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NEW SPECIES OF *ELEODES* (COLEOPTERA: TENEBRIONIDAE)

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Abstract.—Twelve species of *Eleodes* Eschscholtz from the United States and Mexico are described as new: ***Eleodes aalbui*** (California), ***E. spiculiferus*** (Texas). Mexico: ***E. bidens*** (Durango), ***E. brucei*** (Durango), ***E. corrugans*** (Michoacán), ***E. mirabilis*** (Nuevo León), ***E. muricatulus*** (San Luis Potosí), ***E. platypennis*** (Jalisco), ***E. reddelli*** (Nuevo León), ***E. samalayucae*** (Chihuahua), ***E. scyropterus*** (Hidalgo), and ***E. watrousi*** (Durango).

Key Words: *Eleodes*, United States, Mexico

The genus *Eleodes* Eschscholtz is one of the largest, if not the largest genus of the family Tenebrionidae in the Western Hemisphere. There are approximately 230 described species divided into 13 subgenera, all confined to western United States and Mexico. The subgeneric classification is based largely on the female genitalia, which thus far has not proven to be totally satisfactory. Blaisdell (1909) in his monumental revision of *Eleodes* has seven plates illustrating female genitalia, yet in the large number of his subsequent papers in which many new species were described, not a single illustration of genitalia was provided. In the half century in which I have been studying these beetles, I have found no more reliable characters than the female genitalia for dividing this difficult genus into subgenera.

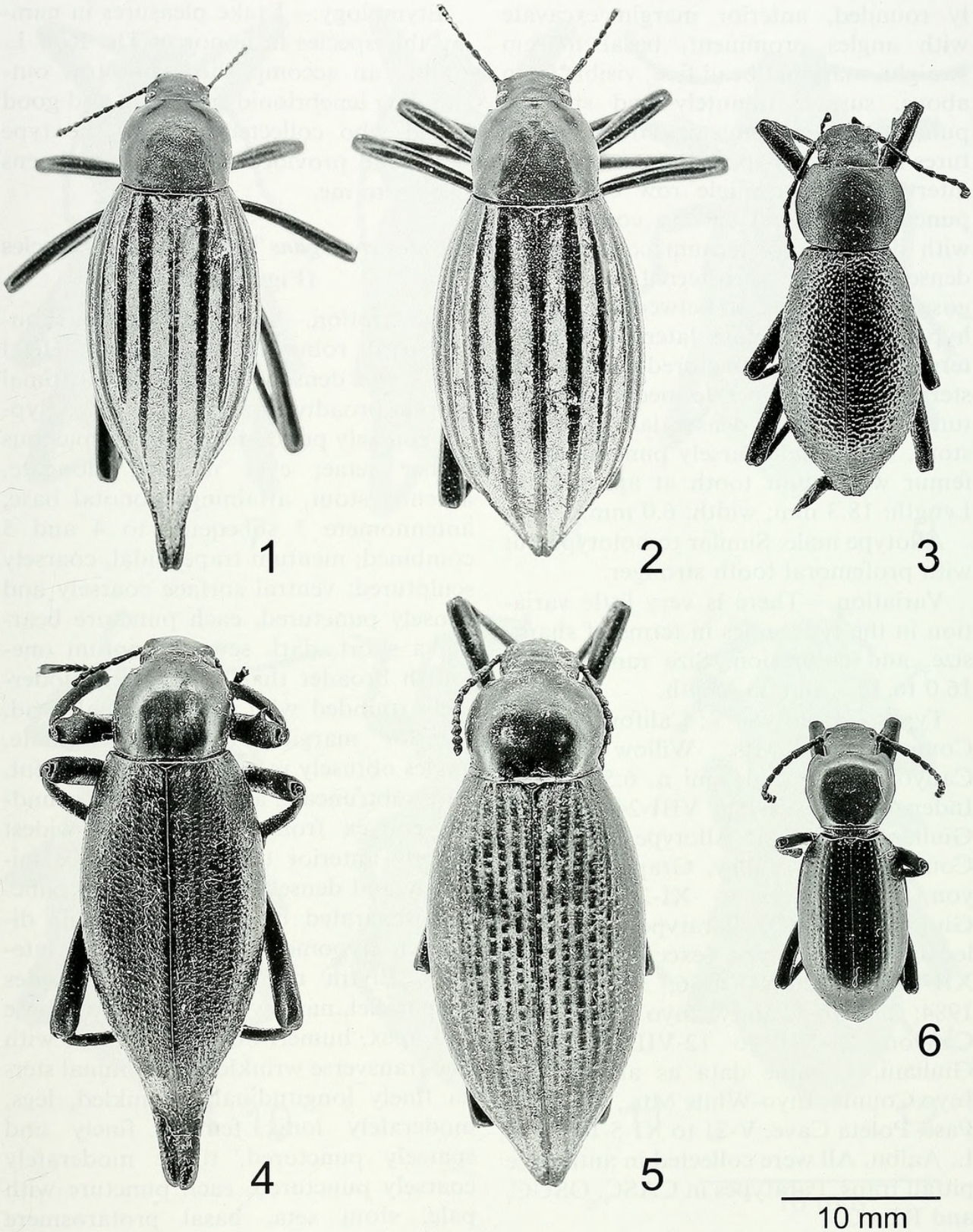
All species of *Eleodes* are wingless and there is a bewildering array of recognizable sedentary populations, many of which have been named, causing considerable synonymy. There are 26 names associated with the common and widespread *E. carbonarius (Say)*, some of which I am recognizing as subspecies, and others I am reducing to synonymy.

Species of *Eleodes* are a conspicuous component of the western beetle fauna, and a few have become economically important in arid land agriculture where they are known as "false wireworms," damaging root crops and other commodities.

In anticipation of a major revision of the genus *Eleodes*, I wish to make known the following new species.

Eleodes aalbui Triplehorn, new species
(Fig. 6)

Description.—Holotype female: Narrowly elongate, glossy, pronotum slightly darker than elytra. Head alutaceous, clypeus rounded, rugosely punctured, punctures becoming smaller and farther apart on frons which is slightly concave, sides reflexed and prominent over antennal insertions, fronto-clypeal suture scarcely evident; eyes narrow, elongate, antenna extending slightly beyond pronotal base. Pronotum slightly broader than long, widest near middle, sides rapidly narrowing toward base, smooth-



Figs. 1–6. *Eleodes* species, habitus. 1, *E. mirabilis*, male, Ciudad del Maiz, S. L. P. 2, *E. mirabilis*, female, same data. 3, *E. bidens*, male holotype, 9 mi E El Palmito, Durango. 4, *E. scyropterus*, male, 5 mi S Galeana, N. L. 5, *E. scyropterus*, female, 7 mi W Pachuca, Hdg. 6, *E. aalbui*, male, Inyo Co., CA, Inyo Mts.

ly rounded, anterior margin excavate with angles prominent, basal margin straight, marginal bead fine, visible from above, surface minutely and sparsely punctate. Elytra punctate-striate, punctures fine, closely spaced, not in grooves, intervals with a single row of minute punctures. Ventral surface concolorous with dorsum, prosternum coarsely and densely punctate, prosternal process rugose, its apex deflexed between procoxae, hypomera impunctate laterally; mesosternum rugosely punctured, abdominal sterna scarcely punctate medially, punctures coarser and denser laterally; legs stout, finely and sparsely punctate, profemur with blunt tooth at apical fifth. Length: 18.3 mm; width: 6.0 mm.

