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REVISION OF THE NORTH AMERICAN SPECIES OF
ICHNEUMON-FLIES OF THE GENUS *EXETASTES* GRAV-
ENHORST

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THIS paper is a revision of the known species of *Exetastes* of North America north of Mexico. Thirty-five names of North American species have been used in combination with *Exetastes* or represent species belonging to the genus. One of these is a *nomen nudum*. Elimination of those erroneously referred to the genus and the *nomen nudum* and the synonymizing of others leave 21 properly referable to *Exetastes*. Of these I find two names preoccupied, for which I propose substitute names. Three of the 21 I consider to represent varieties of a fourth. The status of each of the 35 names is discussed on later pages. To the 18 species and 3 varieties 38 new species and 1 new variety are added in the present revision.

HISTORY

Aside from the description of species, the genus *Exetastes* has received rather scant attention from North American taxonomists. The only keys published are that of Provancher to eight Canadian species and that of Viereck to three Connecticut species.

In 1828 Say described *Ichneumon bifasciatus* and in 1836 *Banchus nervulus*, both of which were transferred to *Exetastes* in 1921 by Cushman and Gahan.

Cresson, usually interpreting the genus correctly, described 15 species: *abdominalis*, *affinis*, *caeruleus*, *consimilis*, *decoloratus*, *fasci-pennis*, *flavipennis*, *flavitarsis*, *niger*, *obscurus*, *rufipes*, and *scutellaris*, all from Colorado, in 1865; *bioculatus*, from Texas, in 1872; and *maurus* and *zelotypus*, from California, in 1878. Finding *maurus* and *flavitarsis* preoccupied, Dalla Torre (1901) renamed them *deutero-maurus* and *cressonii*, respectively.

In 1873 Walsh described *Exetastes suaveolens* and *Leptobatus illinoiensis*. The latter was transferred to *Exetastes* by Cresson in 1877.

In 1874 Provancher described *rufus* and *albitarsis*, later transferring *rufus* to *Ceratosoma*, under which genus, renamed *Ceratogastra* by Ashmead, it stands in Dalla Torre's "Catalogus Hymenopterorum"; in 1877, *rufofemoratus*; in 1879, *brevipennis*, *clavatus*, and *matricus*, later synonymizing *brevipennis* with *Mesostenus promptus* Cresson; and in 1883, *Campoplex niger*, the involved nomenclatorial relationship of which to *Exetastes* will be discussed in detail under *suaveolens* Walsh. Into this nomenclatorial tangle, because of the obvious mislabeling of a specimen of *suaveolens* as *Campoplex niger* Provancher, comes *Exetastes provancheri* Dalla Torre (1901), a name proposed to replace the preoccupied combination *Exetastes niger* (Provancher). In 1886 Provancher published *Banchus caudatus*, which Davis (1894) properly transferred to *Exetastes*. A misidentification by Provancher of *Arenetra rufipes* Cresson as *Exetastes niger* Cresson, later corrected by Provancher himself, brings *A. rufipes* into the nomenclatorial picture as the third species to be mentioned under the name *Exetastes niger*.

In 1898 Davis described his *Exetastes abbreviatus*, *E. exploratus*, and *Rhimphalea brevicorpa*, the last of which I find synonymous with one of Cresson's species of *Exetastes*.

In 1910 Viereck published the *nomen nudum*, *Exetastes propinquus* Cresson.

SPECIES ERRONEOUSLY REFERRED TO EXETASTES

(EXETASTES ABBREVIATUS Davis) = XENOSCHESIS CINCTIVENTRIS (Ashmead), new combination

Colpotrochia? cinctiventris ASHMEAD, Trans. Amer. Ent. Soc., vol. 23, p. 200, 1896; male (not female as given in description).

Homobia cinctiventris (Ashmead) DAVIS, Trans. Amer. Ent. Soc., vol. 24, p. 278, 1897; male (not female).

Exetastes abbreviatus DAVIS, Trans. Amer. Ent. Soc., vol. 24, p. 366, 1898; male. New synonymy.

Xenoschesis slossonae CUSHMAN, Proc. Ent. Soc. Washington, vol. 17, p. 140, 1915; female. New synonymy.

(EXETASTES BREVIPENNIS Provancher) = MESOSTENUS PROMPTUS Cresson

I have already discussed this synonymy (Proc. U. S. Nat. Mus., vol. 74, art. 16, p. 46, 1929).

(*EXETASTES CLAVATUS* Provancher) = *EURYPROCTUS CLAVATUS* (Provancher), new combination

Neither Davis nor Rohwer and Gahan could find the type of this species in the Provancher collection, but I have been able to recognize it in a species closely related to *Euryproctus petiolatus* Davis. A specimen in the United States National Museum agrees almost perfectly with the original description, and I have identified it as *clavatus*.

(*EXETASTES CONSIMILIS* Cresson) = *LISSONOTA CONSIMILIS* (Cresson), new combination

This species is based on a male closely related to *Lissonota americana* (Cresson).

(*EXETASTES NIGER* Provancher, not Cresson) = *ARENETRA RUFIPES* Cresson

Provancher misidentified as *Exetastes niger* Cresson a female specimen, which he later identified as *Arenetra rufipes* Cresson. Dalla Torre, mistaking Provancher's intention, synonymized *Exetastes niger* Cresson female (not male) with *Arenetra rufipes* Cresson. In this he was in error, for *niger* is an *Exetastes*, and the male and female described by Cresson are conspecific.

(*CAMPOPLEX NIGER* Provancher) = *CASINARIA GENUINA* (Norton)

Although this species, as represented by its type, has never really been placed in *Exetastes*, its name is involved with the genus because of the mislabeling of a specimen of *Exetastes suaveolens* Walsh, under which species the matter will be fully discussed.

(*EXETASTES RUFUS* Provancher) = *DYSPETES RUFUS* (Provancher)

I have already published this generic transfer (Proc. U. S. Nat. Mus., vol. 72, art. 13, p. 21, 1927.

HOST RELATIONS

So far as species of *Exetastes* have been reared they are internal parasites of lepidopterous larvae. The full-grown larva leaves its host before spinning its cocoon. The only recorded exception to this host relation is that of *Exetastes cimbicis* Vollenhoven¹ from Holland, which is said to be parasitic on the sawfly *Cimbex aenea* (Fabricius).

Among the Lepidoptera the favored hosts appear to be Noctuidae, especially those of the type known as "cutworms." Records of the rearing of species of *Exetastes* from such hosts as Tortricidae and Pyralidae and perhaps those in other groups, several of which have been published, mostly of European species, seem most likely to be errors of identification either of the host or of the parasite, for in nearly every case the species of *Exetastes* involved is known as a parasite of some noctuid. Probably for the reason that the hosts have been reared only sparingly there are comparatively few rearing records in

¹ I have been unable to secure the original description of this species, but I suspect that it is a species of *Xenoschesis* or of some allied tryphonine genus.

American literature; but that the group must be of considerable economic importance is indicated by the abundance of certain of the species such as *matricus* Provancher, *rufofemoratus* Provancher, *suaveolens* Walsh, *obscurus* Cresson, and others. Such host records of North American species as are known are given in the discussion of the species.

MATERIAL STUDIED

Through the kindness of the Academy of Natural Sciences of Philadelphia, I have had access to the types of all Cresson's and Davis' species and to other material in the Academy. The types of Provancher's species, with the exception of *clavatus*, have been examined by my associates A. B. Gahan and C. F. W. Muesebeck, and specimens compared by them with these types are in the National Museum. The types of Say's two species and Walsh's two are no longer in existence, but specimens of Say's species identified by Gahan and myself and of Walsh's easily recognized species are also in the United States National Museum.

In addition to nearly 400 specimens in the National Museum I have had for study about 300 specimens lent to me by the following institutions and individuals: California Academy of Sciences, University of Arizona, Texas Agricultural Experiment Station, Kansas University, Colorado Agricultural College, Canadian National Collection, Cornell University, American Museum of Natural History (New York); Connecticut State Experiment Station (New Haven); Boston Society of Natural History; P. W. Fattig, of Emory University, Atlanta, Ga.; Frank D. DeGant, of Cleveland, Ohio; Andrew R. Park, of Springfield, Ill.; and Henry K. Townes, of Cornell University.

To all these institutions and individuals I wish to extend my thanks.

Genus *EXETASTES* Gravenhorst

Exetastes GRAVENHORST, Ichneumonologia Europaea, vol. 3, p. 395, 1829. (Genotype, *Ichneumon fornicator* Fabricius.)

Leptobatus GRAVENHORST, Ichneumonologia Europaea, vol. 3, p. 432, 1829. (Genotype, *Leptobatus zieglerei* Gravenhorst.)

Rhimphalea DAVIS, not Foerster, Trans. Amer. Ent. Soc., vol. 24, p. 274, 1897. (Genotype, *Rhimphalea brevicorpa* Davis.)

Mostly rather large insects (7–15 mm), conforming to the following description:

Head from above transverse; never strongly swollen, though with the temples sometimes strongly convex; face flat or convex, usually with a median elevation; clypeus divided into basal and apical portions by elevation of basal portion, by impression of apical portion, or by marked difference in sculpture and frequently also by difference in color, arcuate or truncate at apex and frequently with a median apical groove or narrow emargination; mandibles distinctly bidentate,

the teeth not of very different size; palpi slender, with no markedly enlarged or compressed joints; labium never greatly elongated; antenna filiform or slightly thickened near middle and tapering toward both base and apex, scape obliquely truncate, basal joints of flagellum much longer than second joint; eyes not emarginate; ocelli not touching the eyes, rarely very large; malar space distinct.

Thorax more or less compressed; notauli and sternaui weak or absent; prepectal carina distinct; scutellum moderately elevated, propodeum not areolated, at most with apical carina distinct, spiracles oval to elongate.

Hind leg very much longer than others, coxa very large, calcaria long.

Wings large; stigma and radial cell narrow; areolet trapezoidal with second intercubitus frequently curved and second recurrent at or near middle, usually large and sessile or shortly petiolate, rarely small and with long petiole; discocubitus curved or broken, in the latter case frequently with a short ramellus; second recurrent from nearly straight to strongly bisubgeniculate, bullae confluent or very narrowly separated; nervulus postfurcal; postnervulus broken well below middle; nervellus broken near top and strongly reclivous.

Abdomen fusiform, in female usually more or less compressed apically, hypopygium nearly or quite reaching apex; first segment subsessile to subpetiolate, usually strongly convex above just before spiracles, spiracles at or before middle; ovipositor with a distinct subapical notch dorsally, compressed, straight or curved, usually prominently exerted, sheath rarely as long as abdomen or longer, very rarely barely exerted.

As thus characterized and as represented in the North American fauna, the genus is composed of several more or less well defined groups of species, some of which could be separated as easily recognizable genera; but if this were done there would still be left a more or less heterogeneous residue, composed of a majority of the species. I believe the convenience and aims of classification are better served by the preservation of one large, easily defined, and easily recognized genus than by the erection of a series of small genera with the original genus left as a catch-all of species that can not be placed elsewhere.

Of all the characters ascribed by various writers to *Leptobatus* only one, the long ovipositor, distinguishes it from *Exetastes* as heretofore constituted, and this can not be accepted as a generic character.

Rhimphalea brevicorpa Davis, a synonym of *Exetastes bioculatus* Cresson, was the first species assigned to *Rhimphalea* Foerster, and was recognized by Viereck as the genotype. In my opinion it can not be accepted as such, since it will not run to Foerster's family Tryphonoidae because of the lack of dorsal carinae or groove on the first abdominal segment.

Systematic relationships.—The affinities of *Exetastes* and its closest allies are, in my opinion, on the one hand with the Lissonotini, especially with such genera as *Arenetra* Holmgren, *Alloplasta* Foerster, *Echthrodoca* Schmiedeknecht, *Cryptopimpla* Taschenberg, and *Lampronota* Curtis, and on the other hand with *Banchus* Fabricius and its allies.

Of all the characters listed in the above description only one will, by itself, distinguish *Exetastes* from all the genera known to me that are at present assigned to the Lissonotini. This is the fracture of the nervellus far above the middle. Even the other most striking characteristic of the genus, that of habitus, is approached rather closely by *Cryptopimpla*, *Echthrodoca*, and *Arenetra* and even more closely by certain tropical genera such as *Stictolissonota* Cameron.

The relationship of *Exetastes* and its allies to the typical Banchini is distinctly more remote, although the only known characters exhibited by all true Banchini that are not duplicated in the *Exetastes* group are the broad upper tooth of the mandible and the form of the apex of the abdomen in the female.

The correct position of these two groups of genera has long been a matter of disagreement. Most writers have followed the traditional placing in the subfamily Ophioninae and have treated them as belonging to a single tribe, the Banchini. More recently some writers have transferred the tribe Banchini to the subfamily (Pimplinae) Ichneumoninae, some being inclined to divide the tribe into the Banchini and Exetastini. In my opinion the tribe Exetastini is not sufficiently distinct to justify its separation from the Lissonotini (with which Seyrig has correctly combined the Glyptini). The genera comprised in this group are *Exetastes* Gravenhorst, *Allexetastes* Kokujev, *Tetractenion* Seyrig, *Tegona* Morley, *Agathilla* Westwood (= *Agathobanchus* Ashmead), and *Rhynchexetastes* Cameron.

Banchus and its allies, *Nawaia* Ashmead (probably synonymous with *Banchus*), *Rhynchobanchus* Kriechbaumer, *Ceratogastra* Ashmead, *Banchoides* Dalla Torre, and the apparently synonymous *Eponites* Cameron, I consider to form a sufficiently homogeneous and distinct group to maintain as the tribe Banchini.

Of the other genera assigned to the Banchini by more recent writers *Leptobatopsis* Ashmead has been referred by me to the Lissonotini, where *Fintona* Cameron also evidently belongs; *Baliene* Cameron has been synonymized by Morley with *Pseudeugalta* Ashmead; *Xenoschesis* Foerster belongs to the mesoleptine subtribe Notopygina; *Aethria* Tosqinet appears from the description to be synonymous with *Eugalta* Cameron; *Lapton* Nees and *Allotheca* Cameron are unknown to me, and *Ithagenes* Foerster as yet contains no species.

KEY TO NORTH AMERICAN SPECIES OF EXETASTES

The following key to the North American species of *Exetastes* embodies an attempt to classify the species in natural groups. This has necessitated rather long couplets, but it is hoped that the result will prove more satisfactory than a purely artificial key. In these group definitions color has been employed only as a supplementary character. Within the groups color is more freely used since it frequently furnishes the most easily observable characters. Because of the uncertainty as to its proper position, *Exetastes caudatus* (Provancher) is omitted from the key.

1. A high thin carina between antennae; second discoidal cell very short, the second recurrent being nearly or quite as long as basal abscissa of subdiscoideus; areolet unusually small; apical carina of propodeum very strong..... 2
 No carina between antennae; second discoidal cell with recurrent much shorter than basal abscissa of subdiscoideus; areolet of normal size; apical carina rarely very strong..... 4
2. Clypeus not obviously divided into basal and apical portions, the apical portion represented by a narrow, sharply inflexed margin; occipital carina reaching hypostomal carina; thorax very coarsely, densely, and evenly punctate; recurrent distinctly basad of middle of areolet; ovipositor sheath hardly half as long as first tergite..... 1. *carinatifrons*, new species
 Clypeus distinctly divided; occipital carina not reaching hypostomal carina; thorax less coarsely and densely punctate; recurrent at or very near middle of areolet; sheath nearly or quite as long as first tergite..... 3
3. Temples in female receding at about 45° and nearly flat, less strongly sloping and more strongly convex in male; postocellar line hardly longer than ocellocular line and distinctly less than twice the diameter of lateral ocellus; antenna with 40 joints or less, subapical joints in female hardly longer than thick; wings yellowish infumate with apical fascia little darker.
 2. *septum*, new species
 Temples in female more strongly receding; postocellar line distinctly longer than ocellocular line and fully twice diameter of an ocellus; antenna with 46 joints, subapical joints distinctly elongate; wings nearly hyaline with apical fascia very distinct.
 3. *carinatus*, new species
4. Head and thorax mat, extremely finely and densely punctate, with very dense, fine pubescence; eyes distinctly divergent below; abdomen very broad, first tergite triangular, about as broad as long, others transverse; black species with a distinctly grayish appearance due to the dense pubescence; all tergites broadly margined with yellow..... 4. *lasius*, new species
 More coarsely punctate and usually shining, with pubescence sparser and coarser; eyes at most very slightly divergent below; first tergite distinctly longer than broad; not so colored..... 5
5. Clypeus narrow, divided into basal and apical portions only by slight difference in sculpture; apical carina of propodeum

- distinct, setting off a very short petiolar area; second recurrent vein nearly straight; abdomen barely longer than head and thorax, hardly compressed at apex; ovipositor sheath barely extending beyond apex of abdomen; very small species with head and thorax black, or black and ferruginous, with yellow markings, and abdomen largely red..... 6
- Clypeus usually broader and more distinctly divided; apical carina absent, or if more or less indicated it is farther from apex; recurrent vein usually distinctly flexed or curved; abdomen longer than head and thorax and, in female, more or less compressed at apex; sheath extending distinctly beyond apex of abdomen, sometimes very long..... 7
6. Propodeum and metapleurum largely or entirely ferruginous.
6. bioculatus Cresson
 Propodeum and metapleurum black with apices broadly yellow.
5. pictus, new species
7. Face broader than length of the unusually small eyes, flat with a prominent median rounded elevation; clypeus more than twice as broad as long, transversely divided close to base; second recurrent nearly straight; ovipositor recurved, sheath more than half as long as abdomen..... 8
- Face rarely as broad as length of eye; clypeus not more, usually much less, than twice as broad as long; recurrent usually more or less distinctly curved or flexed; ovipositor shorter..... 9
8. Mesoscutum immaculate; wings infumate..... *7. ridens*, new species
 Mesoscutum with conspicuous yellow markings; wings hyaline.
8. illinoiensis (Walsh)
9. Pale lemon yellow with small black or reddish markings; ocelli unusually large, their diameter in female at least nearly as long as ocellocular line; malar space in female nearly as long as basal width of mandible; ovipositor long and recurved, sheath longer than first tergite; hind femur short and stout..... 10
- Black or ferruginous or both, rarely with yellow markings; ocelli very rarely so large; differing also by one or more of the other characters..... 11
10. Abdomen with black markings; ocellocular line in female shorter than diameter of ocellus..... *9. flavus*, new species
 Abdomen with pale reddish markings; ocellocular line in female slightly longer than diameter of ocellus..... *10. pallidus*, new species
11. Head very thick, with occiput shallowly concave, temples broad and very strongly convex; legs stout, hind femur not, or little, more than two-thirds as long as tibia; claws in female strongly pectinate (abdomen stout with first tergite much more than half as broad as long)..... 12
- Head not especially thick, occiput more deeply concave, temples at most moderately convex and strongly receding; hind femur relatively longer; claws usually simple..... 17
12. Clypeus with apical portion abruptly impressed below level of basal portion, the basal portion forming a strong transverse ridge; malar space in female barely, in male less than, half as long as basal width of mandible; wings in both sexes distinctly infumate; ovipositor straight, sheath not longer than first tergite..... 13

- Clypeus with apical portion not so abruptly impressed (in doubtful cases the wings are hyaline and the ovipositor much longer and curved); malar space in both sexes usually more than half as long as basal width of mandible (in the lone exception the clypeus is notably flat and the thorax is black and yellow); ovipositor curved, sheath nearly or quite as long as first two tergites..... 14
13. Hind tibia and basitarsus not at all darkened; wings deeply infumate with stigma dark ferruginous; sheath much shorter than first tergite..... 11. *propinquus*, new species
Hind tibia at apex and basitarsus blackish; wings yellowish infumate with stigma pale yellowish ferruginous; ovipositor sheath subequal to first tergite..... 12. *scutellaris* Cresson
14. Head and thorax black and yellow, not at all ferruginous; wings deep flavous with apices infumate..... 13. *igneipennis*, new species
Thorax and usually head largely or conspicuously ferruginous, this color sometimes largely replaced by black in male; wings uniformly infumate or subhyaline..... 15
15. Temple reaching outside tangent of eye; eyes hardly as long as width of face, faintly divergent below; head of male black and yellow, not at all red..... 14. *buccatus*, new species
Temple not reaching outside tangent of eye; eyes fully as long as width of face, parallel or faintly convergent; head of male more or less reddish..... 16
16. Flagellum entirely black; hind femur and tibia not at all black apically..... 15. *pectinatus*, new species
Flagellum largely ferruginous; hind femur and tibia blackish apically..... 16. *brevicornis*, new species
17. Head and thorax finely and very densely punctate, dull; clypeal suture deep and straight between the foveae; clypeus rather broad, strongly divided into apical and basal portions, the basal portion very short; face fully as broad as length of eye, nearly flat with a median rounded elevation; eyes parallel; antenna in female very short, subapical joints transverse; legs slender, inner hind calcarium hardly half as long as basitarsus; ovipositor recurved, sheath about as long as first tergite; largely ferruginous, the male with head and thorax conspicuously black marked, sometimes almost entirely black..... 18
Differing in all or most of the above characters..... 19
18. Wings in female distinctly fasciate; stigma pale, at base, dark at apex; malar space in female distinctly shorter than basal width of mandible, in male barely half as long; antenna with about 45 joints..... 17. *bifenestratus*, new name
Wings at most with faint traces of fasciae; stigma uniformly ferruginous; malar space in female subequal to basal width of mandible, in male distinctly more than half as long; antenna with about 50 joints..... 18. *obscurus* Cresson
19. Mandible long with lower tooth larger and longer than upper tooth; clypeus large, two-thirds as long as broad, weakly convex and separated into nearly equal basal and apical portions only by difference in sculpture; antenna with less than 45 joints, hardly two-thirds as long as body, stout, with middle joints fully as thick as long, first joint of flagellum

