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A revision of the genus *Haroldiataenius* Chalumeau
(Scarabaeidae: Aphodiinae: Eupariini)

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Abstract. The genus *Haroldiataenius* Chalumeau, 1981 (Aphodiinae: Eupariini) from southern United States, Mexico, and Central America is revised and nine species are recognized. The subgeneric name *Sayloria* Chalumeau, 1981 is **synonymized** with *Haroldiataenius* (*sensu stricto*) and *Ataenius sabinoi* Cartwright, 1974 is **synonymized** with *A. lucanus* Horn, 1871. Five species are transferred to *Haroldiataenius* from the genus *Ataenius* Harold creating the following new combinations: *H. convexus* (Robinson), *H. griffini* (Cartwright), *H. lucanus* (Horn), *H. saramari* (Cartwright), and *H. semipilosus* (Van Dyke). One **new species**, *Haroldiataenius buvexus* is described from Texas, USA. A key to species of *Haroldiataenius* is included and pertinent morphological details are illustrated.

Key words. Eupariini, *Haroldiataenius*, new combinations, new synonymy, southern United States, Central America.

Introduction

Haroldiataenius was originally proposed by Chalumeau (1981) for two Mexican species formerly placed in the genus *Ataenius* Harold: *A. mariarum* Bates and *A. hintoni* Saylor. Subsequently, *Ataenius limbatus* Bates was combined with *Haroldiataenius* by Galante et al. (2003) and Stebnicka (2007). In this paper, we transfer five additional species that share similar character states from *Ataenius* to *Haroldiataenius*. The genus is apparently restricted in distribution to the area from the southern United States to Central America. These species are found to occur in open sandy soils, associated with leafcutter ants (*Atta* spp.), and in the burrows of small mammals.

Materials and Methods

Specimens of the Eupariini have been studied over many years; however, members of *Haroldiataenius* were found to be poorly represented in collections. Specimens cited here are in the following collections: **ABCG** – Axel Bellmann Collection, Bremen, Germany; **CASC** – California Academy of Sciences, San Francisco, CA, USA; **CEUA** – Collection of Entomology, University of Alicante, Spain; **CMNO** – Canadian Museum of Nature, Ottawa, Canada (includes H. & A. Howden Collection); **EGRC** – E. G. Riley Collection, College Station, TX, USA; **FSCA** – Florida State Collection of Arthropods, Gainesville, FL, USA; **ISEA** – Institute of Systematics and Evolution of Animals, Polish Academy of Sciences, Krakow, Poland; **MCZC** – Museum of Comparative Zoology, Harvard University, Cambridge, MA, USA; **NHML** – Natural History Museum, London, United Kingdom; **NMNH** – National Museum of Natural History, Smithsonian Institution, Washington, DC, USA; **NHRS** – Naturhistoriska Riksmuseet, Stockholm, Sweden; **PESC** – Paul E. Skelley Collection, Gainesville, FL, USA; **PKLC** – Paul K. Lago Collection, University, MS, USA; **RHTC** – Robert Turnbow Collection, Enterprise, AL, USA; **TAMU** – Texas A&M University, College Station, TX, USA; **WBWC** – William B. Warner Collection, Chandler, AZ, USA; **ZMHB** – Zoologisches Museum für Naturkunde der Humboldt Universität, Berlin, Germany.

Genus *HAROLDIATAENIUS* Chalumeau

Haroldiataenius Chalumeau 1981: 137. Type species *Ataenius mariarum* Bates, 1887, by original designation. – Dellacasa 1988: 339 (catalogue).

Sayloria Chalumeau 1981: 138 [as subgenus of *Haroldiataenius*]. Type species *Ataenius hintoni* Saylor, 1933, by original designation. **New synonymy.**

Aphotaenius: Chalumeau 1983: 1-3 (captions to fig. 1-6 erroneously labeled as *Aphotaenius*).

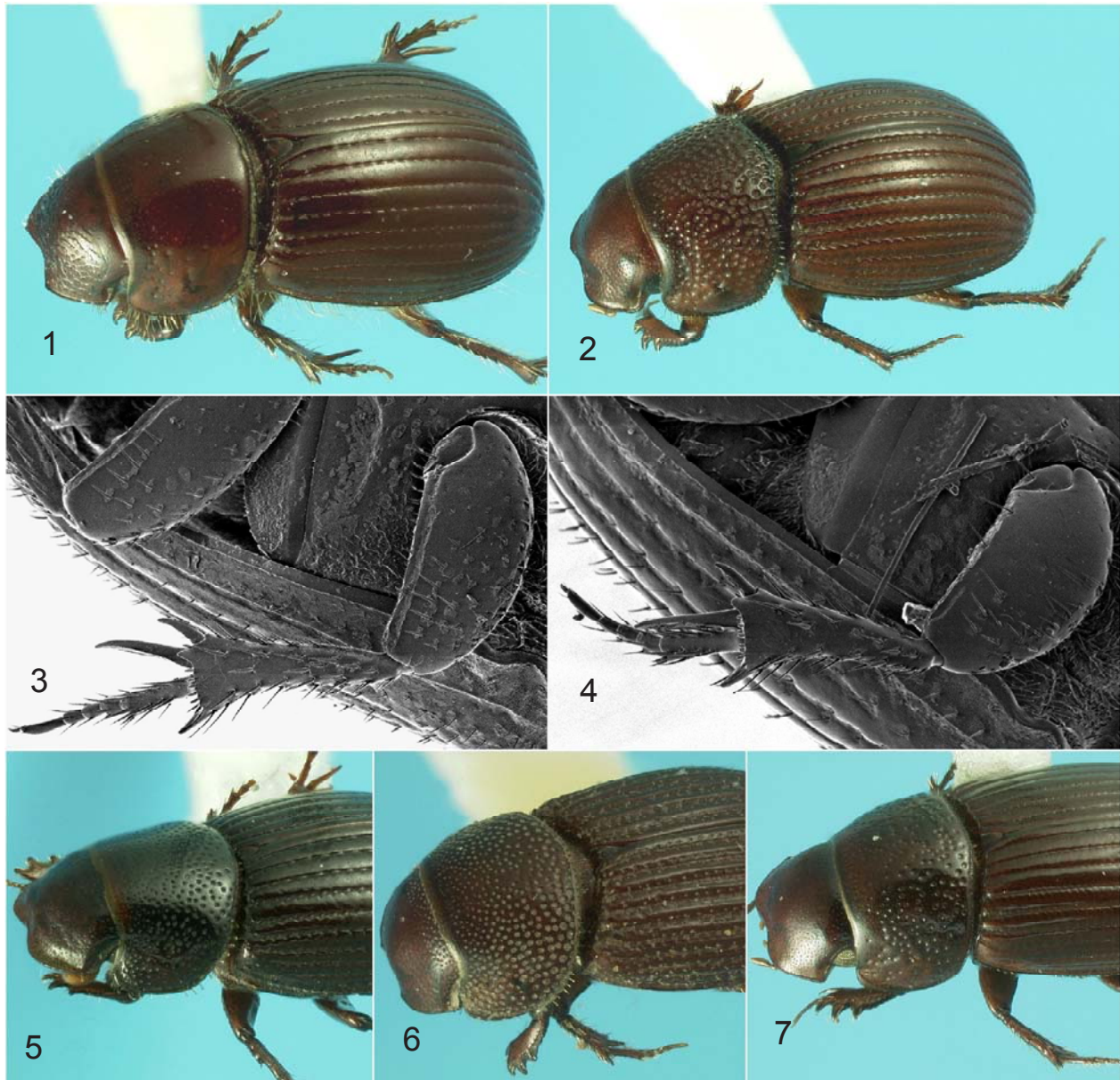
Diagnosis. Body robust, psammodiiform, oval to weakly elongate, strongly convex, length 3.0-5.0 mm. Clypeal anterior face widely deplanate within median emargination, clypeal surface transversely rugulose or smooth; anterior clypeal margin evenly rounded or dentate either side of emargination. Elytra ovoid, strongly convex; margins fringed with fine setae, often short, occasionally indistinct; humerus with carina between 7th elytral interval and epipleural angle, shoulders slightly flattened. Abdominal sternites finely fluted along sutures; lateral sternites 4-5 and disc of pygidium with row of blunted setae. Mesotibia greatly widened at apex; apical margin usually with strong lateral accessory spine, with weak or without median accessory spine. Metatibia more or less dilated apically, median or lateral accessory spine present or absent; tarsi shorter than tibiae. External sexual dimorphism difficult to recognize, usually disc of pygidium in male longer than in female. Male genitalia small, lightly sclerotized.