Allotype male: Similar to holotype but with profemoral tooth stronger.

Variation.—There is very little variation in the type series in terms of shape, size, and coloration. Size ranges from 16.0 to 18.3 mm. in length.

Types.—Holotype ♀: California, Inyo County, Inyo Mts., Willow Springs Canyon, 4600 ft., 1.5 mi n, 6.5 mi e of Independence, VI-1 to VIII-24-1984, D. Giuliani (CASC). Allotype ♂: Inyo County, Saline Valley, Grapevine Canyon, 4000', V-23 to XI-23-1983, D. Giuliani (CASC). Paratypes: 5, same locality as holotype, except dates (6-XII-1984 to 20-XII-1986; 3-I to 1-VI-1984; 2, Inyo County, Inyo Mts., Lead Canyon, 21-XII to 12-VIII-1982, D. Giuliani; 1, same data as allotype; 9, Inyo County, Inyo-White Mts., Westgate Pass, Poleta Cave, V-21 to XI-5-1988, R. L. Aalbu. All were collected in antifreeze pitfall traps. Paratypes in CASC, OSUC, and RLAC.

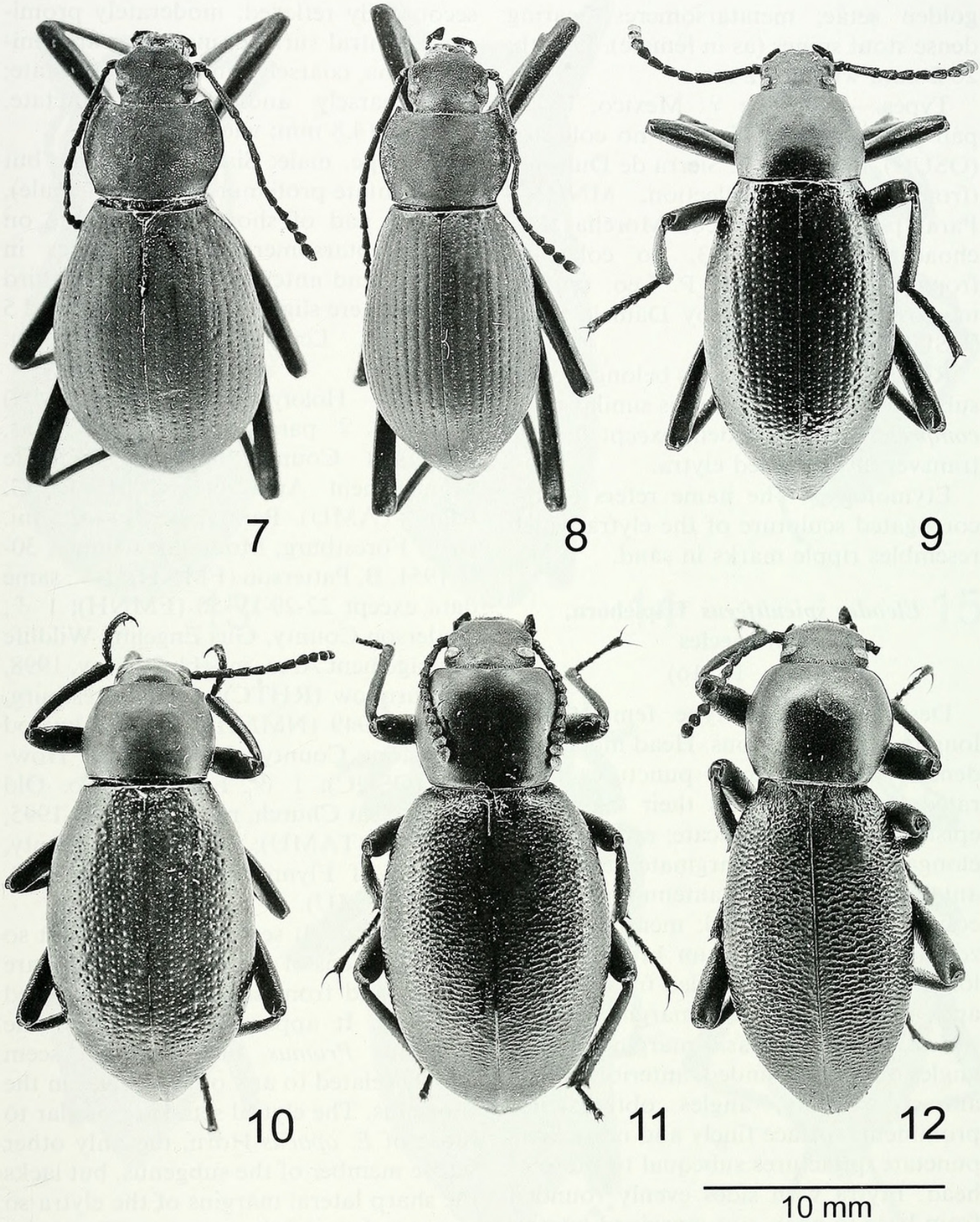
Discussion.—This species is most like *Eleodes dissimilis* Blaisdell, except that the body is more cylindrical, the pronotum is more convex from side to side, its anterior margin arcuate, with angles prominent, and the frons is concave. It belongs to the subgenus *Metablapylis*.

Etymology.—I take pleasures in naming this species in honor of Dr. Rolf L. Aalbu, an accomplished collector, outstanding tenebrionid specialist, and good friend who collected part of the type series and provided all of the specimens known to me.

