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XVI
STUDIES IN THE TENEBRIONIDÆ, NO. 2
(COLEOPTERA)

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The first number of the present studies appeared in the Entomological News of January, 1918 (Vol. XXIX, p. 7.). The new species and subspecies of *Eleodes* described below have accumulated since the publication of my Monographic Revision of the *Eleodiini* (Bull. 63, U. S. Nat. Mus.) in 1909. The material studied since then has cleared up the doubtful status of several of the phases given at that time. Mr. Leng in a foot-note (p. 227) in the Catalogue of the Coleoptera of America North of Mexico, remarks that I have more recently elevated several such names to higher rank, "the original presumption in such cases having been apparently erroneous."

In the mass of heterogeneous material upon which I based my monograph, there were numerous instances in which the specimens were too few for a correct and definite understanding of the relationships; as a result, many subspecies and races were not recognized and unwittingly considered as *forms*,—not wholly from ignorance in many cases, but more truly as acts of conservatism, I having believed it to be more logical and truthful to raise than to lower a grade, whenever more positive data warranted it.

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From the standpoint of taxonomy, the solution of the question of specific relationship is not going to come from the study of dried museum specimens, but must be the result of careful ontogenetic and ecologic studies of large series of specimens collected in the different geographic regions. Such research must be pursued with untiring zeal if we are to arrive ultimately at some conception of the laws governing the divergence of organisms.

The raising of certain *forms* to a definite grade does not invalidate the conception of such intra-specific groups, for even then the specific aggregates will be made up of variants, as no two individuals of any species can be exactly alike as regards size, form, sculpturing and color, no matter how much restricted taxonomically. With Dr. E. C. Van Dyke, I prefer to use the term "phase" in a generic sense to include all variants of a species, subspecies or variety. When a species is limited taxonomically the intra-specific, intra-subspecific or intra-varietal variants can be grouped according to size, form, sculpturing or color, each group constituting a *form*. These are really ecological groups. I expressed these same ideas in my monograph.

In 1909 I presented the conception of *forms* as a means of directing attention to the variation within specific units so as to make them objects of research. I *advised that forms should not be given a place in a check-list*, for on the very face of the matter they are absolute synonyms according to the author and from the standpoint of taxonomy. We must have laws and rules of guidance, otherwise everything passes into confusion, and yet to enforce them rigidly or literally may retard science rather than advance it. The enforcement of laws or the application of rules must be tempered by good judgment, this is absolutely necessary, for no law or rule is strictly applicable in all cases; hence the need of flexibility in the application of a rule. Certain recent changes in our nomenclature have been founded on paleographic facts much to the confusion of other branches of science.

A word or two regarding extremists versus the intermediate path. Conservatism, when extreme, retards the progress of science. Most of this is due to the exercise of the personal equation rather than to biological inquiry. A species relegated

to synonymy is supposed to be defunct for all time and yet some synonymical lists are rich in research material. The other extreme usually overrates biological facts, but the result more than balances the harm done by the stimulus it gives to discussion and research. Why not pursue the more logical and sane path,—bury the personal equation and let intensive research dictate the biological data; the deductions will then be both progressive and scientific.

Forms may be said to constitute ecological groups, for the units of a species exhibit individual differences which are very evidently due to environment and not to reactions in the germ plasm. It may be admitted that environmental conditions will affect the germ plasm in the course of centuries. Environmental conditions are constantly changing and therefore unstable: They change from day to day, from month to month, and from year to year; first warm then cold, dry and then wet, over a whole region or any part of a region, even to small and restricted areas. That is why one season yields notable variations and the next something still different.

A consideration of the principle ecological factors capable of bringing about variations in size, form, sculpturing and color in organisms, includes temperature, humidity, quantity and quality of food, coupled with geographical position. Any one taking cognizance of these facts should eliminate if possible all individual variations (*forms*) of known or described species, subspecies and varieties before describing any of them as new to science. Let it be kept in mind that the earth is Nature's great experimental laboratory and that it is an infinite field for research.

The limitation of species, subspecies and varieties is quite arbitrary in the present state of our knowledge. A species as at present defined, with its subspecies and varieties constitutes a specific complex. I believe that all subspecies and varieties should be recognized and named as they constitute taxonomic subgrades. The main idea in doing this is to make them objects of research. The definition of a species is too well known for me to repeat it, but I would like to make known what I understand by subspecies and variety or race. The usual encyclopedic definition leads the student in a circle so that he usually knows just as much after his investigation as he did

when he began. My definitions have been formulated from observations in the field.

I assume that I am dealing with a specific phase worthy of subspecific grade whenever a series of specimens has been collected in some particular geographical region apart from the type and, as a whole, presents some notable difference in form, size, sculpturing or color from the type.

I assume likewise that a variety (race) is to be recognized when a series of specimens presents some minor but constant difference in size, form, sculpturing or color from the type, and usually inhabits the same geographical region, but in some areas the varietal phase may predominate. A subspecies or variety interbreeds with the type if inhabiting the same geographical region or area. The regions of distribution of type, subspecies and variety may overlap and this accounts in part for the confusion which exists regarding what constitutes a subspecies or variety. I believe that ontogenetic research must decide the relationships in the Insecta. The student in the field must work out the distributional and seasonal phases.

Forms in the sense defined above should be recognized, studied and properly placed in collections, and discussed in current papers and monographs, but not given in a check-list.

