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A STUDY OF THE SUBTRIBE HYDRONOMI WITH A DESCRIPTION OF NEW SPECIES. (CURCULIONIDAE)

STUDY NO. VI(1)

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At the outset of this study only species of the Hydronomi were considered which are found in the western United States, territory not covered by Blatchley and Leng.(2) As the study progressed it was found advisable to deal with all the species of America north of Mexico known to exist at the time of this writing. Eleven genera and fifty-three species are now included in the Hydronomi; nine of these species are being described as new in this study. Several of the genera are monotypic. One of these, Lissorhoptrus simplex, upon the basis of the larval structures, is set up as a subfamily—Lissorhoptrinae by Böving and Craighead.(3) The female genitalia of this species differs from other species of this subtribe, Figure 18. The coxites are small and no trace of the styli can be found even when the genitalia are mounted in glycerine and studied with the compound microscope. It is not clear to what extent the subfamily Curculioninae of Leng will be broken up as a result of biological and morphological studies. Since so little is known about the larval structures of this subtribe other than the one species mentioned above, the present generic arrangement is left unchanged. The species Schizomirrus caecus is not considered as belonging to the Hydronomi, but as Casey suspected it should be placed in the subfamily Raymondionyminae of Schenkling along with the genera Alaocyba and Raymondionymus. Through the kindness of the officials of the United States National Museum and

(1) Contribution No. 101, Department of Zoology and Entomology, Brigham Young University.
(2) Rhynchophora or Weevils of Northeastern America, 1916.
(3) Larvae of Coleoptera. 1931.
Mr. L. L. Buchanan I have been permitted to examine a paratype, one of the two known specimens of this blind weevil. It is not like any of the Erirhinini that I have studied. The following are notes made while studying the paratype specimen:

Body slender, elongate and suboval; dark red, except the antennae which are yellowish and twice the length of the beak, the scape and funicle about equal in length. The beak is long and fairly uniform in dimensions; not as long as the prothorax. The antennae are located near the end of the beak. No eyes are evident. The legs are greatly modified and covered with a whitish pubescens. The tibiae are much expanded at the distal end; tarsi short and pubescent. Body deeply punctured, especially on the thorax and elytra but less so on the beak. Prothorax widest at the middle, being reduced at the anterior and basal regions. Length of prothorax and elytra 2.25 mm. The sternites are interesting since an apparent obsolete suture separates the first two segments which are three times the length of next three sternites. The prosternum is deeply excavated. In this respect it is similar to the Bagous-Pnigodes species.

Col. Casey’s(4) description is good and can be relied upon according to my observations. I have not had a specimen of Raymondionymus for study. In agreement with Mr. Buchanan I believe that Schizomicrus and Raymondionymus are rather closely related and should be kept in the same subfamily.

THE EXTERNAL GENITALIA

The genitalia of the Hydronomi, Figures 13-39, are fairly uniform in pattern. They are more highly specialized than most of the Coleoptera genuina. The styli and coxites are the only genital structures remaining in the females; the valvifers are missing. The eighth sternite is modified by having chitinized arms which are partially fused medially and which extend back into the body in the form of a baculum. The peripheral portions of the segment is largely membraneous. The amount of chitinization which forms the arms and baculum is fairly definite for each species thus providing a specific character. In L. simplex the styli are missing and the coxites are largely membraneous, thus producing a highly specialized organ. This is distinctive enough to justify this species being separated, on this basis, from other members of the subtribe. Species of the genus Bagous are fairly uniform in fundamental structure but rather distinctive in specific characters. Species of Pnigodes show a relationship in their

(4) Coleopterological Notices, IV. p. 708. 1892.
genitalia, eighth segments and spermathecae. The spermathecae are structures which may be used in generic as well as specific separation of members of this subtribe. The male genitalia are of value and have been used in separating many of the species dealt with in this study.

The species of this subtribe are aquatic to semiaquatic in habit. Eggs are deposited upon and in stems and roots of aquatic plants. Some species as *L. simplex*, according to Tucker,\(^5\) cat small holes in the roots of the rice plant and then drop the egg onto the gnawed roots. The genitalia of this species is of the type used to drop the egg rather promiscuously in contrast to Bagous and other genera of this complex which place the eggs in prepared holes in the stems or roots or glue them on the surface of the stems and underside of leaves. *Simplex* is specialized like many of the Scarabeoid series in which the coxites are the only genital structures left.\(^6\) Many of the species of this series just drop their eggs on leaves, in small cracks in the bark or on the soil and grass of pasture land. There are many genital relationships in the species of the Scarabeoid and Cerambycoid series to which the Scolytids and Curculionids belong.

ECONOMIC IMPORTANCE AND BREEDING HABITS OF THE SUBTRIBE HYDRONOMI

This group of weevils is aquatic to semi-aquatic in habits. They feed and breed on palustral plants. The only species of economic importance, at present, is *Lissorhoptrus simplex* (Say) which is a serious pest of cultivated rice. It is widely distributed throughout the eastern United States, feeding on wild rice, arrow-head, bulrushes, water-lilies, as well as cultivated rice. Tucker reports that the larva, known as the "rice-root maggot," destroys the roots, while the adults, "rice water-weevils," feed upon the foliage of the plants. This weevil is one of the most destructive rice pests in the southern United States. Böving and Craighead have pointed out that the larvae have spiracles on the second to seventh abdominal segments which are projecting, hook-shaped and located dorsally. They live submerged between the leaves of rice and on the roots. The larvae of other Curculionids and Scolytids differ from the larvae of *L. simplex* in that the spiracles do not project and are not placed dorsally. It is not known to what extent other larvae of the Hydronomi are similar to *L. simplex*.


Specimens of *Brachybanus electus* have been collected on the arrow-head, *Sagittaria*. It is fairly common in swamps in the northeastern United States.

*Endalus limatulus* is common around New York City, where it is found mainly in or near salt meadows. In Utah it has been collected by the writer on bulrushes, *Scirpus* sp., in a temporary pond, “Dry Lake,” near Wellsville, Cache Co., in June. I have also collected it along the shore of Utah Lake, in Utah Co., on *Scirpus acutus*; and at St. George, Washington Co., in alkali swamps on *Scirpus acutus* and *Typha latifolia*. *E. punctatus* has been taken on sweet fern or marshy plants around New York City; while *E. laticollis* lives on swampy plants and on vegetation around the shores of ponds.

*Tanysphyrus lemnae* breeds in ponds and lakes on various species of the duck-weed, *Lemma*, the leaves of which the beetle perforates with round holes. It probably occurs wherever *Lemma* grows. This is an introduced species from Europe.

*Onychylis nigrirostris* breeds on the arrow-head, *Sagittaria*, while the adults have been collected in large numbers on the flowers of the pickerel-weed, *Pontederia cordata*. *O. angustus* feeds on the arrow-head.

*Lixellus filiformis* was collected by the writer on *Scirpus* sp. in “Dry Lake” near Wellsville, Cache Co., Utah, in June, 1937.

Species of the genus Bagous have been found to feed and breed rather widely on the aquatic plants of this country. *B. magister*, the largest species of this genus, has been collected on water-lilies in New Jersey. *B. cavifrons*, *B. maculatus* and *B. bituberosus* have been found to feed on several pond and marsh plants. *B. chandleri* have been found on sedge, *Carex* sp. in small ponds along the shore of Utah Lake. At Havee, Montana is was found on *Eleocharis palustris*. *B. texanus* was collected on *Cyporus virens* Michx. at Victoria, Texas. *B. tingi* was apparently feeding and breeding on *Potamogeton panormitanus* in Lake Pilarcitos, California, according to Mr. Peter Ting who collected several specimens.

The species *Pnigodes buchanani* was collected on *Ptilimnium capillacccum* (Michx.) in May, at Opelouses, Louisiana. *P. setosus* has been found breeding in the roots of *Lepidium* sp. at Calvert, Texas.

**LOCATION OF THE AMERICAN TYPES OF BAGOUS**

Thomas Say’s type of *B. mamillatus* is lost or destroyed. A neotype has been designated which is being deposited in the entomological
collections of the United States National Museum. An illustration of the plesiotype is contained in this study.

The types of the twelve species described by LeConte are in the Museum of Comparative Zoology, Harvard College, Cambridge, Massachusetts. In only three species did LeConte have several specimens in the type series. Seven of the species were represented by only a single specimen. Dr. Nathan Banks, curator of the Harvard Entomological Collections, and Mr. Floyd Werner, an assistant, have been of great assistance in this study through their identification and comments on specimens compared with the types.

Willis S. Blatchley’s types of Bagous species are in the Purdue University entomological collections, with the exception of puritanus which is in the entomological collections of the Museum of Comparative Zoology, Harvard College. A cotype specimen of ochraceus is in the writer’s collection at Brigham Young University. This specimen was included in a collection of several hundred species of weevils purchased from Dr. Blatchley in 1930. Dr. J. J. Davis, of Purdue University, has kindly sent to me for study purposes specimens from the type series of the following species: maculatus, lunatus and Blanchardi.

The types of the seven species described in this study are being disposed of as follows: blatchleyi, longirostrus and texanus in the United States National Museum, Washington, D. C.; floridanus in the Museum of Comparative Zoology, Harvard College; and lengi, chandleri and tingi in the writer’s collection at Brigham Young University. Paratypes of many of these species have been sent to the collections of cooperating institutions.