Eleodes corrugans Triplehorn, new species
(Figs. 11, 12)

Description.—Holotype female: Elongate-oval, robust, black, shining. Head finely and densely punctured, epistomal margin broadly, shallowly arcuate; clypeus coarsely punctured with conspicuous amber setae; eyes narrow; elongate, antenna stout, attaining pronotal base, antennomere 3 subeqeual to 4 and 5 combined; mentum trapezoidal, coarsely sculptured; ventral surface coarsely and densely punctured, each puncture bearing a short, dark seta. Pronotum one-fourth broader than long, sides moderately rounded with fine marginal bead, anterior margin broadly emarginate, angles obtusely rounded, not prominent, base subtruncate, angles obtusely rounded, convex from side to side, widest slightly anterior to middle; surface minutely and densely punctate, each puncture separated by several times its diameter; hypomera finely wrinkled laterally. Elytra narrowly elongate, sides subparallel, narrowing toward both base and apex, humeri obsolete, surface with fine transverse wrinkles. Abdominal sterna finely longitudinally wrinkled, legs, moderately long, femora finely and sparsely punctured, tibiae moderately coarsely punctured, each puncture with pale, stout seta, basal protarosmere prolonged, acute, longer than protibial spurs, all tarsal claws long and slender. Length: 20.3 mm; width: 11.5 mm.

Allotype male. Similar to female but much more slender, basal protarsomere clothed beneath with fine, dense, golden setae, basal mesotarsomere with dense



Figs. 7–12. *Eleodes* species, habitus. 7, *E. reddelli*, female holotype, 2.4 km S Minas Viejas, N.L. 8, *E. reddelli*, male allotype, same data. 9, *E. brucei*, male, 2 mi NW Nombre de Dios, Dgo. 10, *E. brucei*, female, same data. 11, *E. corrugans*, female holotype, Uruapán, Mich. 12, *E. corrugans*, male allotype, Morelia, Mich.

golden setae; metatarsomeres bearing dense stout spines (as in female). Length: 20.2 mm; width: 8.2 mm.

Types.—Holotype ♀: Mexico, Uruapán [Michoacán] , 28-5-72, no collector (OSUC). Allotype ♂: Sierra de Durango (from Oberthur collection, MNHN). Paratype: 1 ♀, Mexico, Morelia [Michoacán], 15-VIII-1993, no collector, from the collection of P. Leo, sent to me for determination by Daniele Sechi (OSUC).

Remarks.—This species belongs to the subgenus *Steneleodes* and is similar to *E. compressitarsus* Blaisdell, except for the transversely wrinkled elytra.

Etymology.—The name refers to the corrugated sculpture of the elytra which resembles ripple marks in sand.

Eleodes spiculiferus Triplehorn, new species

(Figs. 15, 16)

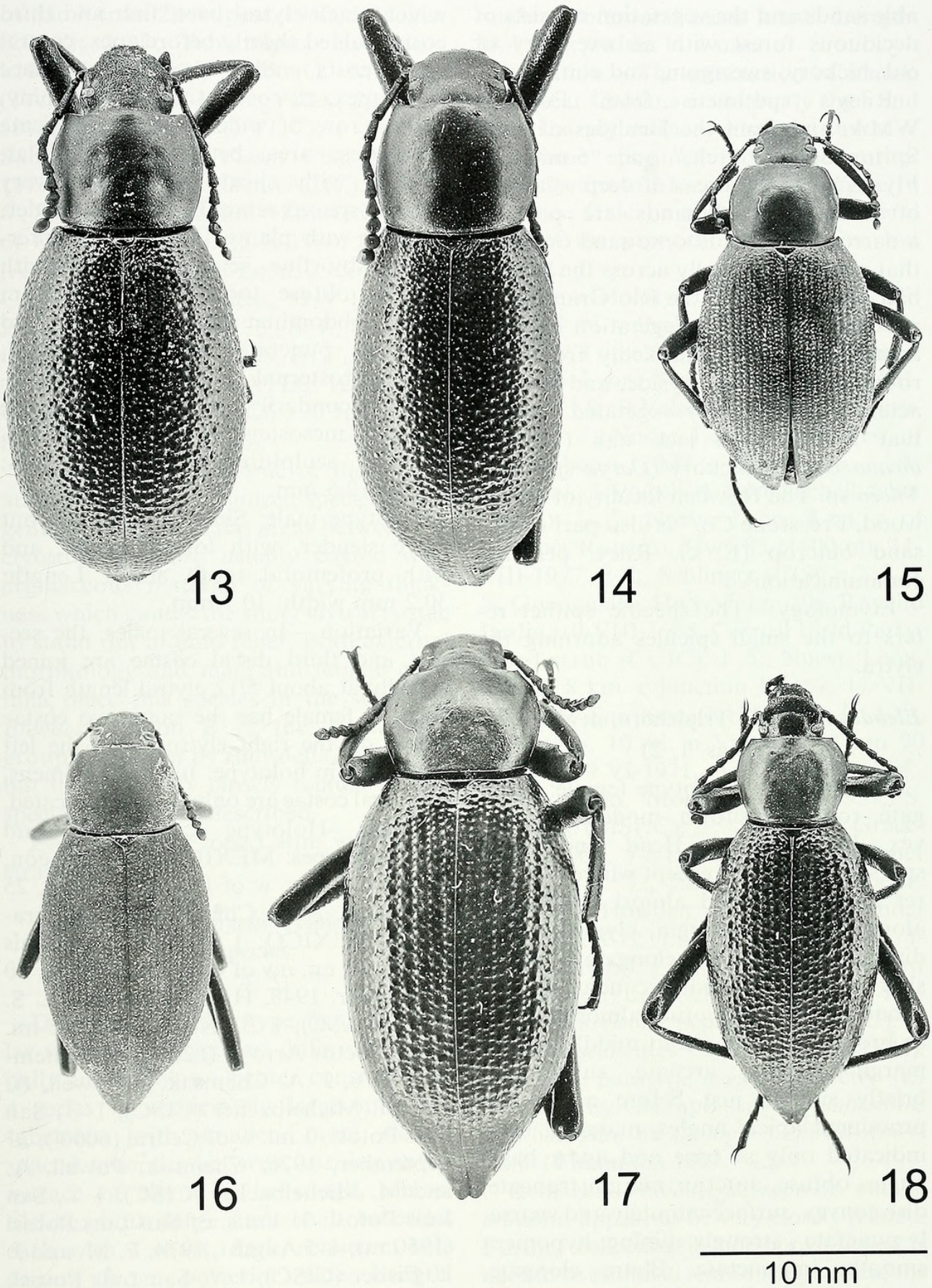
Description.—Holotype female: Oblong-oval, dull, piceous. Head moderatly densely punctate, most punctures separated by several times their diameters; epistomal margin truncate; eyes narrow, elongate, scarcely emarginate anteriorly; antenna short, third antennomere subequal to 4–6 combined; mentum trapezoidal, rugose. Pronotum broader than long, sides slightly rounded from base to apex with very fine marginal bead, widest at middle, basal margin arcuate, angles obtusely rounded; anterior margin almost truncate, angles obtuse, not prominent; surface finely and muricately punctate, punctures subequal to those of head. Elytra with sides evenly rounded from base to apex, not margined laterally, humeri prominent, embracing base of pronotum; striae absent, surface finely and densely papillose, each papilla bearing a short, pale, recumbent seta; hypomera and prosternum smooth with a few scattered muricate punctures, prosternal process convex between procoxae, apex secondarily reflexed, moderately prominent; ventral surface, including abdominal sterna, coarsely. muricately punctate; legs coarsely and densely punctate. Length: 14.8 mm; width: 7.8 mm.

