



A Review of the Species of "Anisodactylus" Inhabiting the United States

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In the summer of 1861 he was appointed by the General Government to establish army hospitals in this city, and the first eight organized and constructed here were put in working order under his supervision. At the height of the conflict, when the Southern forces invaded this State, he was appointed Medical Director of the militia and emergency troops of the State. In fulfilling the duties of this office, he was at Gettysburg after the battle, taking care of the wounded, and established a hospital at Carlisle, and also those at Hagerstown, Md.

Dr. Neill was a writer as well as a practitioner. His contributions to literature were principally, if not exclusively, confined to subjects relating to medical and surgical science, and were usually in the form of articles in medical periodicals. He is known as the author of several anatomical works treating of the arteries, veins and nerves, and also of the surgical and anatomical portions of a very popular work for students, entitled "A Compendium of Medical Science," published about twenty-five years ago.

A Review of the Species of ANISODACTYLUS inhabiting the United States.
By George H. Horn, M.D.

(Read before the American Philosophical Society, Nov. 5, 1880.)

It is difficult to understand why this genus has passed almost entirely neglected, and why so much confusion and consequent synonymy prevail, when a short study will demonstrate how easily the species may be grouped and each separated from the other by sharply defined structural characters.

The division of the genus into three subgenera by the form of the anterior tibial spur is long known, but the characters which follow seem for the most part to have entirely escaped notice. The first of these, taken from the structure of the posterior tarsus, and the length of the first joint as compared with the next two, needs no further explanation.

The presence of two or one setigerous puncture on each side of the clypeus near the anterior margin is a character of very great importance and may be used elsewhere in the Carabidæ in the separation of smaller groups of species in the manner indicated in the accompanying table.

The structure of the underside of the male tarsi is also very useful here, it affords a means of supplementing any character which may be drawn from the two sexes together, separating very sharply species which appear superficially closely allied.

In the *dilatatus* and *sericeus* groups I have been unable to distinguish any true dorsal puncture. In all the other species the dorsal puncture is distinct and will be found at the posterior third of the elytra on or very close to the second stria.

All the species have the spurs of the posterior tibiæ slender and rather

long, in one, however (*immanis*), the spurs are apparently more closely approximated at base, and are broad, slightly foliaceous at the sides and obtuse at tip.

Characters of minor importance will be found under the various group headings.

Having, by means of the characters above indicated, approximated those hitherto recognized species which seemed closely related, numerous forms have been found which have refused to be separated, especially near *rusticus* and *porosus*. I have accordingly placed these as synonyms, and in defence of that course will state, that the mass of material which I have had before me from my own and Dr. LeConte's cabinet fully warrants such a procedure.

In the bibliography, which will be found at the end of the paper, I have marked those species with an asterisk (*) of which I have seen types or specimens compared directly therewith.

The following is the table of groups :

- | | |
|--|-----|
| Terminal spur of anterior tibiæ trifid..... | A. |
| Terminal spur of anterior tibiæ dilated at middle..... | B. |
| Terminal spur of anterior tibiæ slender..... | C. |
| A. Posterior tarsi slightly flattened, shorter than the tibiæ, the first joint very little longer than the second. Hairy species | A—a |
| Posterior tarsi slender, as long as the tibiæ, the first joint nearly as long as the next two together. Glabrous species | A—b |
| B. Posterior tarsi slender, equal to the tibiæ, first joint long ; first joint of middle tarsus ♂ pubescent at tip. Black species..... | B—a |
| Posterior tarsi flattened, first joint short ; first joint of middle tarsus ♂ glabrous beneath. Species bi-colored or metallic..... | B—b |
| C. Elytra with distinct dorsal puncture, first joint of middle tarsus ♂ glabrous beneath or with a very small pubescent space. Elytra smooth, surface more or less metallic..... | C—a |
| Elytra without dorsal puncture, first joint of middle tarsus ♂ pubescent over half its surface. Elytra densely punctulate, surface black, sub-opaque, and finely pubescent..... | C—b |

Group A—a is peculiar to the Pacific region, C—b to the Atlantic, the other groups contain species from both sides of the continent.

A—a has been called *Dichirus*; A—b, *Triplectrus*; B—a, B—b, *Anisodactylus*; C—a, *Haplocentrus*.

A—a, *dilatatus* Group.

Species more or less hairy. Terminal spur of anterior tibiæ ♂ ♀ trifid. Posterior tarsi slightly flattened, the first joint very little longer than the second, the fourth feebly emarginate. Elytra striate, feebly sinuate at tip, the intervals biserially punctate, dorsal puncture not distinct.

Male. Anterior tarsi broadly dilated, the first four joints pubescent beneath, middle tarsi less dilated, pubescent or not.

Female. Anterior and middle tarsi slightly broader than the posterior, not pubescent beneath.