Acknowledgments

The writer acknowledges with thanks the loan of specimens from Dr. J. J. Davis, Purdue University, Indiana; Mr. Peter C. Ting, San Francisco, California; Mr. William T. Davis of New York City; Professor Joseph Knull, University of Ohio, Columbus, Ohio; Professor Henry Dietrich, Cornell University, Ithaca, New York; Mr. Mont Cazier, American Museum, New York; Dr. Dwight Pierce, Los Angeles Museum, Los Angeles, California; Dr. Clarence Mickel, University of Minnesota, St. Paul, Minnesota; Mr. L. L. Buchanan, United States National Museum; Dr. P. J. Darlington, Dr. Nathan Bank and Mr. Floyd Werner of Harvard College, Cambridge, Massachusetts. I am especially indebted to Mr. Darlington and Mr. Werner who compared many specimens with the LeConte types and sent valuable notes
along with the specimens. Dr. Davis sent several of Dr. Blatchley’s paratypes for study, and Mr. Buchanan supplied me with many determined as well as undetermined specimens from the National Museum. Dr. E. P. Van Dyke kindly permitted me to study the specimens of this group in the California Academy of Science collection.

THE SUBTRIBE HYDRONOMI

The weevils belonging to the tribe Erirhinini are divided into several subtribes. This study is concerned with the genera and species of the subtribe Hydronomi. As now constituted this subtribe consists of eleven genera, seven of which are monotypic or contain only one species in our fauna. The other genera except Bagous, contains very few species. As a result there are only fifty-three species ascribed to these genera, twenty-nine of which belong to Bagous. The species of Hydronomi live upon semi-aquatic plants, protecting their bodies with a water-proof coating which has dirt and fine sand intermixed with it. The eyes touch the thorax since the head is not prolonged behind.

A key to the genera of the subtribe Hydronomi found in North America is presented and all the known species are listed. Keys are included to help separate the species. The eleven genera may be separated as follows:

A KEY TO THE GENERA OF THE SUBTRIBE HYDRONOMI FOUND IN AMERICA NORTH OF MEXICO(7) WITH A LIST OF SPECIES AND THEIR KNOWN DISTRIBUTION

1. Metasternum as long as the first sternite; covered with a dense, varnish-like, waterproof coating of scales.............................(2)
   Metasternum one-third the length of the first sternite; front coxae narrowly separated..............................Phycocoetes
   P. testaceus Lec. So. Calif.

2. Beak very short and broad, not longer than the head; tarsi narrow, the third segment deeply emarginate...............Stenopelmus
   Beak cylindrical, much longer than the head......................(3)

3. Third segment of hind tarsi emarginate or bilobed......................(4)
   Third segment of hind tarsi simple; legs long and slender...............(9)

4. Beak curved; funicle of six segments, the second short; third segment of tarsi broad, deeply bilobed, last segment short...................(5)
   Beak straight; second segment of funicle long, as also the last segment of the tarsi..............................(8)

(7) Dr. J. C. Bradley’s “Manual of the Genera of Beetles of America North of Mexico,” 1930, has been drawn upon freely in the preparation of this key.
5. Tarsi with a single claw.......................... *Brachybumus*
Tarsi with two claws..............................................(6)

6. Last segment of tarsi broad, the claws well separated......................(7)
Last segment of tarsi narrow, projecting beyond the lobes of the third,
the claws slender..............................................*Onychylis*
Elytra without rows of setae..................................2
Alternate interspaces with a row of distinct setae... *alternans* Lec.
Texas.
2. Body rather stout..............................................*nigrorostris* (Boh.)
Fla.; Ga.; Pa.
Body more elongate..............................................*longulus* Lec.

7. Elytra but slightly if any wider than the thorax; length usually 2 mm.
or more......................................................*Endalus*

I. Last joint of tarsi slightly prominent claws moderately large, elytra
wider than the prothorax.
Scales with bristles intermixed..............................*setosus* Lec.
Tex.; Kan.
Scales uniform, without bristles intermixed..................2
2. Prothorax not coarsely punctured..............................3
   Prothorax coarsely punctured................................4
3. Scales bronzed, beak long and slender, size 2 mm.
   Scales gray, length 4 to 4.5 mm..........................*acatus* Lec.
   Tex.; Kan.; Id.
   a. Beak shorter, stouter, flatter and scarcely curved, elytra
      shorter, punctation stronger, prothorax more rounding
      and wider..................................................*robustus* Schiff.
      Tex.
   aa. Beak longer, narrow and slightly curved; punctation less;
      prothorax more elongate..............................*limatulus* (Gyll.)
      N. Y.; R. Isl.; D. C.; Colo.; Ariz.; Nev.; Calif.; Logan,
      Provo and Moab, Utah.
4. Prothorax scarcely wider than long.......................*cribridicollis* Lec.
   Prothorax transverse, constricted in front................*punctatus* Lec.

II. Last joint of tarsi not prominent; body oval.
   b. Size 1.5 to 1.7 mm. Prothorax wider, equal to the elytra.
      Sides rounded, coarsely punctured and impressed near
      apex.....................................................*laticollis* Blatch.
      Dunedin, Fla.; Cotype specimens.
   bb. Size 1.8 to 2.3 mm. Prothorax not so wide, less than the
      elytra, surface deeply but not coarsely punctured, with
      three pale vittae........................................*ovalis* Lec.
      Ind.; N. Y.; Mont.; So. Calif.; Ridgeway, Canada.
Elytra much wider than the thorax; length less than 1.5 mm... *Tanysphyrus*
Entire body and appendages shining black in color, beak longer
and more slender..............................................*atra* Blatch.
One specimen from Cambridge, Mass.
Body dull black, antennae and tarsi brown, beak not so long and broader..........................lemnae (Fab.)
Pa.; N. Y.; N. J.; Mich.; Mass.; Ill.; Edmonton, Alta.;
Europe; Japan. An introduced species from Europe.

8. Front and middle tibiae serrate on the inner side; third tarsal segment narrow, slightly emarginate; funicle of six segments............Lixellus L. filiformis Lec., Cypress Hills, Alta.; Boucheville, Ont., Canada; Ore.; Colo.; Nev.; Wellsville, Utah.
Tibiae not serrate within; third tarsal segment broad, deeply bilobed; funicle of seven segments..........................Anchodenus Scales brownish-gray, not mottled............angustus Lec. Fla.; N. Y.; Ill.; Toronto, Ont., Canada.

Club entirely pubescent and sensitive; funicle of seven segments; prosternum broadly and deeply excavated in front of coxae..............(10)

10. Pronotum feebly constricted in front..........................Bagous Key to species below.
Pronotum very strongly constricted and tubulate in front...........Pnigodes Key to species below.

THE GENUS BAGOUS

The genus Bagous was established by Ernst F. Garmar in 1817(8) with Rhynchaeus binodulis Gyllenhal as the genotype. The word Bagous is Persian in origin meaning a spade or castrated animal. The species of this genus are known only from the northern hemisphere. Schoenherr in 1826(9) characterized the genus as follows:

"Antennae breviusculae, subtenues; funiculo 7 - articulato; articulis duobus basalibus elongatis, obconicis, reliquis subperfoliatis, coarctatis, versus apicem gradatim latoribus; clava ovalis, magna.
Rostrum breviusculum, arcuatum, robustum, teres.
Thorax subcylindricus, antice late emarginatus, exigue pone oculos lobatus; canalis inferus, brevis.
Elytra oblongo-ovata, versus apicem valde callosa, abdomen obtentia; humeri obtuse angulati.
Tibiae longae, versus apicem arcuatae, apice ipso unco acuto armatae; tarsi angustati."

It will be noted that Schoenherr points out that the characteristic

(9) Curculionidum Dispositis Methodica, 1926, p. 289.
features of this genus are: an excavated prothorax for the reception of the rostrum; a sensitive antennal club and slender curved tibiae, armored at the distal end with a hooked spine. He also points out on page 232\(^{(10)}\) that the genus *Hydronomus* is similar to Bagous, but lack the channeled thorax; and that these genera live on and around aquatic plants.

In discussing the weevils of the Seine Basin Louis Bedel\(^{(11)}\), however, considered Bagous a synonym of *Hydronomus*. Later European workers have not followed Bedel in this but have treated Bagous as a valid genus and have ascribed to it some thirty-five to forty species.

Thomas Say described *mamillatus*, the first American species of the genus Bagous, in 1831.\(^{(12)}\) Say was confused as to the definite characteristics of Bagous and yet he had the works of Garmer and Schoenherr referred to above. Besides the species *mamillatus* he described *simplex = Lissorhoptrerus simplex* and *aereus = Tyloderma aerea* as species of this same genus.

J. L. LeConte\(^{(13)}\) presented the essential characters of this genus in 1876 and described twelve new species. In 1916 Blatchley\(^{(14)}\) described seven new species to which he added a species in 1920\(^{(15)}\) and another in 1925.\(^{(16)}\) In this study seven species are described as new thus bringing the recognized American species to 29.

**KEY TO AMERICAN SPECIES OF BAGOUS**

A. Third joint of tarsi broader, emarginate..............................................1

B. Third joint of tarsi narrow, not emarginate.......................................4

1. Elytra each with one posterior tubercle.............................................2

Elytra each with two posterior tubercles.

   a. Sides of thorax and elytra clay-yellow, elytra with an oblique strip of clay-yellow scales extending from middle of sides to white lunula at declivity. Size 3.5 mm.\(..................\) lunatus Blatch.

   aa. Sides of thorax and elytra uniform, pale gray to grayish black with some oblique white dots; size 2.3 to 2.5 mm.\(...........\) planatus Lec.

