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DYNASTINAE FROM EASTERN
VENEZUELA WITH A KEY TO THE
NEW WORLD GENERA OF
PENTODONTINI (COLEOPTERA:
SCARABAEIDAE: DYNASTINAE)

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**COLLAGENUS DASYSTERNUS, A NEW GENUS AND SPECIES OF DYNASTINAE
FROM EASTERN VENEZUELA WITH A KEY TO THE NEW WORLD GENERA
OF PENTODONTINI (COLEOPTERA: SCARABAEIDAE: DYNASTINAE)**

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*Whenever I hear of the capture of rare beetles,
I feel like an old war horse at the sound of a trumpet*
—Charles Darwin

Abstract

Collagenus dasysternus Ratcliffe and Hardy, **new genus** and **species**, is described from eastern Venezuela. We include a revised key to the 26 genera of New World Pentodontini.

When the second author (Hardy) first saw this Venezuelan specimen in the Henry Howden collection, he could not readily place it to genus. When the first author (Ratcliffe) received the specimen from Hardy for examination in mid-2003, he was immediately taken with its *gestalt* similarity with the genus *Coscinocephalus* Prell that occurs in Arizona and Mexico. Unfortunately, there is only one specimen, but our examination revealed such unique character states that were indicative of a new, undescribed genus and species that we describe it here. We utilize the Phylogenetic Species Concept as outlined by Wheeler and Platnick (2000). This concept defines species as the smallest aggregation of sexual populations diagnosable by a unique combination of character states. Whether this species occurs rarely in nature remains unknown, but the area from which it was collected is readily accessible if someone wanted to make a concerted effort to find additional specimens. During a visit by one of us (Ratcliffe) to the extensive collections of the Universidad Central de Venezuela in Maracay in 1999, similar specimens were not found.

With the new genus described here, the tribe Pentodontini now contains 26 genera and a few more than a hundred species in the New World. Endrödi (1969, 1985) comprehensively reviewed and defined the Pentodontini, and this tribal concept was used by Ratcliffe (2002) in the latest generic treatment of the North American dynastines. Endrödi's definition did not address monophyly, and we remain concerned that the Pentodontini (as currently defined) may not be monophyletic. In particular, the head and pronotal armature as well as the form of the meso- and metatibiae used to characterize the tribe are not consistently expressed.

Until such time as the monophyly of the Pentodontini is resolved, we place our new genus in the Pentodontini because it possesses the following characters: a weak tubercle on the frons, a strong frontoclypeal carina, tridentate foretibia, and a truncate metatibia with a fringe of short, spine-like setae on the apex.

The last generic keys to adults of the New World Pentodontini were by Ratcliffe (1981) and Endrödi (1985). Morón and Ratcliffe (1997) transferred the genus *Coscinocephalus* from the Cyclocephalini to the Pentodontini, but it has never been incorporated into a comprehensive generic key. In addition, the genus *Oryctomorphus* Guérin-Meneville has bounced back and forth between the Rutelinae (*i.e.*, Machatschke 1972) and Dynastinae (*i.e.*, Endrödi 1985). It is in the key by Ratcliffe (1981), but molecular data based on 28S and 18S DNA gene regions suggest that *Oryctomorphus* is a member of the subfamily Rutelinae (A. Smith and D. Hawks, unpubl. data), and so it is not included in the present key. We provide a revised key to the adults of all the New World genera of Pentodontini. Morón and Ratcliffe (1997) provided a key to nine genera of larval Pentodontini.

Collagenus Ratcliffe and Hardy, **new genus**

Type Species. *Collagenus dasysternus* Ratcliffe and Hardy, **new species**, here designated.

Description. Scarabaeidae, Dynastinae, Pentodontini. *Form:* Suboval, pronotum widest at middle, elytra widest past middle. Length of only known specimen 20.1 mm. *Color:* Light and dark reddish brown. *Head:* Frons at center with weakly elevated, flattened boss. Frontoclypeal carina strong, elevated completely from side to side. Clypeus with apical rim swollen, strongly reflexed; venter of clypeus greatly swollen and plump. Mandibles small, subtriangular, completely hidden beneath clypeus. Mentum strongly swollen and protuberant ventrally. *Pronotum:* Surface completely, moderately punctate. *Elytra:* Surface with 5 distinctly furrowed striae (2 double rows plus 1 sutural stria). *Pygidium:* Surface completely, moderately punctate, strongly convex. *Legs:* Legs with moderately dense, long, yellowish brown setae. Foretibia tridentate; apical tooth slightly removed, larger, curved; apex obliquely truncate. Apices of meso- and metatibiae each with fringe of stout bristles. Tarsi and claws slender. *Venter:* Thoracic sternites with dense, long, yellowish brown setae. Prosternal process a small, rounded protuberance. Abdominal sternites shiny, glabrous.