In consequence of the hairy head, it is difficult to determine the number of clypeal setigerous punctures. The first two species below have two certainly, and *piceus* but one.

The species of this group are as follows :

Thorax very distinctly narrowed behind, the sides arcuate.

Hind angles of thorax obtuse. Intervals of elytra very irregularly biserially punctulate. Middle tarsi ♂ not pubescent beneath.

Posterior and middle tibiæ ♂ coarsely tuberculate externally. Sides of thorax beneath impunctate.....1. ***strenuus*** Horn.

Tibiæ spinulose externally. Thorax beneath punctate..2. ***dilatatus*** Dej.

Hind angles of thorax distinct. Intervals of elytra very regularly and closely biserially punctulate. Middle tarsi ♂ with joints 2—4 pubescent beneath.

Spurs of hind tibiæ slender and acute.

Hairs of surface short and erect. Thorax beneath with few obsolete coarse punctures.....3. ***obtusus*** Lec.

Hairs of surface long and scarcely erect. Thorax beneath with numerous coarse and deep punctures.....4. ***pilosus***, n. sp.

Spurs of hind tibiæ short, broad and dilated at tip, 5. ***immanis***, n. sp.

Hind angles of thorax sharply rectangular.....6. ***brunneus*** Dej.

Thorax scarcely narrower at base, sides feebly arcuate, hind angles obtuse. Clypeus with one setigerous puncture on each side. Middle tarsi ♂ pubescent beneath. Feebly pubescent.....7. ***piceus*** Menét.

1. ***A. strenuus*** Horn. Our largest species, easily known in the group by its more robust and convex form and by the under side of the thorax being opaque and impunctured. The middle and posterior tibiæ in the male are roughly tuberculate on the outer margin. I have not seen the female. Length .60 inch ; 15 mm.

Two specimens ; Fort Tejon, California,

2. ***A. dilatatus*** Dej. With this species I unite *hirsutus*. It is much more depressed than the preceding species and the elytral intervals feebly convex. The middle and posterior tibiæ are simply spinulose externally, and the under side of the thorax sparsely obsoletely punctate. The punctures of the elytral intervals are coarse and very irregularly disposed. Length .32—.44 inch ; 8—11 mm.

Occurs nearly everywhere in California.

3. ***A. obtusus*** Lec. Similar in form to *dilatatus*, but smaller and with the hind angles of the thorax quite distinct but not prominent, and the disc more densely punctured. The underside of thorax has but few coarse punctures and these not deep. The hairs of the surface are short and erect, those of the elytra arising from the interstitial punctures which are very regularly and densely placed. The middle tarsi of the male have the three intermediate joints pubescent beneath. Length .30 inch ; 7.5 mm.

Occurs at San Jose, California.

4. **A. pilosus**, n. sp. Form rather narrow, elongate, piceous, feebly shining, pubescent, legs rufous. Head very coarsely and deeply punctured and with long hairs, clypeus with two larger setigerous punctures on each side. Thorax a little wider than long, narrowed behind, sides arcuate anteriorly, oblique posteriorly, hind angles distinct but not prominent, base slightly arcuate on each side, disc moderately convex, coarsely and deeply punctured, the punctures regularly placed, surface with moderately long hairs. Elytra a little wider than the thorax, oblong, sides very slightly arcuate, surface finely striate, intervals flat and regularly biserially closely punctate, each puncture with a rather long semi-erect hair. Thorax beneath very coarsely and deeply punctate, metasternum at sides coarsely punctate, abdomen at sides more sparsely punctulate. Length .28 inch ; 7 mm.

This species is much more slender in form than *obtusus*, and differs also in the longer hairs of the surface and the sculpture of the thorax beneath. Sexual characters as in *obtusus*.

Occurs in the San Joaquin Valley, California. (Blüthner.)

5. **A. immanis**, n. sp. Oblong, depressed, piceous, feebly shining, pubescent, legs rufous. Head coarsely but not deeply punctate, with short erect hairs, clypeus with one setigerous puncture on each side. Thorax broader than long, narrowed posteriorly, sides in front arcuate, posteriorly oblique, hind angles distinct but not prominent, base on each side slightly arcuate, disc feebly convex, coarsely but not deeply punctate, surface with very short erect hairs. Elytra wider than the thorax, oblong oval, sides slightly arcuate, surface finely striate, intervals flat and rather finely and closely biserially punctulate, with very short erect hairs. Thorax beneath with a few coarse punctures in front. Metasternum at sides and abdomen sparsely punctulate. Hind tibiae with short, broad, spathuliform terminal spurs. Length .34 inch ; 8.5 mm.

I have seen but two females of this species, which bears considerable resemblance to *obtusus*, differing in the structure of the posterior tibial spurs. This character is so remarkable and unexpected in this genus that I would have passed the specimens as probable monstrosities, but the structure precisely agrees in the hind tibiae of both specimens.

