third palpomere with an apical style (Fig. 16). Mentum subquadrate (Fig. 17). Proventrite short. Mesoventrite with elevated mesoventral process, transverse carinate with rounded apex; posterior surface gently arched with fine striations; from basal mesoventral margin projects an elevation covering basal half of process (Figs. 18a and 18b). Metaventrite pubescent on disc with a thin central longitudinal glabrous oval. Abdominal ventrites pubescent. Anterior and middle femur smooth, except for a series of fine setae distributed on the posterior margin. Hind femur with smooth surface. E-

deagus with robust striate parameres, median lobe robust; falobase broad with curved apex and apical manubrium (Fig. 21).

Female. Similar to the male but longer.

Etymology. The name of this species identifies the Llanos region of the state of Apure.

Habitalogy. Similar to the previous species.

Distribution. Similar to the previous species (Fig. 1).

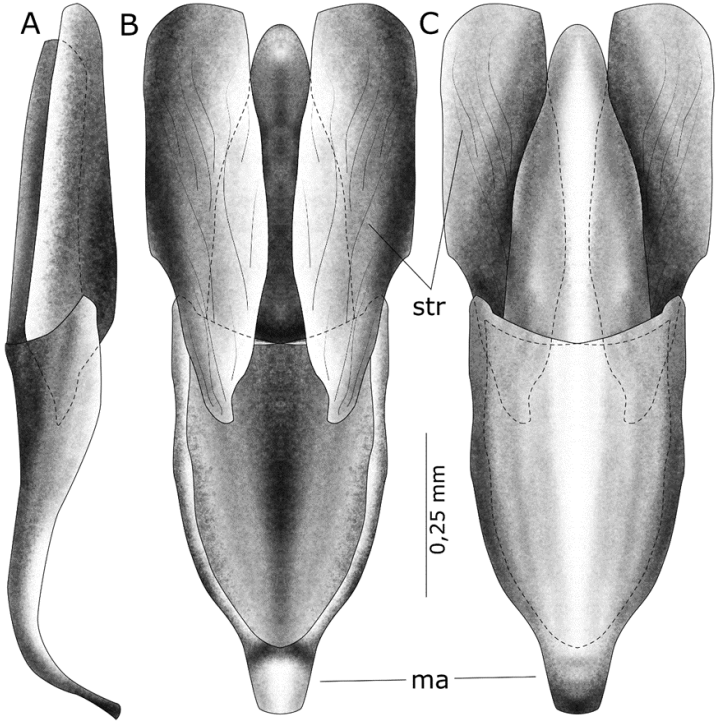


Figure 21. Views of the edeagus of *Anacaena llanera* **sp**. **n**. A. Lateral, B. Dorsal y C. Ventral: ma = manubrium y str = parameral striae.

Anacaena mantecala García y Briceño, **sp**. **n**.
(Figs. 5, 11, 15, 16, 17, 18a-18b, 22).

Differential diagnosis. The cephalic shape its subquadrate configuration, constitutes a distinctive diagnostic character that allows unequivocally differentiating this species from the others catalogued.

Locality type. Mantecal-Achaguas, Achaguas, Alto Apure, Apure, Venezuela.

Material type. Holotype ♂, from Venezuela, Apure, Alto Apure, Achaguas, trocal 19 Mantecal-Samán de Apure, 06.vii.1997, M. García col., (7° 49'20.90“ N and 68° 51'21.80” W), 74 m (MALUZ06664). Paratype ♂, troncal 19 Apurito-Achaguas, 20.viii.1998, M. García col., (7° 50'11.69“ N and 68° 18'03.37” W), 62m (MALUZ06671).

Description. Body shape elongate oval convex, with rounded anterior and posterior margin. Lateral head view discontinuous with pronotum and pronotum, continuous with elytra; lateral margin of pronotum deflexed discontinuous with ventral elytral margin. Length 1.0 mm and width 0.6 mm, greatest width at level of first elytral third. Body coloration earthy brown, with black head except below each eye and pronotum with a dark triangular disk-shaped disk. Brownish palps and antennae; mentum, submentum, proventrite, mesoventrite and metaventrite black, abdomen brownish; legs brownish-yellowish. Head as broad as long, subquadrate; surface coarsely punctate; lateral margin angulate, widened at lower margin of eye. Labrum very short and broad with slightly straight anterior margin and slightly arched posterior margin. Small bulging eyes 3x their diameter apart and anterior margin sinuously emarginate (Fig. 5). Pronotum long 1.1x cephalic length; side margin slight rounded with rounded anteroangular and posteroangular margins; anterior margin with moderate sinuosity and posterior margin oblique ends; surface with fine punctuation. Scutellum short triangular, elytral surface thick with dense punctuation; ventral side margin sinuous with two thirds elytral straight and curved in apical third (Fig. 11). Antenna with nine antennomeres, apical segment rounded and broad with concave surface (Fig. 15). Maxillary palps long with very long fourth palpomere with beveled apex and labial pals longs and slender, with very long third