Diagnosis. *Collagenus* can be easily distinguished from similar genera because of the unique form of the greatly thickened rim on the broadly parabolic clypeal apex, ventrally protuberant mentum, strong frontoclypeal carina, absence of tubercles or a fovea on the pronotum, long tarsi, densely setose thoracic sternites, small rounded prosternal process, and the crenulate apex of the posterior tibiae.

Etymology. One of the most striking features of this new genus is the greatly swollen apical rim and venter of the clypeus that gives the impression of swollen “lips.” In some circles today, it is cosmetically fashionable to enlarge human lips by injecting them with collagen, an insoluble fibrous protein. Collagen is derived from the Greek *kolla*, meaning glue. *Collagenus* is a play on combining “collagen” (in reference to its use to enlarge lips) and “genus” (in reference to this new genus), hence (loosely) the big-lipped genus. The name *Collagenus* is considered masculine.

Collagenus dasysternus Ratcliffe and Hardy, **new species** (Figs. 1–4)

Type Material. Holotype labeled “Ven: Bolivar, 10 km N Corocito, 18.VI-3. VII.87, S&J Peck, FIT, R. Caura rainforest.” Holotype deposited at the Canadian Museum of Nature (Ottawa, Canada).

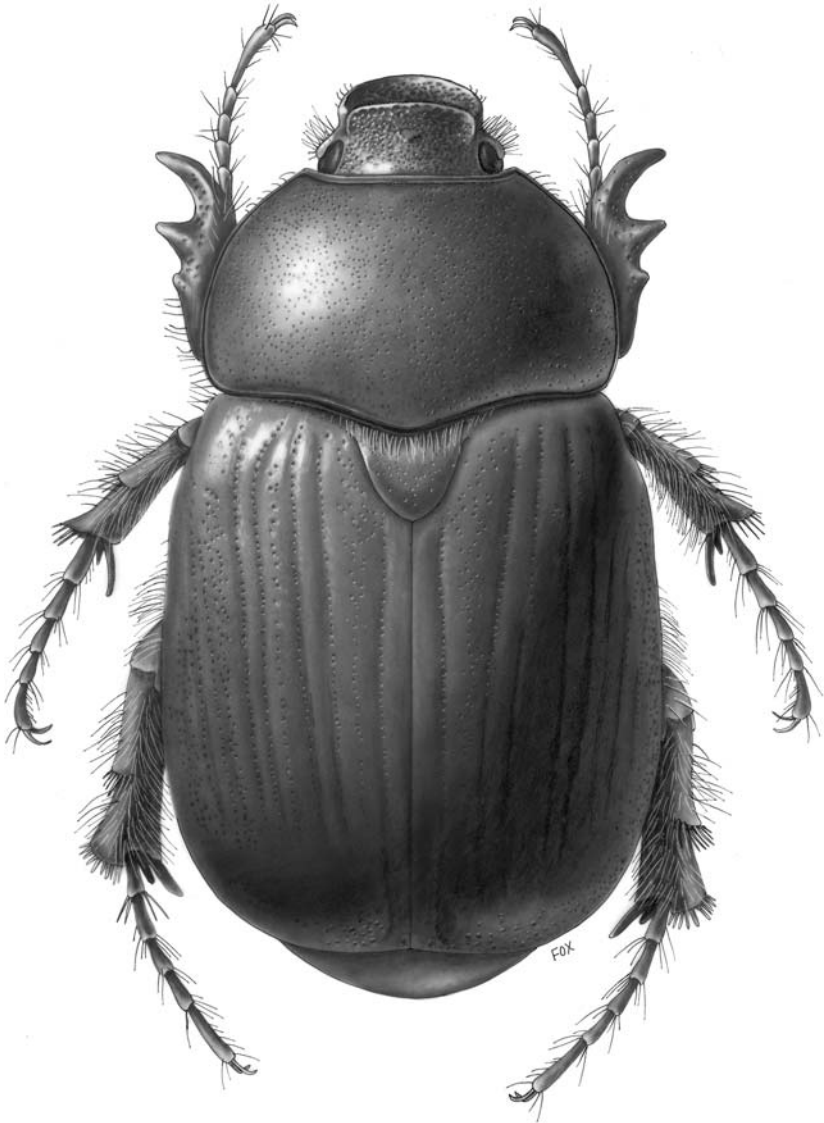


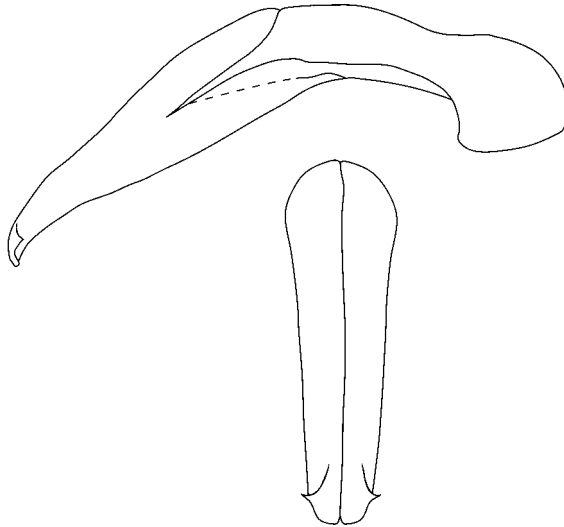
Fig. 1. Habitus of *Collagenus dasystemus* Ratcliffe and Hardy, **new genus and species.**

Description of Holotype. Male (Fig. 1). Length from apex of clypeus to apex of elytra 20.1 mm; width at humerus 9.6 mm. Color of dorsum and legs dark reddish brown, color of pygidium and venter reddish brown. *Head:* Frons with surface densely, coarsely rugopunctate; center with small, transverse, feebly elevated boss. Frontoclypeal carina strong, elevated, complete from side to side, weakly arcuate towards posterior. Clypeus with surface densely, coarsely rugopunctate; apex broadly parabolic, with strongly thickened anterior rim, rim strongly reflexed (Fig. 2); clypeus greatly swollen ventrally. Mandibles small, subtriangular, slender, completely hidden beneath



Fig. 2. Head (dorsal view) of *Collagenus dasystemus*.