Two specimens ; San Joaquin Valley, California (Blüthner).

6. **A. brunneus** Dej. Resembles *piceus* in form but smaller, with the hind angles of the thorax rectangular and slightly prominent. I have never seen any specimen which agrees with the description excepting the type of Dejean in Chaudoir's collection. I have, however, in my cabinet an immature specimen which agrees with my recollection of that type, but which proves to be a *Harpalus* by the biserially papillose tarsi. As the Dejean type is a female, a renewed examination is necessary to prove its generic position.

7. **A. piceus** Menét. In this species the thorax is very little narrowed behind, the posterior angles obtuse. The clypeus has but one setigerous

puncture on each side. The punctures of the elytral intervals are rather irregularly placed and are usually closer on the inner side of the interval than the outer. Length .36 inch ; 9 mm.

This is the most common species of the Pacific coast, occurring from Alaska to the Peninsula of California and the islands adjacent, it extends inland to Idaho and Utah.

A—b, *rusticus* Group.

Species oblong or somewhat oval, glabrous, surface usually opaque, rarely shining (*dulcicollis*) or metallic (*harpaloides*). Terminal spur of anterior tibiæ ♂ ♀ trifid. Posterior tarsi slender, as long as the tibiæ, the first joint as long as the next two, the fourth joint emarginate. Elytra striate, intervals impunctate, a distinct dorsal puncture, tip distinctly sinuate.

Male. Anterior tarsi broadly dilated, the first four joints densely pubescent beneath, middle tarsi dilated joints 2—3—4 densely pubescent, the first with a small pubescent space at tip (except in *harpaloides* where there is no pubescence).

Female. Anterior and middle tarsi not dilated (except in *harpaloides* and *opaculus* where the first joint is broader and stouter).

The clypeus on each side has but one setigerous puncture, except in *carbonarius* where there are two.

The dilatation of the first joint of the anterior tarsus of the female is not a character of great value. It is well marked in the two above mentioned, but less in the second than in the first. In *dulcicollis* also a slight thickening may be observed.

The species of this group are distinguished in the following manner :

Clypeus with one setigerous puncture on each side, prosternum at middle smooth, not pubescent.

Surface shining.

Surface with metallic lustre, aeneous, legs and antennæ pale.

8. *harpaloides* Ferté.

Surface black, shining, legs black.....9. *dulcicollis* Ferté.

Surface opaque, very distinctly alutaceous.

Form elongate parallel, thorax not narrowed in front, widest near the middle.....10. *opaculus* Lec.

Form more or less oval, thorax narrowed from base to apex, widest at base.....11. *rusticus* Say.

Clypeus with two setigerous punctures on each side, prosternum at middle punctured and pubescent.

Surface opaque, form elongate, thorax nearly as wide at apex as at base.....12. *carbonarius* Say.

8. *A. harpaloides* Ferté. An oblong species, shining, with greenish or bluish metallic surface lustre. The clypeus has but one setigerous puncture on each side. Thorax as wide at base as apex, the sides feebly

arcuate. Elytra oblong, parallel or with the sides feebly arcuate, surface striate, intervals smooth and flat, a dorsal puncture in the usual position. The body beneath is smooth. Legs and antennæ rufous. Length .36—.40 inch ; 9—10 mm.

The *male* has the anterior tarsi dilated, the first joint much less so than the others and without pubescence beneath, the three following joints are normally pubescent ; middle tarsi less dilated, first joint glabrous, next three pubescent. In the *female* the first joint of the anterior tarsus is rather broadly dilated and thickened, slightly prolonged under the second joint, not pubescent beneath, joints 2—5 slender ; middle tarsi slender.

The resemblance of this species to *Harpalus amputatus* is worthy of mention, they are almost undistinguishable by superficial comparison. It is remarkable also that the first joint of the anterior tarsus of the male should be so feebly dilated and that of the female so much so.

Occurs in the Gulf States.

9. *A. dulcicollis* Ferté. Form somewhat oval, black, shining, legs piceous. Thorax broader at base than apex and as wide as the elytra, sides moderately arcuate, hind angles obtuse, basal impressions moderate and with very few punctures. Elytra oval, sides moderately arcuate, surface striate, intervals smooth, slightly convex, dorsal puncture distinct. Body beneath smooth, shining. Length .44 inch ; 11 mm.

The anterior tarsus of the *male* is normally dilated, the first joint pubescent beneath, the middle tarsi nearly as broadly dilated, the first joint pubescent at tip.

In the female the tarsi are slender, the first joint of the anterior is however somewhat stouter than in *rusticus*. The elytra are less shining than in the male.

Occurs in the Gulf States and Missouri.