2. Interspaces equal, flat, or nearly so................................................3

   Alternate interspaces more elevated.

   b. Third, fifth and seventh elytral interspaces largely elevated; color chestnut to blackish except a spot on declivity and tubercle which

\(^{(10)}\) Op. Cit.


\(^{(13)}\) The Rhynchophora of America North of Mexico. 1876. pp. 183-188.

\(^{(14)}\) Rhynchophora or Weevils of North Eastern America. 1916. pp. 230-238.


are grayish white. Size 2.9 to 3.3 mm. in length............... \textit{lengi} n. sp.

bb. Third, fifth and seventh interpaces largely elevated, black, but covered with lead gray coating and scales, tubercle large, size 4.2 mm. in length.................. \textit{blatcheyi} n. sp.

bbb. Third, fifth and seventh elytral interspaces only slightly elevated; lateral, apical and area around tubercle and declivity whitish; central area of disk brownish black.................. \textit{sellatus} LeC.

3. Scales in pattern or mottled.
   c. Scales gray and dark brown, striae deeper, callus not very prominent .................. \textit{obligus} LeC.

   cc. Scales grayish brown with striking white scale pattern, intervals slightly convex; without callus on or near the declivity.. \textit{pectus} Blatch.

4. Elytra each with one posterior tubercle..........................5
   Elytra each with a tubercle at the middle and two posterior tubercles .................. \textit{manillatus} Say.

5. Tarsi short, prothorax scarred with deep impressions.................8
   Tarsi short or moderate, prothorax feebly granulate..............9
   Tarsi long, prothorax finely rugose............................6
   Tarsi not so long, prothorax smooth to finely punctate........7
   Tarsi very long, fourth segment longer than the second and third segments combined; prothorax granulate..................10

6. Tarsi long, fourth segment as long as second and third combined, first three segments narrow with long white setae; beak one and one-half times as long as the prothorax............... \textit{longirostrus} n. sp.
   Tarsi long, fourth segment less in length than the second and third combined, first three segments slightly broader and more setiferous than in \textit{manillatus}; prothorax finely rugose, beak only as long as prothorax.......................... \textit{americanus} LeC.

7. Tarsi not so long, prothorax smooth; sides straight to anterior fourth then only slightly constricted; surface clothed with fine ocellate scales; femora black to rufous, size 2.8 to 3 mm. .................. \textit{blanchardi} Blatch.
   Tarsi shorter, third segment a little broader and slightly emarginate, intermediate in this characteristic between \textit{planatus} and \textit{manillatus}.
   Elytral striae deeper and with regular deep punctures, mottled with whitish and brownish scales; body more robust, size 3.5 to 4.1 mm. .................. \textit{lexanus} n. sp.

8. Front deeply excavated, beak tricarinate.......................... \textit{carifrons} LeC.
   Front not excavated, but with fovea.
   d. Front foveate, beak tricarinate, prothorax without median carina .................. \textit{magister} LeC.
   dd. Front foveate, beak tricarinate, prothorax with median carina .................. \textit{carinatus} Blatch.

9. Disc of thorax without ridges and depressions, without median channel, granulate ........................................13
   Disc of thorax without ridges and depressions, with median channel, granulate.
   Surface uniform black except the white cross bar near declivity....
   .................................................. \textit{atatus} Blatch.
Surface mottled or with clouded mixture of blackish and whitish scales.

c. Size 4 mm. Elytra with small pale spots or dots, thorax coarsely granulate; front not foveate............................maeolatus Blatch.

c. Size 3.2 mm., mixture of black and white scales, not spotted; striae deep, interspaces elevated, third interspace wider and with white spot on third and fourth interspaces behind the middle....

10. Fourth tarsal segment long, claws divergent, elytra uniform in color.11
Fourth tarsal segment not so long, claws less divergent, elytra with color spots ..................................................12

Elytra with some mixing of scales of different colors.

i. Size 2.5 to 2.9 mm. with white and brown patches of scales.....

ii. Size 3.0 to 3.1 mm., reddish in color with a white covering over the surface of a granular prothorax and elytra...........tingi n. sp.

Elytra with a cross-bar or band behind.

g. White spot at apex of declivity single, crossing the suture in the form of a small cross-bar; form very slender, size 2.5 mm.....

........................................puritanus Blatch.

gg. Elytra with a broad black band crossing the suture behind the middle; size 1.8 mm..............................pusillus Lee.

13. Prothorax as wide as long, beak shorter than thorax.

h. Elytra black, usually covered with dirt colored scales, their striae deep, size 3 mm..............................bituberosus Lee.

hh. Elytra black, covered with dirt colored scales, except for small white spots before the declivity on the second and third interspaces and pale lateral stripes on the thorax; striae with deep punctures, size 3 to 3.2 mm............................floridanus n. sp.

hhh. Elytra with an oblique clay-yellow strip reaching from humerus to the prominent tubercle and declivity, striae fine..pauxillus Blatch.

Prothorax wider than long, much constricted in front, beak as long as thorax.

i. Front with a large fovea, sides of thorax sinuate; antennae and legs nearly black..........................transversus Lee.

ii. Front without fovea; sides of thorax not sinuate; antennae and legs red..........................ochraceus Blatch.

DISCUSSION OF THE SPECIES OF BAGOUS

Bagous lunatus Blatch., Fig. 1

Blatchley and Leng, Rhynchophora or Weevils of North Eastern America, p. 232, 1916.

Black, clothed with clay-yellow and fuscous-brown scales, the former forming a stripe along each side of the thorax and elytra; this
stripe with an oblique spur extending from basal third of elytra to a broad, lunate white spot, concave behind, which crosses the suture at apical third. Thorax as wide as long; elytra behind the humeri one-half wider than thorax; all intervals slightly convex, the third and fifth with prominent conical tubercles on and posterior to the declivity; the third tarsal segment broad and deeply marginate.

Size: 3.3 to 3.8 mm. in length


Remarks: This is one of the most distinctive species of Group A. The large tubercles just before the declivity along with the crescent white spot and the fuscous-brown scales separates this species from others of this group.

Bagous planatus Lec., Fig. 2


Black, clothed with gray, approaching lead color to dark brown or black scales, with an oblique series of small whitish blue spots between the humeri and the tubercles on the declivity; prothorax also with lateral and a medial stripe of whitish-blue scales; disc granulate and feebly channeled. Beak nearly as long as the prothorax, nearly naked. Elytra wider than the prothorax, interspaces nearly flat, with a V shaped depression on the first third; the tubercles at the declivity and beyond small and covered with whitish blue scales. Antennae and feet dark testaceous; third tarsal segment broad and emarginate.

Size: 2.7 to 3.0 mm. in length.

Remarks: The whitish blue spot on the fifth interval near the middle should not be mistaken for a small tubercle and thus confuse this species with *mamillatus* which has a well-developed tubercle at the middle; see Figures 2 and 4. There has been considerable misidentification of this species. The above descriptive notes and the drawing which emphasizes the broad third tarsal segment and lack of tubercle at the middle should make possible the ready separation of this species.

**Bagous lengi** Tanner, n. sp.

Fig. 3

Type female: Elongate, slender; black except antennae and tarsi that are dark red. Beak curved; apex not dilated, not as long as prothorax, smooth but with ocellate scales. Front broadly impressed and granular. Second joint of funicle about as long as two succeeding joints combined. Prothorax slightly wider than long, sides parallel, with a rounded base and broad constriction at the tip. Surface coarsely punctured with a median whitish channel. Elytra a little wider than the prothorax; humeri oblique and swollen due to the fusion of the seventh, eighth and ninth interspaces; third and fifth interspaces prominent, the fifth with a small tubercle at the declivity; tubercle and third and fourth interspaces behind the middle with white spot; surface granulate. Legs rather short and husky; tarsi short, with third segment much enlarged and emarginate; fourth segment as long as two preceding combined, claws only slightly divergent.

Size: 2.9 to 3.3 mm. in length.

Type Locality: Type specimen, one of two specimens from the Leng collection labeled "Iowa." Paratypes, eleven specimens; four from Lake Okoboji, Iowa, collected by L. L. Buchanan, June 22, 1917; three from Iowa City, Iowa, Wickham collection; one five miles east Renwick, Iowa, May 19, 1928, G. O. Hendrickson collection; and one South McAlester, Indiana; the type and three paratypes in the author's collection at Brigham Young University and eight paratypes in the United States National Museum.
Remarks: This species may be readily separated from other species with the broad third tarsal segment by the well-developed convex interspaces, granulation, slender shape and color.

Bagous blatchleyi Tanner, n. sp.

Elongate; black with covering of lead gray coating and scales. Beak about as long as prothorax, stout, flattened at distal end, coarsely punctured; front with deep punctures and well-developed fovea. Second joint of funicle, longer than the two following joints combined. Prothorax wider than long, sides straight to near the tip where it is broadly constricted; surface granulate, covered with fine crenulated lines, a median channel and lateral median gray stripes. Elytra a third wider than the prothorax; humeri obtusely angular and prominent being composed of the coalesced ends of the seventh, eighth and ninth interspaces; third, fifth and seventh interspaces strongly convex, alternate interspaces practically flat; striae fine, punctures obscure, surface uniformly lead-gray in color; tubercle on fifth interspace prominent and pointed. Antennae, tibiae and tarsi dark reddish-brown in color; tarsi with broad, deeply emarginate third segment, fourth segment as long as the second and third combined, claws small and not divergent.

