

# ENTOMOLOGICA AMERICANA

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VOL. VIII (n. s.)    BROOKLYN, N. Y., SEPTEMBER, 1927    No. 2

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## A REVIEW OF THE NORTH AMERICAN SPECIES OF PODABRUS

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The soft-bodied beetles of the families Lampyridae, Cantharidae and others, have never been favorites of coleopterists, which probably, in part at least, accounts for their general neglect by both collectors and taxonomists. Not since Le Conte's *Synopsis of the Lampyridae of the United States*, in 1881, has the genus *Podabrus* received any attention at the hands of our systematists, nor in the forty-six years since then has a single new species of this genus been described from our fauna.

The scheme adopted by Le Conte of dividing the genus into groups based on the form of the tarsal claws is a good one, but his failure to observe that in many species there exists a sexual difference in the claws, makes it necessary to add new groups and to make some changes in his arrangement of species.

While the present review has been based almost entirely upon a study of the material in my own collection, combined with a careful examination of the Le Conte types, yet I have received aid in the way of specimens from a number of correspondents, notably my Canadian friends Mr. J. B. Wallis and Mr. F. S. Carr; also from Mr. K. F. Chamberlain, then of Cornwall Bridge, Conn., who kindly

collected for me a local series of both *Podabrus* and *Cantharis* (*Telephorus*); Mr. A. W. Andrews, of Detroit; Mr. Chas. Liebeck, of Philadelphia, and Mr. H. S. Barber, of the National Museum, who sent me certain species from their collections.

For a cabinet arrangement, the order of species in the text should be followed rather than that in the tables.

The types of all new species are in the writer's collection.

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PODABRUS LATIMANUS Motschulsky

*P. mellifluus* LeConte

This very distinct and apparently somewhat scarce or perhaps local species is notable for its modification of the male protibia, which structure also exists in an incipient form in the female. It is not represented in my collection, specimens previously so labeled belonging really to the next species. It is known to me only from Middle California.

*Podabrus ambiguus* n. sp.

Size of *latimanus*, to which it seems closely allied. Type—dull yellow, the disk of thorax, occiput, labrum, antennae except the under side of the basal two joints, and legs, black.

The discal pronotal spot varies much in size; the elytra may become entirely blackish, and the body beneath and legs may be in part testaceous. The maxillary palpi are as in *latimanus*, the apical joint, however, rather more obliquely truncate than LeConte's remarks would indicate. Eyes not very prominent, the head scarcely as wide as the thorax in either sex; occiput and neck coarsely densely punctate. Prothorax transversely quadrate, the front angles rounded, hind angles minutely prominent, surface closely punctate, a median eroded line which reaches neither base nor apex. Elytra finely rugose, with faint traces of discal costae. Front tibiae of male feebly sinuate and slightly thickened apically, but without hint of the thin plate peculiar to the male of *latimanus*. Claws all cleft as in Group A of LeConte. Length 6 to 9 mm.

Described from a series of specimens collected by Nunenmacher in Yuba and Tehama Counties, California. A specimen in the LeConte collection is wrongly placed with *latimanus*.

As in *latimanus* the head is small with non-prominent eyes, but the last joint of the maxillary palpi is moderately oblique at apex and cannot fairly be called "nearly transversely truncate" as does LeConte in defining *latimanus*. The thorax in *latimanus* is also more rounded on the sides and more narrowed anteriorly.

#### PODABRUS RUGULOSUS LeConte

This well known species occurs throughout the Northern States from Maine to Kansas. It is our most abundant New England species, and is given in the Washington, Cincinnati and Schwarz' Florida lists; I have a single example from Southwestern Arkansas.

#### *Podabrus appendiculatus* n. sp.

This species is very similar to *basilaris* and is sure to be found mixed with it in collections. Males are easily separated from *basilaris* by the distinctly curved and apically thickened protibiae, and by the hind coxae being apically broadly and strongly appendiculate, the downward projecting process being clothed with short dense fuscous hairs at tip.

Head not wider than the thorax, varying but little in the sexes, black, shining, coarsely and densely punctate, clypeus smooth. Antennae as long as half the body in the female, a little longer in the male; black, first joint pale in basal

half; joints 2 and 3 nearly equal in the female, 3 slightly longer than 2 in the male. Prothorax  $\frac{1}{2}$  wider than long, sides broadly rounded, front angles indistinct, feebly sub-sinuate before the basal angles, which are minutely prominent; color testaceous, having a broad reddish brown discal area with a black central spot; punctuation distinct and rather close on the disk, feeble in the pale margins except in front, an eroded median line through the black spot. Elytra entirely dull testaceous with broad fuscous vittae separated by narrow paler lines on the disk; the suture narrowly, the sides more widely pale; surface moderately rugose, dull or but feebly shining. Metasternum and abdomen blackish; thighs pale except at tip, knees, tibiae and tarsi blackish. Length 10–11 mm.

Three specimens only of this species are now before me; a male (type) from Cornwall, Connecticut, collected by Mr. K. F. Chamberlain June 18, 1921, and 2 females taken by myself, one at Tyngsboro, Mass., the other labeled simply "Mass." I have seen Pennsylvania specimens taken by Mr. Liebeck.

**Podabrus knobeli** n. sp.

Very similar in size and form to *frater* Lec., to which it is otherwise closely related. Head black, sides in front pale beneath the antennae; thorax yellow, discal convexities each with a reddish brown spot, these sometimes confluent; elytra black, side margins and suture narrowly testaceous. Head as wide as or slightly wider than the thorax in the male, not quite as wide as the thorax in the female; clypeus smooth, front loosely, occiput and neck densely punctate, surface polished. Antennae black throughout, not very slender, half the length of the body (♂) or a little shorter (♀); joint 2 from  $\frac{3}{5}$  to  $\frac{3}{4}$  as long as joint 3. Prothorax  $\frac{2}{5}$  wider than long, moderately arcuately narrowed in front, feebly narrowed and slightly sinuate before the hind angles, which are minutely prominent; surface polished, the convexities and the area in front of them moderately punctate, sides nearly smooth, a short eroded line between the convexities. Elytra rugose, thinly pale pubescent, discal costae feeble but traceable. Body beneath and legs black, the prothorax and lateral margins of the ventral segments narrowly pale. Pro-tibiae of male curved basally, and with an angular dilatation on the inner side at about the apical fourth. Length 9–10½ mm.

Described from 4 ♂, 4 ♀, all collected at Hope, Arkansas (Apr. 24–May 17) by Miss Louise Knobel, to whom the species is dedicated with appreciation of her industry and success in collecting the insects of her local fauna. So far as known to me, this species and *frater* alone possess the distinct angulation of the subapical inner margin of the male protibiae. The color differences distinguish the two species very readily.

**PODABRUS FRATER** Lec.

In addition to the color characters given in the table, this species differs from the preceding by the thorax being nearly impunctate except antero-medially. LeConte gives the range of this species from Virginia to Florida, but it is evident from my series that it is not rare from New Hampshire to Pennsylvania.

**PODABRUS COMES** Lec.

This moderately large species is widely dispersed on the Pacific Coast and in the Rocky Mountain region, occurring from Oregon to Southern California, and also according to LeConte in Montana. Specimens from Jemez Springs, New Mexico, in my collection do not seem to be separable from the California ones. LeConte says the occiput is sometimes dark, but I have not as yet seen such specimens. The pale head and thorax, dark antennae and legs, and distinctly curved and apically dilated front tibiae in the male will separate it from nearly all its nearer allies. *Mexicanus* is extremely similar but has the protibiae of the male scarcely modified.