- fully four times as long as thick and twice as long as second; eyes longer than width of face, slightly convergent; temples rather broad and strongly convex, but much shorter than short diameter of eye; ferruginous, the female with fasciate wings (male unknown); ovipositor straight, sheath three-fourths as long as first segment.....19. **callipterus**, new species
- Mandibles, clypeus, and antennae of different conformation; differing also by some or all of the other characters above.....20
20. Thorax, especially the pleura, very coarsely and densely punctate; mesopleurum slightly concave below and meeting the weakly convex sternum in a distinct rounded edge; propodeum sloping from near base, reticulate rugose and with a distinct median groove or a longitudinally rugose area; occipital carina not reaching hypostomal carina (ovipositor sheath not or barely half as long as first tergite; large, slender species with head and thorax black, abdomen and sometimes mesoscutum ferruginous).....21
- Thorax more finely and usually less densely punctate; mesopleurum and mesosternum less definitely separated; propodeum more strongly rounded and usually less coarsely sculptured; occipital carina reaching hypostomal carina.....23
21. Mesoscutum largely or entirely ferruginous.....22
- Mesoscutum black.....22. **concausus**, new species
22. Hind coxa partly and femur and abdomen entirely ferruginous.
20. **crassisculptus**, new species
- Hind coxa entirely and femur except base black; abdomen usually more or less black apically.....21. **rugosus**, new name
23. Scutellum more or less distinctly flattened on top, distinctly margined laterally at least toward base, apex precipitous (in doubtful cases agreeing with all the following characters); eyes large, at least as long as greatest width of face, convergent below; clypeus weakly separated from face and weakly divided transversely, long with more or less distinct apical emargination and usually with a short median groove; malar space much more than half as long as basal width of mandible; propodeum with distinct trace of apical carina medially; ovipositor straight, sheath not or barely as long as first tergite; black with abdomen concolorous or ferruginous, head and thorax sometimes with metallic reflections.....24
- Scutellum not flattened above and not margined; differing also by some of or all the other characters above.....31
24. Hypostomal carina very high and thin and flanked by a deep concavity, lower extremity of occipital carina distant from base of mandible more than width of latter.....25
- Hypostomal carina normal, lower extremity of occipital carina closer to base of mandible.....27
25. Hind femur red; hypostomal carina exceedingly high and strongly arched outward.....26
- Hind femur black; hypostomal carina lower and less strongly arched.....25. **abdominalis** Cresson
26. Wings subhyaline.....23. **matricus** Provancher
- Wings deeply infumate.....24. **infumaticus**, new species
27. Abdomen black.....28
- Abdomen red (head and thorax with metallic reflections).....30

28. With distinct metallic reflections.....26. **caeruleus** Cresson
 Without metallic reflections.....29
29. Malar space in female fully, in male nearly, as long as basal
 width of mandible; hind tarsus entirely red....27. **alticola**, new species
 Malar space in female distinctly, in male much, shorter than
 basal width of mandible; hind tarsus with basal two joints
 fuscous.....28. **dilutipes**, new species
30. Front and middle legs, especially the latter, largely or entirely
 black or fuscous.....29. **purpureus**, new species
 Front and middle legs beyond trochanters, except middle tar-
 sus, entirely red.....30. **rufipes** Cresson
31. Clypeus small, weakly convex in profile and almost without
 trace of transverse division; mandible short, nearly or quite
 two-thirds as broad at base as long; malar space much shorter
 than basal width of mandible; eyes convergent below, rarely
 parallel; antenna nearly as long as body, very slender, atten-
 uate at apex; abdomen slender, first tergite nearly or quite
 three times as long as broad at apex; ovipositor sheath not
 or barely half as long as first tergite.....32
 Clypeus with at least a distinct trace of transverse division; man-
 dible usually distinctly longer; first tergite relatively broader;
 disagreeing also with some of or all the other characters above.....37
32. Head and thorax conspicuously ornamented with yellow; propo-
 deum in female partly ferruginous, in male broadly yellow
 at apex; antenna with white annulus.....31. **ornatus**, new species
 Head and thorax immaculate black, in male face and sometimes
 small markings on thorax yellow, but propodeum immaculate;
 antenna without annulus.....33
33. Notauli weakly indicated by very broad shallow impressions.....34
 Notauli not at all indicated.....35
34. Abdomen black.....32. **subimpresus**, new species
 Abdomen largely ferruginous.....33. **nigribasis**, new species
35. Abdomen ferruginous in middle.....34. **rufobalteatus**, new species
 Abdomen entirely black.....36
36. Legs largely black.....35. **angustus**, new species
 Legs largely ferruginous.....36. **convergens**, new species
37. Mouth very narrow; malar space long, cheeks in front view
 slightly but distinctly concave; clypeus long, strongly convex
 basally, especially in middle; propodeum with apical carina
 more or less distinct; ovipositor recurved; ferruginous, male
 with head and sometimes the thorax largely black with yel-
 low markings (female with fasciate wings).....38
 Not entirely as above structurally; head and thorax not at all
 ferruginous.....39
38. Malar space fully as long as basal width of mandible.
 37. **angustoralis**, new species
 Malar space shorter than basal width of mandible...38. **fascipennis** Cresson
39. Ocellocular line not or barely longer than diameter of an ocellus
 and little more than half as long as postocellar line; first ter-
 gite distinctly constricted before spiracles; nervulus ante-
 fureal or interstitial (head and thorax black; abdomen and legs,
 including eoxae, ferruginous).....39. **ruficoxalis**, new species

- Ocellocular line much longer than diameter of an ocellus and nearly or quite as long as postocellar line; petiole not distinctly constricted; nervulus usually distinctly postfural.----- 40
40. Antenna stout, much shorter than body, tapering but not attenuate at apex, basal joint of flagellum hardly four times as long as thick, middle joints nearly as thick as long; apical portion of clypeus shining, very faintly sculptured; claws in both sexes distinctly pectinate (ovipositor sheath fully half as long as first tergite; head and thorax immaculate black, abdomen usually ferruginous, rarely black)----- 41
- Antenna slender, nearly as long as body, attenuate at apex, basal joint of flagellum more than four times as long as thick; apical portion of clypeus usually dull; claws in female rarely even weakly pectinate, in male simple.----- 44
41. Abdomen largely and hind femur usually ferruginous.----- 42
- Abdomen and hind legs black.----- 43. *coloradensis*, new species
42. Malar space hardly half as long as basal width of mandible; first tergite black only at extreme base.----- 40. *zelotypus* Cresson
- Malar space distinctly more than half as long as basal width of mandible; first tergite largely or entirely black.----- 43
43. Hind femur red; second tergite entirely red. 41. *erythrogaster*, new species
- Hind femur black, second tergite largely black. 42. *concoloripes*, new species
44. Malar space not or barely half as long as basal width of mandible; cheeks in front view convex; mouth distinctly broader than face; clypeus rather short and nearly as broad as face, with a strong, straight transverse ridge; temples strongly convex (ovipositor sheath not, or barely, half as long as first segment; black with abdomen red)----- 45
- Malar space distinctly more than half as long as basal width of mandible; cheeks in front view rarely convex; mouth hardly broader than width of face (if distinctly broader, the eyes are strongly convergent and the face is narrow); clypeus rarely strongly ridged and then much narrower than face; temples flat or weakly convex.----- 46
45. Hind femur black.----- 44. *affinis* Cresson
- Hind femur red.----- 45. *alternatipes*, new species
46. Second recurrent vein nearly straight; face more than twice as broad as long and broader than length of the slightly convergent eyes; ocellocular line nearly three times as long as diameter of an ocellus; inner hind calcarium distinctly less than half as long as basitarsus; head and thorax with dense long erect hair; abdomen short and stout (body and legs black; wings dark)----- 46. *deuteromaurus* Dalla Torre
- Second recurrent strongly curved or flexed; face not or barely twice as broad as long and usually narrower than length of eye; ocellocular line at most a little more than twice as long as diameter of an ocellus; inner hind calcarium fully half as long as basitarsus; head and thorax not conspicuously hairy; abdomen not especially short and stout.----- 47
47. Eyes parallel, barely as long as width of face; head in front view not constricted below eyes; extended angle of cheeks nearly a right angle; clypeus small and with a distinct transverse ridge; antenna in female with about 80, in male with 65 or

- more, joints; ovipositor sheath much more than half as long as first tergite (black, female with pale antennal annulus and red hind femur, male without annulus, but with front and middle legs also largely red)..... 47. *bituminosus*, new species
- Eyes more or less convergent, distinctly longer than width of face; head in front view usually constricted below eyes, extended angle of cheeks narrowly acute; clypeus large, convex at base but without a distinct ridge; antenna in both sexes with not more than 65 joints; sheath not or barely half as long as first tergite..... 48
48. Clypeus separated laterally by distinct groove between fovea and base of mandible; mandible strongly narrowed toward apex, much less than twice as long as broad at base; occiput little broader than vertex, temples very strongly receding and nearly flat..... 49
- Clypeus not distinctly separated laterally; mandible weakly narrowed toward apex, nearly or quite twice as long as broad at base; occiput distinctly broader than vertex, temples more strongly convex and less strongly receding..... 50
49. Abdomen ferruginous..... 48. *dichrous*, new species
- Abdomen black..... 49. *corvinus*, new species
50. Wings bright yellowish with apices dusky..... 50. *flavipennis* Cresson
- Wings uniformly infumate or subinfumate..... 51
51. Hind leg black or piceous, at most with tarsus reddish apically..... 52
- Hind leg distinctly more or less red or yellow; if femur black, the tarsus pale yellow..... 54
52. Diameter of lateral ocellus not or barely more than half as long as postocellar line; temples weakly convex; punctation of thorax moderately coarse and only moderately dense..... 53
- Diameter of lateral ocellus much more than half as long as postocellar line; temples strongly convex; punctation of thorax, especially of mesoscutum, finer and very dense.
53. *persimilis*, new species
53. Malar space two-thirds basal width of mandible; diameter of lateral ocellus fully half as long as postocellar line; antenna in female about 60-jointed, blackish throughout.
51. *anthracinus*, new species
- Malar space three-fourths basal width of mandible; diameter of lateral ocellus less than half as long as postocellar line; antenna in female about 55-jointed, apical half reddish.
52. *geminus*, new species
54. Hind tibia pale yellow; front and middle femora more or less black..... 54. *suaveolens* Walsh
- Hind tibia black; front and middle femora yellowish ferruginous..... 55. *nervulus* (Say)

1. EXETASTES CARINATIFRONS, new species

PLATE 16, FIGURE 1; PLATE 17, FIGURES 23, 34; PLATE 18, FIGURES 53, 64; PLATE 19, FIGURE 78; PLATE 21, FIGURE 111

This and the next two species form a group distinct from the rest of the species in the medially carinate frons, very short second discoidal cell, and small areolet, and from most of the others in the

strong apical carina of propodeum. From a great majority of the species they differ also in habitus, the abdomen being unusually short and the hind legs unusually long. All three are ferruginous with fasciate wings.

Female.—Length 10 mm.

Head thin, temples very strongly receding and nearly flat, occiput shallowly concave; frons coarsely and densely punctate, medially impressed, a high carina between antennae; face densely punctate, impressed on each side and rather prominent medially; clypeus barely half as broad as face, strongly rounded and narrowly inflexed at apex, the basal portion rather densely and finely punctate; cheeks in front view straight, their extended angle slightly acute; malar space as long as basal width of mandible; mouth distinctly narrower than face, mandible nearly as broad at base as long, strongly narrowing toward apex; junction of occipital and hypostomal carinae distant from base of mandible by the width of the mandible; eyes slightly longer than width of face, subparallel, inner margins weakly concavely curved; diameter of a lateral ocellus much more than half postocellar line, latter equal to ocellocular line; antennae (incomplete) very slender, second joint of flagellum about three times as long as thick.

Thorax densely, coarsely punctate throughout; notauli weakly broadly impressed; scutellum elongate subtriangular, lateral areas more sparsely punctate; propodeum rather flat, punctured like thorax, with a short, strongly defined, impunctate petiolar area, pleural carina more or less distinct posteriorly, spiracles small, barely twice as long as broad.

Legs very slender; hind leg nearly twice as long as body, femur reaching fully half its length beyond abdomen, inner calcarium hardly reaching middle of basitarsus.

Wings: Radial cell very narrow, apical abscissa of radius weakly curved at base, twice as long as basal abscissa; areolet smaller than usual, with long petiole, second intercubitus strongly curved, recurrent distinctly before middle; second discoidal cell very short, second recurrent nearly as long as basal abscissa of subdiscoideus and weakly curved; nervulus strongly postfurcal; abscissula not much longer than intercubitella.

Abdomen barely longer than head and thorax, polished; first segment depressed, more than half as broad at apex as long, petiole much broader than thick; second tergite slightly longer than broad at base; segments beyond third strongly compressed; ovipositor short, straight, sheath barely half as long as first tergite, elongate oval.

Ferruginous; face, orbits, and lower part of head paler, orbits yellowish; narrow circles about ocelli and spots on occiput, prepectus, and metasternum black; hind tibia reddish piceous, base yellow;

tarsi yellow; front wing yellowish hyaline with a broad fuscous fascia basad of and another beyond stigma, the basal one darker; stigma and veins in the middle hyaline area yellowish, basal portion of longitudinal veins reddish; hind wing almost uniformly pale fuscous.

Type locality.—Sabino, Ariz.

Type.—U.S.N.M. no. 51794.

Remarks.—Three females, the type dated August 17, 1921; the others from Uvalde, Tex., September 1924, A. P. Dodd, and Tlahuililo, Durango, Mexico, A. Busck. All are in bad condition, none having a complete antenna or hind tarsus. The holotype is the best preserved of the three.

2. EXETASTES SEPTUM, new species

PLATE 16, FIGURE 2; PLATE 17, FIGURE 29; PLATE 18, FIGURE 51; PLATE 19, FIGURE 69; PLATE 20, FIGURES 85, 99; PLATE 21, FIGURE 113

Related to *carinatifrons* in the high interantennal carina, small petiolate areolet, short second discoidal cell, and distinct petiolar area, and differing from that species principally as follows:

Female.—Length 9 mm, antennae 7 mm.

Head thicker, with temples less strongly receding (about 45° to longitudinal axis of body); frons less coarsely punctate and nearly flat, clypeus with apical portion merely impressed, not inflexed, and only slightly shorter than basal portion; cheeks concave; malar space a little shorter than basal width of mandible; mouth as broad as face; occipital carina hardly reaching hypostomal carina, latter high and thin; eyes very faintly convergent below; antenna 38- to 40-jointed, rather stout, slightly tapering apically, second joint of flagellum hardly twice as long as thick.

Thorax less coarsely punctate, scutellum sparsely so; propodeum somewhat more convex, petiolar area longer, reaching to about apical third medially.

Legs shorter, hind femur hardly surpassing apex of abdomen.

Abdomen distinctly a little longer than head and thorax, stouter with first segment thicker and second not longer than broad at base ovipositor slender, slightly recurved, sheath about as long as first tergite.

Body and legs colored as in *carinatifrons*, but antennae blackish apically; wings less contrastingly colored, but with same color pattern; ovipositor sheath blackish.

Male.—Like female except that temples are broader and rather strongly convex; eyes a little smaller, the malar space consequently about as long as basal width of mandible.

Black markings larger; stemmaticum, spots on anterior margin of mesoscutum and upper margin of mesoscutum, lateral areas of scutellum and postscutellum, and meso-metathoracic suture also black.

Host.—*Catabena lineolata* Walker.

Type locality.—Los Angeles County, Calif.

Type.—U.S.N.M. no. 51795.

Paratypes.—Cornell University; Oregon State Agricultural College.

Remarks.—Three females and three males (one of the latter without abdomen) including holotype and allotype, reared under Bureau of Entomology no. 174°; one male reared at Saticoy, Calif., by S. E. Flanders, ostensibly, but very doubtfully, from *Carpocapsa pomonella* (Linnaeus); one male taken July 5, 1930, at Phoenix, Oreg., by H. A. Scullen; one female from San Juan Capistrano, Calif., July 9, 1930, J. C. Elmore; two females from Felton, Santa Cruz Mountains, Calif., May 15–19, 1907, J. C. Bradley; and one female from Priest Valley, Monterey County, Calif., 2,500 feet, August 1927, J. C. Bradley.

3. EXETASTES CARINATUS, new species

Female.—Length 10 mm, antennae 8.5 mm.

Very similar to *septum* but with temples more strongly receding; cheeks straight; hypostomal carina lower; postocellar line distinctly longer than ocellocular line and fully twice the diameter of lateral ocellus; antenna with 46 joints; hind femur extending distinctly beyond apex of abdomen; ovipositor sheath distinctly a little shorter than first tergite.

Wings hyaline, the front wing with two distinct fuscous fasciae.

Type locality.—Dimmit County, Tex.

Type.—U.S.N.M. no. 51796.

One female taken March 30, 1933, by S. E. Jones.

4. EXETASTES LASIUS, new species

PLATE 17, FIGURES 16, 30; PLATE 18, FIGURE 56; PLATE 19, FIGURE 75; PLATE 20, FIGURE 79; PLATE 21, FIGURE 118

Very distinct in form and color and in the sculpture and pilosity of head and thorax, as well as in several structural details.

Female.—Length 10 mm, antenna 7 mm.

Head and thorax mat, very finely and densely punctate and with dense silvery pubescence, longest on lower part of head and very short on dorsum of thorax, this sculpture and vestiture also embracing coxae.

Head very thin medially; temples strongly receding, nearly flat, little more than half as long as short diameter of eye; occiput rather deeply concave; frons moderately concave; face more than twice as broad as long, flat with a small median elevation; clypeus more than twice as broad as long, distinctly divided by differences in slope, sculpture, and color of the basal and apical portions, broadly submarginate apically; cheeks in front view nearly straight; malar space about as long as basal width of mandible; mouth as broad as face;

mandible narrow, nearly twice as long as broad at base; occipital and hypostomal carinae meeting close to base of mandible; eyes distinctly divergent below, shorter than width of face; postocellar line longer than ocellocular line and nearly twice diameter of a lateral ocellus; antenna slender, filiform, very slightly tapering, 45- to 47-jointed, first joint of flagellum twice as long as second.

Thorax short and stout; notauli absent; scutellum elongate triangular, strongly convex longitudinally, discally more sparsely and its lateral areas more coarsely punctate than mesoscutum; propodeum strongly convex both transversely and longitudinally, entirely without carinae though with a shallow longitudinal impression medially.

Legs, especially tibiae and tarsi, slender; hind femur little more than two-thirds as long as tibia and hardly reaching apex of abdomen; inner hind calcarium not nearly reaching middle of basitarsus; apical joints of tarsi very slender, claws slender, weakly curved, fourth joint of hind tarsus nearly as long as fifth.

Wings: Apical abscissa of radius strongly curved at base, only about a half longer than first abscissa; areolet large, sessile, second intercubitus nearly straight, recurrent in middle; second discoidal cell broad, the discocubitus strongly curved with trace of ramellus, basal abscissa of subdiscoideus distinctly though slightly longer than the strongly flexed recurrent; nervulus strongly postfurcal; abscissula nearly twice as long as intercubitella.

Abdomen broad, fusiform, very weakly compressed at extreme apex; first tergite triangular, as broad as long, finely and densely punctate; second tergite much broader at base than long, weakly punctate at base, gastrocoeli distinct, transverse; abdomen otherwise polished; ovipositor slender, slightly recurved, sheath distinctly longer than first tergite.

Black, with yellow as follows: Apical portion of clypeus; sometimes a small spot in middle of face; inner orbit from bottom to top, where it curves mesad and ends in a point behind the lateral ocellus; outer orbit triangularly broadened below, where it is nearly confluent with a small spot on cheek at base of mandible; two narrow stripes on mesoscutum, broadening anteriorly and slightly so posteriorly; scutellum largely; postscutellum; more or less distinct spots on subalar tubercles and on each side of propodeum toward apex; spots on anterior face of front coxa and dorsal face of hind coxa; broad apical margins of tergites and venter except sternites; tegulae, humeral angles of pronotum, and radices of wings stramineous; legs beyond coxae largely ferruginous, trochanters black except narrow apical margin of basal joint and dorsal and ventral surfaces of apical joint; all femora blackish within, the front and middle femora yellow-striped anteriorly. Wings hyaline, venation blackish, stigma paler, with base more or less yellowish.