10. *A. opaculus* Lec. Elongate oval, subparallel, black, opaque. Thorax not wider at base than apex, sides feebly arcuate, hind angles obtuse, basal impressions feeble, surface impunctate. Elytra oblong, sides feebly arcuate, surface finely striate, intervals flat, at apex 3—5—7 with a few feebly impressed punctures, dorsal punctures normal. Body beneath smooth, shining, legs piceous. Length .44 inch ; 11 mm.

The *male* sexual characters are as in *dulcicollis*. The characters of the female are also similar but the first joint of the anterior tarsus is a little stouter but much less so than in *harpaloides*.

Having seen a typical specimen of *elongatus* Chaud., I have no hesitation in placing it with the present species, the differences given by that author are certainly more of an individual character than of a specific nature.

Occurs in Texas.

11. *A. rusticus* Say. With this species I unite not only those already suppressed by Dr. LeConte (List p. 12) but also *merula* Germ. and *haplo-mus* Chaud. The accumulation of large numbers of specimens shows

them to be inseparable. Chaudoir proposes to separate these forms by their dentate or simple humeri, *merula* and *pinguis* with dentate humeri, and *rusticus* and *haplomus* with simple humeri. These characters are not by any means as constant as could be desired. It is true that forms can be selected typifying about four species, but the vast mass of the specimens would occupy the intermediate ground. Locality also has but little to do with the variation except that the form usually called *merula* appears to be peculiar to the Southeastern States. Length very variable .36—.56 inch ; 9—14 mm.

The *male* has the first four joints of the anterior tarsi dilated and pubescent beneath, the middle tarsi are nearly as widely dilated, the first joint very feebly pubescent at tip only. In the *female* the anterior tarsi are slightly broader than the middle, the first joint not stouter.

Occurs everywhere in the Atlantic region east of the Rocky Mountains.

12. **A. carbonarius** Say. Form oblong, black, feebly shining ♂ or opaque ♀. Clypeus with two setigerous punctures on each side. Thorax broader at base than apex, sides feebly arcuate, hind angles obtuse, base truncate, side margin depressed, broadly near the base, base externally and side margin punctulate, distinctly ♂, obsoletely ♀. Elytra oblong, sides nearly parallel ♂, or slightly arcuate ♀, surface finely striate, intervals slightly convex ♂ or flat ♀. Body beneath smooth, shining. Prosternum punctured and with erect hairs, intercoxal process coarsely punctate. Length .52 inch ; 13 mm.

In the *male* the anterior and middle tarsi are dilated and pubescent beneath, the first joint of the middle pubescent over half its surface. In the *female* the characters are as in *rusticus*.

Occurs from the Middle States to Colorado.

B—a, *nigrita* Group.

Species oblong, surface either shining or opaque, glabrous. Terminal spur of anterior tibiæ ♂ ♀ dilated at middle. Posterior tarsi slender, nearly as long as the tibiæ, the first joint nearly as long as the next two together, the fourth joint feebly emarginate. Elytra striate, often very finely, intervals rarely punctulate, tip distinctly sinuate, second stria with a distinct dorsal puncture.

Male. Anterior tarsi broadly dilated, the first four joints densely pubescent beneath, middle tarsus nearly as widely dilated, the first joint pubescent at tip only, the next three densely pubescent over their entire surface.

Female. Anterior and middle tarsi slender or very feebly broader, not pubescent beneath.

The clypeus may have one or two setigerous punctures on each side, the number of species in the first series being greater than the second. Those with one puncture follow naturally after the *rusticus* group.

The species are as follows :

Clypeus on each side with one setigerous puncture.

Surface opaque, elytra feebly striate, especially at tip.

Hind angles of thorax obtuse, sides regularly arcuate, base as wide as the elytra.....13. **furvus** Lec.

Hind angles of thorax sharply rectangular, sides of thorax slightly arcuate posteriorly, base narrower than the elytra (Pacific coast species).

Intercoxal process and middle of second abdominal segment punctured, punctures with short setæ. Metasternum in front and behind punctured.

Thorax feebly narrowed posteriorly, basal impressions very feeble, surface entirely punctured....14. **semipunctatus** Lec.

Intercoxal process and metasternum smooth.

Thorax with broad but very shallow basal impressions. Elytra broad, sides distinctly arcuate.....15. **consobrinus** Lec.

Thorax with rather deep linear impressions, Elytra nearly parallel.....16. **californicus** Dej.

Surface shining in both sexes, elytra more deeply striate.

Elytral intervals feebly convex, quite distinctly but sparsely punctulate, elytra oblong, sides nearly parallel, surface feebly shining.

17. **interpunctatus** Kby.

Elytral intervals convex, smooth, elytra oval, sides arcuate, surface shining; form more robust.....18. **agricola** Say.

Clypeus on each side with two setigerous punctures.

Hind angles of thorax obtuse.

Side margin of thorax very distinctly depressed and with the base punctulate.....19. **Harrisii** Lec.

Side margin of thorax scarcely depressed.....20. **nigerrimus** Dej.