**PODABRUS CONSPIRATUS** Fall

This form, recently described by me from Alaska (Pan Pac. Ent. II, No. 3, p. 152) as a possible variety of *comes*, I now am inclined to consider distinct. In addition to the differences named in the description, I might add that in *comes* the front tibiae of the female exhibit feebly but unmistakably the curvature and apical thickening which is much more conspicuous in the male, while in the present species there is no indication of such modification. It may be that when the male of *conspiratus* is found the protibiae will prove to be unmodified, in which case the species should be associated with *Mexicanus* and *tenuis* rather than with *comes* and allies.

**Podabrus illex** n. sp.

Similar in size and form to *comes*. Head yellow in front, black behind the antennae; muzzle smooth; front sparsely,

occiput and neck densely punctate; surface shining, not alutaceous. Antennae black, basal joint yellow, joints 2 and 3 pale beneath. Prothorax moderately transverse, entirely yellow, polished and nearly impunctate, or with a few fine punctures near the front margin, more evident in the female; sides parallel, broadly arcuate, front angles rounded, hind angles sharp but scarcely at all prominent, the sides before them not or barely perceptibly sinuate; median line finely impressed between the convexities. Elytra entirely black, feebly pruinose with short ashy pubescence; surface rugose, the discal costae fine but traceable. Legs yellow, the tarsi dusky. In the male the head is as wide as the thorax, the antennae a little longer than half the body, protibiae rather weakly curved and dilated, hind coxae appendiculate at apex, venter black with the last segment entirely yellow, the two preceding pale except at sides. In the female the head is narrower than the thorax, antennae half the length of the body, protibiae straight and not dilated at apex, venter black, the terminal segment alone in part yellow. Length 11-12½ mm.

Six examples (3 ♂, 3 ♀) are before me, all collected by Mr. Ralph Hopping at Fallen Leaf Lake and Angora Lake, Middle Sierras, California. The type is a male from the first named locality and bears date vii-8-1915.

Should the color characters of this species not prove definitive, it may I think be separated with certainty from *comes* and *pruinus* by the obviously less strongly modified protibiae of the male, and there is a corresponding difference detectable in the female. Should the present species be referred by the student to the *binotatus-mexicanus* group because of the comparatively feebly modified male protibiae, it would by the table run to *sierrae*, which species differs notably in its more quadrate thorax with sides more nearly straight and convergent posteriorly from a point in advance of the middle, the front angles more or less distinctly obliquely truncate.

#### PODABRUS PRUINOSUS Lec.

This species was united with *tomentosus* by LeConte in his latest paper on the Lampyridae (1881). *Tomentosus* does not, so far as I know, occur on the Pacific Coast, and the error could not have occurred had LeConte been aware of the secondary sexual character of the hind coxae, well marked in *pruinus*, but entirely lacking in *tomentosus*. *Tomentosus* differs further from *pruinus* in its much less prominent eyes and consequently narrower head in

the male. *Pruinosus* is very closely allied to *comes*, and were it not for the entirely black legs of the latter it would be difficult to name good characters for their distinction. In *pruinus* the legs are typically entirely yellow, but in numerous specimens ranging from Northern California to British Columbia, and not otherwise satisfactorily separable, the tarsi or tibiae and tarsi are blackish, which suggests the possibility that the femora may vary in color in these two supposed species. For this supposed variety of *pruinus* the name *diversipes* is proposed.

LeConte gives Oregon as the type locality of *pruinus* in his original description.

### **Podabrus limatus n. sp.**

Head, thorax, antennae and legs rufotestaceous; elytra black, side margins narrowly pale, the suture also extremely narrowly so toward the base; metasternum and abdomen black, segments 6-8 of the latter rufous. Second joint of antennae a little shorter than the third. Front moderately closely punctate, occiput and neck densely so. Prothorax slightly narrower in front, sides arcuate, front angles obtuse, hind angles minutely prominent; surface almost smooth, median line not eroded. Protibiae of male somewhat feebly dilated apically; claws rather narrowly cleft. Length 8 mm.

Inyo Co., California; 2 ♂'s collected by O. C. Poling. Smaller and narrower than *viduus*, to which it is closely similar; the head, however, is much more punctate, the thorax of different form (being more like that in *tomentosus*) and the elytra margined with testaceous. As compared with *tomentosus* the form is narrower, the median line of the thorax not eroded and the front tibiae of the male less dilated.

### **PODABRUS TOMENTOSUS Say**

This species occurs from New Jersey to Kansas. It is also recorded from Colorado and California. The California specimens are certainly something else (*pruinus* et al.) and the Colorado ones need verifying.

There are no eastern species with which *tomentosus* is likely to be confused, and the simple hind coxae in the male (without apical process or tuft of hair) will separate it at once from the Pacific Coast forms which resemble it. The elytra are typically entirely black, but may have the margins narrowly pale; in these latter the tibiae are usually pale, while in the typical form they are dusky.

PODABRUS TRICOSTATUS Say

This large species with its strongly transverse thorax with broadly explanate sides and its dilated and costate elytra is so well known as to need no special comment. It occurs from New England and Canada to Michigan, Southern Ohio and the District of Columbia.

**Podabrus brevicollis** n. sp.

Of large size and robust form for the genus. Color piceous brown or blackish; head in front of a line joining the middle of the eyes pale testaceous, the anterior margin of the epistoma blackish; prothorax testaceous, disk with blackish median spot occupying about the middle half (in a transverse sense), narrowed in front, not or scarcely attaining the apex; elytral suture and margins narrowly pale; body beneath piceous brown, the head and thorax pale. Antennae scarcely differing in the sexes, piceous, basal joint more or less pale beneath, second joint only just perceptibly shorter than the third. Head smooth in front, becoming abruptly coarsely densely punctate in the dark area. Prothorax varying from slightly less than, to a little more than twice as wide as long, a little narrowed in front, sides arcuate throughout, the base angles minutely prominent, front angles rounded; blackish discal area distinctly punctate, pale margins smooth, deeply concave within the base angles. Elytra densely scabrous punctate, each with three fine discal costae, the outer one usually obsolete. Tarsal claws all cleft or acutely toothed. Length 10.5 to 12.5 mm.

New York (Peekskill); Pennsylvania (Inglenook); Rhode Island.

The type is a male from the first named locality and bears date "5-21-90."

This species is generally confused with *basilaris*, with which it stands in the LeConte collection. It is at once distinguishable from the latter by its much more transverse prothorax, which is more narrowed in front, and in form resembles rather that of *tricostatus*. The latter has the elytra more broadly dilated and more strongly costate, and entirely black; and the second antennal joint is conspicuously shorter than the third.

PODABRUS FISSUS Lec.

This species is thus far one of the rarest of the genus and is known to me only by the unique male type. If the type is a nor-

mal specimen the species may be distinguished from all others by the reddish brown densely punctured and opaque discal area of the thorax. Described from Florida.

PODABRUS NOTHOIDES Lec.

Size moderate (8–9 mm.), dull black, sides of front below the antennae, and sides of thorax, yellow; the elytral margin narrowly paler, at least basally. Head unusually small and antennae only half the length of the body in the female; in the male the head is subequal in width to the thorax, the antennae longer, thicker, and with the joints more parallel; antennae and legs entirely black.