Allotype, male: Similar to female but with dentate profemur (mutic in female), a dense pad of short, golden setae on basal protarsomere (coarse spines in female), and antenna stouter, with third antennomere slightly longer than 4 and 5 combined. Length: 17.0 mm; width: 7.0 mm.

Types.—Holotype ♀ allotype ♂ (TAMU) and one ♀ paratype (OSUC): Texas, Anderson County, Engeling Wildlife Management Area, V-31-2001, E. G. Riley (TAMU). Paratypes: 2 ♀, 2.5 mi. sw of Forestburg, Montague County, 30-V-1951, B. Patterson (FMNH); 1 ♀, same data except 22-29-IV-50 (FMNH); 1 ♂, Anderson County, Gus Engeling Wildlife Management Area, mv+bl, 29 May, 1998, R. Turnbow (RHTC); 1 ♂, Forestburg, VIII-15-1949 (NMNH); 1 ♂, Oakwood [Freestone County], V-4-1956, H. Howden (OSUC); 1 ♂, Freestone Co. Old Spring Seat Church, nr. Donie, V-6-1995, E. Riley (TAMU); 1 ♀, Leon County, 5 mi. n of Flynn, VIII-13-1994, E. G. Riley (TAMU).

Remarks.—It seems incredible that so few specimens of this unusual species are known and from such widely separated localities. It appears to belong to the subgenus *Promus*, but does not seem closely related to any other species in the subgenus. The elytral setae are similar to those of *E. opacus* Horn, the only other setose member of the subgenus, but lacks the sharp lateral margins of the elytra so characteristic of that species. The dense pad of golden setae on the basal protarsomere of the male is also diagnostic.

According to Robert Turnbow, his specimen was collected at the Gus Engeling Wildlife Management Area, Tennessee Colony, Texas. There the soils are mostly light colored, rapidly perme-



Figs. 13–18. *Eleodes* species, habitus. 13, *E. watrousi*, female holotype, 2 mi NW Nombre de Dios, Dgo. 14, *E. watrousi*, male allotype, same data. 15, *E. spiculiferus*, female, 2.5 m SW Forestburg, TX. 16, *E. spiculiferus*, male, Anderson, Co., TX, Engeling W.M.A. 17, *E. muricatulus*, female holotype, El Refugio, S.L.P. 18, *E. muricatulus*, male, El. Obligato, Zac.

able sands and the vegetation consists of deciduous forest with an overstory of oak hickory, sweetgum, and elm.

Riley's specimens from Engeling WMA, and from the localities of "Old Spring Seat Church," and "5 mi n of Flynn," are also areas of deep sand. All of these exposed sands are part of a narrow band of Eocene sand outcrops that extend diagonally across the eastern half of Texas, from the Rio Grande into northeastern Texas. Vegetation of these areas often differs markedly from surrounding Texas coutryside, and is characterized by sparsely vegetated patches that include blue jack oak (*Quercus incana* Bartr.), hickory (*Carya* sp.), and *Yucca* sp. The Howden locality of "Oakwood, Freestone Co." is also part of this sand outcrop (E. G. Riley, personal communication).

Etymology.—The specific epithet refers to the small spicules adorning the elytra.

***Eleodes mirabilis* Triplehorn, new species**
(Figs. 1, 2)

Description.—Holotype female: Elongate, robust, fusiform, moderately convex, black, shiny. Head finely and sparsely punctured except where punctures are coarser and almost contiguous along epistomal margin, clypeal suture distinct; eyes narrow, elongate; antenna short, scarcely extending caudad beyond pronotal base. Pronotum almost as long as broad, broadest about middle, lateral margins slightly arcuate, subparallel, briefly sinuate just before acute and prominent apical angles, marginal bead indicated only at base and apex, basal angles obtuse, anterior margin truncate; disc convex, surface minutely and sparsely punctate , strongly shining; hypomera smooth, impunctate. Elytra elongate, tapering gradually behind, forming a distinct cauda; each elytron with sutural, marginal and three discal costae, all of which reach elytral base, first and third costae joined shortly before apex, central discal costa ending about 2/7 distance from apex, all costae smooth and shiny, with a row of widely spaced muricate punctures; area between costae flat, clothed with short, black, not very densely spaced setae. Legs long, slender, all tarsi with planter grooves not interrupted by fine setae; profemur with distinct obtuse tooth one third from apex; abdominal sterna finely and sparsely punctate, faintly wrinkled, shiny; prosternal process deflexed behind, secondarily reflexed and acute apically; mesosternum slightly concave, coarsely sculptured. Length; 32 mm; width: 12.5 mm.

Allotype male: Similar to female but more slender, with longer cauda, and with profemoral tooth acute. Length: 30.2 mm width: 10.7 mm.

Variation.—In several males, the second and third discal costae are joined apically at about 5/12 elytral length from apex. A female has the same two costae joined on the right elytron with the left elytron as in holotype. In two specimens, the discal costae are only slightly indicated.

Types.—Holotype ♀, allotype ♂, and 4 ♂ paratypes: MEXICO: Nuevo León, 42 km n, 3 km. w of Doctor Arroyo, 25 July, 1981, Allan Chaney (TAIU). Paratypes: MEXICO: 1 ♂, 4 ♀, San Luis Potosí, 12 mi. nw of Ciudad del Maiz, 20 November, 1948, H. B. Leech and E. S. Ross (CASC); 1 ♂, Nuevo León, 5 mi. W of Doctor Arroyo (6200'), 22 September, 1976, J. A. Chemsak, J. Powell, A. and M. Michelbacher (CISC); 1 ♂, San Luis Potosí, 3 mi. w of Cedral (6000'), 21 September, 1976, Chemsak, Powell, A. and M. Michelbacher (CISC); 1 ♀, San Luis Potosí, 31 km s. of San Luis Potosí (1950 m), 4–5 August, 1974, E. M. and J. L. Fisher (CISC); 1 ♀, San Luis Potosí, Rio Verde, 3 mi. e (nr Rio Verde River), 25 August. 1969, J. Doyen, J .K. Haddock (CISC); 1 ♀, S. L. P., 4 mi. E