Hind angles of thorax distinct, nearly rectangular.

Elytral intervals distinctly but sparsely punctulate, sides of elytra nearly straight, subparallel.....21. **nigrita** Dej.

Elytral intervals smooth, shining, sides of elytra distinctly arcuate, form more robust.....22. **melanopus** Hald.

To this group belongs *A. signatus* Illig., of Europe and Asia. It resembles *semipunctatus* Lec., and has but one setigerous puncture on each side of the clypeus. The intercoxal process is smooth. It differs from any of the species of the group by the first joint of the middle tarsus of the male having no pubescence beneath.

13. **A. furvus** Lec. Oblong oval, black, opaque. Clypeus with one setigerous puncture each side. Thorax very little wider at base than at apex, sides feebly arcuate, hind angles obtuse, side margin feebly depressed, surface smooth at middle, finely punctured at base and sides. Elytra finely striate, intervals flat, dorsal puncture normal, surface opaque, more so in ♀. Body beneath smooth, shining. Length .44—.50 inch; 11—12.5 mm.

In the *male* the anterior tarsi have the first four joints dilated and pubescent beneath, the middle nearly as wide, the first joint pubescent at tip only, the following three densely pubescent.

The *female* has the tarsi without pubescence, the anterior a little broader than the middle.

This species resembles some of the forms of *rusticus*, but the group characters readily distinguish it.

Occurs from Georgia to Louisiana.

14. **A. semipunctatus** Lec. Form oblong, moderately robust, black, subopaque. Clypeus with one setigerous puncture each side. Thorax broad, slightly narrowed behind, sides feebly arcuate, hind angles rectangular but not prominent, side margin narrowly depressed, surface punctulate, more densely at sides and base. Elytra a little wider than the thorax, finely striate, intervals flat and very obsoletely punctulate on the disc, distinctly punctate at tip, dorsal puncture normal. Metasternum at side obsoletely punctured, in front and behind also, the first ventral segment and prosternum with fine punctures bearing short setæ. Length .50 inch ; 12.5 mm.

The sexual characters are as in *furvus*.

A. similis Lec. and *puncticollis* Chaud. are the same. The first of these names is somewhat older than that which I adopt and has been rejected in favor of a more expressive name, no injustice being done to the original author.

15. **A. consobrinus** Lec. Similar to the preceding but with the thorax more narrowed behind and the hind angles sharply rectangular ; the basal impressions are vague and very shallow. The elytra are similar, but without obsolete punctures on the intervals and the sides are more arcuate. The body beneath is smooth. Length .30 inch ; 12.5 mm.

The sexual characters as in *furvus*.

Occurs in California in the middle and southern portions.

16. **A. californicus** Dej. Resembles the preceding but the form is more slender and the thorax less broad with the hind angles less prominent ; the basal impressions are much deeper and more sharply defined and the surface much less densely punctulate. The body beneath is smooth. Length .50 inch ; 12.5 mm.

While in the two preceding species the sexes are nearly equally opaque, here the male is decidedly more shining.

Sexual characters as in *furvus*.

Occurs in Oregon, California and Nevada.

17. **A. interpunctatus** Kby. Oblong, black, shining (slightly opaque ♀). Head sparsely, finely punctulate, clypeus with one puncture on each side. Thorax much broader than long, base and apex equal, sides feebly arcuate, margin narrowly depressed, hind angles rectangular not prominent, basal impressions moderately deep, disc moderately convex, very sparsely punctulate at middle, more densely along the base and side. Ely-

tra oblong, sides nearly parallel, moderately deeply striate, intervals feebly convex and sparsely obsoletely punctulate. Body beneath smooth. Length .48—.50 inch; 12—12.5 mm.

Sexual characters as in *furvus*. The female is much less shining than the male and the fine punctuation of the intervals much less distinct.

This is the species which has heretofore borne the name *nigrita* and for which Chaudoir suggested the name *Lecontei*. The Kirbyan description will fit equally well either to the present species or the true *nigrita* and I prefer to adopt the above name rather than suggest a new one.

Occurs in Pennsylvania, Vancouver and Canada (Kirby).

18. **A. agricola** Say. Form oblong, moderately robust, black, shining. Thorax broad, base and apex equal, sides moderately arcuate, hind angles rectangular, not prominent, margin narrowly depressed, basal impressions well defined, linear, disc convex, surface smooth with few punctures along the base and margin. Elytra slightly oval, striæ deep, intervals moderately convex, smooth and impunctured. Body beneath smooth. Length .44—.56 inch; 11—14 mm.

Sexual characters as in *furvus*.

This is the most robust and convex species of the present group.

Occurs in Missouri, Kansas and Georgia.