Occurs from the New England states to Manitoba; apparently not abundant.

PODABRUS NOTHOIDES Lec.

Size large, usually 12 to 13 mm. Head black except the posterior part of the clypeus and beneath the antennae. Thorax in the male pale yellow with a median fuscous stripe, sometimes not reaching the apical margin; in the female with disk broadly blackish, at times with the angles alone paler. Elytra black with suture and lateral margins pale. Beneath fuscous, the abdominal apex paler or not in the male; femora pale except near the knees, tibiae and tarsi dark. Antennae blackish, the basal one or two joints in part pale; joints 2 and 3 nearly equal in both sexes. Clypeus smooth, head otherwise densely rather coarsely punctate. Prothorax  $1/2$  to  $1/3$  (♂) or  $3/4$  (♀) wider than long, transversely subquadrate, the sides broadly arcuate, a little narrower and more rounded at the front angles; surface moderately shining and not densely punctate, median line finely eroded, not entire. Elytra thinly pubescent and rather finely rugose.

Northeastern Atlantic region, precise limits of distribution uncertain.

The *basilaris* of LeConte's *Revision* and of collections generally is a composite species, including the forms *brevicollis* and *appendiculatus* herein described as new, and the *punctulatus* and *flavicollis* of LeConte, which I believe to be good species. It can never be entirely certain just what Say had in hand when he described *basilaris*; he specifically states, however, that the thighs are pale, which I take it definitely excludes *brevicollis* in which the legs are

Reprinted from BULLETIN OF THE BROOKLYN ENTOMOLOGICAL SOCIETY,  
Vol. XXIV, No. 2, p. 103. April, 1929.

**Correction to a Revision of Podabrus.**—On page 80, Vol. VIII, No. 2, of *Entomologica Americana*, two species are described under the title *Podabrus nothoides* Lee. The second title should read *Podabrus basilaris* Say.—H. C. FALL.



entirely dark in all specimens seen. Both the present form and *appendiculatus* have pale thighs, and as Say was not aware of the differences in the male hind coxae, he may have had either or both of these before him. The type of *discoideus* Lec. is a female and appears to be identical with the present species.

PODABRUS PUNCTULATUS Lec.

A species of the *basilaris* type but smaller (8-9½mm.), clypeus wholly pale, femora pale only in basal half or less; 2<sup>d</sup> joint of antennae a little shorter than the 3<sup>d</sup> in both sexes, hind coxae of male unmodified.

Described from Kansas and known to me also from Illinois, Indiana and Wisconsin. A male from Smugglers Notch, Vermont (Emerton), and two females from Cornwall, Connecticut (Chamberlain), in my collection appear to be identical with western specimens.

PODABRUS FLAVICOLLIS Lec.

Closely allied to the two preceding species, but seemingly always separable by the immaculate yellow thorax. The size (10-12 mm.) is more nearly as in *basilaris*, the clypeus broadly infusate except at base, also as in *basilaris*, the femora pale in basal third or fourth; joints 2 and 3 of antennae equal in the male, joint 2 a trifle shorter in the female; protibiae and hind coxae unmodified in the male.

In his original description LeConte says "Middle and Southern States." I have taken the species in Rhode Island and have it also from Arkansas. A Lake Superior specimen in the LeConte collection seems to be identical. The type is a male from the Southern States region.

I do not know on whose authority *flavicollis* is placed as a synonym of *modestus* in the Leng List. The two are really quite distinct, the punctate wholly yellow thorax of *flavicollis*, and the relatively smooth thorax with more or less developed discal cloud in *modestus* being probably sufficient for their separation in all cases.

PODABRUS QUADRATUS Lec.

This is one of the rare species and is known to me only by the two original female specimens from Texas in the LeConte cabinet. The thorax is transversely subquadrate, sides straight and parallel

in basal two-thirds, rounded a little in front, quite coarsely uniformly punctate, median impressed line not excavated; joints 2 and 3 of antennae equal; front of head except clypeus at middle, thorax and elytral margins, pale; extreme base of femora paler.

Evidently closely related to *flavicollis*, and possibly only a variety thereof, but more material is needed to establish the relationship.

#### PODABRUS MODESTUS Say

A common species of the Northeastern U. S., ranging from Quebec to west of the Mississippi River, Say's type being from "Missouri" (probably now Iowa or Nebraska). The southern limits are uncertain. It appears in the Southwestern Pennsylvania and New Jersey Lists, but not in the Washington or Cincinnati ones. LeConte, however, gives Georgia among his localities.

The species is of moderate size (9–11 mm.), and as typically colored is black with the base of the antennae, front of head, sides of thorax, elytral margins and suture, and legs, pale. The legs vary from entirely pale to piceous, the femora in the latter case diffusely pale only at the extreme base. The disk of the prothorax is broadly blackish or fuscous from base to apex, the pale side margins rather narrow, especially posteriorly.

*Modestus* is most readily separated from all its near allies by the comparatively smooth prothorax, the discal convexities being broadly almost impunctate. There is a fine median impressed pronotal line, which, however, is not eroded or excavated in the great majority of specimens at least.

#### Podabrus longicornis n. sp.

Pale piceous, including antennae and legs; sides of thorax narrowly, and lateral and sutural edges of elytra, rather obscurely paler. Head (♂) distinctly wider than the prothorax, blackish, clypeus paler, strongly and closely punctate behind the clypeus. Antennae nearly as long as the entire body, basal two joints pale beneath, 2<sup>d</sup> joint much shorter than the 3<sup>d</sup>, intermediate and outer joints filiform, four to five times as long as wide. Prothorax transversely quadrate, 2/5 wider than long, sides parallel, a little arcuate medially, front angles rounded, hind angles prominent; surface sparsely punctate and shining, median line finely acutely impressed. Elytra rather finely and smoothly scabrous, moderately shining. Venter fuscous throughout. Length (head deflexed) 7 mm.

A single male specimen from New Hampshire without precise locality.

It is possible that the rather dilute color may be due in some degree to immaturity, and that in fully colored examples the pale margins of the thorax and elytra will be more distinct. The protibiae and metacoxae are not sexually modified.

PODABRUS DIADEMA Fab.

Length 9–11 mm. Black, clypeus and sides of thorax yellow, elytra without pale margins or suture, head rather sparsely punctured and opaque.

The range of this species is almost identically the same as for *modestus*; Northern U. S. and Canada from New England to Minnesota and Iowa. It occurs in New Jersey and Pennsylvania but is absent from the Washington and Cincinnati lists.

PODABRUS PROTENSUS Lec.

The tabular characters should suffice for the easy recognition of this peculiar species. The rather small head with long tapering neck, and the entirely yellow head and thorax, both of which are finely remotely punctate, are quite distinctive. Although here included among the species having the protibiae of the male straight and without appreciable apical dilatation, there is really an observable modification of the typical sort, so that the species might with almost equal propriety have been tabulated in the other group.

*Protensus* occurs from Southern New England to Indiana, and as a rule seems not to be very common.

PODABRUS BRUNNICOLLIS Fab.

Similar by its long tapering neck to *protensus*, but considerably smaller (7–10 mm.), with narrow thorax, and differently colored and punctured as indicated in the table. This species with its variety *poricollis* ranges from New Jersey to Iowa and south to Georgia and Texas.

PODABRUS BINOTATUS Lec.

A moderately large species (10–11½ mm.), at once recognizable by the generally yellow upper surface and bimaculate thorax. It is known to me by very few specimens, all from the vicinity of San Francisco.