The following new species, subspecies, and varieties are presented at the present time:

1. *Telabis nevadensis* Blaisdell, new species

Form elongate oblong-oval, a little more than twice as long as wide, moderately convex. Color piceous brown, dark rufous beneath, legs paler; luster dull to somewhat shining.

Head a little transverse, sides moderately convergent and feebly arcuate before the eyes, the latter somewhat prominent and coarsely faceted; epistoma slightly produced, arcuato-truncate at apex, sides briefly oblique from the shallow emarginations; front very slightly convex, very feebly and broadly impressed laterally within the sides, moderately and discretely punctate, punctures somewhat coarser, deeper and more or less coalescent on the epistoma; vertex more or less strigose. Antennæ long and slender.

Pronotum nearly twice as wide as long; apex moderately emarginate, angles obtuse and blunt; base feebly bisinuate, marginal bead rather broad and flat in middle third; basal angles obtuse and distinct; sides evenly and moderately arcuate, feebly convergent anteriorly, margin rather thin

and narrowly reflexed, slightly crenulate; disk moderately convex, discretely punctate; punctures smaller in middle third, thence somewhat coarser and more oval, with their margins quite distinct and not coalescent; sides narrowly impressed but rather more widely so toward the basal angles. Propleura with a few scattered hairs; rather coarsely, but not densely punctate, punctures shallow; intervals somewhat prominent longitudinally.

Elytra oblong, about a half longer than wide, sides parallel and feebly arcuate, apex broadly rounded, humeri obtuse and not in the least prominent, although somewhat exposed; disk moderately convex, finely and subasperately punctate, punctures somewhat confused at base, sides and apex, series quite distinct in the central area.

Sterna sparsely and not very coarsely punctate; punctures shallow; mesosternal epimera impunctate; transverse metasternal ante-coxal line well defined and almost entire. Abdomen moderately evenly convex, finely and very sparsely punctate along the middle, rather more coarsely so laterally; under surface of the body clothed with scattered hairs.

Length (types) 6-6.5 mm.; width 2.4-2.8 mm.

Holotype, male, and *allotype*, female, in my collection. *Paratypes* in the collection of Mr. Warren Knaus and in that of the author.

Type locality: Las Vegas, Nevada, collected July 31, 1921. A series of five specimens.

This species evidently falls into the series with Casey's *uteana* and *amica*, both from Utah. In *nevadensis* the punctuation of the head and pronotum is discrete, not very dense (rather more abundant in the female), shallow and scarcely asperate, not muricate; the vertex of the head may be more or less longitudinally strigose. According to Casey, *uteana* is piceous black in color and *amica* is pale testaceous, and he makes no mention of the vertex of the head being strigose in either species.

2. *Eleodes quadricollis lassenica* Blaisdell, new subspecies

Form and sculpturing similar to that of *quadricollis* Esch., but more strongly and densely punctate throughout. Color intense black.

Pronotum more arcuately and strongly declivous laterally, and as a result more strongly convex from side to side. Anterior spurs of the protibiae more elongate in both sexes.

Male: Narrower elongate-oval. Female: Ovate, sides more arcuate; elytra just noticeably inflated. Sexes otherwise as in *quadricollis*.

Length (types) 17-18.5 mm.; width 7-8.5 mm.

Holotype, female, and *allotype*, male, in the author's collection.

Type locality: Martin's Spring, Lassen County, California. Section 14, Tp. 31 N, R. 9 E. Collected by Mr. J. O. Martin, on July 10th, 1922. A single pair.

In *humeralis* Lec. the pronotal marginal bead is visible throughout the length when viewed vertically from above; in *quadricollis* and related species the lateral marginal bead is more or less invisible from above. The main diagnostic characters of *lassenica*, are the denser, stronger sculpturing and less elongate form.

3. *Eleodes parowana* Blaisdell, new species

Form oblong-oval to oblong-ovate, rather strongly convex, a little more than twice as long as wide. Color deep black and feebly shining.

Head moderate in size, densely punctate before the eyes; vertex sparsely punctate; sides arcuate at the supra-antennal convexities, thence straight and convergent to the frontal angles, the latter obtuse; epistoma broadly and evenly emarginate; frontal sutures not evident. Antennæ rather stout and moderate in length, tenth joint transversely oval, the three-jointed club very slightly wider than the preceding joints.

Pronotum quadrate to slightly transverse, widest at apical third; apex truncato-emarginate in moderate circular arc; sides quite strongly arcuate in apical half, thence straight, oblique and moderately convergent to base, marginal bead fine; apical angles nearly rectangular; base transverse and the angles obtuse but not in the least rounded; disk moderately strongly convex, declivous laterally, finely and rather densely punctate, punctures slightly larger laterally, those of the central area being a little more widely separated.

Elytra oval, base sinuate lateral to the scutellum, the latter triangular; humeri obtuse and rather distinct; sides evenly arcuate, apex moderately narrowly rounded; disk costate, costæ moderately convex, smooth and sparsely punctulate, intervals finely and more abundantly, irregularly punctate; punctures on the apical declivity slightly muricate. Legs moderate in length and stoutness, as well as rather densely sculptured. Tarsi moderately stout.