clypeus. Mentum enlarged and strongly protuberant ventrally. Interocular width equals 5.0 transverse eye diameters. Anterior edge of eye canthus with dense, long, reddish brown setae. Antenna with 10 segments, club subequal in length to segments 2–7. Maxillary palpus with last segment longitudinally depressed and roughened on lateral edge, length 3 times longer than preceding (third) segment, third segment half as long as second segment. *Pronotum*: Surface entirely punctate; punctures moderate in density, size small (becoming slightly larger in anterior and



Figs. 3–4. Parameres of *Collagenus dasystemus*.

posterior angles). All margins with strong bead. Sides evenly arcuate. *Elytra*: Surface between suture and humerus with 1 furrowed sutural stria and 2 pair of furrowed discal striae. Intervals slightly convex, those between striae 1–2 and 4–5 with irregular row of large punctures. Sides laterad of humerus with 4 distinct rows and 2 indistinct rows of punctures. *Propygidium*: Surface finely alutaceous with moderately dense, small punctures. *Pygidium*: Surface entirely punctate; punctures moderate in density and size, becoming slightly smaller at apex. In lateral view, surface strongly, evenly convex. *Legs*: Trochanter and femora with dense, long, yellowish brown setae. Tibiae with moderately dense, long, stout, yellowish brown setae, those on anterior femora mostly on venter. Foretibia tridentate, teeth becoming progressively larger from base to apex; apical tooth slightly removed from others, long, curved; apex of foretibia obliquely truncate. Meso- and metatibiae each with strong, obliquely transverse carina at about middle on lateral edge; apices expanded, each with fringe of long, stout bristles. Tarsi slender, subequal in length to their respective tibiae, each tarsomere at apex with 5–10 long, stout, reddish brown setae. Claws slender, equal in size. *Venter*: Thoracic sternites clothed with dense, long, yellowish brown setae. Prosternal process a very small, rounded protuberance. Abdominal sternites shining, glabrous except for about 20 small setae in a transverse row on penultimate segment. Last sternite with apex weakly bisinuate. *Parameres*: Figs. 3–4.

Etymology. From the Greek roots *dasy*, meaning shaggy or hairy, and *sternon*, meaning chest or sternum. So named in reference to the densely setose thoracic sternites, hence *dasy**sternus*.

Distribution. Known only from a single specimen collected in a flight intercept trap just north of Corocito, which is south of Ciudad Piar on the west side of Embalse de Guri in Bolivar state, Venezuela. Nothing is known of its biology.