palpomere with an apical style (Fig. 16). Mentum subquadrate (Fig. 17). Proventrite short. Mesoventrite with elevated mesoventral process, transversely carinate with slightly rounded apex; posterior surface gently arched with fine striations; from basal mesoventral margin projects an elevation covering basal half of process (Figs. 18a and 18b). Metaventrite pubescent on disc with a thin central longitudinal glabrous oval. Abdominal ventrites pubescent. Anterior and middle femur smooth, except for a series of fine setae distributed on the posterior margin. Hind femur with smooth surface. Edeagus with robust striate parameres, median lobe robust; falobase broad with curved apex and apical manubrium (Fig. 22).

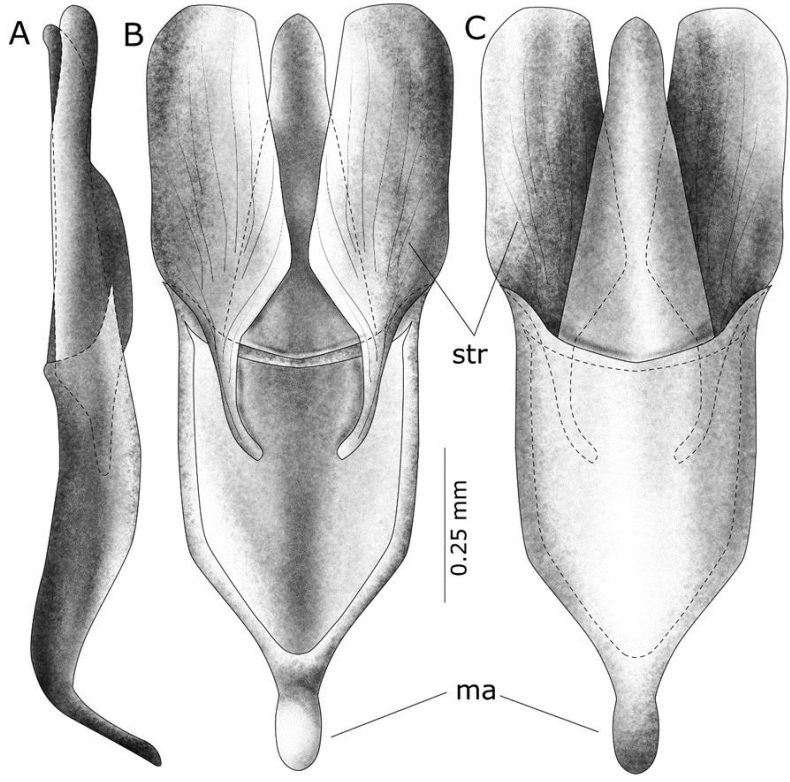


Figure 22. Views of the edeagus of *Anacaena mantecala* **sp**. **n**. A. Lateral, B. Dorsal y C. Ventral: ma = manubrium y str = parameral striae.

Female. Unknown.

Etymology. The name of this species "mantecala" identifies a gentilities of the population of "Mantecal" region near the place of collection and means that it is close to the town of "Mantecal" in the state of Apure.

Habitalogy. Similar to the previous species.

Distribution. Similar to the previous species (Fig. 1).

Anacaena pallida García y Briceño, **sp**. **n**.
(Figs. 12, 15, 16, 17, 18a-18b, 23).