**Podabrus confraternus** n. sp.

Rufotestaceous, the antennae (except basal joint) and elytra brownish testaceous in the type; the antennae, elytra, legs and lower surface varying to piceous. Head moderately closely punctate behind. Prothorax with sides moderately arcuate, somewhat narrower at the rounded apical angles, base angles minutely prominent; surface smooth except anteriorly, median impressed line feebly eroded. Elytra parallel, finely scabrous. Front tibiae of male feebly curved, not appreciably dilated apically; claws all cleft, the inner tooth or division shorter. Length (head deflexed) 9.5 to 11 mm.; width 2.9 to 3.2 mm.

The type is a male taken by the writer at Pomona, California, June 4, '92. A female with darker elytra, legs and under body, from same locality June 28, '92, is unquestionably identical. A third example (♀) from the San Bernardino Mts. appears to be the same.

This species is of the size and form of *comes*, with which it has been associated in my cabinet. The latter species has the elytra truly black, and the front tibiae of the male conspicuously dilated apically.

**Podabrus sierrae** n. sp.

Black; head in front, prothorax, base of antennae and legs throughout, bright rufotestaceous. Antennae in the male two-thirds, in the female scarcely half the length of the body; second joint nearly as long as the third. Neck and back of head coarsely closely punctate, front sparsely punctate, epistoma smooth. Prothorax nearly as long as wide, subquadrate in the male, sides nearly parallel, either nearly straight or slightly angulate at the middle, the basal and apical angles narrowly obliquely truncate; surface polished and varying from finely punctate to nearly smooth, the median impressed line vague and scarcely eroded. Elytra parallel, finely scabrous, with faint discal costae, pubescence fine and inconspicuous. Claws acutely toothed. Length 11 to 14.5 mm.

Described from three examples. The type is a male from Tallac (Lake Tahoe) collected by Dr. Fenyès; a female example, same locality as type, and a second male from Glen Alpine (Lake Tahoe) also collected by Fenyès. A ♀ from Fallen Leaf Lake has been recently received from Mr. Hopping; in it the feeble truncature of the hind angles of the thorax is not obvious.

**Podabrus viduus** n. sp.

Closely allied to *sierrae* and differing as follows. The head is entirely rufotestaceous, the front almost smooth; the prothorax is widest and rather distinctly angulate at the anterior fourth or fifth, the sides thence convergent and straight or but feebly curved to both apex and base, the hind angles sharply defined and slightly prominent, rather than obliquely subtruncate as in *sierrae*. Length 12 to 15 mm.

California. Inyo Co., 4,500 ft., July, '22, type: Inyo Co., Sebastian Lake, 8,900 ft.; Kings River Cañon (Daggett): Mohawk (Fenyes). All specimens are females. A pair (♂ ♀) from Fallen Leaf Lake has more recently been received from Mr. Hopping. The male is slightly smaller and more slender than any of the females, the antennae appreciably longer with the joints more parallel, the protibiae not appreciably modified, the hind coxae with an apical tuft of darker hairs

**Podabrus fulvus** n. sp.

Rather narrow, parallel, size large. Head in front, base of antennae, thorax, elytra and legs, yellow; the base of the hind thighs, body beneath, antennae except basal two joints, and head posteriorly, black. Antennae (♂) attaining the middle of the elytra, slender, joints parallel sided, the second slightly shorter than the third. Front sparsely punctate, occiput and neck coarsely closely so. Prothorax transversely nearly square, sides parallel, anterior angles rounded or subtruncate, hind angles distinct, subrectangular; surface finely punctate to nearly smooth, median impressed line evident. Elytra finely scabrous punctate, discal costae feeble. Legs slender, protibiae of male not appreciably dilated apically. Claws all acutely toothed or cleft within. Length 12 to 14 mm.

Kaweah, California, 6,000 ft. (type ♂); Atwell's Mills, Tulare Co., 6,600 ft. (G. R. Pilate).

This, like all the preceding species, is a member of LeConte's Group A, and except for color is extremely close to the preceding species.

**Podabrus tenuis** n. sp.

Similar to the several preceding species in general characters but more slender in all its parts; the legs entirely black, the mouth, base of antennae, and prothorax, rufotes-

taceous. The prothorax is highly polished and virtually impunctate, the median impressed line very vague and not at all eroded; it is nearly as long as wide, the sides nearly straight except for a slight excurvature at the middle, and evidently convergent to base, the base angles sharply defined and just less than right. Length 11.5 mm.

California: Mt. Whitney, 11,000 ft., 7-24-99. A single male example collected and given me by Mr. F. S. Daggett.

#### PODABRUS MEXICANUS Gorham

Similar in size and color to *comes*, the head, however, usually more or less blackish posteriorly though sometimes entirely pale; legs and antennae entirely black, the first joint of the latter somewhat paler beneath. The front tibiae of the male are not appreciably dilated apically (very distinctly so in *comes*), the hind coxae with an apical process (smaller than in *comes*) tipped with longer hairs. Length  $10\frac{1}{2}$ -12 mm.

This species occurs in our territory in Southern Arizona, the specimens before me being from the Chiricahua Mts.

#### Podabrus muliebris n. sp.

Similar to *comes* and *mexicanus* but a little smaller. Black, prothorax and front of head rufotestaceous; antennae and legs entirely piceous, margins of the last two or three ventral segments tinged more or less with testaceous. Head (♂) barely or scarcely as wide as the prothorax, the eyes less prominent than usual in this sex; clypeus smooth, rest of head and neck closely coarsely punctate. Antennae (♂) more than  $\frac{2}{3}$  as long as the body, 2<sup>d</sup> joint shorter than the 3<sup>d</sup>, 4<sup>th</sup> to 8<sup>th</sup> about three times as long as wide. Prothorax moderately transverse, widest near the middle, sides flatly arcuate, surface sparsely finely punctate, more closely and strongly so in front; median line finely eroded between the discal convexities. Elytra finely scabrous, costae feebly indicated. Protibiae of male only slightly widened apically, hind coxae nearly simple. Length (♂) 9-11 mm.

Cloudercraft, New Mexico; 4 examples, all males.

The less prominent eyes and virtual lack of tibial and coxal sexual modifications distinguish this species from *comes* and *mexicanus*, the only similar species inhabiting the same general region.

**Podabrus occipitalis** n. sp.

Prothorax, neck and head, except for a transverse arcuate blackish occipital fascia from side to side between the eyes, bright yellow; elytra black with conspicuous cinereous pubescence; body beneath, legs and antennae except at base, black or piceous, the front legs sometimes in part paler. Head much wider (♂) or slightly wider (♀) than the thorax; surface moderately shining, very sparsely punctate except at base. Prothorax nearly as long as wide, sides feebly arcuate, a little sinuate posteriorly before the somewhat prominent hind angles; disk with prominent longitudinal convexities which make the median portion appear deeply excavate in posterior half; surface subimpunctate, median impressed line very fine, not eroded. Elytra finely scabrous, the discal costae feeble but evident. Protibiae of male entirely unmodified; claws (♂) finely cleft, the inner part approximate to and but little shorter than the outer; in the female the inner part is shorter and less close to the outer. Length 7 to 8.5 mm.

California: Pasadena (type ♂); Pomona; collected by the writer.