Male: More elongate oblong-oval, front of head more convex. Pronotum subquadrate, widest at middle as viewed from above. Elytral intervals alternately costate. Abdomen very slightly oblique to the sterna, strongly impressed at middle of first two segments, inter-coxal process broad. Anterior spurs of the protibiæ produced and moderate in stoutness.

Female: Oblong-ovate, broader. Pronotum wider than long, widest in front of the middle. Elytra costate as in the male with the *intervening intervals* more or less convex, sides with an incipient margin; apical declivity arcuate and moderately abrupt. Abdomen rather strongly convex. Anterior protibial spur produced and thickened as in the female of *quadricollis*.

Length (types) 15-16.5 mm.; width 6-7.8 mm.

Holotype, female, and *allotype*, male, in my collection. *Paratypes* in that of Mr. Warren Knaus of McPherson, Kansas. Collected on "the Mammoth," at top of Parowan Mountains, Utah, on July 12-22, 1921, at an elevation of 10,000 feet, by Mr. Knaus, while on the Mininger-Hoover Expedition.

Four specimens studied. The elytral sculpturing of *parowana* is unique in the *quadricollis* section of the subgenus *Melaneleodes*. Extending backward from the humeri is an angulation indicating the beginning demarcation of the inflexed sides from the dorsum of the elytra, as observed in *tricostata* and *pedinoides*, although the elytra are strongly convex and not depressed as in the latter species. In *parowana* the anterior protibial spurs are produced and stout as in *quadricollis*. In the *tricostata* group the spurs are produced but they are not so stout. This new species is a most interesting and surprising addition to the subgenus *Melaneleodes*.

4. *Eleodes parowana mimica* Blaisdell, new variety

Mimica resembles *parowana* in most characters, but differs, chiefly in the character of the sculpturing, as follows: *Form* rather more robust, integuments rather denser. Elytral sculpturing more strongly developed and like that observed in the oval form of *tricostata*; alternate intervals strongly convex, surface scabrous from rather fine and quite densely placed muricate punctures; the intermediate intervals may become feebly subcostate.

In *parowana* the elytral punctures are very fine and quite equal throughout, scarcely at all or very feebly asperate at times. In other words in *parowana* the punctuation resembles that observed in typical *porcata* Casey, except that the punctures are equal in size. In *mimica* the punctuation is like that of *tricostata* Say. The pronotum and the anterior tibial spurs

are as in the *quadricollis* group. In the *tricostata* group the pronotum is distinctly transverse.

Length (types) 17-16 mm.; width 6.5-7 mm.

Holotype, female, and *allotype*, male, in my collection. *Paratypes* in that of Mr. Tanner.

Type locality: Bryce Cañon, Utah. Collected by Mr. Vasco M. Tanner on July 27th, 1922.

5. *Eleodes fuscipilosa* Blaisdell, new species

Form rather elongate subfusiform-ovate to ovate, slightly depressed above and a little more than twice as long as wide. Color black throughout, luster rather dull.

Head rather small, front very feebly convex, impressions obsolete, densely and rather finely punctate, punctures much sparser on the vertex; epistoma subtruncate at apex, sides quite straight and slightly convergent anteriorly, angles distinct and rather narrowly rounded, supra-antennal convexities feeble. Eyes rather narrow. Antennæ moderate in length, gradually and very slightly incrassate in outer joints; joints four to seven longer than wide and obconical, eighth triangular, ninth and tenth slightly transverse, eleventh obovate and rather obliquely truncate at tip.

Pronotum subquadrate, relatively small, widest at about the middle, base and apex subequal; apex quite truncate and the angles very distinct, obtuse and not prominent anteriorly; sides rather evenly but not strongly arcuate, almost straight posteriorly and moderately convergent to base, marginal bead fine; base feebly and broadly arcuate, the angles obtuse; disk rather evenly convex, most strongly so laterally and declivous as usual in the *quadricollis* group, finely and almost evenly punctate, punctures well separated.

Elytra suboval, base scarcely wider than the pronotal base, slightly emarginate and adapted to the pronotal base; sides moderately arcuate, convergently so to apex in apical fourth, the apex rather narrowly rounded; disk more or less depressed, more or less moderately and more abruptly rounded into the deflexed sides, rather abruptly and arcuately declivous posteriorly; surface quite discretely muricato-granulate, granules small and shining at summit, not well developed in the central sutural area, irregularly placed, but with a suggestion of a serial arrangement when viewed longitudinally from behind; each granule with a short nearly erect and somewhat stiff brownish hair which is scarcely conspicuous. Epipleura rather narrow and but slightly wider toward base.

Sterna finely and rather densely muricato-punctate. Abdomen finely and rather closely punctate; segments rather strongly convex antero-posteriorly. Legs moderate in length and stoutness.

Male: Narrower, subfusiform-ovate. Pronotum about as wide as long; antennæ slightly stouter; elytral disk less depressed. Abdomen slightly oblique to the sterna; first and second segments flattened in middle third, with a median longitudinal impression. Tarsi rather stout; first protarsal joint not noticeably thickened at apex beneath. Anterior protibial spur distinctly lengthened and stouter than the posterior.

Female: Broader and ovate. Pronotum slightly wider than long. Antennæ rather less stout. Elytral disk noticeably flattened. Abdomen horizontal and moderately strongly convex. Tarsi rather less stout. Anterior protibial spur very distinctly enlarged.

Length (types) 14-16 mm.; width 5-8 mm.