19. **A. Harrisii** Lec. Oblong oval, black, shining. Clypeus with two setigerous punctures each side. Thorax moderately broad, sides regularly arcuate, widest at middle, hind angles very obtuse, side margin depressed more widely behind, disc moderately convex, median line distinct, basal impressions shallow, basal region and depressed margin punctulate. Elytra moderately deeply striate, intervals slightly convex, smooth. Body beneath smooth, a few punctures on the intercoxal process of the abdomen and on the front and posterior portions of the metasternum. Length .44—.48 inch; 11—12 mm.

Sexual characters as in *furvus*.

Occurs from Newfoundland to Pennsylvania.

20. **A. nigerrimus** Dej. Thorax moderately convex, side margin very slightly depressed at middle and not at all at the basal angles, the basal impressions are feeble, shallow and but little punctulate. The other characters are those of the preceding species. Length .44 inch; 11 mm.

Sexual characters as in *furvus*.

Occurs in the New England and Middle States.

21. **A. nigrita** Dej. The description already given of *interpunctatus* applies so exactly to this that I find no differences except, that in the present species there are two clypeal punctures on each side while in that there is but one. Length .50 inch; 12.5 mm.

Sexual characters as in *furvus*.

The determination of the present form as the true *nigrita* Dej. (*interpunctatus* † Lec.) is made from a specimen compared by Chaudoir with Dejean's types.

Occurs in the New England and Middle States.

22. A. melanopus Hald. As the preceding species is parallel with *interpunctatus* so is the present with *agricola*. The differences, other than those drawn from the clypeus, are hardly of sufficient moment to be considered specific, and it is worthy of note that the present and preceding species differ from each other in the same manner as do 17 and 18. Length .52—.56 inch ; 13—14 mm.

Occurs in Pennsylvania and Illinois.

B—b, *discoideus* Group.

Species oblong, surface shining (at least in ♂), either glabrous or with very fine pubescence, variable in color and lustre. Terminal spur of anterior tibiæ dilated at middle. Posterior tarsi slightly flattened, shorter than the tibiæ, the first joint but little longer than the second, the fourth emarginate. Elytra striate, tip sinuate, intervals either smooth or punctulate alternately, dorsal puncture distinct.

Male. Anterior tarsi broadly dilated, the first four joints pubescent beneath. Middle tarsi feebly dilated, first joint glabrous, the next three feebly pubescent.

Female. Anterior and middle tarsi not dilated nor pubescent beneath. Surface usually less shining.

All the species of this group have two setigerous punctures on each side of the clypeus, except *nivalis*. In all, the basal impressions of the thorax are well marked.

The species are as follows :

Clypeus with one setigerous puncture on each side.

Color variable, elytra ♀ subopaque and often ferruginous with discal piceous space. Intervals impunctate..... **23. nivalis**, n. sp.

Clypeus with two setigerous punctures on each side.

Intervals of elytra impunctate, elytra in part at least and legs testaceous.

Thorax piceous, testaceous at the sides..... **24. discoideus** Dej.

Thorax entirely piceous..... **25. baltimorensis** Say.

Intervals of elytra alternately punctulate.

Punctulate near the apex only..... **26. pitychrous** Lec.

Punctulate their entire length..... **27. porosus** Motsch.

23. A. nivalis, n. sp. Form oblong, moderately elongate, piceous, elytra variable, either piceous or brownish-testaceous, with a darker discal space, and subopaque ♀. Head nearly smooth, clypeus with one setigerous puncture each side. Thorax broader than long, narrowed behind, sides arcuate in front, sinuate posteriorly, hind angles obtusely rectangular, disc moderately convex, median line distinct, basal impressions short, deeply impressed and punctured. Elytra wider than the thorax, sides subparallel ♂ or slightly arcuate ♀, apex feebly sinuate, moderately deeply striate, intervals flat, surface shining ♂ or subopaque ♀, dorsal puncture normal. Body beneath smooth, first ventral segment punctured at middle. Legs piceous. Length .£6—.44 inch ; 9—11 mm.

In the *male* the first four joints of the anterior tarsi are dilated (the first joint rather feebly) and pubescent beneath, middle tarsi less dilated, the first joint not pubescent, the next three pubescent. In the *female* the anterior and middle tarsi are slightly dilated but not pubescent beneath.

The males are usually entirely piceous in color, while in the females the elytra are brownish-testaceous with a large, darker discal space. There are however exceptions in both sexes. This species has heretofore been considered a variety of *pitychrous*, but beside the clypeal setæ, the present species differs in the absence of punctures on the alternate intervals near the tip, and the entire absence of any metallic surface lustre.

Occurs in Nevada, northern California, Oregon and Vancouver.

24. *A. discoideus* Dej. Form oblong, moderately elongate, piceous, sides of thorax and elytra and legs testaceous. Head piceous, clypeus with two setigerous punctures on each side. Thorax very little wider than long, narrowed at base, sides arcuate in front, sinuate posteriorly, hind angles sharply rectangular, side margin very narrowly depressed, disc moderately convex, smooth, punctured along the base, basal impressions short and deep. Elytra wider than the thorax, rather deeply striate, intervals slightly convex and smooth. Body beneath smooth, intercoxal process slightly punctulate. Length .44 inch ; 11 mm.