Male.—Very similar to female in structure and color; spots on lower anterior margin of pronotum and on middle coxa and apex of genital sheath yellow.

Host.—*Euxoa auxiliaris* Grote.

Type locality.—Derby, Kans.

Type.—U.S.N.M. no. 51797.

Remarks.—One female and two males, including type and allotype, reared March 16–20, 1934; one female from Herington, Kans., reared by H. H. Walkden under Acc. no. 2193.4; one female, Bucklin, Kans., reared March 22, 1935, by H. H. Walkden, under Acc. no. 35189; one female from Wellington, Kans., E. G. Kelly; and two females, Lincoln, Nebr., October 25, 1923, Owen Bryant.

Two other species of the *lasius* group, each represented by a single much mutilated specimen, are before me, one from Oregon, minus the abdomen, and one taken from the stomach of a roadrunner at Tucson, Ariz. (Biological Survey no. 188825).

5. *EXETASTES PICTUS*, new species

The group represented by this and the next following species comprises the smallest species of *Exetastes*. They are characterized by the small evenly convex clypeus, distinctly defined very short petiolar area, short depressed abdomen, very short ovipositor, nearly straight second recurrent vein, yellow ornamentation of the head and thorax, and red abdomen.

Female.—Length 6.5 mm.

Head thin, temples very strongly receding, nearly flat, little longer than half of short diameter of eye, polished, weakly punctate; occiput shallowly concave; frons flat, densely finely punctate, mat; face weakly elevated medially, densely and more coarsely punctate, mat; clypeus evenly weakly convex, little more than half as broad as face and two-thirds as long as broad, narrowly truncate at apex, finely coriaceous, mat with scattered punctures; cheeks straight in front view, their extended angle sharply acute, posteriorly more densely punctate than temples; malar space a little more than half basal width of mandible, mouth barely as broad as face; mandibles more than two-thirds as broad as long, strongly narrowing apically; junction of occipital and hypostomal carinae removed from base of mandible by about half the width of latter; eyes large and bulging, slightly longer than width of face, faintly convergent below; postocellar line longer than ocellular line and nearly twice diameter of a lateral ocellus; antennae (broken) slender filiform, first joint of flagellum hardly twice as long as second, the latter a little more than twice as long as thick.

Thorax robust, short and deep, shining, with moderately coarse and dense punctation, somewhat coarser and tending to rugulosity on propodeum; notauli absent; scutellum evenly convex, sparsely punctate.

tate; propodeum weakly convex to the very short, distinct, precipitous petiolar area, pleural carina absent before spiracle; spiracles small, broadly oval.

Legs long, moderately slender; hind femur reaching distinctly beyond apex of abdomen; longer hind calcarium nearly two-thirds as long as basitarsus.

Wings: Apical abscissa of radius weakly curved, hardly twice as long as basal abscissa; areolet large, with second intercubitus nearly straight and unusually long so that the areolet is narrower than usual with its outer angle sharply acute, recurrent at middle; second discoidal cell rather narrow, basal abscissa of subdiscoideus more than a half longer than second recurrent, the latter nearly straight; nervulus interstitial; abscissula more than a half longer than intercubitella.

Abdomen polished, little longer than head and thorax, strongly depressed except at extreme apex, where it is weakly compressed; first tergite more than half as broad at apex as long, its sides weakly concavely curved; second tergite hardly longer than broad at base; ovipositor only briefly exerted, sheath barely half as long as first tergite.

Head and thorax black with yellow markings as follows: Clypeus except its brownish apex; mandibles; annulus embracing flagellar joints 9-14; broad anterior margin and humeral angle of pronotum; two large spots on anterior margin of mesoscutum; scutellum and postscutellum; tegulae; subalar tubercle; upper posterior angle and a large spot on lower posterior angle of mesopleurum; and a large spot at apex of metapleurum confluent with a narrower band across apex of propodeum; legs ferruginous, front and middle coxae entirely and trochanters partly yellow, all tibiae at base yellowish, hind tibia narrowly blackish at apex, hind tarsus blackish with a yellow annulus embracing second joint and apical half of basal joint; wings hyaline, venation brown, stigma paler; abdomen ferruginous, first tergite more yellowish, sheath concolorous.

Type locality.—Devils River, Tex.

Type.—U.S.N.M. no. 51798.

One female taken May 4, 1907, by F. C. Pratt.

6. EXETASTES BIOCULATUS Cresson

PLATE 17, FIGURES 19, 24; PLATE 18, FIGURE 58; PLATE 19, FIGURE 77; PLATE 20, FIGURE 80; PLATE 21, FIGURE 119

Exetastes bioculatus CRESSON, Trans. Amer. Ent. Soc., vol. 4, p. 169, 1872; male.
Rhimphalea brevicorpa DAVIS, Trans. Amer. Ent. Soc., vol. 24, p. 274, 1897;
female. New synonymy.

Female.—Differs from the above description of *pictus* Cushman principally as follows:

Slightly larger.

Head thicker with temples longer and less sharply receding (about 45° to longitudinal axis of body); extended angle of cheeks hardly acute; postocellar line about equal to ocellocular line; antenna 43-jointed; propodeum more distinctly rugose and with a median longitudinal groove basally, pleural carina distinct throughout with the spiracle far above it; outer angle of areolet nearly right, recurrent beyond middle; nervulus slightly postfureal; abscissula hardly a half longer than intercubitella.

Antennal annulus beginning on flagellar joint 11; scape more or less distinctly reddish or yellowish below; propodeum and metapleurum largely or entirely ferruginous, not at all yellow; mesopleurum entirely black below; all coxae and trochanters ferruginous, only front coxa yellowish in front; hind tarsus yellow with more or less of basitarsus and the apical one or two joints brownish.

Male.—Temples much more strongly convex; abdomen depressed throughout.

Propodeum usually more extensively black; front coxa and trochanter and hind tarsus more extensively yellow. Otherwise like female.

Type locality.—Of *bioculatus*, Texas; of *brevicorpa*, Algonquin, Ill.

Type.—Of *bioculatus*, U.S.N.M. no. 4018; of *brevicorpa*, Acad. Nat. Sci. Philadelphia no. 4329.

Remarks.—In addition to the types of both names the material examined includes five specimens of each sex as follows: Brownsville, Tex., May 1921, J. C. Bridwell; Victoria, Tex., April 19, 1913, J. D. Mitchell; Onaga, Kans., Crevecoeur; (homotype of *brevicorpa*) Lawrence, Kans., Hugo Kahl; Lexington, Ky.; Dixie Landing, Va., May 27, C. L. Marlatt; Rosslyn, Va., June 15, T. Pergande; and Georgetown, D. C., H. H. Smith.

7. EXETASTES RIDENS, new species

PLATE 18, FIGURE 55; PLATE 19, FIGURE 74; PLATE 20, FIGURE 91; PLATE 21, FIGURE 117

This species and *illinoiensis* (Walsh) form a distinct group characterized by the very broad short face and clypeus, small eyes, long, narrow, and strongly curved mandibles, short calcaria, nearly straight second recurrent vein, and very long strongly upcurved ovipositor.

Female.—Length 12 mm, antennae 9 mm.

Head thin medially, occiput deeply concave, temples long convex, moderately receding; subpolished, minutely sparsely punctate; frons nearly flat, densely finely punctate; face nearly three times as broad as long, nearly flat with a small prominent median elevation, finely densely punctate; clypeus nearly three times as broad as long, distinctly transversely divided near base, broadly rounded and medially straight or weakly emarginate at apex; basal portion more closely and

coarsely punctate than the faintly coriaceous apical portion; cheeks in front view straight, their extended angle very acute; malar space two-thirds as long as basal width of mandible, mat; mouth very broad, broader than face; mandible more than twice as long as broad at base, strongly curved; junction of occipital and hypostomal carinae shortly behind base of mandible; eyes small, broadly oval, prominent, parallel, shorter than width of face; postocellar and ocellular lines equal and distinctly more than twice as long as diameter of a lateral ocellus; antenna slender filiform, about 50-jointed, only slightly tapering, first joint of flagellum barely twice as long as second, second joint more than twice as long as thick.

Thorax nearly twice as long as deep, very finely and rather densely punctate; notauli very broadly and weakly indicated; scutellum evenly convex, polished, sparsely punctate; propodeum evenly convex both transversely and longitudinally, finely irregularly reticulate rugulose, more coarsely and transversely so laterally toward apex, without carinae, pleural carina at most obsoletely indicated, spiracles rather small, elongate oval, far above pleural carina.

Legs not especially long; front and middle legs slender; hind femur rather stout, little more than two-thirds as long as tibia and hardly reaching to apex of abdomen; inner hind calcarium less than half as long as basitarsus; apical joint of hind tarsus nearly as long as third joint.

Wings: Apical abscissa of radius strongly curved at base, much less than twice as long as basal abscissa; areolet large, regular, sessile, recurrent at middle; second discoidal cell rather long, second recurrent hardly two-thirds as long as basal abscissa of subdiscoideus, nearly straight; nervulus distinctly postfurcal; abscissula a half longer than intercubitella.

Abdomen slender, especially in profile; polished and impunctate, except first tergite laterally toward base; first tergite more than half as broad at apex as long, tergites 2-4 as long as broad at base; ovipositor long, stout, strongly recurved, sheath more than half as long as abdomen.

Head and thorax black; apex of clypeus brownish or yellowish; small spot at top of eye yellow; abdomen ferruginous with first two tergites more or less and ventral plica and hypopygium blackish; legs black, front femur and tibia anteriorly, middle femur apically, yellowish, hind femur more or less ferruginous on outer surface and rarely largely ferruginous, in the latter case the tibia largely ferruginous; hind tarsus with joints 2-4 sometimes dark reddish; wings uniformly dark infumate.

Male.—Essentially like female but malar space shorter, ocelli larger, temples more strongly convex; apical portion of clypeus pale yellow; pattern of front and middle legs much as in female but black largely

replaced by ferruginous; hind femur and tibia very largely ferruginous; wings dilutely infumate; abdomen almost entirely red, plica yellowish.

Type locality.—Vernon, British Columbia.

Type.—U.S.N.M. no. 51799.

Paratypes.—Canadian National Collection; Oregon State Agricultural College; Cornell University.

Remarks.—Described from 24 females and 7 males as follows: The holotype, allotype, and 13 paratypes from Vernon, British Columbia, the holotype taken by D. G. Gillispie, May 16, 1927; the allotype by E. P. Venables, April 12, 1926; the paratypes by E. P. Venables, May 10, 1903; I. J. Ward, May 20, 1927; M. J. Ruhman, May 18, 1917; E. A. Rendell, May 20, 1925; from Oliver, British Columbia, four collected by C. B. Garrett, May 1 and 5, 1923, and E. R. Buckell, April 23, 1927; two by P. N. Vroom, May 16, 1922; from Hedley, British Columbia, one by W. B. Anderson, May 5, 1920; from Okanogan Falls, Wash., two by E. M. Anderson, April 27 and 29, 1913; from Pullman, Wash., one by C. V. Piper; one specimen labeled simply "Eastern Wash."; three from Lewiston, Idaho, J. M. Aldrich, April 27, 1912; one from Logan, Utah; and one unlabeled.

8. EXETASTES ILLINOIENSIS (Walsh)

PLATE 17, FIGURES 18, 26

Leptobatus illinoiensis WALSH, Trans. Acad. Sci. St. Louis, vol. 3, p. 148, 1873; female.

Exetastes illinoiensis (Walsh) CRESSON, Synopsis of families and genera of Hymenoptera of America north of Mexico, p. 206, 1887.

Female.—Distinct in the conspicuous yellow markings of the thorax, this species is very similar to *ridens* Cushman structurally, differing essentially only as follows: Temples less strongly convex and more sloping; eyes less convex; postocellar line distinctly longer than ocellular line; thorax stouter; notauli not at all indicated; mesoscutum more shining and less densely punctate; propodeum more coarsely rugose, especially along a more or less well defined median band.

Differs from *ridens* in color as follows: Flagellum reddish, especially below from near base to about the apical third; mandible partly yellow; two broad yellow bands on mesoscutum, confluent behind and curving backward along the sides to tegulae; humeral angles and sometimes a small spot near anterior margin of pronotum, subalar tubercle, tegulae and scutellum, and sometimes postscutellum also, yellow; front and middle legs each with a virtually continuous stripe extending from apex of coxa to apex of tibia, their tarsi reddish, paler above, otherwise black; hind leg with a similar stripe beginning at apical joint of trochanter; wings nearly hyaline with costa and base of stigma yellow.

Male.—Differs from female structurally as does that of *ridens*; also flagellum entirely black; a small yellow spot on each side of face; yellow of mesoscutum confined to subtriangular spots on anterior lateral margins; scutellum, postscutellum, and anterior margin of pronotum immaculate; yellow markings of legs broader.

Type locality.—Illinois.

Type.—Destroyed.

Remarks.—Material examined includes one female and three males reared from "cutworms" at Battle Creek, Mich., April 25, 1916, by A. F. Satterthwait under his "Cage No. C610b"; two females from Denver, Colo., April, E. S. Tucker; one of each sex from Colorado, C. F. Baker; and one female without data except the date April 28, 1898.

9. EXETASTES FLAVUS, new species

PLATE 16, FIGURE 4; PLATE 17, FIGURE 28; PLATE 18, FIGURE 59; PLATE 20, FIGURE 89

This and the next following species constitute a group conspicuous principally because of the pale yellow color of the body with contrastingly colored maculation and the unusually large ocelli. Other features characteristic of the group are the long weakly convergent cheeks, long nearly flat clypeus, short hind femur, and long curved ovipositor.

Female.—Length 12 mm, antennae 9.5 mm.

Head moderately thick, occiput shallow, temples sharply receding, convex, polished, very sparsely and minutely punctate; frons weakly concave, medially sparsely punctate; face more densely punctate, more than half as long as broad, somewhat roundly elevated medially; clypeus nearly two-thirds as long as broad, much narrower than face, weakly transversely divided near base, sharply rounded at apex, narrowly subtruncate, apical portion polished, with small scattered punctures; cheeks in front view straight, their extended angle very acute; malar space three-fourths basal width of mandible; mouth exactly as broad as face; mandible nearly twice as long as broad, gradually narrowing toward apex; junction of occipital and hypostomal carinae distant from mandible by nearly two-thirds the basal width of mandible; eyes prominent, as long as width of face, parallel; diameter of a lateral ocellus as long as postocellar line and much longer than ocellular line; antenna about 50-jointed, slender, tapering but not attenuate, first joint of flagellum barely twice as long as second, which is nearly twice as long as thick, all other joints distinctly longer than thick.

Thorax rather elongate, polished, with fine moderately dense punctation; notauli absent; scutellum strongly convex, sparsely punctate; propodeum rather weakly convex, medially mat and indefi-

nately rugulose, otherwise punctate, with faint trace of apical carina, pleural carinae absent, spiracles small, elongate.

Legs rather slender, hind femur fully six times as long as thick, barely two-thirds as long as tibia; inner hind calcarium not or barely reaching middle of basitarsus.

Wings: Apical abscissa of radius moderately curved at base, much less than twice as long as basal abscissa; areolet large, regular, sessile, recurrent in middle; second discoidal cell elongate, basal abscissa of subdiscoideus fully a half longer than recurrent, the latter somewhat curved above; nervulus distinctly postfural; abscissula nearly twice as long as intercubitella.

Abdomen polished, distinctly longer than head and thorax together, slender in both dorsal and profile views; first tergite not or barely half as broad as long, second tergite longer than broad at base; ovipositor strongly recurved, sheath nearly as long as first two tergites together.

Pale lemon yellow with black markings as follows: Occiput, narrow circles around ocelli; spots in frontal scrobes (confluent medially), clypeal foveae, extreme base and teeth of mandibles, the normally concealed posterior part of propleurum, a narrow transverse streak on pronotum, three longitudinal stripes on mesoscutum, scutellar fovea, lateral areas of scutellum and postscutellum, a small spot below front wing, another on speculum, and another in position of sternaulus, prepectus in part, sometimes a disconnected streak on each side of mesosternum, metasternum, mesolcus posteriorly, more or less of the thoracic sutures, first tergite at base and medially, paired clavate spots sometimes confluent apically on tergites 2 and 3, broad basal bands on tergites 4-6, and sometimes sternites partly. Antennal scape largely yellow, flagellum black, reddish below for most of its length. Legs yellow with all coxae and trochanters more or less black basally, front and middle femora more or less black behind, hind femur ferruginous below and on inner side, hind tibia pale ferruginous below and apically, tarsi reddish apically. Wings hyaline with stigma and costa yellow, veins brown. Ovipositor sheath black.

Type locality.—Bernadillo County, N. Mex.

Type.—U.S.N.M. no. 51800.

Paratypes.—Colorado Agricultural College.

Remarks.—Six females, two from the type locality, 1896, B. Brown, and four from Roggen, Colo., May 19, 1934, M. T. James. The Colorado specimens have the hind femur somewhat thicker than in the type, but there is considerable variation in this respect.

10. *EXETASTES PALLIDUS*, new species

Female.—Of same size and for the most part of the same structure as *flavus*, but differing as follows: Occiput somewhat more deeply concave; extended angle of cheeks even more acute; malar space

nearly as long as basal width of mandible; diameter of an ocellus not or barely as long as ocellocular line; antenna slightly shorter, with 45 joints or less, subapical joints as thick as long; pleural carinae more or less distinct throughout; hind femur not or barely five times as long as thick.

Head, thorax, and legs colored as in *flavus* except that the black markings are usually less extensive, some even missing; tergites 1-3 immaculate yellow except for traces of the black on first; tergites 4-6 pale ferruginous at base.

Type locality.—Buffalo, S. Dak.

Type.—U.S.N.M. no. 51801.

Paratype.—Colorado Agricultural College.

Remarks.—Three females, two from the type locality July 31, 1924, and one from Alamosa, Colo., August 11, 1934. The Colorado specimen very closely approximates *flavus* in the extent of black on head, thorax, and legs.

11. EXETASTES PROPINQUUS, new species

PLATE 16, FIGURE 8; PLATE 17, FIGURE 27; PLATE 18, FIGURES 48, 57; PLATE 20, FIGURES 92, 98; PLATE 21, FIGURE 107

Exetastes scutellaris HOWARD (not Cresson), Insect book, pl. 9, fig. 17, 1903; female.
Exetastes propinquus CRESSON (MS. name), Viereck in Smith, Insects of New Jersey, p. 618, 1910.

The specimen illustrated as *scutellaris* in Howard's "Insect Book" and the specimens on which Viereck based his New Jersey records form a part of the type series, also a specimen labeled "*propinquus* Cress. MS." in Viereck's hand.

This is the first of a distinct group of six species characterized by the unusually thick head with very shallowly convex eyes and strongly convex temples, stout legs with the claws in female strongly pectinate, and very broad abdomen.

The first two species of this group differ from the others by the more distinctly divided clypeus, the apical portion being abruptly impressed and the basal portion ridgelike, by the evenly infumate wings in both sexes, and by the shorter, straight ovipositor.

Female.—Length 11 mm, antennae 10 mm.

Head barely twice as broad as thick, densely finely punctate and mat anteriorly, more sparsely punctate and shining posteriorly; occiput shallowly concave; temple very strongly convex but not reaching outside tangent of eyes; frons weakly concave medially; face convex with a more or less well defined median elevation and somewhat impressed above on each side; clypeus somewhat narrower than face, a little more than half as long as broad with basal portion elevated and apical portion impressed, strongly rounded at apex and with a more or less distinct median longitudinal groove, sometimes weakly

emarginate; cheeks straight, their extended angle moderately acute; malar space slightly less than half as long as basal width of mandible; mouth distinctly broader than face; mandible nearly twice as long as broad at base; junction of occipital and hypostomal carinae less than half width of mandible from base of latter; eyes very shallowly convex, as long as width of face, parallel; postocellar line slightly longer than ocellular line and nearly twice as long as diameter of a lateral ocellus; antenna rather stout, tapering but not attenuate toward apex, 46- to 50-jointed, basal joint of flagellum about four times as long as thick at apex, second barely twice as long as thick, middle joints as thick as long.

Thorax shining, with fine and moderately dense punctation; notauli absent; scutellum strongly convex, sparsely punctate; propodeum strongly convex both transversely and longitudinally, finely and densely reticulate punctate except at base, where it is more sparsely punctate, spiracles rather small, elongate, situated shortly above the obsoletely indicated pleural carinae.

Legs stout, hind femur hardly six times as long as deep, barely two-thirds as long as tibia; inner hind calcarium more than half basitarsus; tarsus stout, apical joint nearly as long as third; claws, especially front and middle ones, strongly pectinate.