Holotype, female, and *allotype*, male, in my collection, both collected at Parowan, Utah, at an elevation of 6000 ft., on July 24-25, 1921, by Mr. Warren Knaus while on the Mininger-Hoover Expedition.

Fuscipilosa belongs to the *quadricollis* section of the genus on account of the enlarged anterior protibial spurs. It differs from all others of the group in the relatively small head and pronotum and brownish pubescence of the elytra. It should follow *coloradensis* in the list of species.

6. *Eleodes reducta* Blaisdell, new species

Form oblong-ovate, about two and a third times longer than wide and moderately strongly convex. Color deep black, luster somewhat shining.

Head moderate in size, front very slightly convex, impressions feebly indicated, most marked within the supra-antennal convexities; densely and irregularly punctate, with small impunctate areas, punctures rather small, becoming still smaller and sparser on the vertex; sides rather arcuately prominent over the antennal base, thence becoming sinuate, straight and obliquely convergent to the narrowly rounded epistomal angles; apex of the epistoma broadly and feebly emarginate. Eyes narrow. Antennæ moderate in stoutness and length, attaining the pronotal base; joints four to eight slightly longer than wide, ninth about as long as wide and subglobular, tenth slightly wider than long, eleventh short obovate and truncate at tip.

Pronotum subquadrate, widest at about the middle; apex truncate in circular arc, apical angles obtuse and distinct; sides broadly and moderately arcuate, becoming straight or slightly sinuate to base, marginal bead very fine; base broadly but not strongly arcuate, sometimes feebly sinuate

at middle; basal angles obtuse; disk evenly convex, more strongly so laterally, marginal bead more or less visible from above, punctures small and distinct, more or less regularly placed and not crowded.

Elytra oval, less than twice as long as wide; base feebly emarginate and adapted to the pronotal base, slightly wider than the latter, humeri obtuse and not prominent; sides broadly and moderately arcuate, converging to apex in apical third, the latter rather narrowly rounded; disk moderately convex on the dorsum, more strongly so laterally but not rounding broadly into the moderately inflexed sides, punctures feebly muricate, rather evenly distributed, although slightly denser at the sides and apex where they become more strongly muricate, irregularly placed, with unimpressed striæ evident; rather abruptly and arcuately declivous posteriorly.

Sterna more or less finely muricato-punctate; abdomen more sparsely punctate. Legs of moderate length and stoutness.

Male: Narrower, pronotum about as wide as long. Abdomen slightly oblique to the sterna, first two segments flattened in the central area, with a slight median longitudinal impression. Protarsal plantar grooves open, first joint not noticeably thickened at apex beneath.

Female: Broader, pronotum a little wider than long. Abdomen horizontal and rather strongly convex. Protarsal plantar grooves closed on the first joint, the latter prominent at apex beneath and set with small black spinules. Anterior protibial spurs enlarged and thickened.

Length (types) 15-17.5 mm.; width 6-7.5 mm.

Holotype, female, and *allotype*, male, in my collection. A female *paratype* is in the collection of Mr. Vasco M. Tanner, Dixie Normal School, St. George, Utah. Collected near Cove Fort on the Beaver County line, Utah, June 20th, 1922, by Mr. Tanner.

Reducta is related to *humeralis*, but at first sight resembles *obsoleta* forma *punctata*, and is readily separated from it by the enlarged anterior protarsal spurs of the female. The form is less robust than in *humeralis* and the sculpturing is less dense and more muricate; in *humeralis* the sculpturing is dense, more granular and very minutely muricate, the lateral pronotal margin is distinctly visible from above as a result of the disk being less arcuately declivous at the sides. *Coloradensis* is more robust and less elongate. The elytra in *fuscipilosa* are clothed with short brownish hairs, while in *concinna* the elytral sculpturing consists of small discrete shining granules.

7. *Eleodes mazatzalensis* Blaisdell, new species

Form elongate-ovate, somewhat depressed, a little more than twice as long as wide. Color deep black and shining.

Head moderate in size, about as long as wide, almost flat, feebly impressed laterally; punctures moderate in size, not crowded, slightly smaller and somewhat sparser on the vertex. Antennæ moderate in length, slightly compressed distally, scarcely at all incrassate; third joint very little longer than the fourth and fifth taken together; fourth joint just the least longer than the fifth; fifth, sixth, seventh and eighth subequal in length, last two very little stouter and feebly triangular; ninth and tenth oval, scarcely longer than wide; eleventh oblong-oval, a little longer than wide and rather broadly rounded at apex.

Pronotum about two-sevenths wider than long, widest slightly in advance of the middle; sides rather broadly arcuate in anterior three-fourths, thence moderately convergent and feebly sinuate to base, marginal bead fine; apex truncate; apical angles obtuse and distinct; base very feebly arcuate and about equal to the apex; basal angles obtuse, almost distinct; disk moderately and evenly convex from side to side, feebly so antero-posteriorly, quite strongly declivous laterally behind the middle, noticeably so at the apical angles, surface finely and sparsely punctulate, slightly alutaceous.

Elytra oval, feebly wider posteriorly, sides broadly arcuate, apex moderately broadly rounded; disk with distinct lines of punctures, the latter moderate in coarseness, rather closely but irregularly spaced, intervals with an irregular line of sparsely placed punctules; surface rather depressed in the central area, almost vertically declivous posteriorly. Humeri small and acute.