Remarks. Some members of *Haroldiataenius* are associated with leaf-cutter ants (*Atta* spp.) (Stebnicka 2007) and possibly other ants. Other members may be detritivores in sandy soils, which may opportunistically use detritus around ant nests.

Distribution. Southern USA, Mexico, Guatemala, Honduras, Panama.

Key to Species of *Haroldiataenius*

1. Body psammodiiform (Fig. 12); lateral margins of pronotum and elytron with long setal fringe, setal length much greater than distance between setal bases (Fig. 1). Clypeus transversely rugose. Mexico, Panama ***H. mariarum* (Bates)**
- Body psammodiiform to robustly elongate (Fig. 13-15); lateral margins of pronotum or elytron bare, or with fringe of short setae; if setae present, then length equal to or less than distance between setal bases (Fig. 2, 5-11). Clypeus punctate, smooth, or weakly rugose **2**
- 2(1). Meso- and metafemoral posterior margin with distinct, complete line from trochanter to apex (Fig. 3) **3**
- Meso- and metafemoral posterior margin lacking complete line, if present, then only in distal half (Fig. 4) **4**
- 3(2). Clypeus rounded each side of median emargination. Base of head lacking band of coarse punctures. Elytral intervals convex (Fig. 5), lacking setae on disc, some setae may be visible on apical declivity. Florida, USA ***H. saramari* (Cartwright)**
- Clypeus angulate to distinctly toothed each side of median emargination. Base of head with band of coarse punctures. Elytral intervals tectiform, with short setae (Fig. 6). Baja California, Mexico and Arizona, USA ***H. lucanus* (Horn)**
- 4(2). Lateral pronotal margin lacking distinct setae; lateral bead of pronotum gradually thickened toward anterior angle (Fig. 7). Mexico, Guatemala, Honduras, El Salvador ***H. limbatus* (Bates)**
- Lateral pronotal margin with distinct setal fringe; lateral bead of pronotum fine throughout length, not distinctly thickened near anterior angles **5**



Figures 1-7. *Haroldiataenius* spp. 1) *H. mariarum*, lateral habitus. 2) *H. hintoni* lateral habitus. 3) *H. lucanus*, mesotibia. 4) *H. semipilosus*, mesotibia. 5) *H. saramari*, lateral habitus. 6) *H. lucanus*, lateral habitus. 7) *H. limbatus*, lateral habitus.

- 5(4). Pronotal punctures of uniform size, punctures dense, separated by less than one diameter over entire surface (Fig. 2, 15); base of pronotum with marginal line obscured by coarse punctures. Mexico, Guatemala, Honduras ***H. hintoni* (Saylor)**
- Pronotal punctures mixed fine and coarse; coarse pronotal punctures more widely scattered, separated by at least their own diameter (Fig. 8-11); base of pronotum with distinct marginal line **6**
- 6(5). Clypeus strongly angulate to dentate each side of median emargination. Elytral intervals with long scattered setae, most prominent laterally (Fig. 8). Texas and Arizona, USA; Mexico ***H. semipilosus* (Van Dyke)**
- Clypeus rounded or angulate each side of median emargination. Elytral intervals lacking setae (Fig. 9-11). Southern Texas, USA **7**

- 7(6). Lateral elytral margin with indistinct fringe of setae, if visible, setae distinctly shorter than distance between their bases (Fig. 9). Coarse pronotal punctures more widely scattered, diameter equal to or less than width of basal pronotal margin *H. griffini* (Cartwright)
- Lateral elytral margin with distinct fringe of short setae, setae as long as distance between their bases (Fig. 10-11). Coarse pronotal punctures evenly distributed basally, their diameter generally greater than width of broad basal pronotal margin 8
- 8(7). Clypeal anterior margin evenly rounded each side of median emargination (Fig. 10). Elytral intervals weakly convex on disc. Body dark brown, nearly black. Big Bend region, Texas, USA *H. buvexus*, n. sp.
- Clypeal anterior margin angulate each side of median emargination (Fig. 11). Elytral intervals strongly convex on disc. Body dark reddish brown. Southern coastal Texas, USA *H. convexus* (Robinson)

***Haroldiataenius mariarum* (Bates)**

(Fig. 1, 12, 16, 22)

Ataenius mariarum Bates 1887: 102 – Cartwright 1964: 101.

Haroldiataenius mariarum – Chalumeau 1981: 138-139, fig. 1, 3; Dellacasa 1988: 339 (catalogue).

Psammodyus perpolitus Schmidt 1916: 105 – Chalumeau 1981: 138-139 (as synonym of *A. mariarum*).

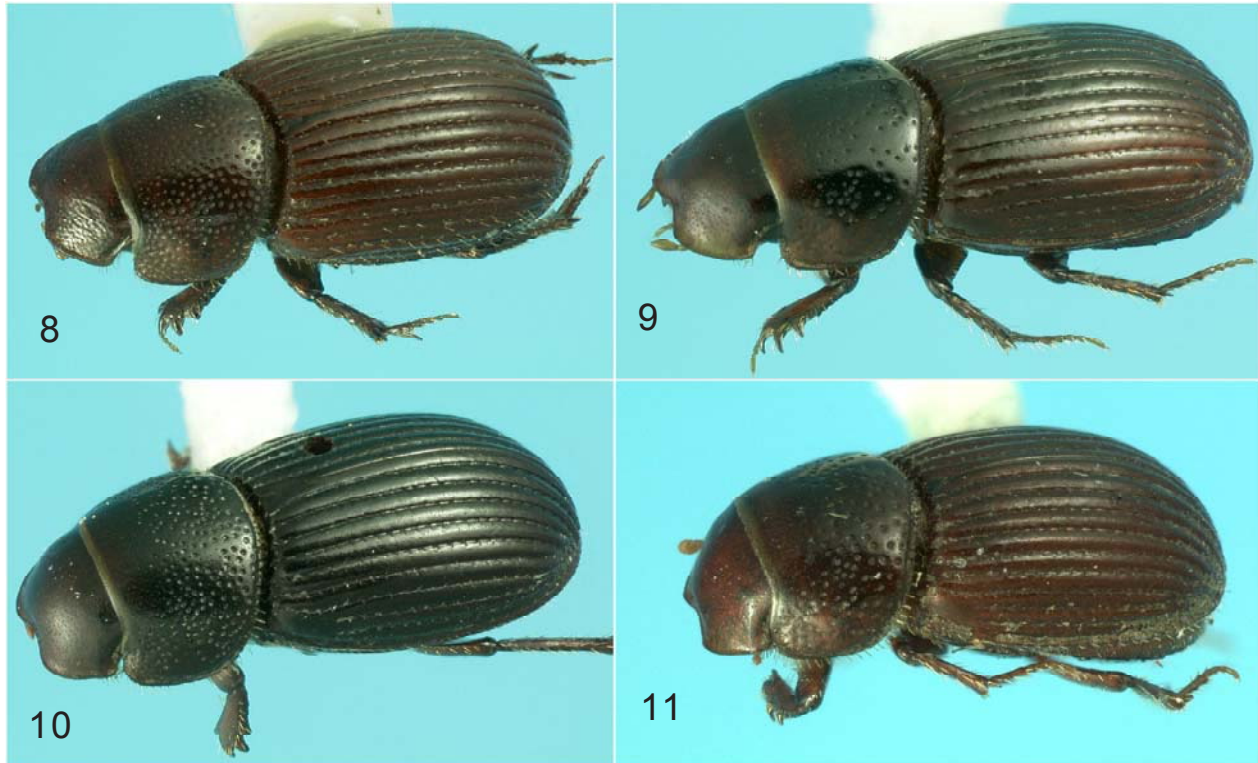
Diagnosis. Clypeal margin angulate each side of middle, surface strongly wrinkled. Pronotum with coarse punctures laterally, widely scattered, weakly defined. Pronotum with basal marginal line strong, broad laterally, narrowed medially. Lateral margins of pronotum and elytron with long fringe of setae. *Haroldiataenius mariarum* is found in Mexico and Panama.