**PODABRUS MELLITUS** Lec.

This species is closely similar in size, form and color to *corneus* and *cavicollis*, together with which it constituted Group C of Le Conte's 1881 Revision. The group characters as given by Le Conte are sufficiently accurate as far as they go, except that the prothorax may be as wide as or wider than long, but there are two errors in the table which follows, both pertaining to *mellitus*. In Group B certain species are said to have the fourth tarsal joint deeply bilobed, while in others it is slightly emarginate; and here again in Group C, *mellitus* is separated from *corneus* and *cavicollis* by the same character. There is in reality no such distinction, all our species of *Podabrus* having the fourth joint bilobed, though at times the contiguity or overlapping of the inner margins of the lobes causes the joint to appear merely emarginate at apex.

In the brief diagnosis of *mellitus* the outer claw of the hind tarsus is said to be toothed, all the others cleft. This is the case in males of *corneus* and *cavicollis*, but an examination of the type shows it is not true of *mellitus*, in which the outer metatarsal claw is cleft like all the others and is the same in both sexes. For this reason *mellitus* is here removed from association with *corneus* and

*cavicollis* and placed after *occipitalis*, to which indeed it is nearly related, although less so in general aspect.

The moderate size—about 8 or 9 mm.—slender form, yellow color, small thorax, and lack of sexual modification of the front tibiae and hind coxae of the male distinguish this and the following species (*modulatus*) among the large group (Le Conte's Group A) having all the tarsal claws in both sexes cleft or with a long internal tooth. The type of *mellitus* is a male from Geysers, Sonoma Co., California. Le Conte also gives "Nevada (Horn)"; probably the extreme western part of the state in the Lake Tahoe region. My specimens are from "Sylvania," Sonoma Co. (Ricksecker), and Lake Tahoe.

**Podabrus modulatus** n. sp.

The tabular characters constitute, I think, a sufficient description of this species. It is very close indeed to *mellitus* and may prove to be no more than a variant of that species. As in *mellitus* the head is evidently wider than the thorax in the male, subequal to the thoracic width in the female; head polished and with only a few sparse punctures in the black area, except at the extreme rear; yellow area of the front and clypeus impunctate; joints 2 and 3 of antennae equal. Prothorax widest at or near the middle, in *mellitus* usually well in advance of the middle; in both becoming rather suddenly oblique and straight at the anterior angles; surface shining and sparsely punctate; dorsal excavation deep, usually with a dark spot or stripe. Length 6.7 to 8 mm.

Described from 12 examples from Sonoma, Marin, Alameda, San Mateo and Santa Clara Counties, California

The type is a male from Cypress Ridge, Marin Co., and bears date "4-11-20."

**Podabrus extricatus** n. sp.

Front of head, prothorax and elytra, yellow, the excavation of the prothorax blackish: antennae except at base, body beneath, and legs in great part, black; the front femora and tibiae, and the middle knees, dull testaceous. Head (♂) moderately closely punctate, alutaceous; second joint of the antennae one-half as long as the third. Prothorax finely sparsely punctate, feebly alutaceous, median concavity deep, without or with only faint trace of eroded line at bottom.

Elytra finely scabrous, apex more or less dusky. Claws all with a broad basal tooth. Length 6 to 7 mm.

California: Placer Co. (type ♂); Sierra Co., Plumas Co. 3 ♀'s, provisionally attached.

This is one of a group of superficially very similar Californian species, of which Le Conte described five. Two of these—*lutosus* and *tejonicus*—were included in his Group B because of the broad basal tooth of the tarsal claws; while *cavicollis*, *mellitus* and *corneus* were placed apart, constituting his Group C, characterized by having the claws narrowly cleft. Le Conte did not discover the fact that in certain species the claws are differently formed in the sexes, so that his groups as defined are not tenable. It so happens that both *lutosus* and *tejonicus* were described from females, and my own study leads me to believe that the former is the female of the previously described *cavicollis*. So far as I know, males of *tejonicus* have not been recognized. The present species, because of the form of the male claws can be compared with no described species unless *tejonicus*, the unique type of which is rather larger and stouter and differs otherwise by the more finely and sparsely punctate head.

#### PODABRUS TEJONICUS Lec.

This species is certainly known only by the unique female type, 7.5 mm. long, from Tejon, California. The male being unknown, the true position of the species in the scheme here adopted remains doubtful. Because of the marked similarity of the type to females of *extricatus* it is here tentatively associated with that species. It agrees with *extricatus* in color and in the alutaceous finely punctate head, the punctures however being still finer in that species. The prothoracic punctation while fine and sparse in *extricatus*, is in *tejonicus* virtually obsolete except on the outer flanks and summits of the prominences, and is there indistinct; the third antennal joint is hardly more than one-fourth longer than the second in *tejonicus*, relatively longer compared with the second in *extricatus*; prothorax more evidently narrowed behind in *extricatus*, barely visibly so in *tejonicus*. These differences are, however, all small, and it may well develop eventually that they are one and the same species, but until more material including males from the type region becomes available it is not safe to assume this.

A single female specimen in my collection from Mt. Tom, Fresno Co., California, collected by Hopping, agrees very nearly with the type of *tejonicus*, and I am so labeling it provisionally.

## PODABRUS SCABER Lec.

Of this species I have seen only very few specimens. The Le Conte collection contains only the Oregon type and a second example from Vancouver, both females. Wickham records taking a specimen on the Stikine River in British Columbia, and I have a single male example from Glacier Park, Montana (Miss Edith Mank, collector).

The insect is black, sides of front below the antennae and sides of thorax reddish yellow. Head and thorax densely rugosely punctate, dorsal line of the latter present but fine in the type, absent in the second specimen. Length 11 mm.

## PODABRUS CINCTIPENNIS Lec.

This is one of the rarest or perhaps most local of the eastern species of the genus. It is still represented in the Le Conte collection by only the unique female type from Pennsylvania. Mr. Liebeck has recently sent me two females taken by him at South Camden, New Jersey, the only ones secured by him in his many years' collecting. He had not identified the species, which is not given in Smith's New Jersey List. It is recorded as common in Hamilton's Western Pennsylvania List, but does not appear in either the Washington or Cincinnati lists.

*Cinctipennis* should be easily identified, its size (11 mm.) being greater than any other eastern species with broadly appendiculate claws.

## PODABRUS LIMBELLUS Lec.

This species is nearly allied to *cinctipennis* and is similarly colored, but is appreciably smaller (9 mm.) and of generally more northern range. Le Conte's type is from New Hampshire, taken by Austin, probably in the White Mts. My own specimen and others in the Blanchard collection are from Mt. Washington. Hamilton records the species from Western Pennsylvania, but I do not find it on any other lists which I have consulted.

## PODABRUS PUNCTATUS Lec.

Easily known by the dull, densely punctated head and thorax, the latter entirely clear red or reddish yellow, the elytra black without pale margins; length 6-8 mm.

Occurs from New Brunswick and Pennsylvania to Lake Superior. It is generally dispersed though not abundant in the New

England States, and I have a specimen from Newfoundland, New Jersey (Bischoff coll.), although the species does not appear in the New Jersey List.