The anterior tarsi of the *male* are not broadly dilated and the first joint has very little pubescence at tip, the middle tarsi are rather slender, the first joint glabrous, the next three feebly pubescent. In the *female* the anterior and middle tarsi are scarcely broader than the posterior.

Occurs from Pennsylvania to Missouri.

25. *A. baltimorensis* Say. Piceous, legs and elytra pale, the latter with darker discal cloud. Form and general characters of *discoideus* but more depressed and less shining. Length .36—.40 inch ; 9—10 mm.

The anterior and middle tarsi of the *male* are more broadly dilated, otherwise the sexual characters are as in *discoideus*.

I adopt or rather retain Say's name for this species in preference to the older one of Fabricius. I can see no advantage in respecting priority in a case of this kind, as the older name carries with it an erroneous locality.

Occurs nearly everywhere in the Atlantic region.

26. *A. pitychrous* Lec. Form of the preceding, but a little more convex, with the surface varying from violaceous to greenish, the general color piceous. Thorax similar in form to *baltimorensis* but less broad, a little more convex and usually less punctured at base. Elytra also similar in form but more parallel, the striæ fine, the intervals flat and at apex 2—4—6 are distinctly punctured. Body beneath and legs piceous. Length .34—.38 inch ; 8.5—9.5 mm.

Sexual characters as in *baltimorensis*.

Closely related to the next species, but differs in the punctuation of the elytral intervals and by the smooth head and absence of coarse punctures from the apex of the thorax.

Occurs from Colorado westward to California and Oregon.

27. *A. porosus* Motsch. Form of *baltimorensis*, piceous, surface with metallic lustre varying from violaceous to green. Head coarsely punctured above the eyes. Thorax usually coarsely punctured along the basal and apical margins, the hind angles rectangular, usually prominent. Elytra strongly sinuate at apex, the striae fine, the alternate intervals usually more convex and impunctured, the flat intervals (2—4—6) punctured from base to apex. Length .36—.42 inch; 9—10.5 mm.

Sexual characters as in *baltimorensis*.

It will be observed in this species, that those forms in which the elytral intervals are decidedly alternating in convexity are females. The punctuation of the flatter intervals varies from very fine to rather coarse, while there are specimens in which the convex intervals are punctulate, but less than the flat ones. By this explanation it will be easy to account for the numerous synonyms.

In recently collected specimens the fine punctures of the flat intervals bear short hairs.

I have placed *Harpalus alternans* Motsch. as a probable synonym, and I would have adopted this name for the species had I been absolutely certain of the correctness of this course.

Occurs from New Mexico to Oregon, following the distribution already noticed in many other species.

C—a, *amaroides* Group.

Species slightly oval, *Amara*-like, surface glabrous and variously colored, usually with slight metallic lustre. Terminal spur of anterior tibiae slender. Posterior tarsi variable. Elytra sinuate at tip, striate, dorsal puncture distinct.

Male. Anterior tarsi rather broadly dilated, the first four joints densely pubescent beneath. Middle tarsi less dilated, the first joint entirely glabrous in *coenus* or with slight pubescence at tip in the other two species, the next three joints pubescent beneath.

Female. Tarsi slender not pubescent beneath. Elytra less shining than the male.

There is but one setigerous puncture on each side of the clypeus in this group.

The species are as follows :

Posterior tarsi slender, the first joint fully equal to the next two. Metasternum at sides and intercoxal process smooth.

Thorax scarcely wider at base than apex. First joint of middle tarsus ♂ glabrous beneath. Species oblong.....28. *laetus* Dej.

Thorax broader at base, as wide as the elytra. First joint of middle tarsus ♂ pubescent at tip. Species oval.....29. *coenus* Say.
Posterior tarsi distinctly flattened, the first joint shorter than the next two.

Metasternum at sides and intercoxal process punctate.

Sides of thorax behind nearly parallel, hind angles rectangular. Middle tarsus of male with first joint very slightly pubescent at tip,

30. *amaroides* Lec.

28. *A. laetus* Dej. Oblong, moderately elongate, parallel, piceous with aeneous metallic surface lustre, narrow margin of thorax and elytra and legs testaceous. Head smooth, clypeus with one setigerous puncture on each side. Thorax broader than long, sides regularly arcuate, hind angles distinct, base a little wider than apex, margin narrowly depressed and pale, disc slightly convex with few punctures near the base, basal impressions distinct but feeble. Elytra rather broadly striate, intervals flat, smooth, more shining in the male, apex feebly sinuate, side margin narrowly and epipleuræ pale. Body beneath smooth, shining, piceous, abdomen somewhat paler. Length .32—.34 inch ; 8—8.5 mm.