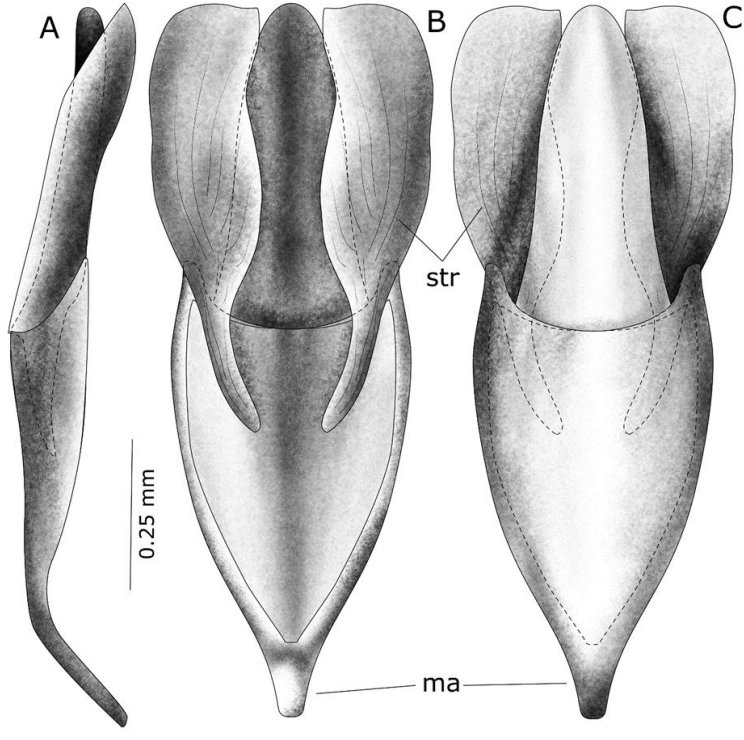


Figure 23. Views of the edeagus of *Anacaena pallida* **sp**. **n**. A. Lateral, B. Dorsal y C. Ventral: ma = manubrium y str = parameral striae.

Differential diagnosis. The head, pronotum and elytron in this species exhibit continuous uninterrupted convexity. However, it is the lateral margin of the pronotum that exhibits the most distinctive diagnostic characters: an abrupt deflection in its medial portion, a horizontal curvature in the anterior region and a marked obliquity in the posterior, which articulates discontinuously with the elytral margin, slight rounded at its base and straight towards the apex.

Locality type. Mantecal-Samán de Apure, Achaguas, Alto Apure, Apure, Venezuela

Material type. Holotype ♂, from Venezuela, Apure, Alto Apure, Achaguas, troncal 19 Mantecal-Samán de Apure, 06.vii.1997, M. García coll., (7° 49'20.90“ N and 68° 51'21.80” W), 74 m (MALUZ06667).

Description. Body shape very convex elongated oval with rounded anterior and posterior margins, seen laterally oblique pronotal margin in contrast with straight elytral margin. Length 1.0 mm and width 0.6 mm, widest at humeral margin. Body coloration earthy brown, with black head except below each eye and pronotum with a dark triangular disk-shaped disk. Brownish palps and antennae; mentum, submentum, proventrite, mesoventrite and metaventrite, black, abdomen brownish; legs brownish-yellowish. Head absent. Pronotum long convexly continuous with elytra; anterior margin slight sinuous; anteroangular margin rounded; lateral margin with posterior half oblique and rounded at its posteroangular margin; posterior margin rounded ends in discontinuity with elytral margin. Scutellum long triangular; commissural stria initiating on second elytral third. Elytral surface with dense coarse punctuation; ventral latero-ventral margin rounded at base and straight towards elytral apex (Fig. 12). Antenna with nine antennomeres, apical segment rounded and broad with concave surface (Fig. 15). Maxillary palps long with very long fourth palpomere with beveled apex and labial palps long and slender, with very long third palpomere with an apical style (Fig. 16). Mentum subquadrate (Fig. 17). Proventrite short. Mesoventrite with elevated mesoventral process, transversely carinate with slight rounded apex; posterior surface arched with fine striations; from basal mesoventral margin projects an elevation covering basal half of process (Figs. 18a and 18b). Metaventrite pubescent on disc with a thin central longitudinal glabrous oval. Abdominal ventrites pubescent. Anterior and middle femur smooth, except for a series of fine setae distributed on the

posterior margin. Hind femur with smooth surface. Edeagus with robust striate parameres, median lobe robust; falobase broad with curved apex and apical manubrium (Fig. 23).

Female. Unknown.

Etymology. The new epithet of this species represents the pale coloration with respect to the rest of the species of this research.