**Podabrus excursus** n. sp.

Black, sides of epistoma and basal two joints of antennae beneath pale; prothorax sometimes entirely black, sometimes with the sides either obscurely or distinctly reddish yellow. Antennae half as long as the body in the male, the 2<sup>d</sup> joint scarcely as long as the 3<sup>d</sup>, intermediate joints parallel sided and about four times as long as wide; in the female nearly as long, 2<sup>d</sup> and 3<sup>d</sup> joints equal, following joints gradually slightly narrowed basally. Head (♂) distinctly wider than the prothorax, moderately coarsely closely punctate, epistoma smooth. Prothorax transversely quadrate, about two-fifths wider than long, sides nearly straight and parallel or feebly convergent toward the base, hind angles rectangular, front angles rounded or obliquely subtruncate; discal convexities moderate, an impressed median line between them; surface rather shining, not or scarcely perceptibly alutaceous, punctuation fine and sparse. Elytra one-half wider than the thorax, parallel, finely rugose, distinctly cinereo-pubescent. Legs entirely black, protibiae and metacoxae not sexually modified. Length 8 to 10 mm.

British Columbia: Vernon, June 5, 1921, one pair (type ♂); Otter Creek, June 14, 1920, 2 ♀'s; Midday Valley, June 5, 1921, 1 ♂; all collected by Mr. Hopping. With these I place a series of specimens collected in Glacier Park, Montana, by Miss Edith Mank, of Lawrence, Mass. These are unfortunately all females, but I am quite satisfied of their identity with the B. C. series.

This species is quite unstable in the color of the prothorax. In the type and in some other examples, while the thorax at first sight seems quite black, closer inspection shows it to be faintly rufescent at sides toward the front angles. In three females the sides are sharply rufotestaceous throughout the length; in others the condition is intermediate. The epistoma also varies to entirely pale except for a dusky spot at the middle of the front margin. The tarsal claws are not fairly typical of this group, the inner tooth being more acutely angulate than usual, and in the front feet of the male is so long and acute that the claw might reasonably be called cleft and the species placed with *laevicollis* and allies.

*PODABRUS MACER* Lec.

A very slender species,  $7\frac{1}{2}$  to 8 mm. long. Head and thorax dull, the former densely punctate, the latter more sparsely so. Thorax very little (about one-tenth) wider than long, sides nearly straight and converging backward from the obliquely truncate front angles. The thorax is typically black with sides fulvous, but in my three examples is entirely fulvous or with only a blackish shade at the middle of the front margin. Elytra normally black, varying to dull testaceous; legs black. In the male the second joint of the antennae is not much more than half the length of the third.

This species occurs in the Middle California Coast region; type locality San Mateo. My specimens are from "Sylvania," near Santa Rosa.

*PODABRUS PINIPHILUS* Esch.

A smallish species ( $5\frac{1}{2}$  to  $7\frac{1}{2}$  mm.). Entirely black except for a small spot at the sides of the front beneath the antennae, and the underside of the first two or three antennal joints. Prothorax small, and with the head distinctly alutaceous and dull.

An abundant and widely dispersed northern species ranging from Maine to Alaska, and south in the mountains to New Mexico and Central California.

*PODABRUS PUNCTICOLLIS* Kby.

Le Conte's brief diagnosis of this species is as follows: "Piceous, base of antennae, sides of mouth, sides of prothorax and margins of elytra testaceous; head sparsely punctured behind; prothorax deeply concave at the middle, dorsal line fine, surface shining, sparsely punctulate; length 8 mm."

Kirby's type was taken in British America, "lat.  $54^{\circ}$ ." It was known to Le Conte from Lake Superior and Mt. Washington, N. H. My specimens are from Mt. Washington; Farmington, N. H., and the summit of Mt. Wachusett, in Massachusetts.

*PODABRUS EXTREMUS* Lec.

Of this northern species, at present rare in collections, I have seen only three specimens, all females; viz.—the unique Hudson Bay type in the Le Conte collection, and single examples taken by my-

self at Banff, Alberta, and Skagway, Alaska. These all agree in coloration; black, the head in front of the antennae and narrow side margins of elytra testaceous, the base of the antennae and the tibiae, more especially of the front legs, also tinged with testaceous. The head is narrower than the thorax (in the female at least), strongly alutaceous and dull; thorax transversely quadrate, sides nearly straight and just perceptibly convergent from the obliquely truncate front angles, surface polished and sparsely very finely punctate except near the side margins, where the punctures are closer and the surface narrowly subalutaceous. Length 6.5 to 7.5 mm.

In addition to the localities mentioned above, *extremus* is also reported from Labrador (Sherman) and Mt. Washington, N. H. (Mrs. Slosson).

#### PODABRUS BREVIPENNIS Lec.

If the type (a female) is a normal specimen, this species is a most remarkable one and quite unique in our fauna, in that the elytra in this sex are very short, less than twice as long as wide, and lack much of covering the abdomen, of which the last three segments are exposed. The form is robust, the prothorax nearly as wide as the elytra at base, the sides subparallel almost to the front angles, black with rufous spots at front and hind angles, disk shining, sparsely finely punctate, more coarsely punctured in front and along the hind margin; antennae short and stout, tapering to tip, joint 2 slightly shorter than 3, each nearly as wide as long; eyes small, not prominent, sides of head feebly convergent behind. Length 8.7 mm.

Type locality—Argentine Pass, Colorado, 13,000 ft. Several specimens from various localities were subsequently placed with the type by Le Conte, but the reasons for the association are by no means obvious and I should be unwilling to admit the identity. It is of course quite possible that the male when found will prove to have normally developed elytra.

#### PODABRUS XANTHODERUS Lec.

Length 7.5 to 8 mm. Head, elytra and legs entirely black; pubescence of elytra short, semierect and black or nearly so. Thorax yellow with front and rear margins narrowly black at middle in the type. The head is finely scabrous and opaque; thorax finely punctate, surface finely alutaceous except the summits of the convexities, which are nearly smooth and more shining. In one

of three specimens from Placer Co., California, in my collection, the thorax shows a narrow median dark stripe. The black suberect pubescence of the elytra is a very exceptional character in *Podabrus*, the elytral hairs being cinereous, or in the yellow species yellowish, and more recumbent in the vast majority of species. *Rugulosus*, *frater* and *pattoni* are the only other species that I notice having the elytral pubescence wholly or predominantly black. In certain examples of *rugulosus* in my series the pubescence inclines to grayish, especially toward the margins, showing that here the character is not entirely constant; moreover I have a number of specimens from the Californian Sierras, from Shasta to Southern California, which seem to agree with *xanthoderus* in every other character of weight, except that the pubescence is grayish. It is at present impossible to say whether these constitute a distinct species or not. *Xanthoderus* was described from Lake Tahoe.

#### PODABRUS BOLTERI Lec.

A slender smallish species (6.5 mm.) inhabiting the Sierras of middle California, and represented in the Le Conte collection by the unique male type from Lake Tahoe. Black, mandibles and sides of thorax reddish yellow, legs entirely black. Second joint of antennae distinctly shorter than the third. Head sparsely finely punctate throughout and somewhat shining. Prothorax not quite as long as wide, sides visibly convergent from near the front angles, polished, very sparsely finely punctate, deeply concave posteriorly, no median eroded line. Le Conte is in error in saying that the thorax is longer than wide and the sides parallel.

#### PODABRUS FISSILIS Fall.

This species is similar in form and appearance to *piniphilis*, *puberulus* and *simplex*, but differs from them and all other known species of our fauna by the narrowly cleft claws on all the tarsi of the male. For detailed statements of characters the student is referred to the recently published description (Pan Pacific Entomologist, Vol. II, p. 153). Length 6–7 mm.

Emerald Lake, British Columbia (type); Skagway, Alaska.