Wings: Apical abscissa of radius moderately curved at base, much less than twice as long as basal abscissa; areolet somewhat irregular, its apical angle rather sharply acute; second discoidal cell rather broad, basal abscissa of subdiscoideus hardly a half longer than second recurrent, the latter strongly curved above; nervulus distinctly postfurcal; abscissula twice as long as intercubitella.

Abdomen stout, weakly compressed at apex; first tergite strongly depressed throughout, much more than half as broad as long, second not or barely as long as broad at base; ovipositor straight, sheath distinctly shorter than first tergite.

Ferruginous with face, clypeus, mandibles, malar space, indefinite markings on anterior margin of mesoscutum, scutellum, and tegulae more or less distinctly yellowish; occiput, stemmaticum, thoracic sutures, areas around scutellum and postscutellum, and meso- and metasterna more or less stained with blackish; flagellum black above, reddish below; legs concolorous, the coxae more or less black at extreme base; hind tarsus with joints 2-4 yellow; wings deeply infumate, stigma ferruginous; ovipositor sheath black.

Male.—Essentially like female, but malar space slightly shorter, ocelli a little larger, claws not pectinate, yellow markings more distinct and extensive, and the black usually less extensive.

Type locality.—Washington, D. C.

Type.—U.S.N.M. no. 51802.

Paratypes.—Collection of Henry K. Townes.

Remarks.—Described from 23 females and 11 males as follows: District of Columbia—three females, the holotype taken by C. N. Ainslie and two on September 8, 1882, and September 23, 1888, collector unknown. Virginia—two females, September 25, 1883, and October 8, 1888, T. Pergande; one female and one male, Falls Church, September 12, 1912, C. T. Greene; one male (the allotype), Vienna, September 27, 1911, R. A. Cushman. Maryland—one female, Bethesda, September 14, 1913, J. C. Crawford; one male, near Plummers Island, September 5, 1914, J. C. Crawford. Pennsylvania—one female, Ogontz, September 7, 1902; one male, Delaware County, August 31, 1897. New Jersey—one female, Riverton, September 11, 1904, G. M. Greene; one female, Boonton, September 11, 1901, G. M. Greene; one female and one male, Great Notch, September 8, 1901, G. M. Greene; one male, Westville, August 26, 1895; two females from the Asa Fitch collection, probably from New York. North Carolina—one female, Raleigh, September 26, 1917, R. W. Leiby. South Carolina—one female, Chapel Hill, Sept. 28, 1883, B. F. Tyson; three females and two males, Greenville, September 18–20, 1934, H. K. Townes; two males, Chesney, September 19, 1934, H. K. Townes. Florida—one female. Tennessee—two females, Nashville (Nashville no. 1522), September 14, G. G. Ainslie. Texas—one male. Del Rio, October 21, 1912, J. D. Mitchell. Also two females without data, one of which is the specimen figured in Howard's "Insect Book."

12. EXETASTES SCUTELLARIS Cresson

Exetastes scutellaris CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 279, 1865: female, male.

Female and male.—Very similar in size, form, and structure to *propinquus*, from the above description of which it differs only as follows: Wings less deeply infumate and more yellowish with stigma more yellowish; apex of hind tibia and basitarsus blackish; antenna (complete in only two specimens) with only 42 joints; pleural carinae more distinct; ovipositor sheath subequal in length to first tergite.

Type locality.—Colorado.

Type.—Acad. Nat. Sci. Philadelphia no. 1620.

Remarks.—Specimens examined include the holotype female and a paratype male in the National Museum (paratype no. 44734); a female (compared with the holotype), Boulder, Colo., June 20, 1897; one female, Colorado Springs, Colo., 5,915 feet, August, E. S. Tucker; one male, Spring Canyon, near Fort Collins, Colo., June 18, 1929, Klotz; one male (Cornell University Collection), Fort Collins, Colo., August 4, 1902, L. A. Titus; one female (Webster no. 5521), Springer, N. Mex., September 20, 1909, C. N. Ainslie; one female, Mendon, Utah, July 16, 1907; and one male and one female (Canadian National Collection), Lethbridge, Alberta, July 10, 1922, and August 8, 1921,

H. L. Seamans. Included are specimens in the Canadian National Collection, Cornell University, and the collection of Andrew R. Park, Jr. I am convinced that the specimens recorded as *scutellaris* in Smith's "Insects of New Jersey" (1910) are erroneously identified, but I have not been privileged to examine them.

13. *EXETASTES IGNEIPENNIS*, new species

PLATE 16, FIGURE 6; PLATE 17, FIGURE 33; PLATE 18, FIGURE 60; PLATE 19, FIGURE 72; PLATE 20, FIGURES 86, 101

Very distinct among the species with thick head because of the black, yellow-ornamented head and thorax and bright yellowish wings with smoky apices.

Female.—Length 12 mm, antennae broken.

Head barely twice as broad as thick, finely punctate, very densely so and mat anteriorly, sparsely so and shining posteriorly; occiput rather shallowly concave; temples very strongly convex, nearly as long as short diameter of eye; frons slightly concave above antennae, with small polished scrobes; face convex, with a deep impression on each side above; sculpture coarser medially; clypeus nearly as broad as face and about twice as broad as long; the weakly elevated and strongly punctate basal portion much shorter than the flat, finely shagreened and mat apical portion, apex strongly rounded and with a shallow median emargination; cheeks in front view short and straight, their extended angle acute; malar space somewhat less than half basal width of mandible; mouth much broader than face; mandible stout, evenly curved, about three-fourths longer than broad at base; junction of occipital and hypostomal carinae removed from base of mandible by more than half basal width of the latter; eyes rather small, moderately convex, hardly as long as width of face, parallel; postocellar line slightly longer than ocellular line and nearly twice diameter of a lateral ocellus, ocelli touching posterior tangent of eyes; antenna (apices of both gone) short and rather stout, slightly thicker in middle, basal joint of flagellum twice as long as second, joints from tenth on as thick as or thicker than long.

Thorax shining, finely and densely punctate; prescutum with a narrow median longitudinal ridge; notauli broadly impressed discally; scutellum strongly evenly convex, less densely punctate than scutum; propodeum evenly convex with slight median trace of apical carina and distinct pleural carinae, finely reticulate rugose; spiracles elongate, situated shortly above pleural carinae.

Legs stout, hind femur a little more than two-thirds as long as tibia; inner hind calcarium almost exactly half as long as basitarsus; tarsus stout, as long as tibia, third and fifth joints equal; claws strongly pectinate.

Wings: Apical abscissa of radius moderately curved at base, barely a half longer than basal abscissa; areolet slightly irregular, shortly petiolate; second discoidal cell rather narrow, basal abscissa of subdiscoides about a half longer than second recurrent; second recurrent flexed above; nervulus shortly postfurcal; abscissula twice as long as intercubittella.

Abdomen broad, weakly compressed at apex; first tergite depressed throughout, not nearly twice as long as broad, second barely as long as broad at base; ovipositor faintly recurved, sheath nearly as long as first two tergites.

Head and thorax black, face, scape below, large triangular mark on each side of mesoscutum anteriorly, scutellum, and postscutellum yellow; clypeus light brownish at base, stramineous at apex; mandibles partly brownish or yellowish; flagellum blackish; coxae and bases of trochanters dark brown, front and middle legs otherwise yellow, hind leg yellow with femur and tibia apically broadly brown, basitarsus dark reddish; wings yellow hyaline with apices broadly dilutely infumate, tegulae stramineous, more or less brownish discally; abdomen yellow, more or less stained with reddish, segments beyond fourth largely blackish; sheath black.

Male.—Essentially like female, but antennae longer and more slender, 44-jointed; claws not pectinate; clypeus, mandibles, malar space, and anterior margin of pronotum medially also, yellow; markings of mesoscutum usually extending backward more or less along notauli; front and middle trochanters entirely and their coxae mostly yellow; fifth tergite yellow; genital sheath pale at apex.

Type locality.—White Mountains, N. Mex., south fork of Eagle Creek, about 8,000 feet.

Type.—U.S.N.M. no. 51803.

Paratypes.—American Museum of Natural History; Cornell University.

Remarks.—Described from two females and four males, the holotype captured August 19 by C. H. T. Townsend; the paratype female without data; the allotype taken at Santa Fe, N. Mex., in August by T. D. A. Cockerell; one male from Cornell University taken at Atzacapalco, Mexico, July 5–31, 1931; two other males at Santa Fe, N. Mex., in July, also by Cockerell; and one male in the collection of the American Museum of Natural History taken at 3,700 feet near Wray, Colo., August 17–19, 1919, and bearing the number F 4411A.

14. EXETASTES BUCCATUS, new species

Female.—Length 10 mm, antennae 8 mm.

Related in the thick head and stout abdomen to the three immediately preceding species, this species differs from the above description of *propinquus* principally as follows:

Head, especially the face, less densely punctate and more shining; temple reaching outside tangent of eye; clypeus less sharply divided into basal and apical portions, without a median longitudinal groove apically; malar space half as long as basal width of mandible; junction of occipital and hypostomal carinae half basal width of mandible from latter; eyes distinctly shorter than width of face, faintly divergent below, antenna shorter, hardly tapering, less than 40-jointed; pleural carinae more distinct; legs even stouter, the hind femur distinctly less than six times as long as deep; second discoidal cell slightly narrower; nervulus at most slightly postfurcal; ovipositor recurved, sheath as long as first two tergites.

Flagellum, pedicel, and upper side of scape black; wings dilutely infumate.

Male.—Very similar structurally to female, but head and sides and sternum of thorax largely black, the yellow markings more distinct; anterior margin of pronotum, propleura largely, an oblique streak on mesopleurum, and front and middle coxae and trochanters largely, yellow.

Type locality.—San Juan Valley, 25 miles northeast of Paso Robles, Calif.

Type and paratype.—California Academy of Sciences.

Allotype and paratype.—U.S.N.M. no. 51804.

Remarks.—The holotype, allotype, and one female paratype were all taken at the type locality on April 22, 1932, by E. P. Van Duzee, while a second female paratype was taken on the same date by the same collector 4 miles west of Paso Robles. Another female is from Spring Canyon, near Fort Collins, Colo., June 23, 1929, Klotz, collector. A second male, which because of its poor condition is excluded from the type series, is labeled simply "Utah."

15. *EXETASTES PECTINATUS*, new species

PLATE 18, FIGURE 47; PLATE 21, FIGURE 115

Female.—Length 10 mm, antennae 7 mm.

Belongs to the same species group as *propinquus*, from the above description of which it differs principally as follows: Clypeus much more than half as long as broad, very weakly divided, basal portion weakly convex, apical portion weakly impressed; extended angle of cheeks sharply acute; malar space fully three-fourths as long as basal width of mandible; mandible fully twice as long as broad at base, weakly narrowed toward apex; junction of occipital and hypostomal carinae much more than half basal width of mandible from the latter; eyes faintly convergent; antennae only very slightly tapering, less than 40-jointed; propodeum with punctures distinct, not reticulate; pleural carina more distinct posteriorly and replaced anteriorly by a distinct groove; hind femur three-fourths as long as tibia; second discoidal cell

narrower, basal abscissa of subdiscoideus nearly twice as long as second recurrent, the latter only moderately curved above; ovipositor recurved, sheath nearly as long as first two tergites.

Black of head and thorax more extensive; flagellum entirely black; hind coxa more extensively black below and within; hind tarsus entirely ferruginous; wings only faintly infumate.

Type locality.—Sugar Loaf, Colo.

Type.—U.S.N.M. no. 51805.

Paratypes.—California Academy of Sciences; Canadian National Collection.

Remarks.—Ten females, the holotype taken July 1 by T. D. A. Cockerell; three collected in Colorado by C. F. Baker; one, Harney Peak, S. Dak., July 22, 1924; one, Custer, S. Dak., July 19, 1924; one, Waterton, Alberta, July 1, 1924, H. L. Leamans; one, Waterton Lakes, Alberta, July 4–11, 1923, J. McDunnough; two, Glacier National Park, Mont., June 30, 1930, E. C. Van Dyke.

What is probably the male of this species, though I do not include it in the type series, is represented by a single male in poor condition captured by E. P. Van Duzee on July 23, 1915, at Half Moon Lake, Tahoe, Calif. It differs from the female in the shorter malar space, larger ocelli, more slender antennae with all joints at least slightly longer than thick, the propodeum medially and posteriorly rugulose with a distinct apical carina, the red of head and thorax largely replaced by black, with only supraorbital spots, mesoscutum largely and propodeum partly ferruginous, the yellow brighter.

16. EXETASTES BREVICORNIS, new species

Female.—Very closely related to *pectinatus*, from which it differs principally in having the extended angle of the cheeks somewhat less acute; hind femur barely two-thirds as long as tibia; head, thorax, and coxae less extensively black; flagellum largely ferruginous and hind femur and tibia blackish apically, the tibia distinctly yellow at base.

Male.—Differs from female in the shorter malar space, larger ocelli, distinct apical carina of propodeum with two more or less distinct carinae diverging forward from it; more extensively black head and thorax, the latter being sometimes very largely or entirely black laterally, ventrally, and on propodeum; brighter yellow markings; more extensively black hind legs, with the middle tarsal joints yellowish.

Type locality.—Calgary, Alberta.

Type.—U.S.N.M. no. 51806.

Paratypes.—Canadian National Collection.

Remarks.—Four females and six males collected at the type locality, July 16–19, 1924, by George Salt; and one female taken July 10, 1932, at Lethbridge, Alberta, by H. L. Seamans.

17. *EXETASTES BIFENESTRATUS*, new name

PLATE 16, FIGURE 11; PLATE 17, FIGURE 32; PLATE 18, FIGURE 61; PLATE 19, FIGURE 76; PLATE 20, FIGURES 84, 94

Ichneumon bifasciatus SAY, Contr. Maclurian Lyc. Arts and Sci., vol. 1, p. 73, 1828; in LeConte, The complete writings of Thomas Say on the entomology of North America, vol. 1, p. 377, 1859; female (preoccupied by *bifasciatus* Foureroy).

(*Cryptus*) *bifasciatus* SAY, Boston Journ. Nat. Hist., vol. 1, p. 234, 1835; in LeConte, The complete writings of Thomas Say on the entomology of North America, vol. 2, p. 691, 1859.

Cryptus? *bifasciatus* (Say) CRESSON, Trans. Amer. Ent. Soc., vol. 6, p. 209, 1877; Synopsis of families and genera of Hymenoptera of America north of Mexico, p. 183, 1887.

Exetastes bifasciatus (Say) CUSHMAN and GAHAN, Proc. Ent. Soc. Washington, vol. 23, p. 163, 1921.

The preoccupation in *Ichneumon* of *bifasciatus* makes necessary a new name for Say's species.

This and *obscurus* Cresson form a group characterized by the very dense fine punctation and vestiture of the head and thorax, thin head, deeply separated and basally strongly convex clypeus, very short antennae especially in the female, and moderately long recurved ovipositor.

Female.—Length 11 mm, antennae 8 mm.

Head medially less than half as thick as broad; temples weakly convex and strongly receding; occiput rather broad and moderately concave; frons broadly and rather deeply concave; face nearly flat and with a small prominent median rounded elevation, less than half as long as broad; clypeus deeply separated, half as long as broad, apex strongly rounded and narrowly subtruncate or emarginate medially, basal portion short, convex, apical portion slightly concave; cheeks in front view straight, their extended angle somewhat acute; malar space about three-fourths basal width of mandible; mouth barely broader than face; mandible about twice as long as broad at base and strongly narrowing toward apex; junction of occipital and hypostomal carinae three-fourths the basal width of mandible from the latter; eyes strongly convex, barely as long as width of face, parallel; postocellar and ocellular lines equal and less than twice the diameter of a lateral ocellus; ocelli distinctly before posterior tangent of eyes; antenna rather slender, weakly tapering, with 44–46 joints, basal joint of flagellum much less than twice as long as second joint, middle joints longer than thick, subapical joints very short.

Thorax stout; notauli absent; scutellum subtriangular, strongly convex, less densely punctate than scutum; propodeum strongly convex, medially and posteriorly rugulose, with irregular apical carina most prominent medially and fading out laterally, a longitudinal impression before the carina, pleural carinae more or less distinct

posteriorly, absent anteriorly, spiracles small, elongate, situated far above pleural carinae.

Legs rather slender; hind femur three-fourths as long as tibia; inner hind calcarium hardly reaching middle of basitarsus; tarsus a little longer than tibia, apical joint shorter than third.

Wings: Apical abscissa of radius moderately curved at base, barely a half longer than basal abscissa; second discoidal cell rather broad, basal abscissa of subdiscoideus much less than twice as long as second recurrent, which is subgeniculate above; nervulus postfurcal, strongly inclivous; abscissula much less than twice as long as intercubitella.

Abdomen polished, broad, weakly compressed at apex; first tergite not nearly twice as long as broad at apex; second barely as long as broad at base; ovipositor slightly recurved, sheath a little longer than first tergite.

Ferruginous with thorax ventrally and sometimes in sutures more or less black; flagellum blackish at base and apex, paler below at base, with a yellowish annulus at about joints 8–13; hind tibia at apex and basitarsus more or less fuscous, joints 2–4 of tarsus more or less yellowish; wings infumate, front wing with a transverse band below parastigma and base of stigma and a triangular spot beyond stigma hyaline; basal half of stigma yellow, apical half black; ovipositor sheath black.

Male.—Malar space barely half basal width of mandible; ocelli larger; antennae slender, as long as body, all joints longer than thick; apical carina of propodeum more distinct; abdomen more slender, first tergite nearly twice as long as broad at apex. Face, clypeus, and mandibles yellow; occiput entirely, vertex and frons medially, black; thorax more extensively black; scutellum yellow; hind tibia broadly at apex and basal and apical joints of tarsus, black; wings hyaline, stigma largely black.

Type locality.—Indiana.

Type.—Lost.

Remarks.—A considerable series including both sexes is before me from Washington, D. C., Georgia, Florida, Alabama, and Texas as well as Jicoltepec and Baja California, Mexico.

Included are eight females and three males reared under Webster no. 4606, from *Feltia malefida* Guenée at Mercedes, Tex., by T. D. Urbahns late in April and early in May 1909; one female reared under Chittenden no. 1057, from a noctuid at Brownsville, Tex., by D. K. McMillan on May 25, 1908; one female reared from *Agrotis* sp. on cabbage at Brownsville, Tex., by D. K. McMillan on January 9, 1909; one female reared from "cutworm", April 4, 1911, at Lyford, Tex.; one male from Bradenton, Fla., February 17, 1927, Truck Crop no. 3565, C. O. Bare. Included in the series are specimens in the collection of Kansas University.

18. EXETASTES OBSCURUS Cresson

PLATE 18, FIGURE 44; PLATE 21, FIGURE 110

Exetastes decoloratus CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 280, 1865; male. New synonymy.

Exetastes obscurus CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 281, 1865, female.—CUSHMAN, in Leonard, Insects of New York, p. 932, 1923.

Exetastes fascipennis HOWARD (not Cresson), Insect book, pl. 10, fig. 7, 1903.

Very closely allied to *bifenestratus* but immediately distinguishable in the female by the paler, at most faintly fasciate wings. Differing also from the above description of *bifenestratus* as follows:

Female.—Cheeks in front view slightly convex, their extended angle nearly right; malar space as long as basal width of mandible; junction of occipital and hypostomal carinae distant from base of mandible only about half width of latter; eyes slightly shorter than width of face; antenna shorter, stouter, and more tapering, about 50-jointed, basal joint of flagellum twice as long as second, middle joints as thick as long; propodeum almost without trace of apical carina and longitudinal groove.

Occiput, frons below, coxae basally and within, trochanter above, and femora above frequently more or less black or piceous; flagellum except annulus entirely black, the annulus frequently obscure; wings nearly hyaline with at most faint indications of fasciae; stigma entirely pale.

Male.—Malar space shorter (somewhat more than half as long as basal width of mandible); ocelli larger; antennae longer with subapical joints longer than thick; apical carina of propodeum indicated medially. Black of head and thorax more extensive; head otherwise largely yellow.

Type locality.—Colorado.

Type.—Of *obscurus* no. 1609 and of *decoloratus* no. 1616, Acad. Nat. Sci. Philadelphia.

Remarks.—In addition to the types the material examined includes specimens from the Atlantic States from Massachusetts to South Carolina, and from Ohio, Manitoba, and Oregon. Both sexes, especially the male, exhibit wide variation in color, three males that I somewhat doubtfully include having the entire thorax, except the yellow scutellum and two ferruginous spots on the propodeum, black, and the legs also more extensively black. About half the females and several males lack most of the black color of the legs.

All specimens, except those from Manitoba and Oregon, which bear dates in September, were taken in October and November. Three females and one male were reared from *Porosagrotis vetusta* Walker at The Dalles, Oreg., by L. P. Rockwood, September 26 to October 4, 1928. Part of the material studied is in the Canadian National Collection and the American Museum of Natural History.

19. EXETASTES CALLIPTERUS, new species

Very similar in general appearance to *bifenestratus*, but much larger with head and clypeus of different form, punctation of thorax coarser and less dense, and differing also by many other characters.