Sterna quite densely punctured. Abdomen finely punctato-rugulose; horizontal in both sexes. Legs moderate in length; the posterior noticeably longer in relative proportion than the anterior.

Male: Somewhat narrower. Abdomen feebly flattened along the middle of the first three segments. Inner spur of the anterior tibiæ a little stouter than the outer; plantar grooves open on all the tarsi, except at the tip of the first joint of the anterior tarsi, where it is closed by a transverse row of coarse blackish spinules.

Female: Slightly broader. Antennæ relatively a little longer; abdomen evenly but not strongly convex.

Male, length 14 mm., width 6 mm.; female, length 18 mm., width 7 mm.

Holotype, male, and *allotype*, female, in the collection of the Entomological Department of the Agricultural College of Cornell University, Ithaca, New York. *Paratype*, female, in the author's collection. Types bear the label: Lot 445, Sub. 3.

Type locality: Mazatzal Mountains, Arizona, collected Sept. 1-3.

The anterior tarsi are imperfect on both types, only the first and second joints being present. The sexes are similar in form, and suggestive of the females of *dissimilis* Blais. In the latter the plantar grooves of the anterior tarsi are open in both sexes, and the elytral punctuation is finer. The tarsal characters and tibial spurs correlate *mazatzalensis* with the *carbonaria* section of the subgenus *Melaneleodes*. A second female in the Agricultural College collection is more finely sculptured.

8. *Eleodes coloradensis* Blaisdell, new species

In my Monographic Revision of the Eleodiini this species was recorded as a form of *humeralis* Lec. (Forma *tuberculo-muricata*). The collecting of recent years has contributed much toward the elucidation of the relationship between certain phases that were of dubious status at the time the above monograph was written. I made no mistake, however, in considering the above species as related to *humeralis* Lec. I gave simply the relationship as I interpreted it from the meager material that was before me at that time. I will now present a modified description considering it a species:

Form robust and less elongate than *humeralis* Lec. Pronotum more arcuately declivous laterally, with the margins more or less invisible from above. Elytra more coarsely and strongly sculptured, subtuberculately muricate with the punctures much sparser than in *humeralis*.

Length (types) 16-16 mm.; width 5.5-7 mm.

Holotype, female, and *allotype*, male, in my collection. Both types were collected in Colorado, the male by C. V. Riley.

In *coloradensis* the elytral granules are larger and more like tubercles. It is separated from *humeralis* by the more robust form, sparser and coarser sculpturing of the elytra, as well as the more abruptly declivous sides of the pronotal disk. It is more robust than *fuscipilosa*, with a relatively larger head and pronotum and the absence of distinct hairs on the elytra. In *rileyi* Casey the elytral sculpturing is sparser and not asperate.

9. *Eleodes concinna* Blaisdell, new species

This species was considered as *humeralis* forma *granulato-muricata* in my Monograph (Bull. 63, U. S. Nat. Mus., 1909). Many specimens collected in Nevada, Lassen and Plumas counties in California have been studied and compared during the last decade. My present conviction is that it should have full specific rank. *Concinna* may be defined as follows:

Form elongate, oblong-ovate to ovate, less robust and more sparsely sculptured than *humeralis* Lec. Elytra moderately convex on the dorsum, sides more or less broadly rounded; disk less densely sculptured with small muricate granules which are shining at their summit.

Length (types) 15.5-16 mm.; width 5.8-7 mm.

Holotype, male, and *allotype*, female, in my collection. The male was collected in Lassen County, California, and the accompanying female was taken at Carson, Nevada.

Distribution: Nevada (Verdi, April — Blaisdell; Carson City, July; Reno,—Wickham; Utah,—Riley). California (Lassen County; Plumas County, April 25th,—Essig.)

The specimens from Lassen County, California, "have the elytra discretely granulate; each granule under low power of magnification is polished and shining, under high power the granules are minutely pointed at their summit." This form of sculpturing constitutes the typical phase.

10. *Eleodes wenzeli* Blaisdell, new species

Form oblong-oval with elytral disk flattened. Color deep black, luster somewhat alutaceous, surface smooth, almost glabrous.

Head relatively small, front very slightly convex, impressions obsolete, punctures fine, discrete, slightly coarser on the epistoma; sides feebly arcuate over the antennal fossæ, thence feebly sinuate and straight, converging to the narrowly rounded epistomal angles, apex of the epistoma feebly and broadly emarginate. Antennæ moderate in length, joints four to seven slightly longer than wide, subequal, seventh slightly shorter, terminal joint not thickened, as long as wide, subglobular and slightly compressed.

Pronotum subquadrate, as wide as the elytra, widest slightly in advance of the middle; apex slightly emarginate in feeble circular arc; apical angles subacute and slightly prominent anteriorly; sides broadly and moderately arcuate in anterior two-thirds, thence less so, straight

and very moderately convergent to the basal angles, marginal bead distinct and moderately fine; base very feebly arcuate; basal angles obtuse; disk moderately and evenly convex, finely and not closely punctate, basal impressions obsolete.