Habitalogy. Similar to the previous species.

Distribution. Similar to the previous species (Fig. 1).

Anacaena paulinacarmenae García y Briceño, **sp**. **n**.
(Figs. 6, 13, 15, 16, 17, 18a-18b, 24).

Differential diagnosis. The new species, *A. paulinacarmenae* sp. n., is characterized by a significantly wider cephalic lateral margin at the upper margin of the eyes, combined with a deeper and more sinuous anterior ocular emargination. The head exhibits reduced convexity and a noticeable discontinuity with the pronotum. The elytral lateral margins, slight parallel, complete the set of diagnostic characters that differentiate it from the described species.

Locality type. Samán de Apure-Mantecal, Achaguas, Alto Apure, Apure, Venezuela.

Material type. Holotype ♂, from Venezuela, Apure, Alto Apure, Achaguas, troncal 19 Mantecal-Samán de Apure, 06.vii.1997, M. García coll., (7° 49'20.90“ N and 68° 51'21.80” W), 74 m (MALUZ06665). Paratype ♂, troncal 19 Apurito-Achaguas, 20.viii.1998, M. García coll., (7° 50'11.69“ N and 68° 18'03.37” W), 62 m (MALUZ06670).

Description. Body shape elongate oval, very convex at the level of the elytra; anterior margin pronounced at the level of the clipeus forming an open V with bulging eyes, posterior margin rounded, with lateral margins slightly parallel. Length 1.0 mm and width 0.6 mm, widest between first and second elytral third. Body coloration earthy

brown, with black head except below each eye and pronotum with a dark triangular disk-shaped disk. Brownish palps and antennae; mentum, submentum, proventrite, mesoventrite and metaventrite black, abdomen brownish; legs brownish yellowish. Head very broad almost twice its length; rounded lateral margin widened at upper margin of eye; surface coarsely punctuated with broad dots; frontoclipeal area forming a slight V-shaped elevation. Labrum short and broad with straight anterior margin and curved posterior margin, very deflexed inclined backwards. Eyes small and bulging separated by four times its diameter with sinuous emargination expanded in the anterior margin of the eyes. Seen side it is scarcely convex, surface almost flat, deflexed (Fig. 6).

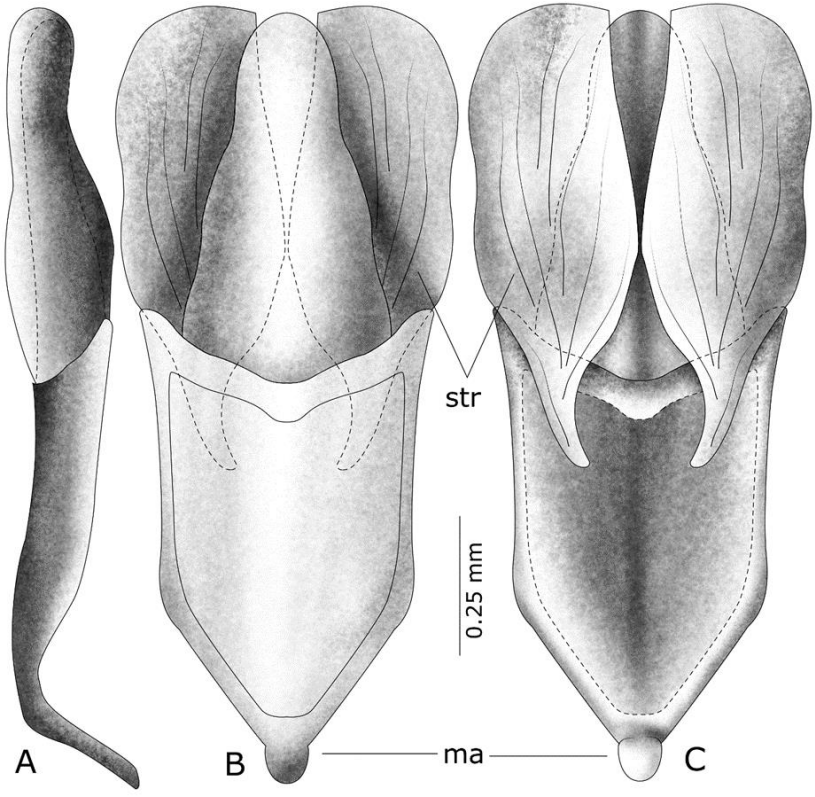


Figure 24. Views of the edeagus of *Anacaena paulinacarmenae* **sp**. **n**. A. Lateral, B. Dorsal y C. Ventral: ma = manubrium y str = parameral striae.