Description. Length 4.5-5.0 mm. Body oval, strongly convex, castaneous, shining (Fig. 1, 12). Clypeal margin subdentate each side of median emargination; surface coarsely wrinkled, frontal area smooth; genae small. Pronotum transverse, sides and base margined, setose; surface with extremely minute punctures throughout and moderate, shallow punctures scattered on sides. Scutellum relatively large, semioval. Elytral humeral lamella obtusely produced laterad; striae narrowly impressed, punctures fine; intervals flat to slightly convex, smooth; elytral margin with long pale setae. Ventral sclerites setose; meso-metasternal carina short with clump of setae; metasternum smooth; abdominal sternites 2-4 without fluting along sutures, all sternites with row of setae; disc of pygidium weakly eroded, punctate. All femora setigerous; posterior line of metafemur incomplete; meso- and metatibia strongly widened apically; mesotibia with traces of transverse ridges; metatibia with row of granules on outer side and row of very short setae apically, without accessory spine; basal tarsomere of metatarsus markedly shorter than upper tibial spur and subequal in length to following three tarsomeres combined. Epipharynx as in Fig. 16. Male genitalia with parameres narrowed, elongate (Fig. 22).

Type data. *Ataenius mariarum* (examined, sex not determined) lectotype (Tres Marias Is., W Mexico) designated by Cartwright (1964), in NHML.

Psammodyus perpolitus (examined, sex not determined): lectotype (Panama, Vadona) designated by Chalumeau (1981), in NHRS.

Specimens examined (21). **Mexico** – (1 ex from type series) Tres Marias Is. (ISEA); (6 ex) Guerrero, Acapulco, 28.VI.1956. R. E. Beer & party (PESC); (2 ex) Guerrero, Acapulco, 20.VIII.1938, L. Lipovsky (FSCA); (2 ex) Guerrero, 20 mi E Acapulco, 12.VIII.1962, U. Kans. Mex. Exped. (PESC); (1 ex) Nayarit, San Blas, 17-21.IX.1953, at light, B. Malkin (FSCA); (7 ex) Oaxaca, Salino Cruz, 29.VI.1970, P. M. Jump (PESC, ISEA); (1 ex) Sinaloa, Culiacan, 2.VII.1972, K. Stephan leg. (FSCA); (6 ex) Sinaloa, 1 mi S of Mazatlan, 10.VIII.1965, collection G. H. Nelson, at lite [sic] (FSCA); (1 ex) Sonora, Yavaros, 31.VII.1952, C.&P. Vaurie (FSCA).



Figures 8-11. *Haroldiataenius* spp., lateral habitus. 8) *H. semipilosus*. 9) *H. griffini*. 10) *H. buvexus*, paratype. 11) *H. convexus*, holotype.

Remarks. *Haroldiataenius mariarum* is readily distinguished from other species of the genus by the long setae along the lateral margin of the pronotum and elytra, distinctly wrinkled clypeus, strongly dilated apex of meso- and metatibiae, and the basal meso- and metatarsomere being distinctly shorter than the long tibial spur. The species is similar in appearance to the psammodiine species *Parapsammodius bidens* (Horn) (Verdú et al. 2006), sharing with that species the strongly expanded metatibia with an external row of granules and similar epipharyngeal structures. In general, *H. mariarum* fits the diagnosis given by Chalumeau (1981) for *Sayloria*, except that the lateral setae are much longer and the clypeus is distinctly wrinkled. These characters are variable among the species placed herein in *Haroldiataenius*.

***Haroldiataenius hintoni* (Saylor)**

(Fig. 2, 15, 18, 24)

Ataenius hintoni Saylor 1933: 159.

Haroldiataenius (Sayloria) hintoni – Chalumeau 1981: 140, fig. 4, 5; Dellacasa 1988: 275 (catalogue).

Haroldiataenius hintoni – Galante et al. 2003: 288; Stebnicka 2007: 585.

Diagnosis. Clypeal margin rounded each side of middle, surface finely punctate. Pronotal punctures coarse, dense across entire surface, separated by less than their diameter. Pronotum with basal marginal line narrow, weakly defined. Lateral margins of pronotum and elytron with short fringe of setae. *Haroldiataenius hintoni* is known from Mexico, Guatemala, and Honduras, where it appears to live in association with leaf cutter ants.

Description. Length 3.0-3.3 mm. Dark reddish brown, shining (Fig. 2, 15). Clypeal margin finely reflexed, rounded each side of deep median emargination; genae small, right-angled, with clump of setae; surface narrowly concave above emargination and finely, transversely rugulose up to median convexity, vertex with fine punctures. Pronotum convex, base without marginal line, lateral edge crenate-fimbriate,

setae short; surface evenly, coarsely punctate throughout, punctures almost contiguous. Elytron convex, humerus finely dentate, striae strong, punctate-crenate; intervals moderately convex with fine scattered punctures; elytral margin with fringe of very short setae. Metasternum smooth, nearly impunctate from side to side, intercoxal carina fine, short; abdominal sternites with inconspicuous fluting along sutures and smooth medially, slightly shallowly wrinkled laterally; sternite 5 weakly and weakly eroded disc of pygidium with row of moderate punctures and fine setae. All femora smooth, shining; meso- and metafemur short, without posterior lines; metatibia apically with short setae, without accessory spine; basal tarsomere of metatarsus shorter than upper tibial spur and shorter than following three tarsomeres combined. Epipharynx as in Fig. 18. Male genitalia with shortened, triangular parameres (Fig. 24).

Type data. Holotype (not examined): “Tejupilco VII. 1932 Mex. D.F. Alt. 3960 f”, “H.E. Hinton coll.”, “*At. hintoni* Saylor”, in CASC.