Elytra oblong, narrowing posteriorly, about twice as long as wide; base feebly emarginate and adapted to the pronotal base, humeri slightly exposed, small and obtuse; sides broadly arcuate, subparallel, gradually converging to apex in apical third, apex rather narrowly rounded; disk flattened on the dorsum, moderately convex, rather abruptly rounding into the moderately inflexed sides, arcuately and rather obliquely declivous posteriorly, finely, not closely and quite evenly punctate, punctures not subasperate, obsoletely striate. Epipleura very gradually widening toward base and comparatively narrow.

Sterna and abdomen shining, feebly and not densely sculptured. Legs moderately long, femora rather stout; tarsi somewhat slender.

Male: Form oblong, parallel; elytra flattened on the dorsum. Abdomen oblique to the sterna and impressed in the middle third of the first two segments.

Length 19 mm.; width 8 mm.

Holotype, male, in the author's collection, taken in the Chisos Mountains of Texas, on July 24, by Mr. H. A. Wenzel, after whom the species is named.

Wenzeli belongs to the *pedinoides* group of the subgenus *Melaneleodes*. It can readily be recognized by its smooth, finely sculptured integuments and alutaceous luster. In *speculicollis* the pronotal disk is polished and shining, the elytra rather strongly sculptured. *Neomexicana* is duller in luster and the elytra are rather densely but not coarsely subasperately sculptured, while *pedinoides* is larger, more shining and the elytra striate; *asperata* Lec. has the elytra more strongly and very distinctly muricate at the sides and on the apex.

11. *Eleodes speculicollis* Blaisdell, new species

Similar in form to *neomexicana* Blais. Surface more shining, the pronotal disk polished.

Pronotum evenly and moderately convex, basal impressions feeble or obsolete; base broadly and not strongly emarginate at middle; disk with several fortuitous impressions, not present in the males.

Elytra moderately feebly convex on the dorsum, laterally rather less broadly rounded than in *neomexicana*; surface obsoletely striate, intervals indicated as faint subglabrous lines, punctures confused, rather dense

and somewhat fine, not at all granulato-muricate, except slightly so on the apex. Legs rather less stout. Otherwise as in *neomexicana* Blais.

Length (types) 20-21 mm.; width 7-9 mm.

Holotype, female, No. 1812, and *allotype*, male, No. 1813, Mus. Calif. Acad. Sci., collected by C. D. Duncan, July 9, 1921, on **Livermore Peak, Davis Mountains, Texas**. *Paratypes*, two males, one in the collection of the Academy and one in that of the author, same data.

Speculicollis is readily separated from *neomexicana* by its shining integuments and polished pronotal disk and smoother elytral sculpturing. Three males and one female have been studied. It is the author's belief that *neomexicana* Blais. should be considered a distinct species and not a race of *pedinoides* Lec.

12. *Eleodes obscura glabriuscula* Blaisdell, new subspecies

Similar to *dispersa* Lec. Color deep black, surface smooth and shining.

Elytral sculpturing consisting of striæ of coarser punctures; intervals with a single series of similar punctures that are more widely spaced with the surface slightly rugose laterally and on the apex, where the punctures become more or less asperate and the sculpturing confused; punctures simple on the dorsum.

Sterna and abdomen polished.

Male narrower as in *dispersa*.

Female broader and rather less elongate.

Length (types) 30-28 mm.; width 10-11 mm.

Holotype, female, No. 1814, Mus. Calif. Acad. Sci., collected by C. D. Duncan, July 12, 1921, at **Alpine, Texas**. *Allotype*, male, collected by C. D. Duncan, July 9, 1921, on Livermore Peak, Davis Mountains, Texas.

In the form *deleta* Lec. the elytral sulci are obsolete, except at the sides behind the middle, where some faint traces of them are seen; the punctures are submuricate and arranged in striæ, distinct on the dorsum, but confused at the sides; between the rows are distinct punctures as in *obscura* Say; posteriorly abruptly declivous and furnished with rows of tubercles, alter-

nately large and small. In *arata* Lec. the elytral sulci are deeper than in *sulcipennis* Mann. and therefore quite different from *glabriuscula*.

13. *Eleodes hispilabris connexa* Lec.

This subspecies was unknown to me in nature when my monograph was written. A couple of years ago a pair of specimens collected at Albuquerque, New Mexico, came into my possession. Both sexes are narrower than in *hispilabris* Say, and the integuments are denser. Le Conte's description very correctly defines the subspecific characteristics: "Elongate, black and bright, thorax moderately punctulate with sides rounded, anterior angles acute and slightly prominent; basal angles obtuse. Elytra elongate oval, intervals subconvex and more or less rugose, subacute posteriorly." Type locality, Prairie Paso, Texas. It is a distinct subspecies.

14. *Eleodes hispilabris nupta* Say

This variety of *hispilabris* Say was first described from specimens taken at Laredo to Ringhold Barracks, Texas. It is less elongate, more robust and the elytra are more or less inflated, sometimes markedly so. Many specimens are more or less broadly rufous along the elytral suture. *Nupta* has been heretofore quite rare, not many specimens having been collected in recent years.

I have recently received the loan of twenty-four specimens from the entomological collection of the University of Kansas, through the kindness of Prof. R. H. Beamer; also seven specimens from Mr. Warren Knaus of McPherson, Kansas. Both series were collected on the sand hills about Medora, Kansas. Those from the University collection were taken on April 13th, 1925, with the exception of one specimen which was collected in Sherman County, Kansas, at an elevation of 3600 feet by Mr. F. X. Williams. The latter specimen is quite identical with one in my own collection secured at Fort Supply, Oklahoma. Those loaned to me by Mr. Knaus were in part also collected in April, on the 25th, the others on September 17th, 1916.