Size: 4.2 mm. in length.

Type locality: Described from a single specimen collected at Tampa, Florida, by Hubbard and Schwartz. The holotype is being deposited in the entomological collection of the United States National Museum, Washington, D. C.

Remarks: Blatchleyi is the largest species of Bagous in group A. The narrow convex interspaces are characteristic, being rather widely separated by flat interspaces. The color, large tubercle, wide prothorax and stout beak separates it from lengi its nearest relative.

Bagous sellatus Lec.

LeConte and Horn, Rhynch. 1876, p. 184.

LeConte’s description of this species is as follows:
"Black; head, three thoracic vittae, sides and tip of elytra densely covered with cinereous scales, leaving a large elongate common triangular space black. Prothorax a little longer than wide, coarsely granulate, sides parallel, suddenly constricted near the tip. Elytra with the humeri oblique and obtusely angulated, striae deep, interspaces convex, first, third, and fifth more elevated, the last terminating in a large conical tuberosity, which is surrounded behind by a dark cloud. Beneath fuscous, thighs with a ring of paler scales. Tarsi with the third joint broader, emarginate."

Size: 2.4 to 2.8 mm. in length.

Distribution: Ft. Monroe, Virginia; St. Augustine, Florida; and Georgia.

Remarks: The color markings consisting of a black triangular spot on the disc of the elytra which extends from the base near the humeri, on the fifth interspace, back to the declivity and the suture as well; the lateral and medial stripes on the prothorax makes this a distinctive species.

**Bagous obliquus** LeC.

LeConte and Horn, Rhynch. 1876, p. 185.

Black, variegated with pale and dark-brown scales. Beak as long as the prothorax; the latter longer than wide with pale stripe. Elytra nearly one-half wider than prothorax, with an oblique pale band extending from the humerus to the suture behind the middle; other pale spots are scattered over the disc and declivity. Antennae and legs testaceous; third tarsal segment broad and emarginate.

Size: 2.3 to 2.8 mm. in length.

Distribution: Florida; Washington, D. C.; Virginia; New Jersey; New York; Minnesota; and Nebraska.

Remarks: Readily separated from other species due to the broad emarginate third tarsal segments, the color pattern, poorly developed tubercle on the declivity, and the broad thick set beak.

**Bagous pictus** Blutch.


"Elongate-oblong. Reddish-brown, densely clothed with grayish-brown and snow-white scales, the latter forming a narrow median and a broad stripe each side of thorax, the lateral stripes forking in front of middle; the white scales on elytra covering the humeri and fifth, sixth and seventh intervals to beyond the middle; basal portion of third interval and a common spot on second and third at apical third
also white. Beak stout, as long as thorax, strongly deflected, densely scaly. Head without frontal fovea. Thorax nearly as broad as long, constricted near apex, densely granulate. Elytra oval, one-third wider than thorax, humeri oblique; intervals feebly convex, without tubercles on or near the declivity. Length, 2.8 mm."

Distribution: Cape Sable, Florida.

Remarks: I have never seen this species which was described from two specimens collected on February 24th by Dr. Blatchley. These specimens are in the Blatchley type collection at Purdue University, Lafayette, Indiana. It is the policy (with which I heartily agree) of this institution not to send out type specimens for study purposes. Because of this I have associated pictus with obliquus only because Blatchley has done so. The original description given above suggests that pictus may be closely related to sellatus both as to color pattern and lack of tubercle on the declivity. The tarsal segments of pictus should be carefully examined. Until the Blatchley specimens are studied this species is questionable.

**Bagous mamillatus** Say

Fig. 4

1821, 28. LeConte, Editor, p. 297.

There has been a question in the minds of students of Bagous as to what species Say actually had before him when he described mamillatus. The original type specimen has been destroyed, so we must rely upon his short but rather definite description of the species. It would seem that even LeConte was confused concerning the actual identity of mamillatus since he believed the species had a broad emarginate third tarsal segment, a character not mentioned by Say. My study of hundreds of specimens of Bagous has resulted in finding several specimens from near the type region which seem to agree almost perfectly with the original descrip-
tion. The accompanying illustration, Figure 4, is an accurate reproduction of a plesiotype specimen which I am designating as the neotype. This specimen was collected at Arkadelphia, Clark County, Arkansas, in July by H. B. Wheel. Other specimens were collected at Tallulah (July 2, 1925) and Shreveport (July 3, 1891) Louisiana; Ann Arbor (June 16, 1918), Michigan; and W. Springfield (May 27, 1895), Massachusetts.

The following is Say’s description of *mamillatus*:

“Cinereous; elytra tuberculate. Inhabits Missouri. Body cinereous; elytra, each with two tubercles behind the middle, placed obliquely, a smaller one on the middle and the humerus with a small tubercle; thighs clavate; tibiae much arcuated toward the tip, and at tip acute, with rather long, rigid hair on their inner side. Length three-tenths of an inch.”

Description of the Neotype: Rather robust, black, covered with cinereous scales, except the tibiae, tarsi and antennae which are red. Beak shorter than the prothorax, faintly trisulcate, scaly, scape attachment on apical third; mouth area red. Frontal fovea not well developed; covered with dense scales, not granulate. Prothorax slightly wider than long, widest just anterior to the middle, sides straight for three-fourth the length, then rounded and only slightly constricted; finely granulate uniform in color and without a median channel. Elytra nearly one-half wider than the prothorax, humeri prominent, oblique and rounded, with a tubercle; interspaces practically flat, no rows of inclined bristles; striae shallow without obvious punctuation; color uniform cinereous, except for white on tips of tubercles, and the dirty yellow coating on some specimens. A small but well developed tubercle at the middle on the fifth interspace which is in an oblique line with the tubercles on the declivity and the humeri. The apical tubercle is well developed but smaller than the one on the declivity. The legs are long, femora noticeable clavate; tibia arcuate, with an inner row of short spines and long setae; tarsi long, and narrow; fourth segment longer than the second and third combined; claws long and only slightly divergent. The female genitalia, Figure 20, has well developed coxites and styli which are extremely chitinized. The eighth sternite is a chitinized spatulate structure. The styli are large and well provided with sensory setae.

Size: 3.9 to 4.5 mm. in length.

Distribution: The neotype specimen is from Arkadelphia, Clark County, Arkansas. One mesothoracic leg has been broken off, but is glued to the tip which bears the specimen; the tarsi are broken off, also the meso- and metathoracic legs. The funicle is missing from
one antenna. This specimen, along with one from Tallulah, Louisiana, and one from Ann Arbor, Michigan, is being returned to the United States National Museum. Two specimens, one from W. Springfield, Massachusetts, and one from Sheveport, Louisiana, are in the writer’s collection at Brigham Young University. These latter two specimens are from the United States National Museum collection and we are pleased to be able to retain them.

Remarks: The determination of mammillatus is a great help in understanding other American species of Bagous. In the LeConte key mammillatus is considered to have broad third tarsal segments. According to the specimens now designated as mammillatus this is not the case.

Bagous longirostrus Tanner, n. sp., Fig. 5

Elongate-oblong. Rufescent, clothed uniformly with silvery-gray scales; except on the legs and beak which are sparsely covered to scaleless; prothorax larger than wide; sides straight for three-fourths, then only slightly narrowed and broadly constricted near the tip; fine punctures on the disc covered by enlarged ocellate scales. Beak one and one-half times as long as the prothorax, slightly curved and dilated, antennae inserted at middle of beak, first segment of funicle a little enlarged. Figure 5. Legs long, tibia slender and only slightly arcuate; tarsi long. fourth segment as long as the second and third combined; claws divergent; ventral surfaces of tarsi segments covered with whitish pubescence. Elytra wider than the prothorax; humeri obtuse, rounded not prominent; interspaces about equal, flat, striae shallow and punctured; only one small tubercle on the fifth interspace at the declivity. Female genitalia with well chitinized coxites, especially at the apices which bear well developed styli. The following are some measurements of the head and prothoracic parts: Beak 1.6 mm.; scape .7 mm.; prothorax 1.0 mm. and mesothoracic tarsus 1.0 mm.
Size: 4 to 4.5 mm. in length.

Type locality: Lake Koshkonong, Fort Atkinson, Wisconsin, July 19, 1923; D. R. Hylan, collector. Type a female deposited in the entomological collection of the United States National Museum, Washington, D. C.; also two paratypes both from Michigan are in the United States National Museum, Acc. 21542. Two paratypes in the writer's collection at Brigham Young University, one from Michigan and one from Buffalo, New York.

Remarks: This species is similar in general facies to americanus but may be separated from it by the long beak, uniform reddish color, long fourth tarsal segment with divergent claws, and whitish pubescence. The genital structures are more heavily chitinized than in americanus. LeConte made the observation that there was a marked difference in the beak of the two sexes of americanus. “That of the male is stout, shining, very finely punctulate, not longer than the prothorax, and about one-half as wide as the head; in the female it is slender, one-third longer and with the antennae inserted about the middle of the length.” The female of americanus is similar in beak characteristics to the male, as revealed by dissecting several specimens of both sexes. I have studied more than a hundred specimens of americanus and find that it is distinctive to longirostrus. I had one specimen of this new species when Mr. Buchanan sent me four additional specimens calling my attention to their long beaks.