Female.—Length 15 mm, antennae 9 mm.

Head much less than twice as broad as thick, the occiput deeply concave, temples short but rather strongly convex, finely and rather densely punctate; frons more closely punctate, broadly concave; face rather flat with a low median elevation, less than twice as long as broad; clypeus more than half as long as broad, much narrower than face, distinctly emarginate at apex, basal portion weakly convex, fully as long as apical portion, which is separated largely by difference in sculpture; cheeks in front view nearly straight, their extended angle nearly right; malar space slightly more than half as long as basal width of mandible; mouth much broader than face; mandible nearly twice as long as broad at base, only slightly narrowing toward apex, lower tooth larger and longer than upper; junction of occipital and hypostomal carinae fully three-fourths basal width of mandible from the latter; eyes unusually long, nearly twice as long as broad, moderately convex, distinctly longer than width of face, weakly convergent below; postocellar line slightly shorter than ocellocular line and barely a half longer than diameter of an ocellus; posterior ocelli touching posterior tangent of eyes; antenna very short, slightly thickened in middle, 43-jointed, basal joint of flagellum fully twice as long as second, middle joints as thick as long, subapical joints a little longer than thick.

Thorax shining and rather densely and finely punctate, mesoscutum more finely and very densely punctate, mat, with very short, very dense erect pubescence, almost pilose; notauli lacking; scutellum strongly convex, more coarsely and sparsely punctate than scutum; propodeum confluent punctate, rugulose medially, positions of pleural carinae indicated by difference in sculpture, spiracles rather broad, far above normal position of pleural carinae.

Legs rather slender, hind femur three-fourths as long as tibia; inner hind calcarium fully half as long as basitarsus; apical joint of hind tarsus as long as third.

Wings: Apical abscissa of radius nearly straight at base, more than a half longer than basal abscissa; areolet rather small with long petiole; second discoidal cell rather broad, second recurrent barely two-thirds as long as basal abscissa of subdiscoideus, moderately curved above; nervulus strongly postfurcal and strongly inclivous; abscissula about twice as long as intercubitella.

Abdomen moderately stout, first tergite a little less than twice as long as broad at apex, second fully as long as broad at base; ovipositor nearly straight, sheath distinctly shorter than first tergite.

Almost entirely ferruginous, with small black stains on occiput, prepectus, bases of coxae, and in thoracic sutures; flagellum black above and apically, brownish below with a yellowish annulus occupying joints 8-15; apices of hind femur and tibia and ovipositor sheath black, the last brown at apex; tibiae and tarsi paler, hind tarsus almost yellow; front wing bright yellow with a longitudinal streak below subcosta, a broad fascia opposite stigma and apex, confluent below with the fascia, infumate, the fascia nearly black; hind wing nearly hyaline with apical third dilutely infumate.

Type locality.—Douglas, Ariz.

Type.—U.S.N.M. no. 51807.

One female taken August 20, 1933, by W. W. Jones.

20. *EXETASTES CRASSISCUPTUS*, new species

PLATE 19, FIGURE 70

This and the next two following species form a very distinct group characterized by very coarse sculpture, concave mesopleurum, ventrally incomplete occipital carina, very long, slender, and apically attenuate antennae, and short ovipositor.

Female.—Length 13 mm, antennae 13 mm.

Head broader than thorax, hardly half as thick medially as broad, occiput deeply concave, temples moderately convex and receding, nearly as long as short diameter of eye, rather coarsely and densely punctate; frons concave, confluent punctate, mat; face less than half as long as broad, medially somewhat elevated, coarsely and confluent punctate; clypeus rather weakly separated, much narrower than face, more than half as long as broad, emarginate and usually with a median groove apically, basal portion very short, punctate almost like face, not strongly convex, apical portion finely shagreened, mat; cheeks in front view straight, their extended angle acute; malar space three-fourths as long as basal width of mandible; mouth hardly wider than face; mandible one and three-fourths times as long as broad at base, somewhat narrowed toward apex; occipital carina not reaching hypostomal carina; eyes strongly convex, shorter than width of face, faintly convergent; ocellular line distinctly longer than postocellar line and more than twice as long as diameter of an ocellus; antenna as long as body, 58-jointed, very slender, attenuate at apex, basal joint of flagellum twice as long as second.

Thorax strongly compressed, the mesopleurum concave below and joining the sternum in a rounded edge; thorax, especially the pleura, very coarsely and densely punctate; notauli absent; mesoscutum more finely and less densely punctate; scutellum small, subtriangular, elevated, precipitate behind, more sparsely punctate; propodeum rather flat, reticulate rugose, more coarsely so laterally and medially, pleural carinae distinct throughout and lateral carinae represented

by more or less distinct irregular ridges, apical carina lacking, spiracles elongate and nearly touching pleural carinae.

Legs slender; hind femur more than three-fourths as long as tibia; inner hind calcarium more than half as long as basitarsus; apical joint of hind tarsus shorter than third.

Wings: Apical abscissa of radius distinctly curved at base, barely a half longer than basal abscissa; areolet shortly petiolate, irregular, recurrent before middle; second discoidal cell rather narrow, basal abscissa of subdiscoideus more than a half longer than second recurrent, the latter strongly curved above; nervulus distinctly postfurcal; abscissula fully twice as long as intercubittella.

Abdomen rather slender, strongly compressed apically; first tergite fully twice as long as broad at apex, petiole flattened and coarsely punctate laterally; second tergite longer than broad at base; ovipositor short, straight, sheath barely half as long as first tergite.

Head and thorax black; apical portion of clypeus frequently brownish or separated from basal portion by a reddish line; mandible usually more or less ferruginous, scape entirely so; flagellum rarely with a distinct incomplete yellow annulus, though frequently with this obsoletely indicated; anterior margin and humeral angles of pronotum, tegulae, mesoscutum, and scutellum ferruginous, the last and the collar sometimes more yellowish; legs ferruginous, coxae more or less black at base, tibiae sometimes yellowish at base, hind tarsus yellowish on middle joints, hind tibia at apex and basitarsus sometimes infusate; wings dilute yellowish infumate, stigma dark stramineous, veins blackish; abdomen ferruginous; sheath ferruginous, more or less infusate at base.

Male.—Remarkably like the female in structure, sculpture, and color.

Type locality.—Vancouver, British Columbia.

Type.—U.S.N.M. no. 51808.

Paratypes.—Canadian National Collection; Oregon State College of Agriculture.

Remarks.—A northwestern species represented by eight females and two males ranging from Alaska to Oregon as follows: The type and another female labeled simply "Vanc."; one female, Fort Wrangell, Alaska, Wickham; one female, Chilcotin, British Columbia, September 1, 1920, E. R. Buckell; one male, Agassiz, British Columbia, May 10, 1932, R. Glendining; one female and one male, Pullman, Wash., May 10, 1894, and May 4, 1899; two females, Corvallis, Oreg., one July 4, 1925, D. G. Gillespie, the other without additional data; and one female without data in the collection of the Oregon State College of Agriculture.

21. *EXETASTES RUGOSUS*, new name

PLATE 16, FIGURE 3; PLATE 17, FIGURE 38; PLATE 18, FIGURES 52, 65; PLATE 20, FIGURES 81, 95; PLATE 21, FIGURE 104

Exetastes albitarsis PROVANCHER, Nat. Can., vol. 6, p. 78, 1874 (preoccupied by *albitarsis* Gravenhorst); vol. 11, p. 213, 1879; Petite faune entomologique du Canada . . ., vol. 2, Hymén., p. 385, 1883, female.—CUSHMAN, in Leonard, Insects of New York, p. 932, 1928.

Very closely allied to *crassisculptus*, from which it is immediately distinguishable by the black hind coxa and femur. Differs from the above description of *crassisculptus* as follows:

Female.—Temples more weakly convex and more strongly receding; eyes barely shorter than width of face, more distinctly convergent; diameter of a lateral ocellus half as long as ocellular line; scutellum in profile evenly convex, not precipitous behind; abdomen even more slender, first tergite about two and a half times as long as broad at apex, second a half longer than broad at base.

Clypeus entirely black, mandibles usually so; scape usually more or less black; antennal annulus distinct; anterior margin of pronotum only medially ferruginous; mesoscutum with a more or less distinct median black vitta and usually with lateral vittae; scutellum yellow; all coxae entirely, hind femur except more or less at base, apical half of hind tibia, and all but apex of basitarsus black; tibiae basally and hind tarsus except basally yellow; abdomen usually more or less black at apex, this color sometimes extending as far forward as base of fourth tergite.

Male.—Virtually like female.

Type locality.—Quebec?

Type.—Public Museum, Quebec.

Remarks.—Material examined includes a female from Axton, N. Y., June 12–22, 1901, "A. D. MacG(illivray) and L. O. H(oward), compared with the type by C. F. W. Muesebeck; 11 other females as follows: One, Hampton, N. H., June 14, 1919, S. Albert Shaw; one, Westford, Mass., June 14, 1914, H. A. Preston (Gipsy Moth Laboratory no. 9761.68); one, labeled simply "Gip. Moth, Lab. 9761.67, June 1"; one, Keene Valley, Essex County, N. Y., June 30, 1917, H. Notman; one, Reading (Mass.?), June 5, 1917; one, Toulon, Manitoba, May 8, 1923, A. J. Hunter; one male, Aylmer, Quebec, June 1, 1924, C. H. Curran; all the above in the United States National Museum; one female, Queens Park, Quebec, June 15, 1925, C. B. Hutchings, and one, Aylmer, Quebec, June 15, 1924, C. H. Curran, from the Canadian National Collection; one, Spencer, N. Y., May 4, and one, Caroline—Harford, N. Y., June 15, 1904, from the collection of Cornell University; and one, Mount Wachusett, Mass., in the American Museum of Natural History.

22. EXETASTES CONCAVUS, new species

Very similar structurally to the two foregoing species, but at once distinguishable from both by the entirely black mesoscutum. From the above description of *crassisculptus* it differs as follows:

Female.—Malar space slightly shorter; eye as long as width of face; scutellum less strongly elevated, less precipitous behind; nervulus interstitial or nearly so.

Clypeus and mandibles black; scape at most faintly reddish; flagellum without trace of annulus; thorax black with only small humeral angles of pronotum and an indefinite spot on scutellum ferruginous; coxae entirely and hind femur below more or less black; hind tibia somewhat infuscate, basitarsus black; first tergite black at base.

Male.—Essentially like female, but scape paler, scutellum entirely black, petiole more extensively black.

Type locality.—Grant, Park County, Colo.

Type.—U.S.N.M. no. 51809.

Remarks.—One of each sex, the holotype female taken at 9,000 feet, July 24–29, 1922; the allotype, labeled simply "Colo., C. F. Baker."

23. EXETASTES MATRICUS Provancher

PLATE 16, FIGURE 9; PLATE 17, FIGURES 22, 42; PLATE 18, FIGURE 63

Exetastes matricus PROVANCHER, Nat. Can., vol. 11, p. 213, 1879, female; Petite faune entomologique du Canada . . . , vol. 2, Hymén., p. 385, 1883, female.

This and the seven following species form a group differing from all the other groups by the form of the scutellum, which is more or less distinctly flattened above, steeply precipitous behind, and more or less distinctly carinately margined laterally at least toward base. In addition the eyes are large, strongly convex and convergent below; the clypeus long, weakly divided into basal and apical portions and apically emarginate; the malar space long; the antennae long and slender and more or less attenuate apically; the legs slender with very long calcaria; the abdomen slender; and the ovipositor straight, the sheath from three-fourths as long to fully as long as first tergite.

Female.—Length 12 mm, antennae 10 mm.

Head hardly half as thick medially as broad, occiput moderately concave, temples nearly flat, strongly receding, about two-thirds as long as short diameter of eye, polished, virtually impunctate; frons concave, mat, sparsely punctate; face more than half as long as broad, medially elevated, concave laterally above, mat, densely punctate; clypeus three-fourths as long as broad, distinctly divided by sculpture but rather weakly so by elevation, emarginate and with a more or less distinct median groove apically; head below eyes very narrow, the cheeks straight, their extended angle very sharply acute; malar space three-fourths as long as basal width of mandible; mouth barely broader

than face; mandible more than a half longer than broad at base, narrowed toward apex; junction of occipital and hypostomal carinae distant from base of mandible more than basal width of latter, the lower cheek deeply excavated and the hypostomal carina very high and thin and arched outward; eyes very strongly convex, longer than width of face and distinctly convergent below; postocellar and ocellular lines equal and about twice as long as diameter of a lateral ocellus; antenna nearly as long as body, slender, and rather attenuate at apex, 52- to 54-jointed, basal joint of flagellum fully twice as long as second, the latter two and a half times as long as thick.

Thorax strongly compressed, polished, with rather sparse punctuation, coarser on pleura; notauli absent; scutellum subtriangular, distinctly flattened above, precipitous behind, strongly margined to top of apical slope; propodeum finely reticulate rugose above, coarsely so medially, very coarsely longitudinally rugose behind the medially prominent apical carina; pleural carina indicated by marked difference in sculpture of propodeum and of metapleurum; spiracles elongate, situated far above pleural carinae.

Legs slender, rather short, the hind femur not reaching apex of abdomen, fully three-fourths as long as tibia; inner hind calcarium distinctly more than half as long as basitarsus, apical joint of tarsus nearly as long as third joint.

Wings: Apical abscissa of radius moderately curved at base, barely a half longer than basal abscissa; areolet shortly petiolate or sessile, irregular, with recurrent before middle; second discoidal cell about a half longer on subdiscoideus than broad at apex; second recurrent strongly subangulate above; nervulus shortly postfural to interstitial, abscissula about twice as long as intercubitella.

Abdomen polished, slender, strongly compressed at apex; first tergite about two and a half times as long as broad, its sides concavely curved, second tergite longer than broad at base; ovipositor straight, sheath three-fourths as long as first tergite.

Black, with abdomen, except more or less of petiole, and hind femur, more or less, ferruginous; front and middle legs more or less reddish in front; apical three joints of hind tarsus somewhat reddish; sheath black; wings subhyaline, veins black, stigma paler.

Male.—Essentially like female, but front and middle femora pale ferruginous, their tibiae and tarsi more yellowish; hind tibia at extreme base and joints 2-4 or 3-4 of tarsus pale yellow; genital sheath largely piceous.

Type locality.—Quebec?

Type.—Public Museum, Quebec.

Remarks.—This is a northeastern species appearing in summer. In addition to a specimen compared with the type by C. F. W. Muese-

beck, the following material has been examined: A large series of both sexes collected by G. S. Walley at Kazubazua, Quebec, on July 26 and 27, 1933; one female, Aylmer, Quebec, on July 20, 1924, H. L. Viereck; one female, Canada, C. F. Baker; one female, West Chop, Mass., July 8, 1893; one female, Forest Hills, Mass., June 22, 1921; and four females, Nantucket, Mass., July 21 to August 17, 1927, C. W. Johnson. Specimens of this species are in the Canadian National Collection and the Boston Society of Natural History.

24. EXETASTES INFUMATRICUS, new species

Very closely related to *matricus*, from which it appears to differ only as follows:

Female.—Malar space only two-thirds as long as basal width of mandible; eyes slightly longer; scutellar carinae confined to base; front tibia and tarsus largely, front femur anteriorly, and middle femur apically ferruginous; hind femur not at all black; joints 3 and 4 and apex of joint 2 of hind tarsus yellow; wings deeply infumate.

Type locality.—Rochester, Wash.

Type.—U.S.N.M. no. 51810.

Paratype.—Cornell University.

Remarks.—The type captured July 22, 1931, by H. T. Peters; the paratype in Washington, July 25, 1893, by T. Kincaid.

25. EXETASTES ABDOMINALIS Cresson

PLATE 17, FIGURE 21

Exetastes abdominalis CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 276, 1865; female.

Similar in the high hypostomal carina to *matricus* and *infumatricus*, but in this species the carina is only about half as high as in the others, and the hind femur is black to piceous. Differs further from the above description of *matricus* as follows:

Female.—Temples hardly two-thirds as long as short diameter of eyes; hypostomal carina hardly half as high and not arched; antenna (one specimen) with 49 joints; propodeum finely mat and sparsely punctate above, densely punctate laterally, apical areas finely rugulose; pleural carinae indicated by fine foveolate grooves.

Head and thorax blue-black, hind femur piceous to black; joints 3 and 4 of hind tarsus, and sometimes apex of 2, yellow.

Type locality.—Colorado.

Type.—Acad. Nat. Sci. Philadelphia no. 1612.

Remarks.—In addition to the type I have seen only two specimens, both in the United States National Museum, from the C. F. Baker Colorado collection, one compared with the type by myself.

26. *EXETASTES CAERULEUS* Cresson

Exetastes caeruleus CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 276, 1865; female.

Similar in form and structure to the three preceding species, but with hypostomal carina only moderately high, body, including abdomen, distinctly metallic blue, and legs beyond trochanters largely ferruginous. Compared with the above description of *matricus* it differs further as follows:

Female.—Temples distinctly convex, distinctly though sparsely punctate; face and frons more shining, frons nearly flat; junction of occipital and hypostomal carinae about basal width of mandible from base of latter; lower cheek not excavated, the hypostomal carina only slightly higher than normal; propodeum mat, punctate, sparsely so above at base, moderately rugulose behind carina.

Body, coxae, and trochanters black with distinct metallic blue reflections; all femora and tibiae ferruginous; front and middle tarsi infusate, basal joint of hind tarsus black, other joints ferruginous; wings rather deeply infumate.

Male.—Essentially like female, but with wings subhyaline.

Type locality.—Colorado.

Type.—Acad. Nat. Sci. Philadelphia no. 1610.

Remarks.—In addition to the type I have seen four females and one male: A female homotype compared by myself with the type, Colorado, C. F. Baker; two females, Creede, Colo., 8,844 feet, August 1914, S. J. Hunter (one in collection of Kansas University); one female, Whitehorse, Yukon, June 5, 1923, 1,000 feet, A. K. Kusche (this is in the California Academy of Sciences); and one male from Colorado.

27. *EXETASTES ALTICOLA*, new species

In this species the scutellum is less distinctly flattened and only very briefly margined at base, but it agrees well with all the other key characters of the *matricus* group.

Female.—Length 10 mm, antennae broken. Differs from the above description of *matricus* as follows: Temples rather strongly convex and nearly as long as short diameter of eye, distinctly punctate; frons more densely punctate; malar space fully as long as basal width of mandible; junction of occipital and hypostomal carinae distant from base of mandible barely the width of latter; hypostomal carina of normal height and cheek not excavated; eyes less strongly convex and barely as long as superior width of face; antennae (tips broken off); thorax more densely punctate; propodeum mat, densely punctate except at base and in a narrow median area, apical areas somewhat rugulose, apical carina indicated only medially; pleural carina represented by a fine foveolate groove; first tergite barely twice as long as broad at apex; ovipositor sheath as long as first tergite.

Abdomen black; legs beyond trochanters entirely ferruginous; wings more deeply infumate, stigma black.

Male.—Malar space slightly shorter than basal width of mandible; ocelli larger; antennae 42-jointed; wings hyaline, stigma brown.

Type locality.—Silverton, Colo.

Type.—U.S.N.M. no. 51811.

Remarks.—One female and two males taken at 12,000 feet, July 8–31, 1903, and one male, Mount Cheam, British Columbia, August 10, 1903.

28. EXETASTES DILUTIPES, new species

PLATE 16, FIGURE 14; PLATE 17, FIGURES 20, 39; PLATE 20, FIGURES 82, 97;
PLATE 21, FIGURE 106

Female.—Length 12 mm, antenna 9 mm.

Very similar to *alticola*, but with malar space three-fourths basal width of mandible; propodeum reticulate-rugulose with apical and pleural carinae distinct; basal two joints of hind tarsus fuscous; abdomen more slender. Antennae shorter than in *matricus*, tapering but not attenuate apically, 45- to 48-jointed.

Male.—Malar space two-thirds basal width of mandible; ocelli slightly larger; hind tibia at apex, especially on inner side, and third joint of hind tarsus fuscous.

Type locality.—Banff, Alberta.

Type.—U.S.N.M. no. 51812.

Allotype.—Cornell University.

Paratype.—California Academy of Sciences.

Remarks.—Five females, including the holotype, all taken at the type locality, July 10 to August 10, 1925, by Owen Bryant; and two males, one (allotype) from Maligne Lake, Alberta, July 1–3, 1915, and one from Yellowstone National Park, June 19, 1930, E. Van Dyke.

29. EXETASTES PURPUREUS, new species

Except for its bluish or purplish luster and darker wings this species is, in general appearance, almost identical with *matricus*, but the cheeks are not excavated and the hypostomal carina is of normal height. It differs also from the above description of *matricus* as follows:

Female.—Malar space slightly shorter; junction of occipital and hypostomal carinae not more than basal width of mandible from base of latter; ocelli somewhat larger; antenna not quite so long, 52-jointed in type; scutellar carinae shorter; propodeum very finely rugulose above and sparsely punctate especially at base, posterior face reticulate rugulose; abdomen slightly stouter, first tergite barely more than twice as long as broad and second barely longer than broad at base.