The *male* has the anterior tarsi rather broadly dilated, the first four joints pubescent beneath, the first at tip only, middle tarsi feebly dilated, the first joint with a small pubescent space at tip, the next three fully pubescent.

In the *female* the tarsi are all slender.

Occurs in southern New Jersey, Georgia and Texas.

29. *A. coenus* Say. Oval, form of *rusticus*, piceous, moderately shining, surface with feeble metallic lustre. Head smooth. Thorax broad, narrowed in front, sides moderately arcuate, hind angles rectangular, side margin very narrowly depressed in front, more widely posteriorly, disc moderately convex, basal impressions broad and shallow and sparsely punctulate. Elytra striate, intervals flat, smooth, more shining in the male, apex feebly sinuate, epipleuræ usually paler. Body beneath smooth, piceous. Femora piceous, tibiæ and tarsi paler. Length .32 inch ; 8 mm.

Sexual characters as in *laetus*, except that the first joint of middle tarsi of male is entirely glabrous beneath.

Occurs in the Middle States region.

30. *A. amaroides* Lec. Oblong oval, piceous, moderately shining, surface with feeble metallic lustre, violaceous to greenish. Head smooth. Thorax broader than long, narrower at apex, sides in front moderately arcuate, posteriorly straight, parallel, hind angles sharply rectangular, margin narrowly depressed, more widely posteriorly, disc moderately coarsely sparsely punctulate in front, more densely at base, basal impressions moderately deep. Elytra striate, intervals flat, smooth, more shining in the male, apex distinctly sinuate. Body beneath piceous. Intercoxal process and sides of metasternum punctate. Legs piceous. Length .36—.46 inch ; 9—11.5 mm.

The sexual characters are as in *laetus*, the first joint of middle tarsi ♂ having a very small trace of pubescence at tip.

Occurs in California in the central valley.

C—b, *sericeus* Group.

Species oblong, black, opaque, densely punctulate, finely pubescent. Terminal spur of anterior tibiæ slender. Posterior tarsi slender, nearly as long as the tibiæ, the first joint as long as the next two. Elytra sinuate at tip, striate but without distinct dorsal puncture.

Male. Anterior tarsi dilated, the first four joints densely pubescent beneath. Middle tarsi dilated, the first joint pubescent over its entire surface, the next three densely pubescent.

Female. Tarsi slender, not pubescent beneath.

The clypeus has but one setigerous puncture on each side.

One species occurs in our fauna :

Thorax as wide at base as apex, hind angles rounded, intervals of elytra alternately with coarser punctures, irregularly placed. Femora black, tibiae and tarsi pale.....31. *sericeus* Harr.

31. *A. sericeus* Harris. Oblong, black, opaque. Head sparsely punctate. Antennae rufous. Thorax broader than long, apex and base equal, sides regularly arcuate, hind angles rounded, disc feebly convex, surface sparsely punctate, more densely at base and near the sides. Elytra striate, intervals slightly convex, densely punctulate, each puncture with a short hair, apex sinuate, the alternate intervals with coarser obsolete punctures. Body beneath black, opaque. Femora piceous, tibiae and tarsi pale. Length .40 inch ; 10 mm.

The anterior and middle tarsi of the *male* are dilated, the first four joints pubescent, the first joint over nearly its entire surface. In the female these tarsi are slender.

Canada and Middle States to Nebraska.

In addition to the species described in the foregoing pages the following has been described :

Dichirus pallidus Motsch. Elongatus, parallelus, pallidus ; capite, thorace elytrorumque medio infuscatis ; mandibulis robustis ; thorace subquadrato, postice angustato, angulis posticis obtusis ; elytris thorace duplo longioribus, striatis, interstitiis impunctatis ; pedibus ciliatis. Long 2½ lin. —lat. 1 lin.

In addition the following characters are given :

There is no punctuation nor pubescence on the upper side of the body. The thorax is square, narrowed behind, the surface transversely rugulose. On each side of the base is a rounded shallow impression.

These characters seem to indicate that the species is not a *Dichirus* (group A—a) but that it is probably more closely allied to and possibly merely an immature form of *A. pitychrous* Lec.

It occurs in California.

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Species marked * are those of which I have studied the type or a specimen carefully compared therewith.

Critical notes on the Species of SELENOPHORUS of the United States. By George H. Horn, M. D.

(Read before the American Philosophical Society, Nov. 5th, 1880.)

Without wishing at the present time to discuss the question of the validity of Selenophorus as a genus distinct from Harpalus, I will only state that no characters have yet been given which are permanent in all the species. Nevertheless it seems to be at least a well defined group in which there are three series of punctures or foveolæ situated on the second, fifth and seventh elytral striæ, a character which suggests a similar division of species in Pterostichus.