Bagous americanus Lec.

LeConte and Horn, Rhynech. 1876, p. 185.

Black or brown, with grayish scales; beak of male and female stout, shining, broad at the tip and as long as the prothorax, antennae inserted on distal third in both sexes. Prothorax longer than wide, sides parallel on basal third, rounded on middle third, broadly constricted near the tip, surface finely punctured but covered with ocellate scales. Elytra at base one-third wider than thorax; humeral angles obtuse, surface covered with fine ocellate scales, some specimens with two large white spots behind the middle, intervals flat, striae fine and with shallow punctures; a small tubercle between the declivity and the apex on the fifth interspace. Male and female genitalia shown in Figures 32, 33 and 37. The female structures are distinctive, the coxites not so long and heavily chitinized as in longirostrus. Legs reddish, fourth joint of tarsus not so long as the two preceding, claws not so divergent.

Size: 3.5 to 4 mm. in length.

Distribution: Crescent City, Florida; Waveland, Mississippi; Oke-
fenokee, Georgia; Kenilworth, Washington, D. C.; Falls Church, Virginia; Jamesburgh and Budds Lake, New Jersey; Lake George, Spencer Lake, Vicinity of New York; Buffalo, Peckskill, Olcott and Esopus, New York; Mansfield, Chicopee and Westfield, Massachusetts; State College, Pennsylvania; Monroe Co., Illinois; Kascinsko Co. and Vigo Co., Indiana; Detroit and Ottawa Co., Michigan; Sudburg, Ontario; Ithasca Park and Olmsted Co., Minnesota; and West Bend and Elkhom, Wisconsin.

Remarks: *Americanus, longirostrus, blanchardi* and *texanus* form a natural group that are separated by definite characters as set forth in the species key. *Americanus* is much larger and with longer, reddish colored legs with slightly broadened tarsi in contrast to *blanchardi*.

**Bagous blanchardi** Blatchley and Leng, Rhynch. 1916, p. 235.

"Much smaller and more slender than *americanus*. Vestiture as there, the entire surface very even, smooth and clothed with silvery gray ocellate scales; antennae, except club, tibiae and tarsi pale reddish-brown; femora black, reddish at base. Beak shorter than thorax, slender, cylindrical, almost straight, front with a small shallow fovea. Thorax subcylindrical, as long as wide; disc broadly feebly constricted near apex. Elytra as in *americanus*, intervals all flat, the fifth with a small tubercle on declivity. Femora much more slender; tarsi more than half the length of tibiae, the third joint not broader nor emarginate. Length 2.8 to 3 mm."

Distribution: Dracut, Chicopee and Tygsboro, Massachusetts; Providence, Rhode Island; and Lake Oscawana, New York.

Remarks: A small elongate species with black to dark red femora.

**Bagous texanus** Tanner, n. sp., Fig. 6

Type female: Elongate, dark red to black, covered with whitish to dark brown small ocellate scales, forming indistinct lateral and a medial vittiae on the prothorax and with interspace spots on the elytra, especially behind the middle. Antennae and legs light red covered with scales; beak curved, dark brown covered throughout with scales, tricarinate with rows of setae which arise in punctures on each side of the median carina; scrobes deep; frontal fovea distinct, area covered with whitish scales. Prothorax a little wider than long, sides slightly rounded, widest near the middle, a narrowed and broadly constricted near the tip; finely punctured and smooth with a median depression at the base, bordered by blackish scaled areas. Elytra nearly one-half wider than the prothorax, humeral angle obtuse, rounded; striae medium with deep punctures; interspaces broad, only slightly elevated and
with decumbent white setae; only one small tubercle on the declivity and the fifth interspace. Whitish blotches or bands on third, fourth and fifth interspaces, back of the middle. Legs short, femora strongly clavate, tibia slightly arcuate, claw heavy set., tarsus short, fourth segment only as long as the two preceding combined; first, second and third segments a little broader.

Size: 3.5 to 3.8 mm. in length.

Type locality: Victoria, Victoria County, Texas. Collected by J. D. Mitchell on Cyporus virens Michx. Type and eleven paratypes in the United States National Museum collection; six paratypes in the author’s collection at Brigham Young University, five from Victoria, Texas, and one from Lake Harney, Florida.

Remarks: Texanus resembles americanus from which it differs as follows: thorax wider and more rounding, disc smooth, striae of elytra deeper and with prominent punctures, surface shining, scales smaller and less ocellate; tibia shorter with larger claw. Known only from the type locality and Lake Harney, Florida.

Bagous cavifrons Lec.

LeConte and Horn, Rhynch. 1876, p. 186.

Black, clothed with fuscous black scales, with an oblique row from the humeri to the declivity which ends in two large spots on the third intervals. Beak stout, curved, tricarinate, scaly, finely punctured, as long as prothorax and with well developed frontal fovea. Prothorax about as wide as long, sides parallel to the tip where it is distinctly constricted; surface scarred with deep impressions and coarsely granulate. Elytra about one-half wider than the prothorax; first, third, fifth and seventh interspaces more convex, third produced into small tubercle at the declivity while the fifth has a well formed tubercle on the apical area; striae punctured, interspaces with a row of whitish decumbent setae. Legs blackish except the tarsi which are dark reddish; tibiae shorter; tarsi short, fourth segment not as long as the two preceding combined, claws not so divergent.

Size: 3.7 to 4.1 mm. in length.
Distribution: Dunedin, Crescent City and Archer, Florida; Irvington, New Jersey; Massachusetts; Illinois; Michigan and Louisiana.

Remarks: Markings and thoracic sculpturing similar to magister, but smaller and with less spotting.

**Bagous magister** Lee.
LeConte and Horn, Rhynch. 1876, p. 187.

Blackish-brown, the elytra spotted with fuscous and pale brown scales, with a transverse spot of grayish scales crossing the suture behind the middle, this spot is sometimes interrupted at the suture; antennae and tarsi dark reddish-brown. Beak tricarinate, finely punctured, as long as the prothorax and with a deep elongate fovea between the eyes. Prothorax longer than wide, widest at the base, then slightly tapering to near the tip where it is broadly constricted, surface with irregular deep impressions, punctate, and with deep channel at middle. Elytra about one-half wider than prothorax, humeri rounded, striae deeply punctured, third, fifth and seventh interspaces more convex; tubercle posterior to the declivity prominent; a pale spot, just back of the middle extending from the fifth to the third interspace, in some specimens beyond to the suture; antennae and tarsi dark reddish; legs short, tarsi similar, but tibiae longer than in cavifrons. The female genitalia are well developed, coxites largely chitinized with prominent styli, eight sternite mainly membranous. The male aedeagus is distinct. Figures 24 and 34.

Size: 4.3 to 5.1 mm. in length.

Distribution: Good Haven, Michigan; Ramsey, Minnesota; Toronto, Ontario; Massachusetts, Penn Yan, New York; Seaside Hts. and Irvington, New Jersey; Indiana; Allgonquin, Illinois, Iowa; and Paradise and Dunedin, Florida.

Remarks: Magister is the largest native species of Bagous. It is widely distributed being found on water lilies. The deep impressions on the prothorax, spotting on the elytra and large size make this species easily separated from other species of Bagous.

**Bagous carinatus** Blatch., Fig. 7

Oblong-oval and distinctly robust. Black; head, beak, femora, tibiae, under-surface and prothorax, except for two black basal spots, covered with a coating of fine clay-yellow scales; elytra covered with fuscous-black scales and a whitish bar which unites the fifth intervals across the suture, back of the middle and before the declivity. Beak shorter than the prothorax, curved, stout and tricarinate; front foveate
and scales dense. Prothorax wider than long; sides slightly sinuate, swollen in front of middle, rather sharply constricted near the tip, surface uneven, but not with deep impressions, with a fine median carina reaching from the constriction to the base and with two basal black spots. Elytra about one-half wider at base than prothorax; humeri obliquely angulate; interspaces convex, especially the third, fifth and seventh which are also wider; each with a row of pale setae surrounded by fuscous scales; the fifth with a prominent tubercle on declivity tipped with whitish scales, while the third has a small callous within the white cross-bar; there is a slight depression before the middle from the humeri obliquely to the suture; anterior to this depression the interspaces are definitely elevated. Antennae and tarsi dark red; fourth segment about as long as the second and third combined; segments not broadened.

Size: 2.9 to 4.1 mm. in length.

Distribution: Moore, Haven, Paradise Key and Barlow, Florida; Ft. Lee and Caldwell, New Jersey; Penn Yan, New York; Formingham and Wayland, Massachusetts; Avenne, Manitoba and Boucheville, Quebec; Detroit, Michigan; Cranmoor, Wisconsin; Illinois; Eddyville, Iowa; Huntington, Ohio; Frontenac, Minnesota; Utah Lake and St. George, Utah; and Vernon, B. C.

Remarks: This species is widely distributed. It has been incorrectly identified in many collections being listed in some as transversus, but the color pattern, median thoracic carina and size clearly separates the two species.

Bagous atratus Blatchley

Blatchley and Leng, Rhynch. 1916, p. 233.