Wings deeply infumate, veins and stigma black.

Type locality.—Siskiyou County, Calif.

Type.—U.S.N.M. no. 51813.

Two females.

30. *EXETASTES RUFIPES* Cresson

Exetastes abdominalis var. α CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 277, 1865; female.

Exetastes rufipes CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 277 (note), 1865; female.

Differs structurally hardly at all from *purpureus*, but the wings are not so dark, the front and middle legs beyond the trochanters are entirely red, and the hind tibia is red at base, this color extending nearly to apex below.

The hitherto undescribed male has the temples more strongly convex, the wings subhyaline, and joints 2-4 of the hind tarsus yellow.

Type locality.—Colorado.

Type.—Acad. Nat. Sci. Philadelphia no. 1613.

Remarks.—In addition to the type, I have seen one female compared with the type and, like the type, from Colorado; and one male from Mount Adams, Wash., June 26, 1932, A. R. Rolfs.

31. *EXETASTES ORNATUS*, new species

PLATE 16, FIGURE 13; PLATE 17, FIGURE 36; PLATE 18, FIGURE 45; PLATE 20, FIGURES 83, 96; PLATE 21, FIGURE 105

The group including this and the next five species is characterized by the unusually small clypeus, which is distinctly narrower than the face, weakly convex and almost without trace of division into basal and apical portions; broad head with large eyes and strongly receding temples; short malar space; long, slender, and apically attenuate antennae; slender abdomen with first tergite nearly or quite three times as long as broad; and unusually short ovipositor sheath.

The present species differs conspicuously from all the others of the group in that the head and thorax are ornamented with yellow and the propodeum and metapleurum in the female are partly ferruginous.

Female.—Length 12 mm, antenna 11 mm.

Head much broader than thorax, fully twice as broad as thick medially; temples strongly receding, flat, sparsely punctate; occiput narrow, shallowly concave; frons shallowly concave, densely punctate, with a more or less distinct median groove; face densely punctate, with a rather weak median elevation, less than twice as broad as long; clypeus much narrower than face, much broader than long, weakly convex in profile, weakly divided into basal and apical portions only by difference in sculpture, truncate at apex with neither emargination nor median groove; cheeks in front view very short, their extended angle about a right angle; malar space hardly two-thirds as long as basal width of mandible; mouth almost exactly as broad as face;

junction of occipital and hypostomal carinae distinctly less than basal width of mandible from the latter, hypostomal of normal height; eyes large, strongly convex, much longer than width of face, very slightly convergent below; postocellar line hardly as long as ocellocular line and less than a half longer than diameter of an ocellus; antenna slender, attenuate at apex, 57-jointed, basal joint of flagellum fully twice as long as second, the latter more than twice as long as thick.

Thorax subpolished, sparsely punctate laterally, very weakly so dorsally; notauli absent; mesoscutum unusually flat; scutellum unusually narrow and rather weakly convex in profile; propodeum weakly convex both transversely and longitudinally, with median trace of apical carina, finely and not densely punctate, with a few short longitudinal rugae posteriorly; position of pleural carina indicated by difference in sculpture; spiracle elongate, situated nearly its length from pleural carina.

Legs slender; inner hind calcarium nearly two-thirds as long as basitarsus; apical joint of tarsus shorter than third joint.

Wings: Stigma and radial cell narrow; apical abscissa of radius moderately curved at base, more than a half longer than basal abscissa; areolet oblique; second discoidal cell rather narrow, second recurrent less than two-thirds as long as basal abscissa of subdiscoideus, subangulate above; nervulus shortly postfureal; abscissula hardly twice intercubitella.

Abdomen very slender, polished, apically compressed; first tergite about three times as long as broad at apex; second nearly twice as long as broad at base; ovipositor short, sheath distinctly less than half as long as first tergite.

Head and thorax black; spot on each side of face, apical portion of clypeus, spot on lower cheek, mandibles, anterior margin of pronotum medially and humeral angles, anterior lateral margins of mesoscutum, scutellum and postscutellum, and a spot below hind wing yellow; antenna black, scape brownish to yellowish in front, flagellum more or less reddish apically and with a broad incomplete yellow annulus; labial palpus white with apical joint piceous; maxillary palpus brownish stramineous; metapleurum largely and propodeum apically ferruginous, the latter more or less yellowish medially; legs ferruginous, front and middle coxae more or less piceous at base, front coxa otherwise and middle coxa at apex and their trochanters below whitish, trochanters above piceous, basal joint of hind trochanter piceous, apical joint mostly whitish, hind femur narrowly and tibia broadly black apically, tarsus basally blackish and apically reddish with joints 2-4 and apex of 1 whitish; wings hyaline, venation black, stigma reddish stramineous; abdomen ferruginous, segments beyond fifth and sometimes apex of fifth black, sheath piceous.

Male.—Structurally much like female, but with eyes parallel, malar space less than half as long as basal width of mandible, and the

punctuation of frons and propodeum confluent. Thorax not at all red, the yellow markings larger and embracing also the following: Entire face with extensions along frontal orbits, malar space, entire clypeus, under side of scape and pedicel, propleura, lower anterior margin of pronotum, mesosternum and lower portion of pleura, subalar tubercle, apex of propodeum and of metapleurum, and small spot at upper end of propodeal spiracle; front and middle coxae and trochanters, their femora anteriorly, tibiae largely and tarsi, hind coxa and trochanters below, and hind tibia basally stramineous; hind coxa and trochanter above ferruginous and black; abdomen piceous rather than black at apex.

Type locality.—Flint, Ohio.

Type.—U.S.N.M. no. 51814.

Paratype.—Academy of Natural Sciences of Philadelphia.

Remarks.—Three females and four males, the holotype female taken July 5, 1924, by J. O. Pepper; one female, Highspire, Pa., July 12, 1908, W. S. Fisher; the allotype and one other male, Lyme, Conn., June 15, 1918, Wm. Middleton; two males, Ramsey, N. J., June 19 and 28, 1916; and the paratype female from Connecticut in the Academy of Natural Sciences.

32. EXETASTES SUBIMPRESSUS, new species

Similar in form of clypeus and slender abdomen as well as in many other respects to *ornatus*, but immediately distinguishable by the entirely black body in the female and the lack of yellow markings dorsally in the male.

Female.—Length 12 mm, antennae (broken).

Head slightly broader than thorax, a little more than twice as broad as thick medially; occiput rather deeply concave, temples weakly convex, strongly receding, sparsely and weakly punctate; frons shallowly concave, rather densely punctate; face less than twice as broad as long, densely punctate, roundly elevated medially, concave laterally below antennae; clypeus narrower than face, weakly convex in profile, divided into basal and apical portions only by difference in sculpture; cheeks in front view short, their extended angle slightly acute; malar space a little more than half basal width of mandible; mouth as broad as face; junction of occipital and hypostomal carinae distant from base of mandible by nearly the width of latter; eyes rather strongly convex, slightly convergent below, longer than superior width of face; postocellar and ocellular lines equal and each nearly twice as long as diameter of ocellus; antennae slender (tips gone but undoubtedly attenuate apically and probably with 55–60 joints), first joint of flagellum hardly twice as long as second, which is nearly three times as long as thick.

Thorax shining, with moderately dense punctation, finer and sparser dorsally; notauli broadly impressed throughout; scutellum narrowly triangular, rather weakly convex in profile; propodeum only moderately convex both transversely and in profile, irregularly reticulate rugose, with median trace of apical carina; spiracle elongate, situated about half its length above the distinct pleural carina.

Legs slender; inner hind calcarium distinctly more than half as long as basitarsus; apical joint of tarsus much shorter than third.

Wings: Apical abscissa of radius slightly curved basally, barely a half longer than basal abscissa; second discoidal cell narrow; second recurrent rather weakly curved above and hardly two-thirds as long as basal abscissa of subdiscoideus; nervulus slightly postfurcal; abscissula barely twice as long as intercubittella.

Abdomen slender, strongly compressed apically; first tergite nearly three times as long as broad at apex, second fully a half longer than broad at base; ovipositor short, sheath less than half as long as first tergite.

Body entirely black except reddish apex of clypeus and along sutures of abdomen; antennae black; palpi dark brown; wings faintly stained, venation dark brown; legs black; front and middle femora in front toward apices and hind femur except at apex ferruginous; joints 2-4 of hind tarsus whitish.

Male.—Malar space slightly shorter and ocelli slightly larger; antenna 56-jointed; face, clypeus, malar space, and mandibles yellow; maxillary palpi stramineous; apices of propleura, tegulae basally, paired spots on mesosternum, all coxae, and front and middle trochanters beneath yellow; front and middle femora pale ferruginous, their tibiae and tarsi stramineous to yellowish; hind tibia reddish at base; otherwise essentially like female.

Type locality.—Beaver Creek, Mont., 6,300 feet.

Type.—University of Kansas.

Allotype.—Canadian National Collection.

Remarks.—One of each sex, the holotype female taken in August 1913 by S. J. Hunter; the allotype male, Waterton, Alberta, July 14, 1923, H. L. Seamans.

33. EXETASTES NIGRIBASIS, new species

Structurally almost identical with *subimpressus*, but with abdomen beyond first tergite in female and beyond second in male entirely ferruginous. Antenna in female nearly as long as body, 55- to 58-jointed, attenuate apically. Hind femur entirely ferruginous.

The male differs from the female as does that of *subimpressus* except that the malar space and sternum are entirely black and the front and middle femora are more or less piceous behind.

Type locality.—Harney Peak, S. Dak.

Type.—U.S.N.M. no. 51815.

Remarks.—Two females and one male, the holotype female and allotype male taken at the type locality July 22 and July 21, 1924, respectively; the paratype female, Norquay Mountain Meadows, 5,000–6,000 feet, Banff, Alberta, July 4, 1925, Owen Bryant.

34. EXETASTES RUFOBALTEATUS, new species

In general form and structure similar to *subimpressus*, from the above description of which it differs as follows:

Female.—Length 10 mm, antennae 9 mm.

Head distinctly wider than thorax and more than twice as broad as thick medially; distance between junction of occipital and hypostomal carinae and base of mandible much shorter than basal width of mandible; eyes very strongly convex; diameter of a lateral ocellus two-thirds as long as postocellar line; antenna slender, apically attenuate, 53-jointed, first joint of flagellum fully twice as long as second; notauli not indicated; propodeum finely irregularly rugulose; spiracles small and situated their length from the obsolete pleural carinae; first tergite fully three times as long as broad at apex.

Black; tergites 2–4 and apex of 1 ferruginous; wings hyaline; front and middle tibiae below and hind tibia at base more or less ferruginous.

Male.—Face, clypeus, malar space, mandibles, palpi, under side of scape, apex of propleurum, mesosternum partly, all coxae and front and middle trochanters and femora beneath, front and middle tibiae and tarsi largely, hind tibia at base, hind basitarsus apically, a median stripe on scutellum, a dot on postscutellum, the tegulae, and sometimes paired spots on anterior margin of mesoscutum yellow; fifth tergite also ferruginous; otherwise essentially like female.

Type locality.—Glacier Park Station, Mont., 4,800 feet.

Type.—U.S.N.M. no. 51816.

Paratypes.—Canadian National Collection; Cornell University.

Remarks.—Four females and two males; the holotype female without additional data; the allotype and another male, Harney Peak, S. Dak., July 21–22, 1924; one female, Banff, Alberta, August 30, 1922, C. B. D. Garrett; one female, Sudbury, Ontario, 1892; and one female, Carbonate, Columbia River, British Columbia, July 7–12, 1908, 2,600 feet, J. C. Bradley.

35. EXETASTES ANGUSTUS, new species

Similar in form and structure to *subimpressus*, from the above description of which it differs as follows:

Female.—Face twice as broad as long; eyes more strongly convex and more distinctly convergent; first joint of flagellum fully twice as long as second; notauli not at all defined; pleural carinae of propodeum distinct; first tergite not nearly three times as long as broad; sheath very nearly half as long as first tergite.

Color as in *subimpressus* except that hind femur is entirely black.

Type locality.—Banff, Alberta, Norquay Mountain Meadows, 5,000–6,000 feet.

Type.—U.S.N.M. no. 51817.

Paratype.—Canadian National Collection.

Remarks.—Two females, the holotype taken by Owen Bryant, July 20, 1925; the paratype, at Banff, Alberta, August 16, 1922, by C. B. D. Garrett.

36. EXETASTES CONVERGENS, new species

Female.—Very closely allied to *angustus* and possibly merely a variety of that species, but differing constantly, so far as can be judged from the rather scanty material, in the conspicuously ferruginous legs, this color involving all femora entirely, front and middle tibiae, and basal two-thirds of hind tibia; also the wings are distinctly darker.

Type locality.—Colorado.

Type.—U.S.N.M. no. 51818.

Paratypes.—American Museum of Natural History; Cornell University.

Remarks.—Five females, the holotype from the C. F. Baker collection; the National Museum paratypes from Malta, Colo., 9,400 feet, August 4, 1919, and University of Wyoming Camp, Centennial, Wyo., 9,600 feet, July 5, 1929; the American Museum paratype from Tennessee Pass, Colo., 10,500 feet, August 6–8, 1920; and the Cornell University paratype from Oslar, southwestern Colorado, July 17, 1900.

37. EXETASTES ANGUSTORALIS, new species

PLATE 16, FIGURE 15; PLATE 17, FIGURE 31; PLATE 18, FIGURE 46; PLATE 19, FIGURE 71; PLATE 20, FIGURES 87, 93; PLATE 21, FIGURE 108

Eretastes fascipennis (authors, not Cresson) WALSH, Trans. Acad. Sci. St. Louis, vol. 3, p. 147, 1873; female.—PROVANCHER, Additions et corrections au volume II de la Faune entomologique du Canada . . . , p. 92, 1886; female.—VIERECK, in Smith, Insects of New Jersey, p. 618, 1910.—CUSHMAN, in Leonard, Insects of New York, p. 932, 1928.

There is nothing in the descriptions of Walsh and Provancher that does not apply equally well to either *fascipennis* Cresson or *angustoralis*, but both records, as well as the others cited above, are from well outside the known range of *fascipennis* and within that of *angustoralis*.

This and *fascipennis* form a group very easily distinguishable from those that follow it in the present arrangement by the combination of characters employed in the key. The present species is distinguishable from *fascipennis*, as which it has frequently been misidentified, by the distinctly longer malar space.

Female.—Length 12 mm, antennae 9 mm.

Head little broader than thorax, though distinctly more than twice as thick, with occiput moderately concave and temples very strongly receding and weakly convex; frons shallowly concave, densely and finely punctate, mat; face somewhat more coarsely punctate, mat, barely twice as broad as long, medially prominent, concave on each side below antennae; clypeus fully three-fourths as long as broad, strongly convex medio-basally, strongly rounded at apex and with a more or less distinct median emargination; cheeks in front view very long, slightly concave, their extended angle very sharply acute; malar space fully as long as basal width of mandible; mouth hardly as broad as face; mandibles rather narrow; distance from junction of occipital and hypostomal carinae to mandible about equal to base of latter; eyes strongly convex, longer than width of face, virtually parallel; ocellular line slightly shorter than postocellar line and barely a half longer than diameter of an ocellus; antenna conspicuously shorter than body, with 48-51 joints, tapering but not attenuate apically, first joint of flagellum hardly twice as long as second which is little more than twice as long as thick, joints immediately beyond middle shorter than thick.

Thorax strongly compressed, mat, densely and finely punctate, especially dorsally; notauli faintly indicated on disk; scutellum strongly convex both transversely and in profile, more sparsely punctate and more shining than rest of thorax; propodeum in profile weakly convex above, with faint trace of apical carina, beyond which it is concavely sloping, punctate-rugulose laterally, reticulate-rugose medially; spiracles rather short oval, situated shortly above the obsolete pleural carinae.

Legs slender; hind femur more than three-fourths as long as tibia; inner hind calcarium more than half as long as basitarsus; apical joint of tarsus shorter than third joint.

Wings: Apical abscissa of radius moderately curved at base, more than a half longer than basal abscissa; areolet somewhat longer on second intercubitus, the other three sides subequal; second discoidal cell rather broad, second recurrent fully two-thirds as long as basal abscissa of subdiscoideus, rather strongly curved or subangulate above; nervulus distinctly postfurcal; abscissula less than twice as long as intercubitella.

Abdomen very minutely and delicately sculptured, with sparse punctation on first and sides of second tergite, weakly compressed at apex, first tergite twice as long as broad at apex, the sides concavely curved, second tergite slightly longer than broad at base; ovipositor stout, upcurved, sheath three-fourths as long as first tergite.

Ferruginous; occiput, prepectus, and thoracic sutures black; face, clypeus, mandibles, anterior margin of pronotum, and scutellum

paler, sometimes yellowish; antenna black with a broad yellow annulus, scape mostly ferruginous; wings lightly infumate with darker fasciae below apical half of stigma and along basal vein, venation dark brown, stigma and costa pale ferruginous; legs concolorous, coxae more or less black basally, front and middle legs paler in front, hind femur and tibia apically black, tibia at base and tarsus more yellowish; sheath black with apex ferruginous.

Male.—Differs from female principally as follows: Head a little thicker, with temples more convex and less sharply receding; antenna as long as body and more slender; propodeum less roughly sculptured, especially medially.

Varies greatly in color, sometimes essentially like female except that head is largely black with face, frontal orbits, clypeus, and mandibles definitely yellow, black of thorax a little more extensive and the paler portions more distinctly yellow, antennal annulus shorter, scape yellow below, and wings hyaline and immaculate. From this it varies to specimens in which the head is black except for large yellow spots on each side of face and the clypeus, thorax except scutellum entirely black, coxae and hind trochanter largely or entirely black, front and middle legs more definitely yellow, hind femur largely piceous, and abdomen more or less black at base. Many males have a well marked color pattern of black and ferruginous yellowish on mesoscutum.

Type locality.—Falls Church, Va.

Type.—U.S.N.M. no. 51819.

Paratypes.—Canadian National Collection; Cornell University; American Museum of Natural History; and the private collections of Henry K. Townes and Andrew R. Park, Jr.

Remarks.—This species is widely distributed in the Northeast, specimens being at hand from Quebec, Ontario, and South Dakota, south to North Carolina (Black Mountains) and Kansas, and including the States of Vermont, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, Virginia, Illinois, Nebraska, Wyoming, and the District of Columbia. It is an autumn species, and I have taken it in abundance in October and November about young pine trees in northern Virginia. A large series, mostly males, from Ontario and Quebec were taken in September.

The species has escaped description because it has repeatedly been misidentified as *fascipennis*.

38. EXETASTES FASCIPENNIS Cresson

Exetastes flavitarsis CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 277, 1865; male (preoccupied by *flavitarsis* Gravenhorst).

Exetastes fascipennis CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 278, 1865; female.

Exetastes fasciipennis DALLA TORRE, *Catalogus hymenopterorum* . . . , vol. 3, pt. 1, p. 71, 1901; female.

Exetastes cressonii DALLA TORRE, *Catalogus hymenopterorum* . . . , vol. 3, pt. 1, p. 70, 1901; male (new name for *flavitarsis* Cresson).

In studying this species I have examined the entire type series of both of Cresson's names including a paratype of each in the United States National Museum, also one other female from Colorado in the collection of the University of Kansas.

Female.—From *angustoralis* it differs principally in the malar space being distinctly shorter than basal width of mandible, the cheeks being therefore shorter in front view and with their extended angle somewhat less sharply acute; junction of occipital and hypostomal carinae much less than basal width of mandible from the latter; antenna slightly more slender, the joints immediately beyond middle fully as long as thick; apical half or more of stigma blackish.

Male.—Differs from female in much the same way as the male of *angustoralis* differs from its female. All the known males of the present species have the head and thorax black with yellow markings, the face, clypeus, mandibles, malar space, lower cheeks, frontal orbits below, superior orbits, anterior margin of pronotum (sometimes), a mark on each side of mesoscutum anteriorly and scutellum largely yellow. Legs colored as in male of *angustoralis* except that hind femur is largely ferruginous.

Type locality.—Colorado.

Type.—Of *fasciipennis* no. 1617, of *flavitarsis* no. 1618, Acad. Nat. Sci. Philadelphia.

Paratype.—Of *fasciipennis*, U.S.N.M. no. 51257; of *flavitarsis*, U.S.N.M. no. 44733.

39. EXETASTES RUFICOXALIS, new species

PLATE 17, FIGURES 17, 25; PLATE 18, FIGURE 54; PLATE 20, FIGURES 90, 102;
PLATE 21, FIGURE 114

A small species distinct from all the other North American species with black head and thorax and ferruginous abdomen in its bright ferruginous coxae. Structurally also it stands alone in the combination of characters employed in the key.

Female.—Length 9 mm, antennae 7 mm.