Specimens examined (45). **Guatemala** – (2 ex) Jalapa, Laguna del Moyo, 12.VI.1982, with *Atta* sp. J. Baster (CEUA). **Honduras** – (1 ex) El Paraiso, 8.VII.1999, M. Cruz (CEUA). **Mexico** – (8 ex) Chiapas, Cinco Cerros, 860 m, 31.V.1990, H. & A. Howden (CMNO); (6 ex) Chiapas, El Aguacero 16 km W Ocozocoautla 600 m, 5.VI.1998, H. & A. Howden (CMNO); (17 ex) Chiapas, Puente Macuilapa, Rt. 90 near Los Amates, 22.V.1964, R. Woodruff, blacklight trap (CMNO); (1 ex) Chiapas, Mpio Cintalapa 5 mi N Nvo Tenochtitlan, 31.VIII.1991, Kovarik & Philips (PESC); (3 ex) Jalisco, 28 km S Chamela, 16.VII.1987, light trap, R. Turnbow; 28.4 km S of Chamela, 16.VII.1987, R. Turnbow (ISEA, RHTC); (1 ex) Jalisco, km 59, Hwy 200, Chamela Bio. Station, N19°29.9', W105°2.6', 105m, 27-28.VI.2006, D. Brzoska (FSCA); (3 ex) Sonora, 17 km SW Montezuma, 22.VII.1980, S. McCleve; Sonora, Hwy 16, 20 mi E Rio Yaqui, 26-27.VII.1987, S. McCleve (PKLC); (4 ex) Sonora, 15 km NE Alamos, 30.X.1972, K. Stephan (FSCA).

Remarks. *Haroldiataenius hintoni* has been previously recorded from Sonora (Alamos) and Tamaulipas (Magiscatzin), Mexico by Chalumeau (1981); from Honduras (no further data) by Galante et al. (2003); and from Guatemala (no further data) by Stebnicka (2007). Specimens were found in detritus remnants in the nest of *Atta sexdens* and collected with light traps. The coarse, dense pronotal punctation readily distinguishes *H. hintoni* from all other members of the genus.

***Haroldiataenius griffini* (Cartwright), comb. nov.**
(Fig. 9, 26)

Ataenius griffini Cartwright 1974: 77-78, fig. 24 e, g – Dellacasa 1988: 343 (catalogue); Riley and Wolfe 2003: 7, 16.



Figures 12-15. *Haroldiataenius* spp., dorsal habitus. **12)** *H. mariarum*. **13)** *H. saramari*. **14)** *H. limbatus*. **15)** *H. hintoni*.



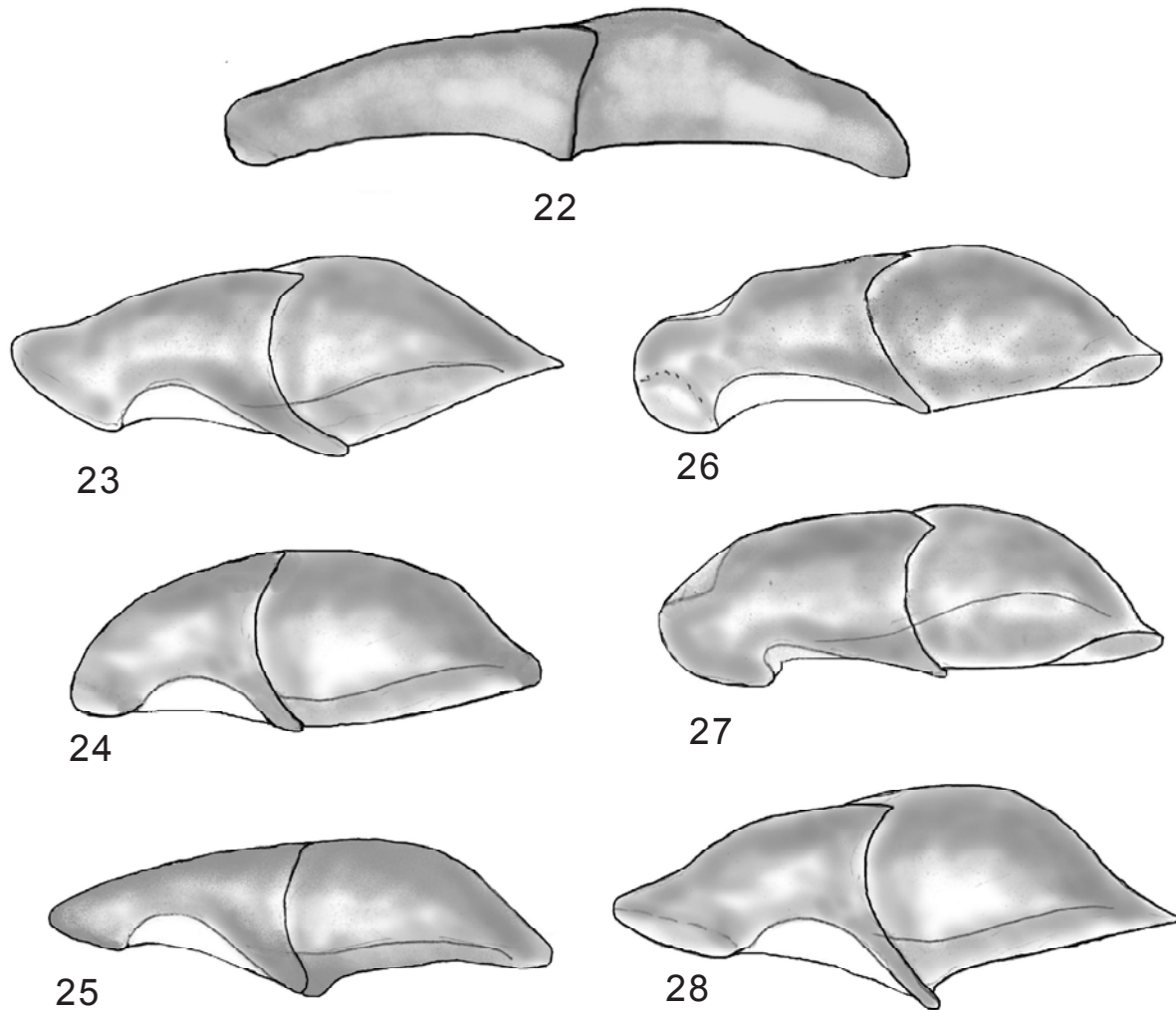
Figures 16-21. *Haroldiataenius* spp., epipharynx. 16) *H. mariarum*. 17) *H. limbatus*. 18) *H. hintoni*. 19) *H. lucanus*. 20) *H. semipilosus*. 21) *H. saramari*.

Diagnosis. Clypeal margin rounded to indistinctly angulate each side of middle; surface finely punctate. Coarse punctures of pronotum widely scattered, separated by 2 or more times their diameter. Basal marginal line of pronotum not wide, narrowed near sides, narrower than coarse pronotal punctures, filled with unordered rugose sculpturing. Lateral margin of pronotum with short fringe of setae. Lateral margin of elytron lacking distinct setae. *Haroldiataenius griffini* occurs in southern Texas, USA.

Description. Length 3.5-3.7 mm. Dark reddish brown, shining (Fig. 9). Clypeal margin finely reflexed, slightly angulate but not dentate each side of deep median emargination; genae right angled; surface of head smooth except for fine, not close, uniformly distributed punctures. Pronotum convex, lateral edge not distinctly crenate, marginal setae moderate in length; surface with mixed fine and scattered moderate punctures, the latter absent over median anterior third of disc; basal marginal line not wide, narrowed near sides, narrower than coarse pronotal punctures, filled with unordered rugose sculpturing. Elytron convex, striae fine, strial punctures widely separated, intervals with weakly crenulate margins; intervals convex, with some minute scattered punctures; lateral margin lacking distinct setae. Metasternum shining, finely punctate on disc; abdominal sternites finely fluted along sutures and punctate from side to side, punctures finer at middle; sternite 5 and eroded disc of pygidium with row of close, coarse punctures bearing long pale setae. All femora shining, smooth, without posterior lines; metatibia apically with short setae and strong, triangular accessory spine; basal tarsomere of metatarsus shorter than upper tibial spur and longer than next three tarsomeres combined. Male genitalia short, rounded apically (Fig. 26).