Black, clothed with black distinctly ocellate scales, elytra with a grayish-white cross-bar crossing the suture between third intervals at the upper edge of the declivity. Beak short and stout, less in length.
than the prothorax, with fine carinae and a distinct frontal fovea. Prothorax, wider than long, constriction at tip well developed, surface granulate and with median channel. Elytra one-third wider than the prothorax; humeri rounded; interspaces convex the third and fifth more so; striae fine with obscure punctures; noticeable decumbent setae on the fifth and seventh interspaces which are surrounded by whitish scales, giving an obscure spotting appearance. Cross-bar of whitish scales distinctive, being .5 mm. in width and covering the area between and including the third intervals. Antennae and tarsi dark red in color; fourth segment greater in length than the second and third combined, third segment not broad and claws on fourth not divergent.

Size: 3.0 to 3.2 mm. in length.

Distribution: Michigan; Palo Alto Co., Iowa (Bufo. 2011); and the type locality, Virgo County, Indiana.

Remarks: Atratus resembles in general facies planatus from which it is easily separated by tarsal structures and the distinct white cross-bar. Rare in collections; known only from the type in the Purdue collection and the two specimens discussed above, one of which will be deposited in the United States National Museum and one in the writer's collection at Brigham Young University.

Bagous maculatus Blatch.

Blatchley and Leng, Rhynch. 1916, p. 232.

Black, covered with slate-gray coating and scales in an obscure pattern of lateral prothoracic stripes and spots on the elytra, a small round to oblong one, back of the middle. Beak stout, curved and short, not as long as the prothorax; front granulate and scaly; fovea very small. Prothorax about equal in width and length; sides widest beyond the middle to near the tip, then only broadly restricted; surface with two obscure whitish stripes, punctate, but covered with slate-gray coating, slightly channeled at the base. Elytra wider than prothorax, broadly rounded humeri, uniformly colored; interspaces only slightly convex, third and fifth wider; fifth with a small tubercle beyond the declivity; an oblong spot of whitish scales back of the middle. Antennae, funicles, distal parts of the tibiae and tarsi dark red in color.

Size: 3.8 to 4.1 mm. in length.

Distribution: Known only from Dunedin, Florida.

Remarks: Through the kindness of Dr. J. J. Davis in charge of the Blatchley collection at Purdue University I have had the opportunity of studying two of the three specimens of macalatus in the Blatchley collection. "The large size, distinctly maculate elytra, and tibiae, red only near the apex," as Blatchley observes, may be used in distinguishing this species.
Bagous nebulosus Lec.
LeConte and Horn, Rhynch. of Amer. 1876, p. 186.

Form robust, black, covered with dirty scales, variegated with darker and paler ones. Beak slender, curved, finely punctulate, free from scales except at the base; as long as the prothorax. Prothorax wider than long, sides straight to near the tip then rather sharply and deeply constricted, surface coarsely granulate and covered by dark and pale scales which make two obscure lateral stripes. Elytra wider by one-third than the prothorax; humeri obtusely angular and prominent; striae deep and punctured; punctuation obscured by scales and coating; interspaces convex and about equal except the third one which is wider; fifth bears a small callus; all interspaces with a row of decumbent pale colored setae; a pale colored band extends irregularly from the humeri to back of the middle. Antennae and legs dark red. Tarsi are short, especially the first three segments, fourth segment slender and almost as long as the first three combined.

Size: 3 to 3.5 mm. in length.

Distribution: Port Huron and Gd. Ledge, Michigan, June; collected by Hubbard and Schwarz; Brookline and Dover, Massachusetts; Chinchilla, Pennsylvania; New York; Washington, D. C.; Iowa; and Laramie, Wyoming.

Remarks: I have before me two specimens from the United States National Museum, one of which is from the type locality, Port Huron, Michigan, and was collected by Hubbard and Schwarz. The other one collected by these two famous collectors is from Gd. Ledge, Michigan. The specimen from Port Huron may well be considered as a valuable topotype if not a paratype although it was probably not in LeConte's possession when the species was named. I have made the description above from this specimen, which is being properly labeled and returned to the entomological collection of the United States National Museum. The variegated scale pattern and markings is very distinctive.

Bagous californicus Lec.
LeConte and Horn, Rhynch. of Amer. 1876, p. 187.

"Rather robust, black, clothed with dark-gray scales of uniform color. Beak stout, curved, shorter than the prothorax, scaly; frontal fovea not deep. Prothorax wider than long, coarsely granulated and rugose; sides straight, diverging slightly from the base for two-thirds the length, then rounded and narrowed to the tip, where it is strongly constricted; with a broad dorsal channel near the base. Elytra nearly one-half wider than the prothorax, humeri oblique, slightly rounded; sides parallel, then obliquely narrowed and narrowly rounded at the tip, disc flattened from the suture to the third stria, and from the
base for three-fifths the length, striae fine, interspaces slightly convex; posterior callus prominent; there is a feeble tubercle on the third interspace at about two-thirds the length. Antennae and legs reddish brown; tarsi long. Length 2.8 mm.; 11 inch.

One specimen, San Diego, California; G. R. Crotch.

Differs from *B. restrictus* by the tubercle on the third interspace behind the middle, and by the absence of the white spot which occupies a similar position in that species."

Remarks: I have before me several specimens of Bagous from Los Angeles and Redondo, California, which are clearly *restrictus* due to the presence of the white spot back of the middle and the tubercle on the third interspace. I am unable to separate the Texas and California specimens. Mr. Werner compared my California specimens with LeConte's type of *californicus* and considered one of them as similar to the type, but commented that "type MCZ 5297 has been rubbed slightly. The white spot is present, although indistinct because of this, a slip, on LeConte's part." If the San Diego specimen (type of *californicus*) has a distinct third interspace tubercle along with other morphological characters, mentioned in the description, it undoubtedly is a distinct species. At present I am inclined to believe that *restrictus* may be a synonym of *californicus*, but the types of the two species must be carefully studied in the light of our present knowledge of the species of Bagous. Until this is done these species are treated as distinct.

**Bagous chandleri** Tanner, n. sp., Fig. 8

Rather elongate, black, covered with cinereous, variegated scales over the body, prothorax, head beneath and legs; a whitish band behind the middle connecting across the suture, the third interspaces; antennae, femora, tibiae and tarsi red, except the distal ends of the femora which are black. Beak black, stout, slightly curved well toward tip with white scales, not as long as the prothorax, front broadly impressed and densely covered with white scales and coating. Prothorax about one and one-third as wide as long; sides diverging from the base to beyond the middle where it is widest, a broad constriction at the tip; surface granulate and finely punctate; with a broad basal and apical median depression; covering uniform whitish ocellate scales. Elytra one-third
wider than prothorax humeri oblique, not prominent, sides straight for four-fifths the length then smoothly rounded at the apex; interspaces slightly convex, the third and fifth a little wider than the others; the fifth with a small conical tubercle on the declivity; a distinct whitish cross-bar between the third interspaces; interspaces each with a row of pale setae; tarsi long, the fourth segment as long as the two preceding combined; claws divergent and long; third segment not emarginate or broad.

Size: 2.5 to 2.9 mm. in length.

Type locality: Type, Utah Lake shore, Utah County, Utah, (Harry P. Chandler, June 6, 1941; paratypes, Utah Lake shore, Wickham and Chandler, collectors; mouth Bear River, Boxelder County, Utah, A. Wetmore, collector, July 12, 1915; and one specimen collected in Washington, D. C., on Eleocharis palustres which was collected at Havee, Montana. Type and paratypes in the writer’s collection at Brigham Young University. Nine paratypes in the United States National Museum. One paratype in the Entomological Collection of the Museum of Comparative Zoology at Harvard College, Cambridge, Massachusetts.

Remarks: In general appearance this species seems to be related to the californicus-restrictus complex. The white variegated scales and coating along with the size, wide prothorax, short, stout beak and long tarsi make this a distinctive species. Named in honor of the collector and a former student of entomology, now in the Naval forces of our country.

Bagous tingi Tanner, n. sp., Fig. 9

Oblong-oval, robust, rubescent to black covered with grayish white scales and coating. Prothorax and elytra scales noticeably ocellate, the red color of the integument showing through the covering of scales. Beak not as long as the prothorax, curved, tricarinate, the median carina well developed and extending from the origin of the scrobes to the broad well developed fovea of the front which is black granulate and with white scales; sides and tip reddish and punctulate. Prothorax wider than long, widest beyond the middle, strongly constricted at the tip; surface granulate, with a median channel at base and tip interrupted at the middle; elytra only one-fourth wider than the prothorax; humeri broad and oblique; interspaces practically flat, except the third and fifth which are slightly convex and wider. The fifth with a small tubercle on the declivity; striae shallow and finely punctured. Antennae and legs red, distal portion of femora black; tarsi, fourth segment about as long as the three preceding segments combined, claws long and divergent.

Size: 2.8 to 3.1 mm. in length.
Type locality: Lake Pilarcitos, San Mateo County, California; collectors, P. C. Ting and M. Cazier, August 27, 1939. Type and one paratype in writer's collection at Brigham Young University; one paratype in Mr. P. C. Ting's collection, San Francisco, California, and one paratype in the entomological collection, United States National Museum, Washington, D. C. The four specimens from the type locality.

Remarks: Tingi has a rubescent color, a beak that is tricarinate, no white spot before the declivity, long tarsi and size about 3 mm. It is closely related to chandleri.

Bagous restrictus Lee.

LeConte and Horn, Rynch. of Amer. 1876, p. 187.