Head little broader than thorax and little more than twice as broad as thick medially; occiput shallowly concave; temples moderately convex and sharply sloping; frons broadly concave and densely, finely punctate; face densely, finely punctate, barely twice as broad as long, strongly elevated medially and slightly concave laterally; clypeus much narrower than face, two-thirds as long as broad, strongly convex basally, strongly rounded apically and more or less emarginate medially; cheeks in front view slightly convex, their extended angle nearly a

right angle; malar space very nearly as long as basal width of mandible; mouth barely as broad as width of face, mandibles rather narrow; distance between junction of occipital and hypostomal carinae and base of mandible little more than half basal width of latter; eyes moderately convex, longer than width of face, parallel; ocellular line little longer than diameter of an ocellus and much shorter than postocellar line; antenna 51- to 55-jointed, rather slender, first joint of flagellum distinctly less than twice as long as second, which is hardly more than twice as long as thick, joints of apical third shorter than thick.

Thorax densely and finely punctate, shining; notauli absent; scutellum rather elongate subtriangular, moderately convex, sparsely punctate; propodeum rather weakly convex, reticulate rugulose, apical carina distinct at least medially; spiracles elongate, close to the distinct pleural carinae.

Legs slender, hind femur more than three-fourths as long as tibia; inner hind calcarium more than half as long as basitarsus, apical tarsal joint shorter than third.

Wings: Apical abscissa of radius rather strongly curved at base, fully a half longer than basal abscissa; areolet oblique, the lower angle distinctly apical of upper angle; second discoidal cell scarcely a half longer on subdiscoideus than broad, recurrent strongly curved or subangulate above; nervulus antefurcal or subinterstitial; abscissula less than twice as long as intercubitella.

Abdomen polished, shallow, rather slender and strongly compressed apically; first tergite distinctly deurved, slightly more than twice as long as broad, sparsely punctate, petiole in dorsal view more or less constricted; second tergite distinctly longer than broad at base; ovipositor straight, strongly compressed, sheath three-fourths as long as first tergite.

Head and thorax black; apex of clypeus, anterior margin and humeral angle of pronotum, and scutellum at apex yellowish or reddish; abdomen and legs ferruginous, hind tibia and tarsus more or less darker, joints 3 and 4 of tarsus yellowish; sheath piceous; wings hyaline, venation dark brown.

Male.—Malar space slightly shorter; ocelli slightly larger; antennae as long as body; yellow markings of thorax larger and including apices of tegulae; hind tibia at apex and tarsus definitely black, tarsal annulus more distinctly yellow; otherwise essentially like female.

Type locality.—Colorado.

Type.—U.S.N.M. no. 51820.

Paratypes.—Canadian National Collection; Cornell University.

Remarks.—Nineteen females and 16 males ranging from Colorado and Alberta, west to Utah, Idaho, Washington, and British Columbia,

and including a series of 7 females and 5 males without locality but probably from Nevada. It is an autumn-flying species, most of the collection dates being in September.

40. *EXETASTES ZELOTYPUS* Cresson

PLATE 16, FIGURE 12; PLATE 17, FIGURE 40; PLATE 18, FIGURES 50, 68; PLATE 21, FIGURE 112

Exetastes zelotypus CRESSON, Proc. Acad. Nat. Sci. Philadelphia, 1878, p. 370; female, male.

This and the three next following species form a group characterized by short, stout antennae, strongly pectinate claws, black head and thorax, usually with largely ferruginous abdomen, and deeply infumate wings.

Female.—Length 13 mm, antennae 9 mm.

Head little broader than thorax and only slightly more than twice as broad as thick; occiput broad and rather deeply concave; temples strongly convex, finely and rather densely punctate; pubescence unusually dense; frons shallowly concave, densely punctate; face densely punctate, narrowly and only slightly elevated medially, laterally convex below and concave above, twice as broad as long; clypeus nearly as broad as face, two-thirds as long as broad, the short basal portion strongly convex, the long apical portion flat or weakly concave, apex medially emarginate and with a more or less distinct longitudinal groove; cheeks in front view very short, straight, their extended angle sharply acute; malar space barely half as long as basal width of mandible; junction of occipital and hypostomal carinae distant from mandible by about basal width of latter; mandible more than twice as long as broad at base, not strongly narrowed toward apex; eyes moderately convex, as long as superior width of face, strongly convergent below; postocellar and ocellocular lines subequal and about three times as long as diameter of an ocellus; antenna about 45-jointed, stout, rather abruptly tapering at apex, basal joint of flagellum hardly twice as long as second and hardly four times as long as thick at apex, second less than twice as long as thick.

Thorax stout, densely punctate, metapleurum confluent so, rugose below, mesoscutum and scutellum more finely and sparsely punctate and shining; notauli absent; scutellum moderately convex; propodeum moderately convex, reticulate rugose, finely so medially, coarsely so laterally, without trace of apical carinae, spiracles large, elongate, situated more than half their length above the distinct pleural carinae.

Legs rather stout, hind femur three-fourths as long as tibia; inner hind calcarium more than half as long as basitarsus; apical joint of tarsus nearly as long as third joint.

Wings: Apical abscissa of radius strongly curved at base, more than a half longer than basal abscissa; areolet petiolate, second intercubitus much longer than other sides and curved; second discoidal cell broad, second recurrent more than two-thirds as long as basal abscissa of subdiscoides, strongly curved above; nervulus strongly postfural; abscissula much less than twice as long as intercubitella.

Abdomen stout, weakly compressed at apex, first tergite little more than twice as long as broad at apex, second about as long as broad at base; ovipositor straight, sheath a little more than half as long as first tergite.

Head and thorax immaculate black, abdomen ferruginous with petiole black at extreme base, venter ferruginous; coxae, trochanters, front and middle femora largely, apical half of hind tibia, and hind tarsus black, hind femur ferruginous, legs otherwise more or less distinctly testaceous or fuscotestaceous; wings deeply infumate; pubescence of head and thorax dense, conspicuous, and dark cinereous.

Male.—Differs very little from female beyond having the wings much paler.

Type locality.—San Diego, Calif.

Type.—Acad. Nat. Sci. Philadelphia no. 1611.

Remarks.—Of this species I have seen four females and one male, all from California. These include the type, a female homotype compared by myself with the type and taken with another female in Los Angeles County by D. W. Coquillett, one female from Claremont (collection of Cornell University), and one male from Walnut Creek, Contra Costa County, April 19, 1913, J. C. Bridwell.

41. EXETASTES ERYTHROGASTER, new species

Very closely related to *zelotypus*, differing structurally from the above description of that species only in its distinctly longer malar space, this in the present species being about three-fourths as long as basal width of mandible in female and only slightly shorter in male.

Both sexes differ from *zelotypus* by having the front and middle legs entirely black except the faintly reddish apices of the femora, the hind leg except femur entirely black, the first tergite and venter largely black.

Type locality.—Unknown.

Allotype locality.—Corvallis, Oreg.

Type.—U.S.N.M. no. 51821.

Paratype.—Canadian National Collection.

Remarks.—One female (the holotype) without data; and two males, the allotype captured April 24, 1897, and the paratype April 25, 1923, at Oliver, British Columbia, by C. B. D. Garrett.

42. *EXETASTES CONCOLORIPES*, new species

This may prove to be only a color variation of *erythrogaster*, but the limited material at hand shows no intergradation.

The only differences appear to be those of color, the present species having the legs entirely black and the black color of the abdomen involving most or all of the second tergite, and in a paratype male most of the third and part of the fourth.

Type locality.—Colorado.

Type.—U.S.N.M. no. 51822.

Paratype.—Canadian National Collection.

Remarks.—One female (in poor condition), the holotype, from the C. F. Baker collection; the allotype male from La Grande, Oreg., 2,800 feet, May 12, 1930, H. A. Scullen; and one paratype male from Waterton Lakes, Alberta, June 19, 1923, J. McDunnough.

43. *EXETASTES COLORADENSIS*, new species

Differs apparently only in color from *concoloripes*, the abdomen being entirely black except in the sutures, where it is reddish piceous.

Like *concoloripes* this may be a color phase of *erythrogaster*, but it seems best until more material is available to treat it as a distinct species.

Type locality.—Colorado.

Type.—U.S.N.M. no. 51823.

A single female taken by C. F. Baker. Both antennae are broken.

44. *EXETASTES AFFINIS* Cresson

PLATE 16, FIGURE 10; PLATE 17, FIGURE 41; PLATE 18, FIGURE 62

Exetastes affinis CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 277, 1865; female.

This and the next following species are very similar in general form and color to those of the *zelotypus* group, but are at once distinguishable by the long slender legs and antennae, shorter clypeus, and convex cheeks.

The male referred to this species and described by Provancher² certainly does not belong here, nor am I able to recognize it from his description as referable to any species known to me. I strongly suspect that it is not an *Exetastes*.

Female.—Length 13 mm, antennae 12 mm.

As in *zelotypus*, except pubescence of head and thorax much shorter and less conspicuous; cheeks in front view convex, their extended angle nearly right; malar space barely half as long as basal width of mandible; clypeus little more than half as long as broad; mandible

² Petite faune entomologique du Canada . . . , vol. 2, Hymén., p. 385, 1883.

not more than twice as long as broad at base; eyes rather weakly convex, hardly as long as width of face, weakly convergent below; diameter of ocellus more than half as long as postocellar line; antenna very slender, attenuate at apex, nearly 60-jointed, first joint of flagellum nearly six times as long as thick, all other joints much longer than thick; propodeum with distinct median trace of apical carina; legs slender, claws simple; second recurrent weakly curved above.

Color as in *zelotypus* except hind legs entirely black and front and middle legs more largely so.

Type locality.—Colorado.

Type.—Acad. Nat. Sci. Philadelphia no. 1614.

Remarks.—In addition to the type I have seen four females, one of which, a homotype compared by myself, is from Albert Lake, Oreg., June 17, 1934, Joe Schuh, collector; two taken on snow on Pikes Peak, Colo., July 20, 1901, by Dyar and Caudell; and one taken in Michigan by C. H. T. Townsend.

45. EXETASTES ALTERNATIPES, new species

A small replica of *affinis*, differing only as follows:

Female.—Length 10 mm, antennae broken.

Hind femur, except extreme apex, bright ferruginous; tibia, except apical third, dark reddish.

Type locality.—Bernadillo County, N. Mex.

Type.—U.S.N.M. no. 51824.

A single female taken in May 1896 by B. Brown.

46. EXETASTES DEUTEROMaurus Dalla Torre

Exetastes maurus CRESSON, Proc. Acad. Nat. Sci. Philadelphia, 1878, p. 370; female (preoccupied by *maurus* Desvignes).

Exetastes deuteromaurus DALLA TORRE, Catalogus hymenopterorum . . ., vol. 3, pt. 1, p. 71, 1901.

The only specimen that I have seen is the type.

Among the black species this is very distinct because of the unusually short stout abdomen and the conspicuously hairy head and thorax.

Female.—Head and thorax with dense long erect hair, especially conspicuous on temples; temples weakly convex, strongly receding; face very densely and coarsely punctate, more than twice as broad as long and broader than length of the slightly convergent eyes; clypeus two-thirds as long as broad and about two-thirds as broad as face, strongly convex basally, especially in middle, basal portion densely and coarsely punctate, apical portion also coarsely but more sparsely punctate; cheeks in front view slightly concave, their extended angle acute; malar space fully two-thirds as long as basal width of mandibles; postocellar and ocellular lines equal and nearly three times as long

as diameter of an ocellus; antenna slender, attenuate apically, fully as long as body, 59-jointed.

Thorax rather densely and coarsely punctate, mesoscutum much less densely so than pleura and shining; mesopleurum rather deeply longitudinally concave below; scutellum strongly convex, narrow triangular; propodeum rugulose, without distinct apical carina.

Legs rather stout, hind femur fully three-fourths as long as tibia; inner hind calcarium less than half as long as basitarsus; apical joint of hind tarsus shorter than third, claws weakly pectinate basally.

Wings: Second recurrent vein nearly straight; nervulus nearly interstitial and slightly reclivous; abscissula less than twice as long as intercubitella.

Abdomen polished, short and broad, first tergite depressed throughout, in dorsal view with sides straight from base to apex, nearly two-thirds as broad at apex as long, sparsely punctate at base; second fully as broad at base as long, sides widely divergent; ovipositor straight, sheath much less than half as long as first tergite.

Black with wings very deeply infumate and slightly paler apically; antennae brownish.

Type locality.—California.

Type.—Acad. Nat. Sci. Philadelphia no. 1609.

47. *EXETASTES BITUMINOSUS*, new species

PLATE 16, FIGURE 5; PLATE 17, FIGURE 37; PLATE 18, FIGURES 43, 67; PLATE 21, FIGURE 116

Exetastes rufofemoratus RILEY and HOWARD (not Provancher), *Ins. Life*, vol. 3, p. 158, 1890.

A very distinct species which, because of its black color with bright red hind femora, has repeatedly been misidentified as *rufofemoratus* Provancher.

Female.—Length 15 mm, antennae 14 mm.

Head hardly broader than thorax and barely more than twice as broad as thick medially, occiput broad and moderately concave; temples punctate, slightly convex and receding at about 45°; frons slightly concave, rather densely punctate, mat, the interspaces finely sculptured; face sculptured like frons with punctation somewhat coarser, fully twice as broad as long, concave below each antenna, and somewhat roundly elevated medially; clypeus much narrower than face, nearly twice as broad as long, basal portion short, strongly convex, especially in middle, apex strongly rounded with a more or less distinct median emargination and groove; cheeks in front view straight or faintly convex, their extended angle nearly right; malar space about three-fourths as long as basal width of mandible; junction of occipital and hypostomal carinae much less than basal width of mandible from the latter; mandible less than twice as long as broad

at base; eyes rather shallowly convex, barely as long as width of face, parallel; postocellar and ocellocular lines equal and hardly twice as long as diameter of an ocellus; antenna very long, slender, attenuate at apex, with about 80 joints, basal joint of flagellum fully twice as long as second.

Thorax coarsely, densely, partly confluent punctate, shining laterally, mesoscutum more finely and less densely punctate but duller; notauli lacking; scutellum moderately convex, elongate subtriangular, more sparsely and coarsely punctate than scutum; propodeum moderately convex, coarsely reticulate rugose, without apical carina, spiracles elongate, nearly their length above the distinct pleural carinae.

Legs slender; hind femur fully three-fourths as long as tibia; inner hind calcarium more than half as long as basitarsus; apical joint of hind tarsus shorter than third joint.

Wings: Apical abscissa of radius strongly curved at base, hardly a half longer than basal abscissa; second discoidal cell broad, second recurrent fully two-thirds as long as basal abscissa of subdiscoides, strongly curved above; nervulus interstitial or slightly postfurcal; abscissula not or barely twice as long as intercubitella.

Abdomen unusually long and very shallow, especially at apex, very minutely sculptured, petiole coarsely punctate laterally; first tergite two and a half times as long as broad at apex, second longer than broad at base; ovipositor unusually slender, straight, sheath fully three-fourths as long as first tergite.

Black; usually with whitish annuli on antenna and joints 2-4 of hind tarsus (one female from Illinois lacks both); hind femur except apex pale ferruginous; front legs usually more or less reddish in front; wings infumate, venation black.

Male.—Differs from female principally in having the temples more strongly convex; antenna even more slender and with far fewer joints (65-70), entirely black; front and middle femora pale ferruginous, their tibiae and tarsi largely white; apical joint of hind tarsus also white; wings nearly hyaline.

Host.—*Agrotis alternata* Grote.

Type locality.—Vienna, Va.

Type.—U.S.N.M. no. 51825.

Paratypes.—Canadian National Collection; Cornell University; Kansas University; collections of A. R. Park, Jr., and F. D. DeGant.

Remarks.—Eighteen females and 16 males, the holotype female and four other females collected by myself at Vienna, Va., October 29 and November 2, 1913; one female, Virginia near Washington, D. C., J. C. Bridwell; one female, Gunston Cove, Fairfax County, Va., November 20, 1932, R. A. Cushman; three males (the allotype), Falls Church, Va., October 15, 1913, Wm. Middleton, October 22, 1913,

C. T. Greene; two males, Plummers Island, Md., October 19, 1914, R. C. Shannon, October 6, 1932, G. P. Engelhart; one female, Fluvanna County, Va.; one female, Columbia, S. C., G. F. Atkinson; two females and one male, Harrisburg, Pa., September 20 and October 6, 1923, J. N. Knull; one male, Ocean View, N. J., October 7, 1927, C. H. Ballou; one male, Seaside Park, N. J., October 24, Weiss and West; one male, Ithaca, N. Y.; two males, Blue Hill, Mass., September 20, 1891; two males, Hinckley, Ohio, September 26, 1934, F. D. DeGant; one male, Agricultural College, Mich.; one female, Springfield, Ill.; September 19, 1935, A. R. Park, Jr.; one female, Shades, Ind., November 12, 1927, H. H. Ross; one of each sex reared October 21, 1884, at Washington, D. C., under Bureau of Entomology no. 3355° from *Agrotis alternata* Grote (this is the record published in Insect Life under *Exetastes rufofemoratus* Provancher); one female, Hopkins U. S. no. 2525, Cornelia, Ga., November 28, 1903, "crawling in road; temperature below freezing", W. F. Fiske; one female, Willard, Mo., November 26; and one female, Itasca State Park, Minn., September 1927, S. Garthside.

48. *EXETASTES DICHROUS*, new species

Female.—Length 14 mm, antennae broken.

Head much more than twice as broad as thick; occiput moderately concave, little broader than vertex; temples nearly flat, strongly receding, finely, sparsely punctate; frons broadly concave, sparsely punctate; face more densely punctate, less than twice as broad as long, medially somewhat elevated, distinctly convex at sides below; clypeus distinctly separated at sides, much narrower than face, fully three-fourths as long as broad, basal portion strongly convex, especially in middle, apical portion flat, apical margin strongly rounded and medially subtruncate; cheeks in front view concave, their extended angle sharply acute; malar space nearly three-fourths as long as basal width of mandible; distance from base of mandible to junction of occipital and hypostomal carinae three-fourths as long as basal width of mandible; mouth hardly broader than face; mandible much more than half as broad at base as long, little more than half as broad at apex as at base; eyes moderately convex, slightly longer than width of face, subparallel; postocellar and ocellocular lines equal and nearly twice diameter of an ocellus; antennae very slender (tips gone).

Thorax shining, evenly, not densely punctate, metapleurum partly rugulose so, mesoscutum and scutellum more sparsely so; notauli absent; scutellum large, strongly convex; propodeum coarsely reticulate rugose, spiracles very long, curved, situated less than their length above the distinct pleural carinae.

Legs very slender; hind femur fully three-fourths as long as tibia; inner hind calcarium more than half as long as basitarsus; apical tarsal joint much shorter than third.

Wings: Apical abscissa of radius moderately curved at base, about a half longer than basal abscissa; second recurrent less than two-thirds as long as basal abscissa of subdiscoideus; nervulus slightly postfurcal; abscissula twice as long as intercubittella.

Abdomen polished, strongly compressed, and very deep apically; first tergite a little more than twice as long as broad at apex, second slightly longer than broad at base; ovipositor short, straight, sheath only about a third as long as first tergite.

Black, with abdomen ferruginous, tergites beyond sixth and apex of hypopygium blackish; wings deeply infumate.

Type locality.—Siskiyou County, Calif.

Type.—U.S.N.M. no. 51826.

One specimen.

49. EXETASTES CORVINUS, new species

Similar in structure to *dichrous*, but at once distinguishable by its black abdomen.

Female.—Length 13 mm, antennae 11 mm.

Differs from *dichrous* as follows: Temples even more strongly receding; face twice as broad as long; malar space two-thirds basal width of mandible; eyes slightly convergent below; antenna 64-jointed, slender, attenuate at apex; propodeum very coarsely reticulate rugose, this sculpture also involving most of the metapleurum.

Abdomen entirely black.

Type locality.—Vya, Washoe County, Nev.

Type.—Cornell University.

One specimen, July 19, 1927, H. E. Guerlac.

50. EXETASTES FLAVIPENNIS Cresson

Exetastes flavipennis CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 275, 1865; female.

This and the rest of the species form a group most closely related to the genotype, *fornicator* (Fabricius). They are characterized by receding temples; large convergent eyes; long, weakly divided clypeus; moderately long, usually somewhat concave malar space; long mandibles, only slightly narrowing apically; long slender antennae with from 50 to 60 joints, apically somewhat attenuate in female; evenly, rather densely punctate thorax; usually more or less distinctly impressed notauli; strongly convex, immargined scutellum; rugose propodeum with the rugosity coarser and somewhat elevated medially and with longitudinal and apical carinae more or less indicated; long, rather stout hind legs with femora fully three-fourths as long

as tibiae and inner calcarium fully half as long as basitarsus; simple claws; strongly curved apical abscissa of radius; large obliquely rhomboidal areolet; very strongly curved or subangulate second recurrent; rather long second discoidal cell; smooth, polished, apically compressed abdomen with first tergite at least twice as long as broad at apex; ovipositor short, straight, with sheath not or barely half as long as first tergite; entirely black body, this color including at least the coxae and trochanters and sometimes the entire legs; and more or less distinctly infumate wings.