of Rio Verde, 29 August, 1969, J. Doyen (CISC); 2 ♂, Tamaulipas, Hwy 80× k101, 10 August, 1975, G. Merkord (TAIU); 2 ♂, S. L. P., Valles, 22 May, 1972, V.C. Allman (BYUC); 1 ♂, 1 ♀, San Luis Potosí, Yucca Flat, 3-VIII-1977, P. Blom, A. Allen (ACIC); 3 ♂, 1 ♀, San Luis Potosí, km 54 on Hwy. 80 w of Ciudad del Maiz, 5-X-1980, P. Blom (ACIC); 1 ♀, Nuevo León, 29 km n San Cayentano de las Vacas, 31-V-1981, W. E. Steiner (USNM); 1 ♂, S. L. P., 11 mi n. Matahuala, 2-IX-1958, H. F. Howden (CNCI). UNITED STATES: Texas, 1 ♂, Comstock (Val Verde Co.) 20 July, 1972, S. M. Benbow (TTCC).

Remarks.—This is one of the largest and most easily recognized species in the genus *Eleodes*. The flat areas between the elytral costae are usually coated with argillaceous material of varying thickness which causes the shiny elytral costae to stand out in bold relief. Both external morphology and male and female genitalia place this species in the subgenus *Eleodes*, section B of the *E. dentipes* group as defined by Blaisdell (1909: 234), but it is not very closely related to any species heretofore described.

Etymology.—From Latin: wonderful, strange.

Eleodes scyropterus Triplehorn, new species

(Figs. 4, 5)

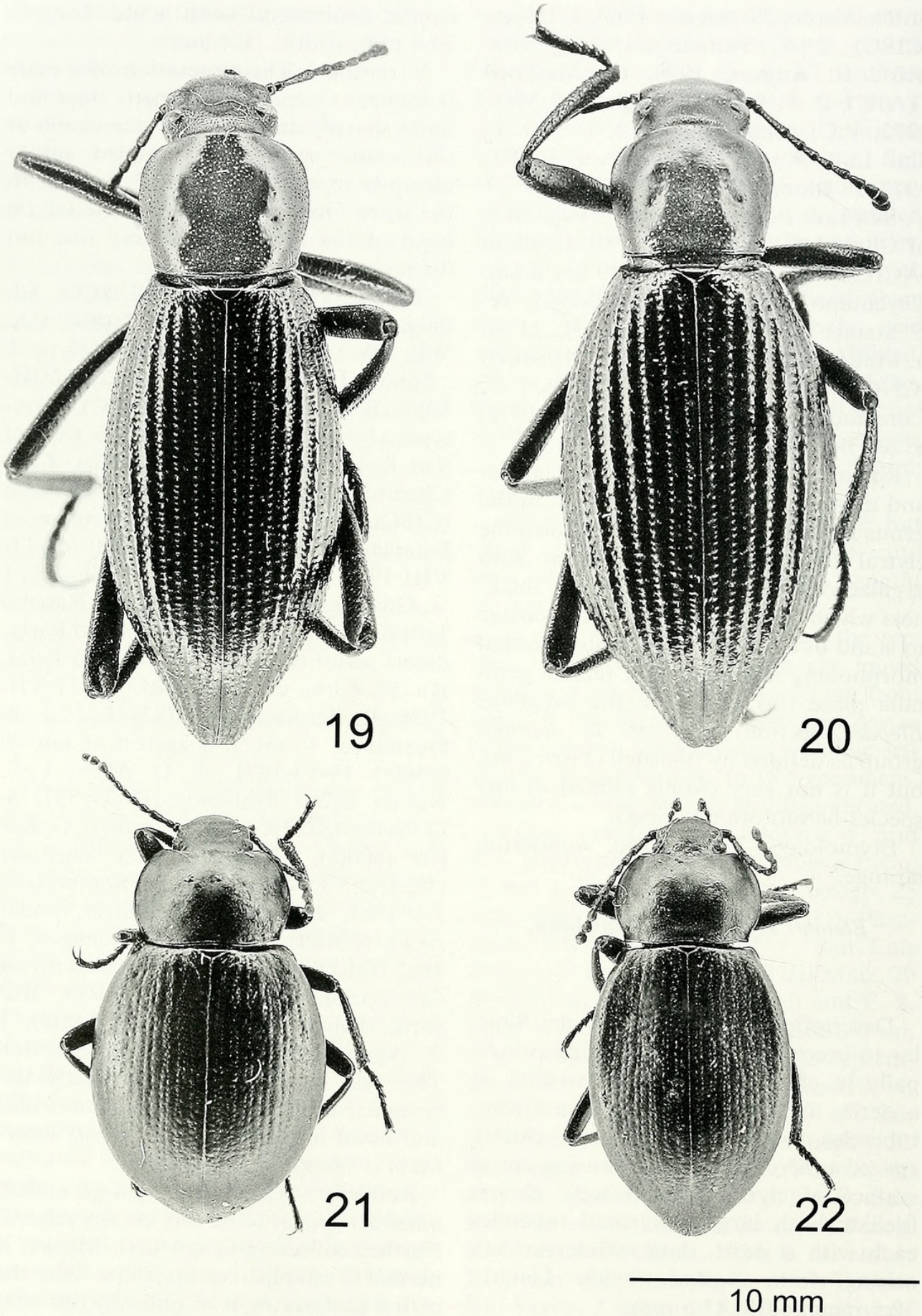
Description.—Holotype female: Similar to preceding species, differing principally in elytral sculpture, consisting of a series of moderately large muricate tubercles, with smaller, more closely spaced tubercles between, causing entire surface of elytra to be rough, almost filelike; both large and small tubercles each with a short, dark, semierect seta arising from posterior side Length: 32.5 mm; width: 11.5 mm.

Allotype male: Similar to female but more slender and with a much longer cauda, profemoral teeth acute. Length: 34.4 mm; width: 11.4 mm.

Variation.—The punctation of a male from near Galeana is distinctly finer and more sharply defined. Also, the cauda of this same specimen is angled rather abruptly upward for its entire length. In the three Galeana specimens, the lateral bead of the pronotum is very fine but distinct.