Type data. Holotype (examined; male): "Texas, San Patricio Co., US Hwy 77 [near] Tex. 9, 16. Aug. 1969, C.W. Griffin", "*Ataenius griffini* O. L. Cartw.", No 71747 NMNH. Paratypes (4) same data as holotype, in NMNH.

Specimens examined (8). USA— (3 ex) Texas, Karnes Co., Ecletto Metz Ranch, 13.V.1997, J. E. Wappes (PESC, WBWC); (3 ex) Texas, Kenedy Co., Kenedy Ranch, Jaboncillos Pasture, sand dune area, 26°58'38"N,



Figures 22-28. *Haroldiataenius* spp., male genitalia. 22) *H. mariarum*. 23) *H. limbatus*. 24) *H. hintoni*. 25) *H. lucanus*. 26) *H. griffini*. 27) *H. saramari*. 28) *H. semipilosus*.

97°40'59"W, 6-20.IV.2001, E. G. Riley & W. Godwin, Berlese sifted debris/sand (TAMU); (1 ex) Texas, Kenedy Co., Kenedy Ranch, Jaboncillos Pasture, sand dune area, 26°58'38"N, 97°40'59"W, 6-20.IV.2001, W. Godwin & E. G. Riley, pit-fall trap (TAMU); (1 ex) Texas, San Patricio Co., Welder Wildlife Refuge, 19.V.1993, Wm. Godwin, sifting *Atta texana* nest surface 3cm (TAMU).

Remarks. *Haroldiataenius griffini* is most similar to *H. convexus*, but differs from that species by the sparser pronotal punctation, the reduce lateral elytral fringe of setae, the more evenly rounded clypeal margin, and the less convex elytral intervals. The male genitalia of both species are similar in shape.

Specimens were found in an unknown animal burrow (probably armadillo) and under cow dung. Others were associated with sandy soils and leafcutter ant nests. The only conclusion on the habits of *H. griffini* is that it appears to prefer sandy soils.

***Haroldiataenius convexus* (Robinson), comb. nov.**

(Fig. 10-11)

Ataenius convexus Robinson 1940: 149 – Cartwright 1974: 42-44, fig. 24 f, h; Dellacasa 1988: 114 (catalogue); Riley and Wolfe 2003: 7.

Diagnosis. Clypeal margin weakly angulate each side of middle; surface finely punctate. Pronotal coarse punctures large, deep, generally separated by less than their diameter. Basal marginal line of pronotum wide medially to lateral angles, wider than coarse pronotal punctures, filled with longitudinally arranged sculpturing. Lateral margins of pronotum and elytron fringed with distinct, short setae. *Haroldiataenius convexus* is only known from a few localities in southern Texas, USA.

Description. Length 3.2-4.2 mm (Cartwright 1974). Dark reddish brown, shining (Fig. 11). Clypeal margin finely reflexed, slightly angulate but not dentate each side of deep median emargination; genae right angled; surface of head smooth except for fine, not close, uniformly distributed punctures. Pronotum convex, lateral margin very weakly crenate, marginal setae moderate in length; surface punctures fine over anterior fourth at middle; coarse and irregularly spaced punctures on sides and along base, generally separated by less than their own diameter; basal marginal line wide medially to lateral angles, wider than coarse pronotal punctures, filled with longitudinally arranged sculpturing. Elytron convex; humeral lamella bidentate; striae fine, strial punctures widely separated, intervals with weakly crenulate margins; intervals strongly convex, with median row of minute punctures; lateral and apical elytral margin noticeably fimbriate. Metasternal disc alutaceous, finely punctate on disc, intercoxal carina fine; abdominal sternites finely fluted along sutures with minute, scattered punctures at sides; sternite 5 and eroded disc of pygidium with row of close, coarse punctures bearing long pale setae. All femora shining, smooth, without posterior line, mesofemur with a single, strong marginal seta at middle; metatibia apically with short setae and strong, triangular accessory spine; basal tarsomere of metatarsus slightly shorter than upper tibial spur and longer than next three tarsomeres combined. Male genitalia similar to those of *H. griffini* (as in Fig. 26).

Type data. Holotype (examined, sex not determined): "Hidalgo, VIII. Tex.", "from coll. of Chas. Schaeffer", "Property of Mark Robinson", "M. Robinson Collection 1959", "TYPE No 65614 USNM", in NMNH. Paratypes (2, not examined) same data as holotype, in NMNH.

Specimens examined (1). USA – (1 ex) TEXAS: Cameron Co., 13.5 mi. E. Brownsville [sic] on hwy. 4, Ebony Loma, IX-2-1995, E. Riley-201, Berlese moist ebony litter (EGRC).

Remark. Specimens of this species were found in wood rats (probably *Neotoma micropus micropus* Baird), armadillo burrows (Cartwright 1974), and ebony litter.

Cartwright (1974) reported studying additional Texas specimens from Big Bend National Park, Corpus Christi, and San Diego. None of these specimens were available for study, as Cartwright did not state where specifically they were deposited. Cartwright (1974) stated that the largest specimens he studied were from Big Bend National Park. It is possible that these Big Bend specimens are actually the new species described below, and that *H. convexus* and the new species are geographically separated, restricted to different zoogeographic regions of Texas.

***Haroldiataenius buvexus*, new species**

(Fig. 10)

Diagnosis. Very similar to *H. convexus*, with short, distinct elytral fringe of setae and pronotal punctation. *Haroldiataenius buvexus* differs from *H. convexus* in its larger body size, darker coloration, less convex elytral intervals, and distinctly rounded clypeal margin each side of middle. *Haroldiataenius buvexus* is known from the Big Bend region of Texas, USA.

Description. Length 3.9-4.1 mm. Body dark brown to black, shining (Fig. 10). Clypeal margin finely reflexed, distinctly rounded each side of deep median emargination; genae right angled; surface of head smooth except for fine, not close, uniformly distributed punctures. Pronotum convex, lateral margin very weakly crenate, marginal setae moderate in length; surface punctures fine over anterior fourth at middle, coarse and irregularly spaced on sides and along base. Elytra convex; humeral lamella bidentate; striae fine, strial punctures widely separated, intervals with margins weakly crenulate; intervals convex, with

median row of minute punctures; lateral and apical elytral margin noticeably fimbriate. Metasternal disc alutaceous, finely punctate on disc, intercoxal carina fine; abdominal sternites finely fluted along sutures, surface with minute, scattered punctures, sides coarsely punctate; sternite 5 and eroded disc of pygidium with row of close, coarse punctures bearing long pale setae. All femora shining, smooth, without posterior line, mesofemur with single, strong marginal seta at middle; metatibia apically with short setae and strong, triangular accessory spine; basal tarsomere of metatarsus slightly shorter than upper tibial spur and longer than next three tarsomeres combined. Male unknown.

Type material. Holotype (female) “Texas, Brewster Co, Big Bend Natl. Park, Buttrail [sic, should be Buttrill] Springs, 13.VII.1991, R. Vogtsberger, yellow pan trap”, “TAMU-ENTO X0006951 [bar code]”, in TAMU. Paratype (1 female): “Texas, Presidio Co, BBRNSA, Colo. Cyn. Riv. Acc, 3.VI.1997, C. Wolfe & D. Marqua”, “TAMU-ENTO X0288914 [bar code]” in TAMU. The abbreviation for the locality on the paratype label stands for Big Bend Ranch State Natural Area, Colorado Canyon River Access, a point of access to the Rio Grande (pers. comm., E.G. Riley 2008)

Remarks. This species is very similar to *H. convexus*, differing primarily by characters in the key and above diagnosis. *Haroldiataenius convexus*, *H. buvexus*, and *H. griffini* form a closely related complex of rarely collected species. Thorough taxonomic assessment is difficult as we are hesitant to fully dissect the few available specimens. Also see remarks under *H. convexus*.