#### PODABRUS LATERALIS Lec.

Black, conspicuously ashy pubescent; front of head and sides of thorax yellow. The yellow thoracic margin is often quite narrow and almost interrupted opposite the discal convexities. Head and

thorax alutaceous and not or scarcely shining, rather closely finely punctate; elytra black without pale margins. Length about 7 mm.

Rocky Mts. of Colorado and New Mexico up to 13,000 ft. Le Conte records a variety with thorax entirely yellow. This is represented in his collection by a single female example from Veta Pass, Colorado. When the male turns up it may prove to be a distinct species.

**Podabrus obscurevittatus n. sp.**

Virtually identical in size, form and general aspect with *lateralis*, of which it may be no more than a more northern race. It differs from typical *lateralis* in having the lateral margins of the elytra testaceous, the disk with an indistinct paler subsutural vitta, the front legs in great part testaceous, and the yellow side margins of the thorax continued narrowly along both apical and basal margins though sometimes limited to the reflexed edge, more especially at base. In *lateralis* the broad black median area widely involves both apical and basal margins. In the present form as in *lateralis* the head is slightly wider than the thorax in the male, antennae passing the middle of the elytra, the 2<sup>d</sup> joint about 2/3 or 3/4 as long as the 3<sup>d</sup> joint. In the female the head is scarcely as wide as the thorax, the antennae somewhat shorter. The thorax is a little wider than long, sides slightly convergent from the obliquely truncate front angles, surface finely alutaceous and moderately closely finely punctate. Elytra finely scabrous and distinctly pale pubescent. Length 6-7 mm.

The type (♂) is one of a series of specimens from Edmonton, Alberta, kindly sent me by Mr. F. S. Carr. Other examples are from Calgary, Banff and Medicine Hat in the same province.

**PODABRUS PUBERULUS Lec.**

Of this little species there are in the Le Conte collection the two Lake Superior types and a Hudson Bay specimen, these typically colored, the prothorax black with a dull rufous spot at the anterior angles, and a fourth specimen with entirely red thorax, from Canada, mentioned by Le Conte as a color variety in his Revision of 1881. This last is strikingly suggestive of *simplex*, a closely allied species with reddish yellow thorax, and may belong there. Both *puberulus* and *simplex* have the front and middle tarsal claws finely cleft in the male, and were therefore wrongly included by Le Conte in his Group B, which was intended to comprise only

those species in which the claws are armed with a broad basal tooth in both sexes. In the case of *puberulus* the mistake was natural enough since Le Conte had only females in his series.

In his brief diagnosis (1881), Le Conte says of *puberulus*: "Mouth piceous" and "three joints of antennae testaceous." These color characters are evidently not constant, for in several of the examples before me the epistoma is entirely testaceous, and in no specimen at hand are more than two of the antennal joints entirely pale.

*Puberulus* is truly a northern species; my own small series contains examples from Lake Superior (Michigan-Mackinac Co.) and Manitoba (Onah and Mile 256 H. B. Railway). A female specimen from Canaan, Conn., seems also to belong here.

#### PODABRUS SIMPLEX Lec.

A small species (5-5½ mm.) having the front of the head, base of antennae and entire thorax yellow; legs in part testaceous, the front ones more fully so. The head and thorax are visibly alutaceous and finely sparsely punctate. Le Conte gives for localities "Canada and Florida (Bolter)." My own specimens are all from eastern Massachusetts. Inasmuch as the species does not appear on either the New Jersey, District of Columbia or Cincinnati lists, the Florida reference is open to suspicion.

#### PODABRUS PATTONI Lec.

This apparently scarce little species is represented in the Le Conte collection by the unique female Pennsylvania type, and in my own collection by a single female from Mt. Toby, Massachusetts. Le Conte also gives "Canada." *Pattoni* may easily be known among the Eastern species of the genus by the tabular characters, notably the small very smooth and shining and almost impunctate thorax. It is included by Le Conte in his group with tarsal claws broadly toothed at base, but a male in the Horn Coll., Mr. Liebeck informs me, has the claws of the four anterior feet cleft.

#### *Podabrus gracilis* n. sp.

General form in all respects similar to *cavicollis* and allied species, but rather more slender than any of them. Head behind the antennae, and elytra, black, the latter with the side margins narrowly paler. Antennae blackish, paler at base; thorax yellow with the excavation blackish; legs varying from almost entirely dull yellowish to largely

piceous. Head ( ♂ ) sparsely finely punctate, scarcely perceptibly alutaceous; ( ♀ ) alutaceous and more numerous less finely punctate. Antennae filiform, second joint ( ♂ ) one-half, ( ♀ ) two-thirds as long as the third. Prothorax narrow, almost as long as wide in the male, front angles obliquely subtruncate, sides a little convergent to the base angles, which are slightly prominent; surface finely indistinctly punctate. Elytra moderately shining, finely scabrous. In the male the front and middle claws are cleft, hind claws toothed; in the female all claws toothed at base. Length 4.5 to 6.5 mm.

Described from a series of eight examples taken by the writer in the San Bernardino Mts. (7,500 ft.), Southern California.

In its ungual formula this species agrees with the Eastern *simplex*, and does not look greatly unlike it; the latter however differs in its entirely yellow thorax, shorter antennae with the second joint relatively longer and by the elytra not paler at margins.

**Podabrus instabilis n. sp.**

Similar in size, form and general features to *gracilis*, with which alone, among Western species, it agrees in ungual formation. The color above as well as the legs varies greatly from a fairly clear though rather dull yellow to a nearly uniformly dilute fuscous, the great majority of specimens being of a dingy yellow, with the elytra gradually more or less dusky posteriorly. The thorax is usually entirely dull yellow, but may be completely or partially suffused with brownish, but seems never to be a clear yellow with sharply defined black central spot as in *gracilis*. Length 5 to 6.75 mm.

California: Lake Tahoe (type ♀, taken by the writer); Tuolumne Meadows, 8,600 ft. (G. R. Pilate); Plumas and Sierra Counties (Nunnenmacher); Inyo Co., Mono Co. (above Lundy, 9-11,000 ft., Wickham).

This species, like the preceding, seems to be confined to the Sierras, but with a more northern range, and both appear to be partial to rather high altitudes.

**Podabrus moestus n. sp.**

Black, a spot beneath the antennal insertion, mandibles and basal two joints of antennae beneath, pale; anterior

tibiae tinged with testaceous. Pubescence fine, short and inconspicuous. Head and thorax alutaceous and scabrous, the former barely as wide as the thorax in the male, slightly narrower in the female. Antennae attaining the middle of the elytra in the male, joints feebly obconic, the 2<sup>d</sup> barely half the length of the 3<sup>d</sup>. Thorax distinctly transverse, rather large for the size of the insect, front angles truncate, sides just perceptibly convergent posteriorly with a slight prominence at middle; convexities moderate, with only a trace of impressed line between them. Elytra scarcely more than one-third wider at the humeri than the thorax, sculptured as usual. Length 6-6½ mm.

Described from a single pair (type ♂) taken at an elevation of 10,000 ft. on Mt. Silliman, California, by Mr. Hopping.

The claws of the front and middle tarsi of the male are cleft, the inner portion nearly as long as the outer on the front feet, a little shorter on the middle feet, and so much shorter on the hind feet as to best be described as an acute subbasal tooth, which also describes the dentition of all the claws in the female. In the two following species the claws are similarly formed.