Types.—Holotype ♀: MEXICO, Hidalgo, 7 mi w Pachuca, 24-VI-1975, CA, WE, BW Triplehorn (OSUC). Allotype ♂ : Nuevo León, 5 mi s Galeana, 8-VIII-1959, B. & B.Valentine (OSUC). Paratypes: 1 ♀, Nuevo León, 10 mi. west of San Roberto (7000'), 15 IX-1976, J. A. Chemsak, J. Powell, A & M Michelbacher (CISC); 1 ♂, Nuevo León, 8 mi. e of Estancia Roberto, Hwy 85 (1800 m), 11-VIII-1977. E. L. Schlinger (CISC); 2 ♂, 1 ♀, Guanajuato, Hwy 57, km 306, Rancho Jardin, 10-VIII-1965, Cornell Field Party, desert scrub (CUIC); 1 ♂, Nuevo León, Rt. 58, 8 km. e junction Rt. 57, 17-VII-1988, R. Turnbow (RHTC); 1 ♂, 1 ♀, Queretaro, 10 mi. n Vizarron at km 90 (5300'), 19-VI-1971, A. O. Allen; 1 ♂, Nuevo León, Monterey, IX-1-1957, S. G.Wellso (MSUC); 1 ♂, Durango, Graceros, (6000'), 7-VII-1961, R.A Scheibner (MSUC); 1 ♀:, Zacatecas, Sombrerete, 3-V-1961, Howden and Martin, under rocks (CNCI); 1 ♀, Aguascalientes, I-1892 (DEUN); 1 ♂, Zacatecas, 30 mi sw Concepción del Oro, 9-VII-1983, Kovarik, Harrison, Schaffner (TAMU); 1 ♀, Aguascalientes City, Höge (BMNH). This last paratype was incorrectly determined by Champion as *E. glabricollis* and listed in the *Biologia Centrali-Americana* (Champion 1892: 515).

Remarks.—*Eleodes scyropterus* and *E. mirabilis* appear to be very closely related. Further collecting in northern Mexico is needed to establish relationships. Since the elytral sculpturing is so radically different in the two (see figures), and since no intermediate forms were encountered, I



Figs. 19–22. *Eleodes* species, habitus. 19, *E. samalayucae*, male, Samalayuca, Chih. 20, *E. samalayucae*, female, same data. 21, *E. platypennis*, female, Sierra de Manantlan, Jal. 22, *E. platypennis*, male, same data.

choose to consider them distinct species at this time. It belongs to the nominate subgenus *Eleodes*.

Etymology.—From Greek: scyro (rough), ptero (wing).

Eleodes platypennis Triplehorn, new species
(Figs. 21, 22)

Description.—Holotype female: Broadly oval, flattened, dull, opaque. Head with epistomal margin truncate, frontoclypeal suture scarcely evident; surface finely and densely punctate; eyes narrow, elongate, antenna short, stout, extending just past base of pronotum, antennomere 3 subequal to 4–5 combined; mentum small, rounded, rugosely punctured. Pronotum 2/5 broader than long, sides broadly and uniformly rounded, widest at middle, with strong marginal bead, basal margin subtruncate, with strong bead, basal angles obtuse; anterior margin broadly emarginate, with fine bead, angles obtuse; surface minutely and sparsely punctate. Elytra broadly rounded, sharply deflexed laterally, finely punctate-striate, punctures not in grooves, intervals flat, with rows of punctures slightly smaller than those of striae. Ventral surface, hypomera smooth, longitudinally wrinkled near procoxae; prosternum coarsely, rugosely punctured, prosternal process deflexed between procoxae, apex not prominent; mesosternum coarsely punctured, scarcely excavate anteriorly; metasternum coarsely punctured; abdominal sterna almost smooth (except for terminal one with distinct punctures), finely wrinkled, especially laterally; legs short, metafemora extending only to middle of third visible abdominal sternum; all femora finely and sparsely punctate, tibiae with fine muricate punctures, each bearing a short, pale seta, protibial spurs short, thin; tarsi with short, stout setae. Length 11.8 mm; width: 7.0 mm.

Allotype male: Almost identical to female, sexes separable only by dissection. Length: 12.5 mm; width: 6.7 mm.

Variation.—In several specimens the elytral intervals are subconvex, otherwise the series is quite uniform in size, shape, luster, and punctation.

Types.—Holotype ♀, allotype ♂, and 3 paratypes: Mexico, Jalisco, Sierra de Manantalan, Bosque Mesofilo, 1899–1900 m, 18-VII-1985, J. Doyen (CISC). Two paratypes, same data (OSUC); one ♂ paratype, same locality, but 21-III-1990, J. Pal (HNHM).

Remarks.—This species bears a superficial resemblance to *E. tesselatus* Champion, but the female genitalia are quite different. I am unwilling to assign either of these species to any known subgenus at this time.

Etymology.—The specific epithet refers to the flat elytra.

Eleodes muricatulus Triplehorn, new species
(Figs. 17, 18)

Description.—Holotype female: Elongate, slender, fusiform, subconvex, black, shining. Head with frons finely and sparsely punctate, frontoclypeal suture indistinct, clypeus moderately densely punctured, eyes small, narrow, elongate, antenna moderately long, extending three antennomeres beyond base of pronotum. Pronotum slightly broader than long, broadest slightly anterior to middle, lateral margins arcuate, narrowing rapidly toward base, basal margin rounded, angles obtusely rounded, apical margin shallowly emarginate, apical angles acute, prominent, marginal bead fine and entirely visible from above; disc subconvex, surface minutely and sparsely punctate, glossy. Elytra elongate, widest near middle, sides subparallel, narrowing gradually to apex, not meeting at midline, but each separately rounded, apex bifid; surface with uni-

form longitudinal rows of muricate punctures with shiny crests, intervals microreticulate, glossy. Ventral surface shiny, propleura almost impunctate, prosternal process deflexed between procoxae, abdominal sterna shiny, finely wrinkled; legs long, profemur with blunt tooth at outer 1/5, metafemur attaining elytral apex. Length: 24.8 mm; width: 9.5 mm.

Allotype male: Similar to female, but with strong profemoral tooth at outer 1/5. Length: 19.7 mm; width: 7.8 mm.

Variation.—The size and sculpture of the seven available specimens is very constant. Both sexes have very similar body proportions and it is necessary to check the profemoral teeth to distinguish between them.

Types.—Holotype ♀: MEXICO, San Luis Potosí, El. Refugio, 2-IX-1958, H. F. Howden, roadside flowers (CNCI). Allotype ♂: San Luis Potosí, 3 mi w Cedral (6000'), 21-IX-1976, J. A. Chemsak, J. Powell, A. and M. Michelbacher (CASC). Paratypes: 1 ♂, San Luis Potosí, 7.6 mi ne San Luis Potosí on Mex. Rt. 30 (6075'), 8 IX-1964, W L. Nutting and sons (UAZC); 1 ♂, San Luis Potosí, Ft. Huizache, 22-VIII-1954, J. G. Chillcott (CNCI); 1 ♀, Coahuila, 20 mi se Saltillo, 10-VII-1963, H. and A. Howden (CNCI); 1 ♂, Zacatecas, 7 mi e Sombrerete, 31-VIII-1965, Gertsch and Hastings (AMNH); 1 ♀, Zacatecas, El Obligado, (2100 m), 2-VII-1990 leg. Heinz (SMNS)

Remarks.—This species belongs to the nominate subgenus *Eleodes* and resembles *E. scyropterus* in elytral sculpture, but males are not caudate as in that species.