Etymology. The species name is based on the similarity with *H. convexus*, and being apparently larger in body size. The name is formed by joining the root ‘*bu-*’ (Latin meaning large) and ‘*convexus*’; with an intentional abbreviation of spelling to make the name euphonic.

***Haroldiataenius limbatus* (Bates)**

(Fig. 7, 14, 17, 23)

Ataenius limbatus Bates 1887: 98 – Cartwright 1964: 101; Dellacasa 1988: 152 (catalogue).

Haroldiataenius limbatus – Galante et al. 2003: 288; Stebnicka 2007: 585.

Diagnosis. Clypeal margin rounded each sided of middle; surface finely punctate. Pronotal coarse punctures more or less evenly distributed on surface separated by 1 to 3 times their diameter, absent along anterior edge; basal marginal line well defined, narrower than diameter of coarse puncture; lateral marginal bead distinctly widened anteriorly. Pronotum lacking lateral fringe of setae. Lateral margin of elytron with short fringe of setae. *Haroldiataenius limbatus* is found in Mexico and northern Central America, where it appears to live in leaf cutter ant nests.

Description. Length 4.5-5.0 mm. Dark castaneous to piceous (Fig. 7, 14). Head moderately convex, clypeal margin broadly rounded each side of deep median emargination; genae right angled; surface anteriorly with a trace of transverse wrinkles, everywhere minutely punctate. Pronotum convex, margined, lateral margin smooth with minute, scarce setae; surface punctures mixed minute and moderate in size; moderate punctures shallow, irregularly spaced, usually lacking on lateral tumosity. Elytron oblong-oval, shining, humeral denticles fine; striae narrowly impressed, strial punctures fine, intervals with margins not crenulate; intervals flat to slightly convex, with very minute scattered punctures; posterior elytral margin very finely setaceous. Metasternum convex, smooth, almost impunctate from side to side, intercoxal carina sharply defined, long; abdominal sternites finely fluted along sutures, punctate from side to side, sternite 5 and weakly eroded or not eroded disc of pygidium with row of coarse punctures bearing short setae. Profemur shining, closely punctate; meso- and metafemora smooth with few setigerous punctures apically, posterior line lacking; metatibia at apex with fringe of short setae, without accessory spine; basal tarsomere of metatarsus subequal in length to upper tibial spur and subequal to following four tarsomeres combined. Epipharynx as in Fig. 17. Male genitalia shortened, weakly acute apically (Fig. 23).

Type data. Lectotype (examined, sex not determined): (Mexico, Presidio, Sinaloa) designated by Cartwright (1964), in NHML. Paralectotype, labeled "Pres." [Presidio], "87327", in ZMHB.

Specimens examined (43). **El Salvador** – (1 ex) San Salvador, 1.VI.1958, OL Cartwright, in detritus ex nest of *Atta mexicana* (F.Sm.) (FSCA). **Guatemala** – (1 ex) Jalapa, Laguna del Moyo, 16.VI.1982, J. Baster (ISEA). **Honduras** – (1 ex) Cortes Lago de Yojoa, 22.VIII.1988, R.D. Cave (ISEA). **Mexico** – (1 ex) Campeche, Zoh-Laguna, 10.IV.1968, Pedro Reyes & M. Cabrera, in ant nest of *Atta* sp. (FSCA); (2 ex) Chiapas, El Aguacero, 16 km W Ocozocautla 680 m, 5.VI.1990, H. & A. Howden (CMNO); (1 ex) Hidalgo, Rio Tula 2 km N, 1650 m, nest *Atta mexicana*, R.E. Woodruff (FSCA); (4 ex) Hidalgo, 24 km NW Carconal, 13.VII.1990, 1590 m, J. S. Ashe, K. J. Ahn, R. Leschen #171, ex *Atta* refuse pile (PESC); (2 ex) Jalisco Estacion Biol. UNAM, Chamela, 17.VII.1987, UV light, R. Turnbow (ISEA, RHTC); (1 ex) Morelos, Cuernavaca, 16.VIII.1967, Pedro Reyes, in ant nest of *Atta mexicana* (FSCA); (3 ex) NL [Nuevo Leon], 29 km W Linares, Santa Rosa Cyn. 2.VI.1983, UV light, thorn scrubs, S. Peck & W. Kaulbars (CMNO); (8 ex) Oaxaca, San Sebastian Frontera, Cerro Colorado, 10.VII.1999, E. Galante (CEUA, ISEA); (2 ex) Oaxaca, 62 km SW Valle National, 12.VIII.1986, H. & A. Howden (CMNO); (2 ex) Oaxaca, Huajupan de Leon, between Puebla and Oaxaca, 9.VIII.1998, O Hillert (ABCG); (3 ex) Puebla, Zapotitlan Salinas, 8.VII.1999, E. Galante; (3 ex) Puebla Techuacan, Altapexi 1125 m, M. Moron (CEUA, ISEA); (2 ex) Puebla, 9 mi S Izucar Matamoros, 8.VI.1971, berlesate ex ant debris, S. Peck (CMNO); (2 ex) Sonora, 17 km SW Montezuma, 12.VII.1982, P. Jump, 11-12.VII.1983, S. McCleve; (2 ex) Sonora, Hwy 16, 20 mi E Rio Yaqui, 26-27.VII.1987, S. McCleve; (3 ex) Sonora near Chih border, 3.2 mi N Hulcoche, 11-13.VII.1983, S. McCleve (ISEA, PKLC).

Remarks. Superficially, *Haroldiataenius limbatus* is similar to some species of *Paraplesiataenius* Chalumeau, but differs in having a smaller head and the meso- and metatibiae are more expanded apically. Label data indicate that the species is usually collected during summer, and that it has been sifted from leaf litter of oak-pine forest, found in cattle dung, in *Atta* dump, and *Atta* refuse pile.

***Haroldiataenius lucanus* (Horn), comb. nov.**

(Fig. 3, 6, 19, 25)

Ataenius lucanus Horn 1871: 288 – Horn 1887: 70-71; Cartwright 1974: 5 (nota); Dellacasa, 1988: 155 (catalogue).

Ataenius sabinoi Cartwright 1974: 38-39. **New synonymy.**

Diagnosis. Clypeal margin angulate to dentate each side of middle; surface finely punctate, some weakly wrinkled. Pronotal coarse punctures evenly distributed, separated by less than 1 diameter, larger laterally, becoming small at medial anterior margin; basal marginal line distinct, narrow, width less than diameter of coarse punctures. Elytral intervals weakly tectiform. Pronotum and elytron lateral margin with fringe of short setae. *Haroldiataenius lucanus* is found in southern Arizona, USA, and Baja California, Mexico, where it appears to live in pack rat middens.