Black, covered with dirt-colored scales, with some brown to blackish scales intermixed, white spots on the second and third interspaces, also the tubercle on the declivity. Beak carinate, not as long as the prothorax; distal reddish, front clothed with dirt-colored scales, which obscure the fovea. Prothorax wider than long, widest just before the tip which is broadly constricted; surface finely granulate and with slight basal channel. Elytra wider than prothorax, humeri oblique, not prominent; interspaces slightly convex, third one widest, fifth with a small conical tubercle on the declivity; the white spot before the declivity and the white of the tubercle noticeable. Legs, antenna and distal portion of the beak reddish, tarsi long, fourth segment not so long as in chandleri and tingi, but about as long as the second and third segments combined.

Size: 2.4 to 2.7 mm. in length.

Distribution: Brownsville, Texas; Lake Okoboji, Iowa City and Eddyville, Iowa; Indiana; Illinois; Ithaca, New York; Boucherville, Quebec, Canada; Maryland; California and Oregon.

Remarks: The above is the distribution of the specimens considered as restrictus. The California specimens are identical with those from Texas which according to LeConte's description are restrictus. Collecting, in the future, around San Diego may result in obtaining specimens of californicus.
Bagous puritanus Blatch.

Blatchley and Leng, Rhynch. 1916, p. 233.

"Elongate, slender, subcylindrical. Black, densely clothed with dark gray scales; a stripe each side of thorax, a spot on humeri and a narrow cross-bar between the third intervals of elytra at declivity of whitish ones; antennae, except club, tip of beak, tibiae and tarsi pale reddish-brown. Beak much shorter than thorax, slender, curved; front not foveate. Thorax as wide as long, sides feebly curved constricted near apex; disc densely and finely granulate. Elytra one-third wider at base than thorax, sides straight to the declivity, then strongly converging to apex: third interval slightly more convex than the others. Tubercle of the fifth very faint. Length 2.5 mm. (W.S.B.)"

Distribution: Dracut and Nantucket Island, Massachusetts.

Remarks: The above is a short, good description of puritanus. The gray scales and coating gives the appearance of a powder on the body. To the above description should be added the following: Legs not long, slender; tarsi not long, fourth segment about as long as the three preceding combined; distal end of the fourth segment black. Through the kindness of Dr. Banks and Mr. Werner of Harvard College I have had an opportunity of studying specimens of this species.

Bagous pusillus Lec.

LeConte and Horn, Rhynch. of Amer. 1876, p. 187.

"Less robust, black, clothed with dirt-colored scales, elytra with a broad toothed transverse band behind the middle. Beak stout, curved, as long as the prothorax, scaly, frontal fovea faint. Prothorax about as wide as long, sides straight, suddenly rounded, narrowed and strongly constricted near the tip; coarsely granulated. Elytra nearly one-half wider than the prothorax, humeri prominent, oblique and rounded, sides nearly parallel, then oblique, tips rather broadly rounded, posterior callus small, very prominent; striae fine, interspaces nearly flat. Antennae and legs brown, tarsi long. Length 1.8 mm.; .07 inch."

Distribution: Capron, Florida; Illinois; and Mt. Co., Massachusetts.

Remarks: This is one of the smallest American species of Bagous, ranging from 1.8 to 2.2 mm. in length. The brownish black band; prominent tubercle and small size gives this species considerable distinctiveness.

Bagous bituberosus Lec.

LeConte and Horn, Rhynch. of Amer. 1876, p. 188.

"Black, covered with dirt-colored scales. Beak stout, shorter than
the prothorax, which is of the same form as in the preceding, feebly channeled and more finely granulate. Elytra wider than the prothorax, humeri less oblique, obtusely angulated, prominent; striae deep, interspaces convex, fifth more elevated behind, and terminating in a large tuberosity; the third is a little wider and more convex than the adjoining ones. Antennae, tibiae and tarsi dark testaceous; third joint not dilated, fourth as long as the two preceding united. Length 3 mm.; .12 inch."

Distribution: Lawrence, Kansas; Eddyville, Iowa; Indiana; Boucherville, Quebec and Montreal, Canada.

Remarks: This is one of the most misidentified and confused species of Bagous. LeConte referred a specimen from Capron, Florida to this species which Mr. Werner reports is not the same as the Kansas specimen, a cotype. This being the case the Kansas specimen is considered as the type and the Florida specimen which seems to be distinct is probably an undescribed species according to Mr. Werner. All the specimens I have studied have a prothorax which is as wide, if not slightly wider than long, a white spot before the declivity on some specimens, also a slight mixture of brownish and gray scales, and with the interspaces more convex than in floridanus. The third interspace has a slight callus in some specimens.

**Bagous floridanus** Tanner, n. sp.

Oblong-oval. Black, clothed with uniform dirt-colored scales, except for two white spots before the declivity on the second and third interspaces and obscure pale lateral stripes on the prothorax. Beak as long as the prothorax, slender, distinctly tricarinate, fovea small, front and beak to near the tip covered with scales; scrobes deep to the eyes. Prothorax as wide as long, finely granulate sides slightly sinuate, widest just before the tip which is constricted, the channel being broadly rounding; pale lateral stripes. Elytra about one-half wider than the prothorax, humeri obtuse; sides slightly sinuate before the middle; surface with ocellate scales; intervals only slightly convex, third with a very small callus at the white spot, fifth with a small conical tubercle on the declivity. Antennae, except the club, tibiae and tarsi dark red; fourth segment about as long as the three preceding ones. Third segment not broad; a band of white scales on the outer surface of the swollen portion of the femora.

Size: 3 to 3.2 mm. in length.

Type locality: Enterprise, Florida. Type and eight paratypes from Enterprise, Florida in the entomological collection, Museum of Comparative Zoology, Harvard College, Cambridge, Massachusetts. Four paratypes in the writer’s collection at Brigham Young Univer-
sity, three from Enterprise, Florida, and one from Ithaca, New York. Two paratypes in the United States Natural Museum, both from Enterprise, Florida. Two paratypes in the Purdue Blatchley collection, Purdue University, one from Lake Okeechobee, Florida, and one from Enterprise, Florida. Two paratypes in the California Academy of Science, San Francisco, California, both from Enterprise, Florida, and one paratype from Enterprise, Florida in the Cornell University Entomology collection, Ithaca, New York.

Remarks: The white spots on the elytra and femora, conical tubercle, tricarinate beak and regular slightly convex interspaces distinguish *floridanus* from *bituberosus*. Mr. Werner reports that the Florida specimen referred to *bituberosus* by LeConte is not cospecific with the Kansas specimen. *Floridanus* described from Enterprise, may be the same as the Capron, Florida specimen. In any event, it is a distinctive species being remarkably uniform in color, color markings and body shape in the 21 specimens of the type series.

**Bagous pauxillus** Blatch.

Blatchley and Leng, Rhynch. 1916, p. 238.

"Oblong-oval. Piceous-black; above clothed with clay-yellow and dark brown scales, the paler ones covering the head, most of the thorax and forming a broad, uneven stripe along each side of the elytra, these merging across the declivity; four small spots across base of thorax and a large triangular discal one on elytra dark brown; under surface of body and apical halves of femora sooty brown; antennae and remainder of legs reddish. Beak one-half as long as thorax, stout, naked and finely punctate near apex; front with an elongate fovea. Thorax subcylindrical, as long as wide, sides straight, feebly constricted near apex, disc finely and densely granulate-punctate. Elytra broadly oval, one-third broader at base than thorax, humeri rounded, sides straight to declivity; intervals feebly convex, minutely setose, the fifth with a prominent tubercle on declivity. Length 2 mm. (W.S.B.)"

Distribution and Remarks: Known only from the type locality, Guilford, Connecticut and Massachusetts. I have never seen a specimen of *pauxillus* and since I have no reason to question its distinctiveness as portrayed by Blatchley it is undoubtedly a good species.

**Bagous transversus** Lec.

LeConte and Horn, Rhynch. of Amer. 1876, p. 188.

Robust, oblong and less convex. Black covered with dirt-colored scales; beak as long as the prothorax, curved, naked, carinate just
shortly below a distinct fovea. Prothorax wider than long by about one-third, widest near the tip where it is distinctly constricted; surface finely granulate, sides sinuate; no trace of median channel. Elytra uneven, marked with faint impressions, interspaces convex, all about the same in width, striae fairly deeply punctured; tubercle on declivity well developed. Legs and antennae, except the club, dark red to black; tarsi short, especially the fourth segment.

Size: 2.3 to 2.7 mm. in length.

Distribution: Detroit, Michigan; Irvington, New Jersey; New Haven, Connecticut; and Brookline, Massachusetts.

Remarks: Transversus has been greatly confused and misidentified in the collections that I have been permitted to study. Blatchley's carinatus has been most frequently considered as transversus. The color markings and distinctly carinate prothorax easily separates them. LeConte's description fails to mention any white scales as spots or bars on the elytra. Mr. Werner has compared a specimen of what I consider carinatus with transversus and reports that they are very similar, even may be considered as identical. Transversus was described from a single specimen taken at Detroit, Michigan. It should now be studied in connection with other specimens of transversus as well as other species of Bagous, in order that the range of variations may be noted. With the aid of several specimens compared with the type by Mr. Werner, and after a careful study of the original description the specimens now considered as transversus are distinctive. LeConte emphasizes the anterior prothorax in transversus. Specimens considered as this species do not seem to have the prothorax more strongly constricted and tubulate than other species of this genus.

Bagous ochraceus Blatch.

Blatchley and Leong, Rhynch. 1916, p. 237.