Also, the pronotum is quadrate in *E. muricatulus* and longer than broad in *E. scyropterus*

Etymology.—The specific epithet refers to the muricate sculpture of the elytra.

***Eleodes brucei* Triplehorn, new species**

(Figs. 9, 10)

Description.—Holotype female: Oblong, ovate, robust, head and pronotum dull, elytra shiny. Head finely and densely punctate; antenna stout, extending caudad two antennomeres beyond base of pronotum. Pronotum quadrate, widest anterior to middle, sides feebly arcuate, slightly narrowed to base, marginal bead fine and sharp, basal margin straight, basal angles obtuse, apical margin arcuate, apical angles right, not prominent, surface dull, very finely, somewhat irregularly punctate; elytra with three distinct striae on either side of suture, composed of large, well-separated, deep punctures, intervals with much finer more closely spaced, slightly irregular punctures; remander of elytra confusedly punctured, with punctures of two sizes, tending to coalesce laterally, forming transverse plicae. Ventral surface glossy black, hypomera impunctate, smooth, with a few wavy lines along upper margin and laterad of procoxae; prosternum smooth, prosternal process rugosely sculptured between procoxae, strongly prolonged caudad, acute and horizontal, a slight depresson on face of mesosternum for its reception. Abdominal sterna finely and very sparsely puncate, except terminal sternum on which punctures become coarser and denser from base to apex. Legs moderate in length, stout, profemur with distinct anteapical notch, protibial spurs subequal, mesothoracic and metathoracic legs without modifications; all tarsi with only coarse setae on plantar surfaces (no setae in plantar grooves). Length: 19.0 mm; width: 8.4 mm.

Allotype male: Similar in punctation to female, much more slender. Profemur strongly dentate anteriorly, basal protarsomere with conical tuft of dense golden setae interrupting plantar groove. Length: 17.8 mm width: 7.0 mm.

Variation.—The type series is relatively homogeneous. In a few specimens, the serial arrangement of punctures is evident over the entire elytra, in some, even the striae bordering the suture have lost the serial arrangement. In the more strongly punctured individuals, the entire elytra are somewhat rugose due to coalescence of punctures. The shape of the pronotum is somewhat variable, the sides are often subparallel and widest at the middle. Females range from 16.4–19.4 mm in length; males 14.6–18.0 mm.

Types.—Holotype ♀, allotype ♂, and 89 paratypes (52 ♀, 37 ♂): MEXICO, 2 mi. NW of Nombre de Dios, 12-VII-1975, CA, WE, and BW Triplehorn, L. E. Watrous, D. S. Chandler, F. W. Fisk, and Q. D. Wheeler. Holotype, allotype, and paratypes in OSUC. Paratypes in BMNH, MNHN, FMNH, CUIC, and DSCC. Additional specimens seen, but not designated paratypes: 1 ♀, Nombre de Dios, Durango (5900'), 13-VIII-1947, W. Gertsch; 5 ♀, same location, 4 VIII-1954, M. Cazier, W. Gertsch, Bradts (AMNH); 1 ♂, 5 ♀, Zacatecas, 1 km S of Tropic of Cancer on Rt 45, 29-IX-1982, B.W. Triplehorn (OSUC); 1 ♂, Zacatecas, Guadeloupe, 16-VIII-1947, M. Cazier (AMNH).

Remarks.—*Eleodes brucei* belongs to the subgenus *Promus* as indicated by the female genitalia. It most closely resembles *E. montanus* Champion which is known from only a few specimens collected in the Alvarez Mountains (presumably in the state of San Luis Potosí, see Selander and Vauri 1962: 201). Both have relatively coarse, simple elytral punctures which are subserial in arrangement with smaller punctures on the intervals.

Both males and females of *E. brucei* have the prosternal process subhorizontal with the apex prolonged and acute; in *E. montanus*, the process is deflexed behind the procoxae with the apex secondarily reflexed and mucronate. The lateral marginal bead of the pronotum is extremely fine and scarcely visible from above, whereas in *E. montanus*, the bead is much more strongly developed, slightly reflexed, and entirely visible from above. In males of *E. brucei*, only the basal protarsomere has a tuft of fine golden setae interrupting the plantar groove; *E. montanus* has such setal tufts on the two basal protarsomeres.

The entire type series was collected on a single night with the aid of battery-operated headlamps. It was the most abundant species of *Eleodes* in the area at that time.

Etymology.—I take pleasure in naming this species for my son, Dr. Bruce Wayne Triplehorn, a diligent and enthusiastic collector, who helped collect the type series.

Eleodes reddelli Triplehorn, new species
(Figs. 7, 8)

Description.—Holotype female: Obovate, robust, black, opaque. Head finely and sparsely punctate, frontoclypeal suture well defined, epistomal margin feebly emarginate; eyes very narrow; elongate, antenna long, slender, extending about 5 antennomeres beyond pronotal base, antennomeres 3–8 cylindrical, 9–10 about as long as wide, 11 larger and acuminate apicaly; mentum trapezoidal, longitudinally rugose, ventral surface coarsely and densely punctured. Pronotum 1/3 broader than long, sides strongly rounded, widest at middle, slightly sinuate near base, lateral marginal bead extending around both basal and apical angles, basal angles obtusely rounded, apical margin broadly emarginate, angles acute, prominent; surface minutely and sparsely punctate; elytra strongly inflated behind, abruptly declivous, humeri obsolete, epipleura broad, smooth basally, slightly reflexed near apex, surface punctate-striate, strial punctures, not in grooves, individual punctures separated

by several times their diameters, intervals with a single row of very minute punctures; hypomera almost smooth with a few wrinkles and scattered minute punctures; prosternal process rugosely punctured, mesosternum coarsely and densely punctured, scarcely excavate anteriorly; metasternum and abdominal sterna practically smooth, with feeble longitudinal wrinkles laterally; legs long and slender, tibiae clothed with short, stout setae, plantar surfaces of tarsi with stout setae. Length: 19.2 mm; width: 8.7 mm.

Allotype male: Similar in color, size, and sculpture to female, but much more slender and with profemur strongly dentate in apical ¼.

Variation.—The three females and one male comprising the type series are very uniform in size and scultpture.