Description. Length 3.3-3.5 mm. Dark red-brown, shining (Fig. 6). Clypeal margin finely dentate each side of moderately deep median emargination, genae almost right angled; surface narrowly concave above emargination and weakly transversely wrinkled with fine, scattered punctures above wrinkles and band of close vertical punctures. Pronotum convex, lateral margin crenate-fimbriate, setae moderate in length; surface everywhere closely coarsely punctate, punctures separated by about one their diameter. Elytron convex, striae strongly impressed, strial punctures weak, intervals with margins crenulate; intervals more or less strongly carinately convex to tectiform, interval 10 flattened, each interval with row of coarse, setigerous punctures, setae are more noticeable laterally and on apical declivity; lateral margin of elytra posteriorly noticeably crenate. Intercoxal carina sharply defined; metasternum shining, finely punctate on disc, punctate-rugose at extreme sides; abdominal sternites with increasingly longer fluting along sutures and punctate from side to side, punctures finer at middle; sternite 5 and eroded disc of pygidium with row of stiff moderate setae. Profemur rough posteriorly; meso- and metafemora smooth, posterior line deep, complete (Fig. 3); metatibia apically with short setae and strong accessory spine; basal

tarsomere of metatarsus equal in length to upper tibial spur and slightly longer than next three tarsomeres combined. Epipharynx as in Fig. 19. Male genitalia shortened, acutely rounded apically (Fig. 25).

Type data. *Ataenius lucanus*: holotype (examined on-line at the MCZ type database, see Perkins 2006; sex not determined), "Cape S. Lucas, Baja California, Mexico", in MCZC.

Ataenius sabinoi: holotype (examined; male), "Arizona Tucson (Cat. Foothills)", "Den 2, *Neotoma* sp.", "Berlese funnel 2.VIII.1962, W.L. Nutting, P Mehringer", "*Ataenius sabinoi* O.L. Cartw.", No 71739 in NMNH.

Specimens examined (holotypes + 15). **Mexico** – (2 ex) Baja Sur, 10 km S La Paz, 28.VIII.1994, R. Turnbow (ISEA, RHTC); (1 ex) Baja Calif. Sur, 3.3 mm. [sic] S. El Cien, 26.IX.1981, D. Faulkner & F. Andrews coll., blacklight (PESC); (2 ex) Baja Calif., 10 mi. SW San Jose del Cabo, 1.IX.1959, R. K. Radford & F. G. Werner, light trap (FSCA). **USA** – (4 ex) Arizona, Pima Co, 8 mi NNE Tucson, 15.VII.1980, P. K. Lago; Maricopa Co, Phoenix Salt River at Coon's Bluff, 19.VII.1985, P.K. Lago (ISEA, PKLC); (1 ex) Arizona, Pima Co, Madera Canyon, mv + bl, 24.VII.1989, R. Turnbow (RHTC); (2 ex) Arizona, Pima Co, Tucson, 17.VIII.1968, K. Stephan leg (FSCA); (1 ex) Arizona, Pima Co., W of Tucson, 'A' Mts, 6.IX.1990, P. E. Skelley, packrat nest (PESC); (1 ex) Arizona, [Yavapai Co.] Castle Hot Spgs., 4.VIII.1941, L H. Banke (PESC).

Remark. *Haroldiataenius lucanus* appears most similar to the partially sympatric *H. semipilosus*. However, *H. lucanus* appears to occur in low desert areas (W. B. Warner, pers. comm. 2007), while *H. semipilosus* appears to occur more in the high desert areas. *Haroldiataenius lucanus* is distinguished by its more tectiform elytral intervals with scattered short setae and in having a complete posterior marginal line on the meso- and metafemora.

The types of both *A. lucanus* and *A. sabinoi* were studied and no notable difference could be found. Thus, they are here synonymized.

***Haroldiataenius semipilosus* (Van Dyke), comb. nov.**

(Fig. 4, 8, 20, 28)

Ataenius semipilosus Van Dyke 1928: 158 – Cartwright 1974: 34-36; Dellacasa 1988: 197 (catalogue).

Diagnosis. Clypeal margin rounded to weakly angulate each side of middle; surface finely punctate and weakly wrinkled. Pronotal coarse punctures evenly distributed, separated by 1-2 diameters, larger laterally, becoming small at medial anterior margin; basal marginal line distinct, width equal to coarse punctures. Elytral intervals evenly convex. Lateral margin of pronotum and elytron with fringe of short setae. *Haroldiataenius semipilosus* is found in the southwestern USA (Arizona, Texas) and northern Mexico.

Description. Length 3.2-4.2 mm. Dark castaneous, shiny (Fig. 8). Clypeal margin finely reflexed, subdentate each side of moderately deep median emargination; genae rounded with clump of setae; surface narrowly concave above emargination and weakly transversely wrinkled, becoming obscure above median area, front and vertex with wide band of moderate punctures. Pronotum convex, sides and base arcuate, lateral margin crenate-fimbriate, setae moderate in length; surface quite evenly, coarsely punctate throughout, punctures separated by about one their diameter. Elytron convex, humerus sharply dentate, striae moderately deep punctate-crenate; intervals moderately convex, outside margin of each interval with row of fine punctures bearing fine, upright setae. Metasternum shining, finely punctate on disc, coarsely punctate-rugose at extreme sides; abdominal sternites with increasingly longer fluting along sutures and punctate from side to side, punctures finer at middle; sternite 5 and roughly eroded disc of pygidium with row of fine, long setae. Profemur posteriorly coarsely punctate; meso- and metafemora with scattered, setigerous punctures, posterior line of metafemur short (Fig. 4); metatibia apically with short setae and strong, triangular accessory spine; basal tarsomere of metatarsus, upper tibial spur and

next three tarsomeres combined equal in length. Epipharynx as in Fig. 20. Male genitalia short, weakly acute apically (Fig. 28).

Type data. Holotype (not examined), “Texas Pass, Dragon [Dragoon] Mountains, Arizona”, “Van Dyke Coll”, in CASC.

Specimens examined (39). **Mexico** – (2 ex) Sonora, Hermosillo, 9-16.VII.1953, B. Malkin (ISEA). **USA** – (13 ex) Arizona, Cochise Co, Douglas, lite [sic], 18-22.VII.1972, S. McCleve Coll. (FSCA); (2 ex) Arizona, Cochise Co, Peloncillo Mountains, Guadalupe Canyon, 1300me, UV light, 28.VIII.1982, R. S. Anderson, S. McCleve (PESC); (1 ex) Arizona, Cochise Co, Texas Pass, Dragon [sic] Mts, 19.VII.1917, Wheeler (FSCA); (2 ex) Arizona, Maricopa Co, Coon’s Bluff on Salt R., 19.VII.1985, W. B. Warner, UVBL (PESC); (2 ex) Arizona, Maricopa Co., Fr. McDowell, 11.VII.1986, W.B. Warner, at light (WBWC); (3 ex) Arizona, Maricopa Co, Phoenix, Salt River at Coon’s Bluff, 19.VII.1985, P.K. Lago (PKLC); (1 ex) Arizona, Pima Co, Arivaca, 20.VII.1941, R. H. Beamer (PESC); (1 ex) Arizona, Pima Co., Continental, 20.VII.1990, W. B. Warner, at light (WBWC); Arizona, Pima Co., Green Valley, 28.VII.1990, W. B. Warner, at light (WBWC); (2 ex) Arizona, Santa Cruz Co., Pena Blanca, Pajarito Mts., 26.VII.1961, R. H. Arnett, Jr., E. VanTassell (FSCA); (4 ex) Arizona, Santa Cruz Co., Pena Blanca Lake, 26.VII.1963, G. H. Nelson (FSCA); (1 ex) Arizona, Santa Cruz Co, Nogales, 7.VII.1949, D.J. & J.N. Knull coll. (FSCA); (2 ex) Arizona, Santa Cruz Co., 1 km S Rio Rico, 18.VII.1990, W. B. Warner, at light (WBWC); (1 ex) Texas, 30 mi N of Presidio, 19.VII.1947, J.H. Russell, “*Ataenius semipilosus* Van Dyke, det. O.L. Cartwright” (ISEA); (1 ex) Texas, Presidio Co., Candelaria, 15.VIII.1927, R. H. Beamer (PESC).