A pair was first submitted to me for identification and I thought that they represented a new race of *hispidabris* Say, until I saw the entire series. *Nupta* Say has a wider distribution than was at first believed. The body form of the Kansas series is more like that of the females of the *carbonaria*, *omissa* and *quadricollis* sections of the subgenus *Melaneleodes* Blais. The small prothorax, shorter and broader, and the more or less inflated elytra gives quite a different facies from that of the typical *hispidabris* Say.

The specimens collected in September are more decidedly red along the suture than those collected in April. This may be due to a somewhat immature condition or to retardation and alteration in the chemical constitution of the pigment. The darker individuals appear to have firmer integuments.

15. *Eleodes dentipes montana* Blaisdell, new variety

Form and color of *dentipes*. Pronotum very finely but not densely punctate. Elytra with unimpressed striæ of rather coarse and closely placed punctures, with single interstitial series of slightly smaller and rather more widely spaced punctures; series not confused laterally or apically.

Length (types) 24-23 mm.; width 8.1-9.2 mm.

Holotype, female, and *allotype*, male, in my collection. Collected in the Santa Cruz Mountains, near Mt. Hermon, Santa Cruz County, California, on July 20, 1922.

In *dentipes* Esch. the pronotal punctuation is a little coarser and that of the elytra finer and *confused* laterally and apically. In *confinis* Blais. the punctuation is still finer and the sides of the pronotum are straight posteriorly and not in the least sinuate before the basal angles. In *perpunctata* Blais. the form is more elongate, the punctuation variable and the sides of the pronotal disk are impressed, dull and granulate within the bead. *Dentipes* and *montana* have the pronotal disk glabrous and transversely convex from bead to bead. *Tularensis* is more alutaceous, the legs and antennæ are slender and the

elytra are oval, the humeri being obsolete. In the race *marinæ* Blais, the elytral punctures are diffuse and of equal size throughout and the form is rather more robust.

16. ***Eleodes dentipes tularensis*** Blaisdell, new subspecies

Form elongate, subfusiform oval. Color black, luster rather dull.

Head about a third wider than long, feebly convex and with very shallow impressions within the antennal convexities; finely and sparsely subasperately punctate, punctures rather dense laterally and on the epistoma. Antennæ rather long, moderately slender, last three or four joints slightly wider.

Pronotum about a seventh wider than long, base quite equal to the apex, the latter feebly emarginate in circular arc, finely or obsoletely beaded; base feebly arcuate and finely beaded; sides broadly and rather moderately arcuate, briefly sinuate before the basal angles which are distinct but feeble; apical angles small, dentiform and more or less everted; disk rather evenly and moderately convex, finely and sparsely punctate, scarcely denser laterally, not impressed along the margin but narrowly opaque with granulate punctures, marginal bead fine, rather thin and very feebly reflexed. Propleura sparsely, rather finely, subasperately punctate with scattered rugulæ.

Elytra fusiform-oval to oval. Base equal to the pronotal base, truncate to feebly bisinuate; humeri very small or absent; sides quite evenly arcuate, rather narrowly rounded at apex; disk moderately arcuate, more strongly rounded laterally, rather obliquely declivous apically; evenly and sparsely punctate, punctures equal in size, arranged serially in the central area, and closely placed in the series, interstitial punctures rather widely spaced, all becoming confused laterally and on the apex where they are minutely muricate, with the prickles discernible.

Parapleura finely and more thickly punctate. Abdomen sparsely punctate, punctures finely subasperate. Legs rather long and noticeably slender.

Male: Narrower and fusiform oval in form. Abdomen nearly on a plane with the sterna, very moderately convex and just noticeably flattened along the middle.

Female: Broader, elytra more oval. Abdomen a little more convex. Legs less slender.

Male, length 15.5 mm., width 8 mm.; female, length 14 mm., width 9 mm.

Type locality: Northfork, Fresno County, California. Collected by Mr. Henry Dietrich on March 4, 1920.

Holotype, female, and *allotype*, male in my collection; *paratypes* in Mr. Dietrich's and my own collection. A female paratype has been placed in the collection of the California Academy of Sciences by Mr. Dietrich. A series of twelve specimens have been studied.

The salient characteristics of *tularensis* are the absence of humeri and the unusually slender legs. The anterior femora have a small triangular tooth at about the outer fourth. *Confinis* Blais. is found in the foothills on the west slope of the Sierras and coast range foothills as well, and is a robust race with the pronotal sides without basal sinuations. *Perpunctata* Blais. is a larger and more elongate race, legs long and stout, sides of the pronotal disk noticeably impressed along the lateral margins; the latter character being entirely absent in *tularensis*. *Marinæ* Blais., a stouter more compact race found in Marin County, California, has the elytral punctuation distinct, the punctures diffuse and of equal strength throughout.

17. *Eleodes parvicollis alticola* Blaisdell, new variety

In form similar to *trita*, but less opaque and more finely punctured. Oblong-ovate, a little more than twice as long as wide. Head finely punctate, the punctures slightly denser at the periphery.