Types.—Holotype ♀: MEXICO, Nuevo León, Cueva de Cuchillo, 2.5 km s of Minas Viejas, 1270 m, 22 April, 1998, Peter Sprouse. Allotype ♂: same locality but 24 Nov., 1995, G. Veri. Paratypes: 1 ♀, Mexico, N. L. Gruta del Palmetto, 4 mi S of Bustamente, 12-30-64, F. McKenzie; 1 ♀, same locality, but 15-IX-1942, C. Bolivar. Holotype and allotype deposited in TAMU. Paratypes in TMMC and CNIC.

Remarks.—This species is a member of the subgenus *Caverneleodes* as indicated by the long, slender antennae, small eyes, and the female genitalia. It is by far the largest member of the subgenus. The large size, long, slender legs, and inflated elytra are distinctive.

Etymology.—This species is named in honor of James Reddell, who has collected many unusual beetles and other arthropods in caves.

Eleodes watrousi Triplehorn, new species
(Figs. 13, 14)

Description.—Holotype female: Elongate-oval, robust, piceous, head and pronotum dull, elytra shining. Head finely and densely punctured, epistomal margin shallowly emarginate, clypeolabial suture scarcely evident; eyes narrow, elongate, upper lobes slightly larger than ventral; antenna stout, extending about four antennomeres beyond pronotal base, antennomere 3 subequal to 4–6 combined; mentum trapezoidal, about as long as broad; gular area longitudinally finely wrinkled. Pronotum ¼ broader than long, widest just anterior to middle, sides moderately rounded, narrowing toward base, basal margin round, angles obtuse, anterior margin shallowly emarginate, angles rectangular, slightly prominent, lateral marginal bead very fine; surface minutely and sparsely punctate; hypomera strongly sculptured, especially adjacent to procoxae; prosternum strongly sculptured, prosternal process horizontal, its apex acute and prominent. Elytra convex, sides strongly rounded, apical declivity steep; humeri obsolete; punctures coarse, not in rows, tending to coalesce into horizontal rugae. Mesosternum rugose, feebly excavate anteriorly; metasternum and abdominal sterna smooth, almost impunctate but with conspicuous wrinkles, terminal abdominal sternum more coarsely punctate. Legs slender, finely and densely punctate; profemur with slight emargination at apical 1/5, protibial spurs very short, metafemora not quite attaining elytral apex, all tarsi clothed beneath with short dark setae. Length: 23.5 mm; width: 10.3 mm.

Allotype male: Similar to female, but slightly more slender and with profemur strongly dentate at anterior 1/5, and basal protarsomere with dense, fine, pale setae in plantar groove. Length: 22.0 mm; width: 8.7 mm.

Types.—Holotype ♀, allotype ♂, and five paratypes: Mexico, Durango, 2 mi. NW of Nombre de Dios, 12- VII-1975, C. A., W. E., B.W. Triplehorn, L. E. Watrous, collectors (OSUC).

Remarks.—This species is known only from the type series. It belongs to the subgenus *Promus* and differs from all other members of that subgenus in having the elytra rugosely punctured and without striae.

Etymology.—I am pleased to name this interesting species in honor of Dr. Larry E. Watrous, a skilled and dedicated companion in the field and an accomplished beetle systematist who collected part of the type series.

Eleodes bidens Triplehorn, new species
(Fig. 3)

Description.—Holotype male: Similar to *E. watrousi*, but with pro- and mesofemora bearing denticles at apical 1/5 on both upper and lower surfaces, and metafemur slightly dentate. Head and lateral portion of pronotum more densely punctate than in that species. Prosternal process deflexed between procoxae, its apex not prolonged; ventral surface, especially abdominal sterna, rugosely punctured. Length: 22.8 mm; width: 8.5 mm.

Holotype.—♂, Mexico, Durango, 9 mi E of El Palmito (7500'), 15-VI-1971, H. F. Howden (CNCI).

Remarks.—This is the only species of *Eleodes* I have seen with double teeth on the pro- and mesofemora, a very unique character. It belongs to the nominate subgenus *Eleodes*.

Etymology.—The specific epithet refers to the double teeth on the pro- and mesofemora.

Eleodes samalayucae Triplehorn, new species
(Figs. 19, 20)

Description.—Holotype female: Elongate, slender, black, shining. Head finely and sparsely punctate, epistomal margin subtruncate, clypeus small, transverse, deeply emarginate, sparsely punctate, each puncture bearing a black seta; eyes narrow, elongate, feebly emarginate anteriorly; antenna moderately stout, third antennomere almost as long as next three combined. Pronotum 2/5 wider than long, widest in anterior third, smoothly converging to base, anterior margin truncate, angles obtuse, not prominent, basal margin rounded, angles obtusely rounded, marginal bead extremely fine, surface finely and sparsely punctate, hypomera smooth, impunctate, feebly wrinkled, prosternum with fine, transverse rugae, prosternal process deflexed between procoxae, apex not prolonged. Elytra elongate-oval, rather slender, slightly rounded from base to apex, humeri obsolete, surface punctate-striate, strial punctures finely muricate, not in grooves, intervals convex, with widely spaced muricate punctures, stronger laterally and apically; legs long, slender, hind femora extending beyond last visible abdominal suture, femora sparsely, muricately punctured, tibiae densely spiny, tarsi clothed beneath with coarse, dark setae, tibial spurs and claws unusually long on all legs, ventral surface finely wrinkled and sparsely punctate. Length: 19.8 mm; width: 7.5 mm.

Allotype male: Similar to female but slightly more robust and with a very slight suggestion of a profemoral tooth. Length: 22.2 mm; width: 7.4 mm.

Types.—Holotype ♀ and allotype ♂: Mexico, Chihuahua, Samalayuca, 24-VI-1947, Cazier, D. Rockefeller Exp. (AMNH). Paratypes: 1 ♂, same data as holotype (AMNH); 1 ♂, 1 ♀, same locality, but 15-V-1947, C. M. Bogart (OSUC); 2 ♂, 5 mi S of Samalayuca, 31-VII-1974, R. L. Mangan, D. S. Chandler (DSCC).

Remarks.—This species is apparently confined to the dry lake Samalayuca, south of Juarez, Chihuahua, Mexico. It superficially resembles *E. hispilabris* (Say), but differs in not having the profemora dentate in the male, and in the narrow and sparsely punctate pro-

notum with apical angles obtusely rounded, not prominent. The tibial spurs and tarsal claws are likewise much longer than in *E. hispilabris*. It belongs to the nominate subgenus *Eleodes*.

Etymology.—This species is named for the type locality, Samalayuca in Chihuahua, Mexico.

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