"Short, oval, robust. Piceous, everywhere densely clothed with a crust of dirty yellow scales; antennae and legs dark red. Beak rather slender, curved, as long as thorax, densely scaly, finely and densely punctate. Thorax one-third wider than long, sides broadly rounded, strongly constricted near apex. Elytra oval, one-fourth wider at base than thorax, humeri rounded, sides evenly converging to declivity, then more strongly so to apex; striae deep, intervals convex, each with a row of fine whitish recurved setae; the tubercle on declivity scarcely evident. Tibiae and tarsi short, stout. Length 2.3 to 2.5 mm. (W.S.B.)"

Distribution: Dubois County, Indiana, the type locality; Garland, Colo.; Laramie, Wyoming; and Utah Lake, Utah.

Remarks: In 1930 I obtained from Mr. Blatchley, by purchase,
several hundred species of weevils. Included in this collection was a pinned labeled cotype of this species. It and specimens from the above localities agree well with the description. The tubercle on the declivity is “scarcely evident” in all specimens; also rather thick crusting which obscures the sculpturing of the prothorax and elytra.

THE GENUS PNIGODES

The genus Pnigodes was described by LeConte in 1876.\(^{(17)}\) This genus is similar to Bagous both as to habitat and general facies. Pnigodes possesses the following distinctive characteristics: the second joint of the funicle is as long as the next three combined; the legs are stouter and longer; the fourth joint of the tarsi as long as the other three combined; prothorax wider than long and suddenly and strongly constricted and tubulate in front; and elytra wider than prothorax with well developed interspaces.

KEY TO SPECIES OF PNIGODES

1. Tarsi broader and emarginate. Prothorax with black vitta bordering the white median channel; lateral portions of elytra whitish, median portion chestnut brown to black; size 3.5 mm.........................buchanani n. sp.
   Tarsi narrow and not emarginate; prothorax without black vitta; lateral portions of elytra not whitish...............................2

2. Prothorax and elytra coarsely granulate; a white band behind the middle, which connects the third interspaces; one small tubercle on declivity of each elytron; size 2.5 to 2.9 mm.........................setosus Lec.
   Prothorax and elytra without granulation; prothorax uniformly whitish to yellowish except for two basal dark spots bordering the median channel: four tubercles on the declivity of each elytron; size 4.15 mm...tuberosus n. sp.

Pnigodes buchanani Tanner, n. sp., Fig. 10

Type: Female, elongate, slender. Chestnut brown to black, covered beneath, lateral portion of elytra, sides and on median, channel of prothorax with whitish scales. Legs and antennae dark red. Beak long, curved not carinate, slender and black; front with a distinct fovea: finely granulate, with light yellow and brown scales intermixed. Prothorax wider than long, rather flat on top and angulate from base to widest part anterior to middle, then strongly constricted and moderately tubulate; black vitta from base to apex on each side of shallow whitish channel, surface moderately granulate. Elytra slightly wider than prothorax, humeri prominent, angle obtuse, inter-

\(^{(17)}\) Op. cit. p. 188.
spaces separated by well developed striae; third and fifth only a little more elevated, fifth bearing a tubercle at the declivity; color pattern distinctive, the central area including the third interspaces from the base to apex chestnut brown to black; while the lateral portions including the tubercle are whitish. The interspaces each have a row of whitish setae. The tarsi are moderately long; the fourth segment as long or longer than the other three combined; the third segment is broad and emarginate. The first segment of the funicle is large, the second one is as long as the next three combined.

**Size:** 3.5 to 3.6 mm. in length.

**Type locality:** Opelousas, Louisiana, collected by R. A. Cushman, on *Ptilinumum capillaceum* (Michx.) on May 7, 1908. Type and five partypes in the entomological collection of the United States National Museum. Four paratypes in the author's collection, Brigham Young University.

**Remarks:** *Buchanani* differs from *setosus* in that it is larger, with less tubulation on the constricted portion of the prothorax, less granulate on thorax and elytra and with a very different color pattern. They are similar since the second joint of the funicle is long, the legs are stout and long, the fourth joint of the tarsi is as long as the other three combined and the claws are long and divergent. The third tarsal joint is broader and emarginate in *buchanani*. Both species have a median channel on the prothorax and a depression from the base of the elytra to the apex along the suture between the third interspaces.
The third interspaces are slightly elevated. All the interspaces have a row of decumbent white setae. The tubercle on the fifth interspace is larger in *buchanani* than it is in *setosus*. The female genitalia are similar in that the valvifers are not present; the coxites bear small terminal styli and the eighth sternite is largely membranous with two chitinized areas forming a V. The spermathecae of *setosus* is less crenulate than *buchanani*.

**Pnigodes setosus** Lec., Fig. 11

LeConte and Horn, Rhynch. of Amer. 1876, p. 189.

“Black, covered with a dirt-colored crust; prothorax deeply and broadly channeled; elytra finely striae with the alternate interspaces elevated, and bearing each a row of long bristles; a transverse common pale spot is seen behind the middle, extending from the suture to the third stria. The antennae and legs are brown. Length 2.4 to 2.8 mm.; .09 to .12 inch.”

Distribution: Calvert, Paris and Brownsville, Texas; Louisiana; Riley Co., Kansas; Gresham, Nebraska; Iowa; Lake Preston, South Dakota; Santa Ana, California; Peach Springs, Arizona; and Helena, Montana.

Remarks: *Setosus* is found to be fairly widely distributed. Specimens have been bred from the roots of *Lepidium* sp. at Calvert, Texas. In the original drawings of these species, now assigned to this genus, the generic and specific characters are clearly shown, which should be of aid in separating the species.

**Pnigodes tuberosus** Tanner, n. sp., Fig. 12

Type female: Elongate, oblong. Black, densely clothed with brownish yellow, very small ocellate scales; anterior thorax and posterior portion elytra lighter in color; beak and femora black; antennae, tibiae and tarsi dark red in color. Beak shorter than the prothorax, slightly curved with sparse black scales on upper portion, anterior glabrous; front broadly impressed, covered with light yellow scales. Prothorax wider than long, narrowed behind, with a widening to the lateral tubercle before the middle then greatly constricted, but not tubulate; surface with shallow impressions, dorsal channel complete, with two dark basal spots near the channel. Elytra more than one-half wider than the prothorax, humeri oblique and tuberculate; the tubercle on the origin of the seventh and eighth interspaces; the fifth interspaces are more convex, each with an anterior and two posterior tubercles, the posterior tubercle on the declivity is .5 mm. in length; the third interspaces more elevated than the contiguous ones, each with a tubercle on the declivity and the apex, the apical ones are about
one-half the size of the tubercles on the declivity of the fifth interspaces; disc flattened and sloping to the suture, making a wide depression from the base to the apex which includes the first and second interspaces; the basal half is brownish while the posterior half is yellowish. Second joint of the funicle is as long as the next three combined. Tarsi long, third joint not dilated, fourth as long as the three preceding united, legs long, hind tibiae heavy and strongly arcuate.

Size: 4.1 mm. in length.

Type locality: Described from a single specimen collected in Iowa. Holotype in the writer's collection at Brigham Young University.

Remarks: This is a most distinctive species, which may be easily separated from other described species by the lateral tubercles of the prothorax and the several large tubercles of the elytra.
EXPLANATION OF PLATE I

Female Genitalia

Fig. 13. Ventral view of Endalus limatulus (Gyll.)
Fig. 14. Spermathecae of Endalus limatulus (Gyll.)
Fig. 15. Ventral view of Onychylis nigririostris (Boh.)
Fig. 16. Spermathecae of Onychylis nigririostris (Boh.)
Fig. 17. Ventral view of Anchodemus hubbardi Lec.
Fig. 18. Ventral view of Lissorhoptrus simplex Say.
Fig. 19. Spermathecae of Lissorhoptrus simplex Say.
Fig. 20. Ventral view of Bagous mamillatus Say.
Fig. 21. Ventral view of Bagous carinatus Blatch.
Fig. 22. Spermathecae of Bagous carinatus Blatch.
Fig. 23. Ventral view of Bagous tingi, new species
Fig. 24. Spermathecae of Bagous tingi, new species
Fig. 25. Ventral view of Bagous texanus, new species
Fig. 26. Ventral view of Bagous magister Lec.
Fig. 27. Ventral view of Bagous ochraceus Blatch.
Fig. 28. Ventral view of Pnigodes setosus Lec.
Fig. 29. Spermathecae of Pnigodes setosus Lec.
Fig. 30. Spermathecae of Pnigodes buchanani, new species
Fig. 31. Ventral view of Pnigodes buchanani, new species
Fig. 32. Ventral view of Bagous americanus Lec.
Fig. 33. Spermathecae of Bagous americanus Lec.

Male Genitalia

Fig. 34. Aedeagus of Anchodemus hubbardi Lec.
Fig. 35. Aedeagus of Anchodemus angustus Lec.
Fig. 36. Aedeagus of Bagous magister Lec.
Fig. 37. Aedeagus of Bagous americanus Lec.
Fig. 38. Aedeagus of Bagous carinatus Blatch.
Fig. 39. Aedeagus of Bagous chandleri, new species

ABBREVIATIONS

sty .................. stylus 7ths .......... seventh sternite
c .................... coxite 8ths .............. eighth sternite
vf .................... valvifer 9ths .............. ninth sternite
PLATE I
Male and Female Genital Structures of Species of Weevils belonging to the Subtribe Hydronomi