#### PODABRUS TETRAGONODERUS Fall.

This species may probably be separated with certainty by the tabular characters from *moestus* and *altus*, with which alone it agrees nearly in ungual formation. It is closely similar to *altus*, but it should be remarked that the head is more coarsely densely punctate and somewhat shining, while in *altus* it is scabrous and dull with the punctures finer and less distinct. *Scaber* also resembles the present species quite strongly, but in it the thorax is still more densely and strongly punctured, and the claws are differently toothed.

Since describing *tetragonoderus* from Alaskan specimens (Pacific Ent., II, p. 152), I have received a specimen from Glacier Park, Montana (Miss Edith Mank, collector), which seems to be identical.

#### *Podabrus altus* n. sp.

Black, epistoma and sides of prothorax yellow; basal two joints of antennae yellowish beneath. The yellow area of the epistoma is invaded posteriorly by two short approximate extensions of the black color of the front. Antennae moderate, 2<sup>d</sup> joint about 3/5 (♂) or 3/4 (♀) as long as the third,

intermediate joints ( ♂ ) parallel sided and about  $2\frac{1}{2}$  times as long as wide. Head ( ♂ ) distinctly wider than the thorax, scarcely as wide as the thorax in the ♀, rather closely scabrous punctate and dull. Prothorax transversely quadrate, front angles obliquely subtruncate, sides slightly convergent backward, nearly straight in the female, a little arcuate becoming sinuate behind in the male, hind angles sharply defined; surface obscurely punctured, dull or feebly shining; longitudinal elevations quite obtuse and entirely within the broad black discal area, which is dilated at the basal third in the male, and in the female extends outward to the side margins. Elytra finely scabrous without discal costae. In the male the claws of the front and middle tarsi are finely cleft, the inner part a little shorter, the hind claws with a shorter acute tooth. In the female all the claws have a rather narrow acute basal tooth. Length 7-8 mm.

Described from a male and two female specimens, the male (type) from Monarch Lake, Tulare Co., California, 11,000 ft., the females from Tuolumne Meadows, 8,600 and 9,240 ft., these latter collected by Mr. G. H. Pilate.

This very distinct species resembles *lateralis* somewhat, but the claws are differently toothed. It is closely related to *tetragonoderus*, but the characters given in the table and under the last-named species should suffice to separate it.

#### PODABRUS LAEVICOLLIS Kirby

This small species is common and well known to all collectors. It is widely dispersed in northern latitudes, occurring from Labrador and New England to Alaska. Wickham includes it in his Iowa and Colorado lists, but it is not recorded from Cincinnati, Western Pennsylvania or New Jersey. It is instantly recognizable by its perfectly smooth impunctate thorax, which is small as in *simplex* and which varies in color from entirely piceous to largely testaceous. Length about 6 mm.

#### Podabrus fenestratus n. sp.

Similar in form and appearance to *piniphilus*, but averaging somewhat larger. Black, finely cinereo-pubescent; basal two joints of antennae pale beneath; thorax with a variable but usually small rufous marginal or submarginal spot behind the obliquely truncate front angles. Antennae

in the male filiform, passing the middle of the elytra, 2<sup>d</sup> joint  $\frac{2}{3}$  (♂) or  $\frac{3}{4}$  (♀) as long as the 3<sup>d</sup>. Head evidently wider than the thorax in the male, narrower in the female, alutaceous and rather finely scabrous punctate, not shining. Prothorax almost as long as wide (♂), or distinctly wider than long (♀), form as in *piniphilus*, convexities strong, without eroded line between them, surface finely alutaceous and somewhat shining, punctuation a little variable but generally fine and sparse. Elytra entirely black, rather coarsely rugulose; legs entirely black. Length 6.5–8 mm.

Described from five examples (1 ♂, 4 ♀'s) from the Lake Tahoe region in California. The type (♂) bears label, Echo Lake, Tahoe, Cal., July 8, and was collected by Hopping. The four females are from Glen Alpine, July 3–4 (Fenyés); Angora Lake, June 22 (Hopping), and Tahoe, July 7 (Hopping).

This species, as indicated above, resembles *piniphilus* quite markedly, but differs primarily in that the front claws of the male have the free angle of the broad basal tooth so strongly produced and acute as to make them appear cleft, while in *piniphilus* the tooth is much shorter and broader; moreover in *piniphilus* the prothorax never, in my experience, has the rufous spot characteristics of the present one.

#### **Podabrus probus n. sp.**

Similar to *piniphilus* but with the head (♂) much wider, the epistoma entirely pale, the front tibiae tinged with testaceous, the protarsal claws cleft. The prothorax is virtually of the same form as in *piniphilus* but a little more elongate, being quite as long as wide, the surface finely rather closely punctate, and there is a well-marked eroded line between the convexities. The 2<sup>d</sup> antennal joint is scarcely more than half as long as the 3<sup>d</sup>. Length 7 mm.

A single example bearing label, Mt. Washington, N. H., 5-28-18.

#### **Podabrus citrinus n. sp.**

Pale yellow, head behind the antennae, and neck, black; scutellum and elytra at apex dusky; antennae blackish, basal two joints yellow, several of the following joints pale beneath; venter fuscous, apex pale; legs yellow, middle and hind femora dusky except toward the apex. Head (♂) dis-

tinctly wider than the thorax, front sparsely punctured, occiput and neck closely so. Antennae slender, filiform, 2<sup>d</sup> joint very nearly as long as the 3<sup>d</sup>. Prothorax nearly square, sides straight and parallel, front angles obliquely subtruncate; hind angles right, their vertices minutely prominent; surface moderately shining and evenly finely but rather feebly punctate, a small prominence but no eroded line between the discal convexities. Elytra finely ruguloso-punctate, discal costae faintly traceable. Claws of front tarsi cleft, of middle and hind tarsi with a broad basal tooth having the free angle moderately acute. Length 7 mm.

Described from a single male specimen taken at Tahoe, California, July 7, 1915, by Mr. Hopping.

This species resembles in a general way several other yellow Californian species of about the same size, but none of them agrees with it in ungual formation.

**Podabrus heteronychus n. sp.**

Form of *lateralis*. Black, luster dull throughout; head in front of antennae yellow; base of antennae, apex of femora, base of tibiae, and the sixth ventral except at sides, dull yellow. Antennae not very slender, 2<sup>d</sup> joint  $\frac{2}{3}$  as long as the 3<sup>d</sup>, the latter obviously shorter than the 4<sup>th</sup>. Head (♂) but slightly wider than the thorax, scabrous punctate. Prothorax transversely quadrate, as in *lateralis*, front angles obliquely truncate, sides a little sinuate before the rectangular hind angles, surface finely punctate, median impression moderate. Elytra finely scabrous, discal costae feebly indicated. Claws of front tarsi finely cleft; of middle tarsi, outer claw toothed at base, inner claw cleft; of hind tarsi both claws with broad somewhat acute basal tooth. Length 5.5 mm.

The male type above described was collected by Mr. J. B. Wallis at Mile 214, Hud. Bay R. R., Manitoba, July 6, 1917. With this I associate with some confidence a female from Homer, Alaska, viii-5-1911 (W. S. McAlpine). This agrees well with the male type in most respects, the legs being, however, less varied with yellow, and the abdomen entirely black. The head is slightly narrower and the antennae shorter, common sexual differences. The claws are all broadly toothed at base. This and the following species are thus far unique in the form of the male claws.



Fall, H. C. 1928. "A review of the North American species of Podabrus." *Entomologica Americana* 8, 65–103.

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