Revised Key to the Genera of New World Pentodontini

- | | | |
|--------|--|--|
| 1. | Antenna with 9 segments | 2 |
| 1'. | Antenna with 10 segments | 3 |
| 2(1). | Head in both sexes with a short horn. Apical region of pronotum declivous. Argentina | <i>Eremobothynus</i> Ohaus 1910 |
| 2'. | Head lacking horns, instead with a transverse carina. Apical region of pronotum not declivous. SW United States | <i>Aphonides</i> Rivers 1889 |
| 3(1'). | Small species, <i>generally</i> less than 15 mm in length. Head lacking carina, tubercles, or horn (rarely with a trace of tubercles). Pronotum lacking tubercles or fovea. Posterior tibia strongly broadened towards apex | 4 |
| 3'. | Larger species, <i>generally</i> greater than 15 mm in length. Head with transverse carina (on subapex of clypeus or frontoclypeal suture), tubercles, or horn. Pronotum usually with tubercles (rarely obsolete in <i>Aphonus</i> , <i>Indieraligus</i> , <i>Collagenus</i> , some <i>Tomarus</i> , occasionally <i>Philoscaptus</i>) and usually with a fovea or sulcus behind tubercles. Posterior tibia not strongly broadened apically | 7 |
| 4(3). | Color black | 5 |
| 4'. | Color rufous or reddish yellow | 6 |
| 5(4). | Pronotum completely and distinctly punctate. Propygidium lacks stridulatory striae. Southern United States through South America | <i>Euetheola</i> Bates 1888 |
| 5'. | Pronotum virtually impunctate. Propygidium with stridulatory striae. African genus with one species introduced into southern Brazil | <i>Heteronychus</i> Burmeister 1847 |
| 6(4'). | Posterior femur greatly thickened, apex of posterior tibia greatly expanded. Peru | <i>Pentodina</i> Endrödi 1968 |
| 6'. | Posterior femur normal, apex of posterior tibia not greatly expanded. Honduras to Brazil and Peru | <i>Parapucaya</i> (in part) Prell 1934 |

- 7(3'). Size large (30–35 mm). Color rufous. Mandibles without teeth on external margin. Male with central horn on head, pronotum with a strong bifurcate tubercle or horn. Anterior tibia with a small, basal, fourth tooth. Posterior leg with basal tarsomere very wide. Propygidium without stridulatory striae. Argentina, Brazil, Colombia *Thronistes* Burmeister 1847
- 7'. Not with above combination of characters 8
- 8(7'). Clypeal apex acute, unidentate 9
- 8'. Clypeal apex bidentate, truncate, or rounded 10
- 9(8). Mandibles large, tridentate. Southern United States, northern Mexico without tubercles. Size generally less than 17 mm. United States west of the Rocky Mountains *Oxygrylius* Casey 1915
- 9'. Mandibles smaller, nearly hidden by clypeus, lacking lateral teeth. South America *Oxyligyrus* Arrow 1908
- 10(8'). High, transverse carina present immediately behind apex of clypeus 11
- 10'. Transverse carina absent immediately behind apex of clypeus 12
- 11(10). Transverse carina (usually tridentate) just behind apex of clypeus. Pronotum without tubercles. Size generally less than 17 mm. United States west of the Rocky Mountains *Aphonus* LeConte 1856
- 11'. Transverse carina just behind apex of clypeus entire or bidentate. Pronotum tuberculate or not. Size generally greater than 17 mm. Central and SW United States, Mexico, Guatemala, El Salvador, Nicaragua, Honduras *Orizabus* Fairmaire 1878
- 12(10'). Mandibles only slightly visible from above or hidden under clypeus; outer edge arcuate, not toothed or convexly rounded 13
- 12'. Mandibles distinctly visible from above; outer edge toothed or convexly rounded or lobed 17
- 13(12). Clypeus strongly narrowed toward apex, apex narrowly bidentate. Color castaneous to black. Canada to Chile *Tomarus* (in part) Erichson 1847
- 13'. Clypeus not strongly narrowed toward apex, apex broadly truncate. Color fulvous to rufocastaneous 14
- 14(13'). Frontoclypeal suture present, deeply impressed, strongly arcuate either side of middle. Head lacking horns or tubercles. Length 14 mm or less. Honduras to Brazil and Peru *Parapucaya* (in part) Prell 1934
- 14'. Frontoclypeal suture absent. Head with horns, tubercles, or low boss. Length 18 mm or greater 15
- 15(14'). Small horn (males) or tubercle (females) present next to each eye. Apex of pronotum declivous with subapex weakly to strongly bituberculate. Panama, Colombia, Ecuador *Pucaya* Ohaus 1910
- 15'. Paired horns or tubercles absent. Center of head with, at most, a low boss. Apex of pronotum evenly convex 16
- 16(15'). Clypeus with apex strongly emarginate, reflexed, apical rim thin. Center of head slightly tumid. Prosternal process long, columnar. SW United States, N. Mexico *Coscinocephalus* Prell 1936
- 16'. Clypeus with apex broadly parabolic, apical rim strongly thickened (Fig. 2). Center of head with strong, elevated carina, carina complete from side to side. Prosternal process small, rounded. Venezuela *Collagenus* Ratcliffe and Hardy, **new genus**
- 17(12'). Mandibles entire or lobed on lateral edge 18
- 17'. Mandibles distinctly tridentate (1 apical tooth, 2 lateral teeth) 23
- 18(17). Apex of clypeus narrowly bidentate. Ecuador (Galapagos Islands) *Neobothynus* Prell 1936
- 18'. Apex of clypeus truncate, acute, or narrowly rounded 19
- 19(18'). Clypeus abruptly constricted at apex; tip elongate, narrowly truncate or