Pronotum about a fifth wider than long; finely and not very closely punctate, punctures slightly larger and somewhat granulate laterally in the marginal area, where the disk is very feebly impressed; apex, sides, base and angles as in *producta*. Propleura rather sparsely granulato-punctate, more or less rugulose on the coxal convexities.

Elytra less elongate than in *producta* and *planata*, about a third longer than wide; base truncate, wider than the pronotal base; sides moderately arcuate, apex obtusely and somewhat narrowly rounded; disk somewhat flattened, but moderately convex, less so in basal fourth, obliquely and arcuately declivous posteriorly; surface not eroded, moderately densely punctate, punctures slightly muricato-granulate, laterally and apically.

Prosternum rather densely punctate, elsewhere the punctures are more widely separated and not coarse. Abdomen densely and not very finely granulato-punctate on the first and second segments, less so on the third, fourth and fifth finely and sparsely punctate. Legs moderately stout. Sexual differences as in *trita*.

Length (types) 14-14.5 mm.; width 6.5-7 mm.

Types, male and female, in my collection.

Type locality: Piute Mountain, Kern County, California; collected May 29th, 1913. Many specimens have been identified.

Alticola is more shining and less coarsely punctate than *trita* Blais. although similar in form. *Planata* Esch. is more elongate and there is greater difference in body form between the sexes, besides it inhabits a different geographical region—the oak groves of the great valleys, while *trita* and *alticola* are found at higher altitudes in the mountains. *Constricta* Lec. is more strongly and coarsely punctate, with the elytra more depressed on the disk and the basal constriction of the pronotum is stronger and more abrupt, with the sides perfectly straight and parallel before the basal angles; in *alticola* the sinuations are more gradually formed and the sides not parallel.

18. *Eleodes manni dilaticollis* Blaisdell, new variety

Form oblong-oval, less than twice as long as wide, more robust and less elongate than *manni* Blais. Color deep black.

Head more transverse and the antennæ rather shorter than in *manni*. Pronotum distinctly more transverse than in the latter species and more strongly and a little more coarsely, closely punctate. Elytra more broadly oval, humeri more or less distinct, disk more noticeably muricately punctate laterally and about the apex. Otherwise as in *manni*.

Length (types) 13-15.5 mm.; width 5.6-7.6 mm.

Holotype, female, and *allotype*, male, and *paratypes* in my collection. Mr. M. C. Lane of Ritzville, Washington, also possesses paratypes and collected the types at Sprague, Washington, on May 15, and June 19, 1921; other specimens were secured at Lake McElroy, Paha, Washington, on May 24th. In the types the humeri are distinct. A considerable series has been studied and the differential characters have been found constant.

In *parvicollis* Esch. and its races the pronotal punctures are smaller and more distinctly separated. In *manni* var. *variolosa* Blais, the elytra are more coarsely and subrugosely sculptured, a character resembling that observed in *cordata* Esch.; the pronotum is less transverse and subequal in the sexes. In *dilaticollis* the pronotum is much more transverse in the female. In *horni* Blais. and its race *monticola* Blais. the sculpturing is finer, legs more slender and the surface luster more opaque. As a rule *manni* and its race *dilaticollis* have the pronotal sides less abruptly sinuate at base than is found in *parvicollis* and its races. These characters are maintained in larger series. *Sierra* Blais. is more alutaceous, elytra more parallel with the humeri more or less distinct.

19. *Eleodes nigrina difformis* Blaisdell, new subspecies

Form and size variable, more robust than typical *nigrina* Lec., mimicking *omissa* Lec.; the males less elongate. Color black, luster more or less moderately shining. Sculpturing as in *nigrina*. Comparative stoutness of appendages variable.

Male: Less elongate and broader, differing but little from the female in form.

Female: Broader on the average than the female of *nigrina*; pronotum quadrate to a fourth wider than long.

Length (types) 20-20.5 mm.; width 8-9 mm. Variations in size; largest female, length 23 mm., width 9.5 mm.; smallest female, length 15 mm., width 6 mm.

Holotype, female, and *allotype*, male, in my collection. *Paratypes* in the collection of Mr. M. C. Lane, Ritzville, Washington, and in my own. The types were collected at Lind, Washington, on April 10, 1920.

I am indebted to Mr. Lane for a generous series showing the remarkable variation in body form and size. Most of these specimens were taken in the vicinity of Ritzville, in September and October, 1921.

Large series of *nigrina* Lec. show an adherence to a uniform body form, and the individuals are more elongate and duller in luster, while the race *perlonga* Blais. is more elongate, polished and shining. *Schwarzi* Blais. has a differently formed

pronotum and is on the whole more robust as regards the dorso-ventral thickness of the body. *Nevadensis* Blais. is more slender, very dull and alutaceous in surface luster.

Neobaphion Blaisdell, new genus

This genus is proposed to receive *Eleodes planipennis* Lec. The genital characters are embaphionoid and the body form that of an *Eleodes*. It is therefore to be placed between *Eleodes* Esch. and *Embaphion* Say. in our lists. Since the Monograph on the Eleodiini (Bull. 63, U. S. Nat. Mus.) was written, at least three new species have been studied, unfortunately as uniques, but all referable to the genus as given above. For further data consult the above cited monograph.



Blaisdell, Frank E. 1925. "Studies in the Tenebrionidae, No. 2. (Coleoptera)." *Proceedings of the California Academy of Sciences, 4th series* 14, 369–390.

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