Pronotum long 1.2x cephalic length; slightly convex and discontinuous with elytral margin; anterior margin slight sinuous; anteroangular margin rounded; lateral margin with straight edge; posteroangular margin rounded and posterior margin slightly sinuous with rounded ends very discontiguous with elytral margin; pronotal surface fine punctuation. Scutellum short triangular and commissural stria initiating on second third elytral. Elytral surface punctuated with coarse dots, convex; ventral side margin sinuous (Fig. 13). Antenna with nine antennomeres, apical segment rounded and broad with concave surface (Fig. 15). Maxillary palps long with very long fourth palpomere with beveled apex and labial palps long and slender, with very long third palpomere with an apical style (Fig. 16). Mentum subquadrate (Fig. 17). Proventrite short. Mesoventrite with elevated mesoventral process, transversely carinate with soft rounded apex; posterior surface gently arched with fine striations; from basal mesoventral margin projects an elevation covering basal half of process (Figs. 18a and 18b). Metaventrite pubescent in disc with a thin central longitudinal glabrous oval. Abdominal ventrites pubescent. Anterior and middle femur smooth, except for a series of fine setae distributed on the posterior margin. Hind femur with smooth surface. Edeagus with robust striate parameres, median lobe robust; falobase broad with curved apex and apical manubrium (Fig. 24).

Female. Unknown.

Etymology. The name of this species is dedicated to Paulina Del Carmen Santos Mendoza.

Habitalogy. Similar to the previous species.

Distribution. Similar to the previous species (Fig. 1).

Anacaena samana García y Briceño. **sp**. **n**.
(Figs. 7, 14, 15, 16, 17, 18a-18b, 25).

Differential diagnosis. The cephalic morphology of this species shares similarities with *A. crenituloides* and *A. paulinacarmenae* in width. However, it differs by the presence of a localized cephalic widening at the median margin of the eyes and

a prominent V-shaped frontoclipetal elevation. In lateral view, the pronotum has an elongated lateral margin with a pronounced curvature.

Locality type. Mantecal-Samán de Apure, Achaguas, Alto Apure, Apure, Venezuela.

Material type. Holotype ♂, from Venezuela, Apure, Alto Apure, Achaguas, troncal 19 Mantecal-Samán de Apure, 06.vii.1997, M. García coll., (7° 49'20.90“ N and 68° 51'21.80” W), 74 m (MALUZ06662).

Description. Elongated oval body shape, near homogeneity convex, with rounded anterior and posterior margins. Lateral margins almost continuous. Length 1.1 mm and width 0.6 mm, greater width at the level of the first elytral third. Body coloration earthy brown, with black head except below each eye and pronotum with a dark triangular disk-shaped disk. Brownish palps and antennae; mentum, submentum, proventrite, mesoventrite and metaventrite black, abdomen brownish; legs brownish-yellowish. Head very broad, widened at median margin of eyes; cephalic surface coarsely punctuated with broad dots. Labrum short and broad with slight curved anterior margin and arched posterior margin. Eyes small 4x their diameter apart; anterior margin sinuous (Fig. 7). Pronotum long 1.4x cephalic length; surface fine punctuation; anterior margin sinuate; anteroangular margin rounded; lateral margin arcuate in discontinuity with elytral lateral margin; posterior margin sparsely sinuate with rounded ends. Scutellum long triangular and commissural stria initiating on second third elytral. Elytral surface coarsely punctuated with coarse dots; ventral latero-ventral margin slightly sinuous (Fig. 14). Antenna with nine antennomeres, apical segment rounded and broad with concave surface (Fig. 15). Maxillary palps long with very long fourth palpomere with beveled apex and labial palps long and slender, with very long third palpomere with an apical style (Fig. 16). Mentum subquadrate (Fig. 17). Proventrite short. Mesoventrite with elevated mesoventral process, transversely carinate with rounded apex; posterior surface gently arched with fine striations; from basal mesoventral margin projects an elevation covering basal half of process (Figs. 18a and 18b). Metaventrite pubescent in disc with a thin central longitudinal glabrous oval. Abdominal ventrites pubescent. Anterior and middle femur smooth, except for a series of fine setae distributed on the posterior margin. Hind femur with smooth surface. Edeagus with robust striate parámeros, median lobe robust; falobase broad with curved apex and apical manubrium (Fig. 25).