- rounded. Males with head horn, pronotum with bifurcate horn; females lacking horns. Color piceous (females) to grey-tomentose (males), opaque. Brazil, Argentina *Diloboderus* Reiche 1859
- 19'. Clypeus regularly acuminate, subtriangular. Horns absent. Color castaneous, shining 20
- 20(19'). Pronotum lacking distinct apical fovea, sulcus, or tubercle or fovea either side of middle; marginal bead absent on base. Scutellum impunctate. Base of pygidium, lateral edge of abdominal sternites and meso- and metatibiae with extremely long, dense setae. Puerto Rico *Indieraligus* Dechambre 1979
- 20'. Pronotum with distinct apical fovea, sulcus, or tubercle or fovea either side of middle; marginal bead present on base. Scutellum with punctures. Setae present on meso- and metatibiae, pygidium, or sternites but extremely long setae absent 21
- 21(20'). Clypeus strongly convex on dorsal surface. Frontoclypeal suture strongly elevated into a transverse, weakly bituberculate ridge. Pronotum with a shallow, ovoid concavity in median half behind subapical tubercle (male) or with subapical rounded swelling (female). Elytron with sutural stria and 3 feebly indicated discal striae. Mexico *Gillaspytes* Howden 1980
- 21'. Clypeus not strongly convex on dorsal surface, either weakly convex in basal half only or weakly concave. Frontoclypeal suture with a transverse tubercle only. Pronotum lacking a shallow, ovoid concavity in median half behind apical margin, instead a median longitudinal sulcus or a shallow fovea either side of middle. Elytron with sutural stria and 4–5 punctate-striate rows on disc 22
- 22(21'). Apex of clypeus narrowly truncate. Tubercle on head entire. Pronotum with shallow fovea either side of disc; subapical sulcus and apical tubercles absent. Metasternum setigerously punctate in anterior half only. Paraguay *Heikeianus* Endrödi 1978
- 22'. Apex of clypeus narrowly rounded. Tubercle on head feebly emarginate. Pronotum without fovea either side of middle; both sexes with a weak, subapical, longitudinal sulcus (weaker in females), and males with an apical, emarginate tubercle. Metasternum completely, setigerously punctate. Panama, Costa Rica *Barutus* Ratcliffe 1981
- 23(17'). Propygidium with stridulatory striae or granules 24
- 23'. Propygidium lacking stridulatory striae or granules 26
- 24(23). Apical segment of maxillary palpus expanded, triangular. South America *Hylobothynus* Ohaus 1910
- 24'. Apical segment of maxillary palpus normal, cylindrical 25
- 25(24'). Foretibia tridentate. Mexico through South America *Bothynus* Hope 1837
- 25'. Foretibia bidentate. Southern Brazil *Parabothynus* Endrödi 1968
- 26(23'). Elytron with sparse, minute punctures, appearing smooth. Clypeus on sides constricted at base. Southern Brazil *Aceratus* Prell 1936
- 26'. Elytron distinctly punctate or punctate-striate. Clypeus not constricted at base 27
- 27(26'). Body form suboval, stout, strongly convex on dorsum. Surface coarsely punctate-striate. Frontoclypeal carina short, less than 1/3 width of base of clypeus. Pronotum evenly convex or with a trace of an apical tubercle. Argentina, Uruguay, S. Brazil *Philoscaptus* Bréthes 1919
- 27'. Body form more elongate, less stout, not strongly convex on dorsum. Surface variably punctate. Frontoclypeal carina long, interrupted at middle or not or

replaced by 2 distinct tubercles. Pronotum with or without apical tubercle and subapical fovea. Canada to Chile *Tomarus* (in part) Erichson 1847

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