Remark. Most specimens of *H. semipilosus* have been collected at light, but a few were collected in *Neotoma* nests. *Haroldiataenius semipilosus* appears most similar to the partially sympatric *H. lucanus* (see remarks under *H. lucanus*). However, *H. semipilosus* differs by its smoothly convex elytral intervals with scattered long setae and the incomplete posterior marginal line on the meso- and metafemora.

***Haroldiataenius saramari* (Cartwright), comb. nov.**

(Fig. 5, 13, 21, 27)

Ataenius saramari Cartwright 1939: 360 – Cartwright 1974: 41-42; Woodruff 1973: 130 (habitus p. 106); Woodruff 1982: 91; Dellacasa 1988: 280 (catalogue); Skelley 1993: 133, fig. 3; Woodruff and Deyrup 1994: 434; Lamb and Justice 2005: 42, 61.

Diagnosis. Clypeal margin rounded each side of middle; surface finely punctate. Pronotal coarse punctures evenly distributed, separated by 1-2 diameters, little larger laterally; basal marginal line distinct, width equal to diameter of coarse puncture. Lateral margin of pronotal and elytron with fringe of short setae. *Haroldiataenius saramari* appears restricted to peninsular Florida, USA, where it may be a detritivore in open sands of upland sand ridges.

Description. Length 3.0-3.2 mm. Body piceous, shining (Fig. 5, 13). Clypeal margin finely reflexed with a trace of angulation each side of moderately deep median emargination; genae obtusely rounded with clump of setae; surface weakly concave above emargination with vague shallow depression each side of anterior fourth, punctures generally fine to moderate, not close. Pronotum convex, lateral margin crenate-fimbriate, setae short, club shaped; surface quite evenly punctate, punctures mixed fine to moderate in size. Elytron convex, striae impressed with deep punctures, intervals with margins slightly crenulate; intervals weakly convex with fine, scattered punctures more noticeable on lateral and apical intervals; lateral margin of elytron with fringe of setae similar to those of pronotal fringe. Intercoxal carina sharply defined; metasternum shining, finely punctate on disc, punctate-rugose at extreme sides with eroded line anteriorly around mesocoxae; abdominal sternites finely, irregularly fluted along sutures and punctate from side to side, punctures finer at middle; sternite 5 and eroded disc of pygidium with row of stiff moderate setae. Profemur rough posteriorly; meso- and metafemora smooth, posterior line strong, complete; metatibia apically with short setae, without accessory spine; basal tarsomere of metatarsus equal

in length to upper tibial spur and slightly longer than next three tarsomeres combined. Epipharynx as in Fig. 21. Male genitalia short, apically rounded (Fig. 27), see Skelley (1993: 133, fig. 3) for SEM image of genitalia with everted internal sac.

Type data. Holotype (examined; male), “St Cloud Florida”, “*Ataenius saramari* Cartw.”, No 53422, in NMNH.

Specimens examined (219). USA – (1 ex) Florida, Alachua Co., 2.5 mi SW Archer, 28.I.4.II.1990, P. Skelley, *Geomys* burrow pitfall (FSCA); (8 ex) Florida, Highlands Co., Archbold Biological Station, Lake Placid, 2-V.1988, M. Deyrup, sifted from sand scrubby flatwoods; (48 ex) Florida, Levy Co., 3.8-4.0 mi SW Archer [various dates year round, 1987-2000], P. Skelley [various collecting methods see Remarks below] (PESC, FSCA); (44 ex) Florida, Marion Co., Juniper Springs, [various dates 1959], H. A. Denmark, Berlese *Pinus clausa* debris (FSCA); (1 ex) Florida, Marion Co., Weirsdale, 22.V.1955, M. H. Muma, Berlese funnel Spanish moss (FSCA); (1 ex) Florida: Orange Co., Orlando, UCF [University of Central Florida], 14.XII.2000, xeric oak scrub underground pitfall trap, T. R. Smith, P. Skelley (FSCA); (3 ex) same data only 21.I.2001 (FSCA); (3 ex) Florida, Osceola Co., nr. Alligator Lake, 17.VII.1959, H. A. Denmark, Berlese funnel *Pinus clausa* debris (FSCA); (5 ex) Florida, Osceola Co., SE of St. Cloud, 29.I.1962, Martin H. Muma, leaf litter of *Pinus clausa* (FSCA); (5 ex) Florida, Polk Co., E side of Lake Marion, SE of Haines City, 10.IV.2002, P. Skelley, sifting sand and grass (FSCA); (60 ex) Florida, Polk Co., Tiger Creek Preserve, 2.5mi SE Babson Park, 18-19.V.2006, sand sifts, P. Skelley, D. Almquist (FSCA); (12 ex) Florida, Putnam Co., 8 mi E Melrose, K. Ordway Pres. sandhill meadow, 20.VI.1997, P. Skelley (FSCA, ISEA); (1 ex) Florida, Putnam Co., 2.5 mi NE Florahome, 9.I.1993, P. Skelley, nest of *Pheidole morrisi* (FSCA); (16 ex) Florida, Putnam Co., Hollister, Robert’s Ranch, [various dates 1984-1985], E. Milstrey, gopher tortoise burrow (FSCA); (11 ex) Florida, St. Lucie Co., 17.VI.1959, H. A. Denmark, Berlese funnel *Pinus clausa* debris (FSCA).

Remarks. Additional Florida locality records for *H. saramari* reported in the literature are: Brevard Co., Titusville; Citrus Co., Holder Mine; Clay Co., Gold Head State Park; Lake Co., Alexander Springs (Lamb and Justice 2005: 61); Hillsborough Co. (Woodruff and Deyrup 1994); Martin Co., Jonathan Dickinson State Park (Woodruff 1973: 213).

Haroldiataenius saramari appears to be restricted on the inland fossil dune systems in Florida (Woodruff 1973). Specimens have been collected in nearly every month of the year. All data and field observations by PES indicate *H. saramari* is possibly a detritivore at the edges of open sandy soils. Specimens have been collected in sandhill meadow edge, sifted from sand scrubby flatwoods, berlesate from litter with deer dung, in *Geomys* [pocket gopher] burrow, under leaf debris of *Pinus clausa* [sand pine], sifting grass roots, gopher tortoise burrow, sifting debris around edge of open sandy areas, in barrier pitfall traps, and in nest of *Pheidole morrisi* [a sand-dwelling ant].

Woodruff and Deyrup (1994) state “The wings of specimens examined appear to be unusually short for the genus [*Ataenius*], and it is likely that at least some individuals or whole populations are flightless.” Lamb and Justice (2005) pushed this observation further stating “Its wings are greatly reduced and some populations are considered flightless.” A study of wings from most populations showed no variation between them regarding wing size, and they all appeared fully developed. Discussion of the original statement with M. Deyrup (pers. comm. 2008) confirmed the speculative aspect of the species being flightless, and that the wings appear proportionally a little shorter than normal *Ataenius* spp. However, this is not enough to confidently state the species is flightless.

Collections of *H. saramari* have never been by any method that requires flight (e.g. light, Malaise, or flight intercept traps). Author PES has found them locally abundant even within the habitat’s substrate, possibly implying low dispersal ability. The only aphodiines with similar local abundance which PES has regularly collected during years of sifting sand in Florida have been flightless scarabs (*Geopsammodius* spp., see Skelley 2006). Discovering if the apparent low dispersal ability in *H. saramari* is due to being functionally flightless or behaviorally earth-bound will require much more work.

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