Female. Similar to the male but longer.

Etymology. The name of this species identifies a gentilities of the population "Samán de Apure" region near the place where the specimen was collected, "samana" means that it belongs to the Samán de Apure.

Habitalogy. Similar to the previous species.

Distribution. Similar to the previous species (Fig. 1).

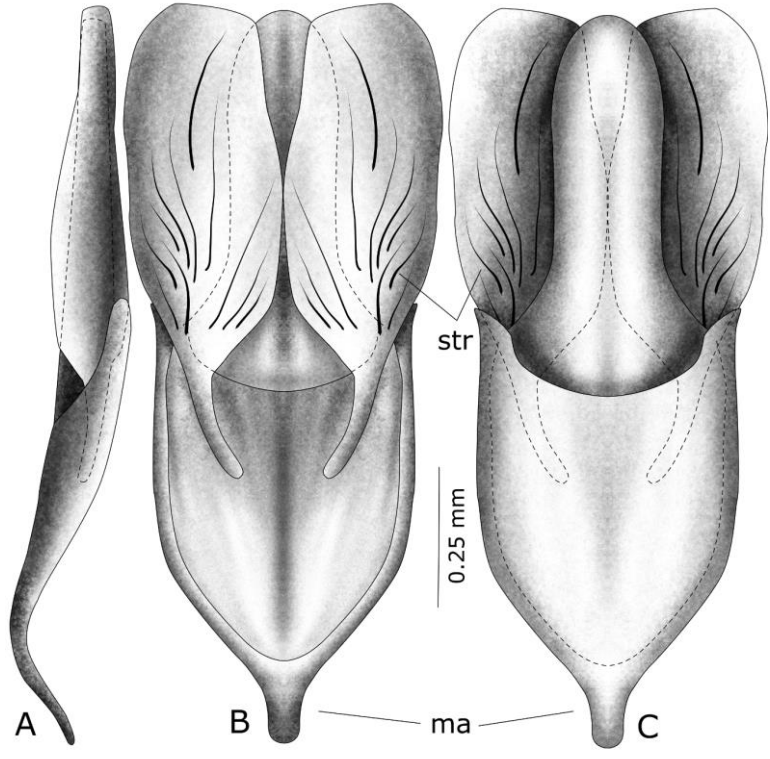


Figure 25. Views of the edeagus of *Anacaena samana* **sp**. **n**. A. Lateral, B. Dorsal y C. Ventral: ma = manubrium y str = parameral striae.

DISCUSSION

The Venezuelan llanos present a great richness of species that include the Alto Apure (Machado-Allison 2020). It is geographically a diverse region, rich in natural resources and of great ecological importance due to its natural richness and diversity, harboring a great variety of ecosystems. This diversity of ecosystems translates into a rich entomological biodiversity (Ruiz-Briceño 2004). The genus *Anacaena* is a cosmopolitan taxon that is present in almost all biogeographic regions. The morphological diversity of aquatic beetles, particularly within a single genus, often presents intriguing patterns that defy simple classification based on external characters.

Morphological analysis of the seven species has revealed a marked heterogeneity in dorsal configuration, where body shape and lateral profiles emerge as distinctive characters. In contrast, ventral characters, such as mouthparts, thorax and abdomen, show a remarkable uniformity, suggesting a strong evolutionary conservation of these features.

Future research and phylogenetic analysis is essential to elucidate the evolutionary relationships among these species and to understand the genetic and ecological mechanisms underlying their diversification (Ribera *et al*. 2001).

The convergence in ventral morphology of the *Anacaena* species in this research may be possible due to the fact that they share a similar way of life in the aquatic substrate, which would require specific adaptations in ventral structures for locomotion and interaction with the environment. The uniform brownish coloration could serve as camouflage in similarly colored backgrounds such as the mud of a pond with turbid water (Schluter 2000). The seven *Anacaena* species in question may share a recent common ancestor that already possessed the ventral features we observe today. Diversification in dorsal morphology could be a more recent phenomenon, driven by local selective pressures and adaptations to specific microhabitats (Wheeler 1990, Nilsson 2010).

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