The present species is distinct from all the others in its bright yellow, apically infumate wings.

Female.—Length 15 mm, antennae 13 mm.

Head slightly more than twice as broad as thick; occiput rather deeply concave; temples weakly convex, sharply receding, finely sparsely punctate; frons densely punctate, mat, with a median welt between antennal foramina; face densely and medially confluent punctate, medially longitudinally elevated and with a deep impression on each side below antenna, distinctly less than twice as broad as long; clypeus more than three-fourths as long as broad, divided slightly before middle, weakly by elevation and distinctly by sculpture, apical margin sharply rounded; cheeks in front view slightly concave, their extended angle sharply acute; malar space three-fourths basal width of mandible; mandible twice as long as broad at base, little narrowed toward apex; eyes slightly longer than dorsal width of face, distinctly convergent; antenna 58- to 60-jointed, slightly attenuate at apex, first joint of flagellum barely twice as long as second, joints just beyond middle about as thick as long.

Thorax densely punctate, least densely so and strongly shining on mesopleurum and scutellum; notauli shallow but distinct; propodeum finely reticulate rugose, with more or less distinct lateral median traces of apical carina, and with lateral and pleural carinae indicated; spiracles elongate, situated well above pleural carinae.

Legs rather stout, hind femur barely six times as long as thick, three-fourths as long as tibia; inner hind calcarium distinctly more than half as long as basitarsus, apical joint of hind tarsus nearly as long as third joint.

Wings: Apical abscissa of radius a half longer than basal abscissa, strongly curved at base; areolet oblique rhomboidal, apical angle acute, second recurrent slightly before middle; basal abscissa of subdiscoideus hardly a half longer than second recurrent, the latter strongly curved above; nervulus slightly postfurcal; abscissula twice as long as intercubitella.

Abdomen polished, with only sides of petiole punctate, compressed at apex; first tergite twice as long as broad at apex, second longer than broad at base; ovipositor sheath less than half as long as first tergite.

Body, antennae, and legs black; front femur at apex and tibia throughout anteriorly yellowish, tarsi brownish apically; wings bright yellow, apically infumate, venation yellowish ferruginous.

Type locality.—Colorado.

Type.—Acad. Nat. Sci. Philadelphia no. 1608.

Paratype.—U.S.N.M. no. 44732.

Remarks.—In addition to the type series I have seen one female from Poudre River Canyon, Fort Collins, Colo., 6,000 feet, June 20, 1929, Klotz, collector; one from Pollock, Idaho, July 1, 1907, J. M. Aldrich, and one from Meadow Valley, Mexico, C. H. T. Townsend. The above description is based on the three specimens listed above and the National Museum paratype.

51. EXETASTES ANTHRACINUS, new species

Female.—Length 16 mm, antennae 12 mm.

Head more than twice as broad as thick; occiput rather deeply concave; temples weakly convex and receding at about 45°, sparsely punctate; frons more densely punctate, especially at sides, scrobes separated by a triangular elevation; face densely punctate, confluent so in middle, with a deep impression on each side above; nearly twice as long as broad; clypeus two-thirds as long as broad, base rather strongly convex and densely punctate; cheeks in front view weakly concave; malar space two-thirds basal width of mandible; mandible twice as long as broad at base; eyes very weakly convergent below, slightly longer than dorsal width of face; diameter of lateral ocellus slightly more than half postocellar line; antenna 60-jointed, first joint of flagellum fully twice as long as second, joints beyond middle as thick as long, apex attenuate.

Thorax dorsally densely, laterally more coarsely and sparsely, punctate; notauli very faintly indicated on disk; scutellum narrow, strongly convex, densely punctate; mesopleurum shining; more coarsely punctate, the punctures about their diameter apart; metapleurum somewhat more densely punctate; propodeum irregularly rugose, longitudinal and apical carinae indicated.

Legs slender; hind femur three-fourths as long as tibia; inner calcarium slightly more than half as long as basitarsus; apical joint of hind tarsus as long as third.

Wings: Apical abscissa of radius strongly curved at base, less than twice as long as basal abscissa; areolet oblique rhomboidal, recurrent in middle; recurrent strongly curved and subangulate above; abscissula twice as long as intercubittella.

Abdomen polished, strongly compressed at apex; first tergite fully twice as long as broad at apex, punctate laterally at base; second nearly a half longer than broad at base; ovipositor straight, sheath hardly as long as first tergite.

Black; legs black throughout except that front legs are pale anteriorly and all tarsi are brown apically; wings deeply, uniformly infumate.

Male.—Except for slightly larger ocelli, shorter malar space, and less attenuate antennae with three or four fewer joints, differing only sexually.

Type locality.—Nantucket, Mass.

Type.—U.S.N.M. no. 51827.

Paratypes.—Boston Society of Natural History.

Remarks.—Two of each sex, the holotype female captured July 16, 1926, and the allotype and the male paratype June 23, 1926, by C. W. Johnson, and the female paratype July 12 by A. P. Morse. All are from the type locality.

52. EXETASTES GEMINUS, new species

This species is extremely closely allied to *anthracinus*, perhaps only a southern race of that species, but the nine specimens at hand differ constantly by the key characters, though in practically every other respect they are like *anthracinus*.

Type locality.—Swannanoa, N. C.

Type.—U.S.N.M. no. 51828.

Paratypes.—Kansas University; Emory University, Atlanta, Ga.

Remarks.—Nine females; the holotype taken September 23, 1924, by T. B. Mitchell; paratypes, Atlanta, Ga., September 4, 1932, September 23, 1934, and October 2, 1932, P. W. Fattig; Wrens, Ga., August 22, 1930, R. H. Beamer; Venus (1,100 feet), Greenville County, S. C., September 22, 1934, H. K. Townes; three specimens, Batesburg, S. C., August 24, 1930, J. Nottingham.

53. EXETASTES PERSIMILIS, new species

PLATE 19, FIGURE 73

Like *geminus* this is perhaps only a geographical race of *anthracinus*, but the temples are distinctly more strongly convex and less strongly receding, forming with the longitudinal axis an angle of distinctly less than 45° ; the ocelli are larger, in diameter much more than half postocellar line; the malar space is fully three-fourths basal width of mandible; the punctation of the thorax is distinctly finer and denser; and the front and middle legs are reddish piceous rather than black, with the front legs in female paler reddish in front rather than yellowish, though distinctly pale in male.

The male differs from the female as does the male of *anthracinus* from its female.

Type locality.—Boulder, Colo.

Type.—U.S.N.M. no. 51829.

Paratypes.—Cornell University; University of Arizona.

Remarks.—Eight females and two males; the holotype female and another female taken at the type locality by S. A. Rohwer on August 28, 1902, and August 25, respectively; two females from the C. F. Baker collection, Colorado; the allotype male, Wind Cave, S. Dak., July 15, 1924; one female, Jemez Springs, N. Mex., 6,400 feet, September 4, 1916, John Woodgate; one male, South Fork, Eagle Creek, White Mountains, N. Mex., 8,000 feet, August 16, C. H. T. Townsend; and two females, White Mountains, Ariz., July 28, 1926, R. B. Streets.

The New Mexico and Arizona specimens are somewhat smaller than those from Colorado but appear not to differ otherwise.

54. EXETASTES SUAVEOLENS Walsh

PLATE 16, FIGURE 7; PLATE 17, FIGURE 35; PLATE 18, FIGURES 49, 66; PLATE 20, FIGURES 88, 100; PLATE 21, FIGURE 109

Exetastes suaveolens WALSH, Trans. Acad. Sci. St. Louis, vol. 3, p. 146, 1873; female, male.—PROVANCHER, Nat. Can., vol. 11, p. 212, 1879; Petite faune entomologique du Canada . . . , vol. 2, Hymén., p. 384, 1883.—DALLA TORRE, Catalogus hymenopterorum, vol. 3, pt. 1, p. 74, 1901.—VIERECK, in Smith, Insects of New Jersey, p. 618, 1910; Hymenoptera of Connecticut, p. 274, (1916) 1917.—GAHAN, Proc. U. S. Nat. Mus., vol. 55, p. 114, 1919.—CUSHMAN, Proc. U. S. Nat. Mus., vol. 64, art. 20, p. 43, 1924; in Leonard, Insects of New York, p. 932, 1928—JOHNSON, Biological survey of the Mount Desert (Maine) region, Insects, p. 132, 1927.

Paniscus quebecensis PROVANCHER, Nat. Can., vol. 6, p. 106, 1874.

Exetastes? *niger* DAVIS, Proc. Acad. Nat. Sci. Philadelphia, vol. 21, p. 188, 1894 (preoccupied by *niger* Cresson). New synonymy.

Exetastes provancheri DALLA TORRE, Catalogus hymenopterorum, vol. 3, pt. 1, p. 73, 1901. New synonymy.

Campoplex niger GAHAN and ROHWER (not Provancher), Can. Ent., vol. 49, p. 335, 1917.

Provancher himself synonymized his *Paniscus quebecensis* with *suaveolens*, and A. B. Gahan's note (in MS.) says "not in Public Museum, Quebec, unless under *Exetastes suaveolens* Walsh. All specimens under this name are the same species."

The name *Exetastes provancheri* Dalla Torre was proposed and comes into the synonymy of *suaveolens* because of the obvious mislabeling of a specimen in the Provancher collection. In his study of the Provancher types Davis found a specimen labeled "*Campoplex niger* Prov." and in his report doubtfully referred this specimen to *Exetastes*. Dalla Torre, finding the name *niger* preoccupied in *Exetastes*, proposed the name *provancheri* and placed *Campoplex niger* Provancher in the synonymy. When A. B. Gahan was studying the Provancher types he evidently found the same specimen that Davis had seen, for he compared with it a specimen of *suaveolens* and pronounced them identical; and Gahan and Rohwer designated the Provancher specimen as lectotype of *Campoplex niger* Provancher. That this specimen can not be the type of *Campoplex niger* is at once

evident when *suaveolens* is compared with the description of *niger*, for it disagrees in almost every particular. In a subsequent reference to *Campoplex niger*, Provancher³ himself expressed the opinion that it is nothing more than a variety of "*Limneria genuina* Say" (undoubtedly *Casinaria genuina* [Norton]), and still later he⁴ actually synonymized it with *genuina*. His type specimen without the original name label is probably among those placed by him under *genuina*. The last-named species agrees entirely with the description of *Campoplex niger*, and the synonymy is doubtlessly correct.

It is obvious, then, that the lectotype designated by Gahan and Rohwer can not serve in that capacity; that *Campoplex niger* Provancher is not synonymous with *Exetastes suaveolens*; that *Exetastes? niger* Davis (not Cresson) and *Exetastes provancheri* Dalla Torre and the lectotype of *Campoplex niger* Provancher must go into synonymy with *suaveolens*; and that therefore *Exetastes provancheri* Dalla Torre can not be accepted as a new name for *Campoplex niger* Provancher, a synonym of *Casinaria genuina* (Norton).

Recognizable immediately by its pale yellow tibiae and tarsi contrasting with the black body and otherwise black legs.

Female.—Very similar in size and structure to *anthracinus* as described above, except that the malar space is fully three-fourths basal width of mandible, the ocelli much more than half postocellar line in diameter, antenna with four or five fewer joints, punctuation of thorax somewhat finer and denser, notauli more distinctly impressed, hind femur very slender, inner calcarium much more than half basitarsus, and apical tarsal joint much shorter than third.

Black with all tibiae and tarsi and front and middle femora apically yellow; wings dilutely infumate, paler at base; ovipositor sheath black at base, brown at apex.

Male.—Differs from female in the usual way, larger ocelli, shorter malar space, and less attenuate antennae, and also in having the front and middle femora more extensively yellow and the wings usually paler.

Type locality.—Of *suaveolens*, Illinois (?); of *quebecensis*, Quebec.

Type.—Of *suaveolens*, destroyed; of *quebecensis*, Public Museum, Quebec.

Remarks.—Within its range in the Northeastern States and southeastern Canada this is one of the commonest species of the genus. Among about 75 specimens before me the following States and Provinces are represented: New Brunswick, Quebec, Ontario, Manitoba, Maine, New Hampshire, Massachusetts, New York, Michigan, Ohio, Pennsylvania, Maryland, and Virginia. Included in this series are specimens in the Canadian National Collection, American Museum of

³ Petite faune entomologique du Canada . . . , vol. 2. Hymén., p. 786, 1883.

⁴ Additions et corrections au volume II de la Faune entomologique du Canada . . . , Index, 1889.

Natural History, Boston Society of Natural History, Cornell University, California Academy of Sciences, and the collections of H. K. Townes and A. R. Park, Jr.

It is on the wing late in July and in August and, especially in the southern part of its range, as late as the middle of September.

Despite its abundance, only one rearing record is available; a male was reared in September 1892 from a larva of *Cucullia asteroides* Guenée at Canobie Lake, N. H., by George Dimmock.

55. EXETASTES NERVULUS (Say)

The first to recognize this species as an *Exetastes* were Cushman and Gahan.⁵ The specimens then identified by them as *nervulus* are here treated as a new variety.

Structurally similar to *suaveolens*, but with the ocelli slightly smaller, the notauli virtually effaced, and the legs, notably the hind femur, somewhat stouter. Distinguishable also by the black hind tibia and the entire absence of black on the front and middle femora.

Except for the slightly larger size of the typical *nervulus*, I have been unable to find any structural characters to distinguish from it *niger* Cresson, *rufofemoratus* Provancher, and *exploratus* Davis. However, the differences in the color of the hind femora and tarsi are too sharp to be ignored, even though bridged by the new variety *intermedius* and by variation within the varietal limits, and I recognize them as color varieties.

The black hind femur of the typical form is approached in the new variety, and the dark wings in *niger* and *exploratus*; in *rufofemoratus* the hind femur is sometimes considerably infusate at apex and on the other side this variety sometimes approaches *exploratus* in the color of the hind basitarsus; while *exploratus* is intermediate in tarsal color between *rufofemoratus* and *niger*, the apical tarsal joints in the last named being sometimes yellowish.

The varieties *nervulus*, *intermedius*, and *rufofemoratus* are north-eastern in distribution, while *exploratus* represents the westward extension of the species and *niger* the southwestern extension, the species through its varieties ranging from Nova Scotia to British Columbia and New Mexico and the typical form as far south as North Carolina.

The varieties may be distinguished by the following key:

KEY TO VARIETIES OF EXETASTES NERVULUS (Say)

- | | |
|--|----------------------------------|
| 1. Hind femur black or uniformly more or less deeply piceous..... | 2 |
| Hind femur ferruginous, sometimes more or less infusate at apex..... | 3 |
| 2. Wings deeply infumate; hind femur black; 15 mm..... | nervulus (Say) |
| Wings dilutely infumate; hind femur piceous; less than 15 mm. | |
| | intermedius , new variety |

⁵ Proc. Ent. Soc. Washington, vol. 23, p. 159, 1921.

3. Hind basitarsus yellow, at most slightly infusate basally; wings dilutely infumate..... **rufofemoratus** Provancher
Hind basitarsus largely or entirely black; wings, at least in female, rather deeply infumate..... 4
4. Hind tarsus with only the basal joint black..... **exploratus** Davis
Hind tarsus largely or entirely black, at most reddish or yellowish apically..... **niger** Cresson

EXETASTES NERVULUS var. NERVULUS (Say)

Banchus nervulus SAY, Boston Journ. Nat. Hist., vol. 1, p. 246, 1836; in LECONTE, The complete writings of Thomas Say on the entomology of North America, vol. 2, p. 700, 1859.

Distinguishable from the other varieties by the combination of larger size, dark wings, black hind femur, and entirely yellow hind tarsus.

Type locality.—Indiana.

Type.—Lost.

Remarks.—This form is represented in the material before me by the following specimens: One female, Wallingford, Conn., August 13, 1922, B. A. Porter; one male, Flushing, N. Y.; one male, White Plains, N. Y., August 20, 1921; one female, Troy, N. Y., September 1, 1934, H. K. Townes (in collection of H. K. Townes); one female, Garrett Rock, N. J., September 7, 1927, F. M. Schott; and one male, Pineola, N. C., June 15, 1934, D. L. Ray.

EXETASTES NERVULUS INTERMEDIUS, new variety

Exetastes nervulus (Say) CUSHMAN and GAHAN, Proc. Ent. Soc. Washington, vol. 23, p. 159, 1921.

Female and male.—Very similar to the typical variety but distinguishable by smaller size, paler wings and piceous rather than black hind femur, the last sometimes approaching brownish red.

Type locality.—Southwest Harbor, Mount Desert, Maine.

Type.—U.S.N.M. no. 51830.

Paratypes.—Boston Society of Natural History, American Museum of Natural History, Cornell University, and the collection of the State entomologist at New Haven, Conn.

Remarks.—The following specimens: Two females and one male from Mount Desert Island, Maine (Southwest Harbor, July 15, 1918 [type], Bar Harbor, July 3, 1922, and Eagle Lake, July 18, 1919, C. W. Johnson); two males, Princeton, Maine, July 12, 1909, C. W. Johnson; one female, Montreal, Quebec, July 1; one female, Gravenhorst, Muskoka District, Ontario, July 20, 1918; one female, Waubanic, Ontario, July 2, 1915, H. S. Parish; one female, Laurel Lake, near Jacksonville, Vt., July 13, 1934, Harry D. Pratt; one female, Savoy, Mass., July 16, 1909, W. E. Britton; one female, one male, Great Barrington, Mass., June 16, 1915, C. W. Johnson; one female, Bashbish Falls, Mass., June 28, 1912; one female, Canaan, Conn., June

24, 1929; one male, Salisbury, Conn., July 10, 1926, W. E. Britton; one female, Keene Valley, Essex County, N. Y., August 3, 1918, H. Notman; and one male, Newcomb, N. Y., July 5, 1918.

***EXETASTES NERVULUS* var. *RUFOFEMORATUS* Provancher, new combination**

Exetastes rufofemoratus PROVANCHER, Nat. Can., vol. 9, p. 212, 1877; vol. 11, p. 210, 1879; Petite faune entomologique du Canada . . . , vol. 2, Hymén., p. 384, 1883, female.—JOHNSON, Biological survey of the Mount Desert (Maine) region, pt. 1, Insects, p. 132, 1927.

Female and male.—Like variety *intermedius* except that the hind femur is bright ferruginous, sometimes more or less infusate at apex. In some specimens this variety varies toward the variety *exploratus* in that the hind basitarsus is slightly infusate at base.

Type locality.—Quebec?

Type.—Public Museum, Quebec.

Remarks.—Like *intermedius* this is a northeastern form, specimens before me having been collected in the following States and Provinces: Nova Scotia, New Brunswick, Quebec, Ontario, Maine, Vermont, Massachusetts, New York, and Illinois. Included are specimens in the Canadian National Collection, Boston Society of Natural History, American Museum of Natural History, Cornell University, and the collection of the State entomologist at New Haven, Conn.

It is in flight from about the middle of June to the middle of August.

***EXETASTES NERVULUS* var. *EXPLORATUS* Davis, new combination**

Exetastes exploratus DAVIS, Trans. Amer. Ent. Soc., vol. 24, p. 365, 1897; female, male.

Female and male.—Intermediate between the varieties *rufofemoratus* and *niger*. From the former it differs in the somewhat darker wings and the largely black hind basitarsus; and from the latter in the yellow hind tarsus with only the basitarsus black.

Type locality.—South Dakota.

Type.—Acad. Nat. Sci. Philadelphia no. 177.

Remarks.—Originally described from South Dakota and Michigan, this form is represented also by specimens from New Hampshire, Illinois, Wisconsin, North Dakota, and British Columbia. All specimens before me were captured during June, July, and August. The series includes specimens in the Canadian National Collection, American Museum of Natural History, Boston Society of Natural History, Emory University, and the collection of Andrew R. Park, Jr.

***EXETASTES NERVULUS* var. *NIGER* Cresson, new combination**

Exetastes niger CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 275, 1865; female, male.—DALLA TORRE, Catalogus hymenopterorum . . . , vol. 3, pt. 1, p. 73, 1901; male.

Arenetra rufipes DALLA TORRE, Catalogus hymenopterorum . . . , vol. 3, pt. 1, p. 513, 1901; female (part).

It is pointed out elsewhere in this paper that Dalla Torre, through misinterpretation of a statement by Provancher, erred in synonymizing the female of this form with *Arenatra rufipes* Cresson.

Female and male.—Differs from the variety *exploratus* only in having the wings somewhat darker and the hind tarsus entirely black or at most with the apical joints pale.

Type locality.—Colorado.

Type.—Acad. Nat. Sci. Philadelphia no. 1607.

Remarks.—Before me are specimens from Alberta, North Dakota, Wyoming, Colorado, and New Mexico, the last from an altitude of 8,000–8,200 feet in the White Mountains. All were captured during July and August. Included are specimens in the Canadian National Collection, Emory University, the American Museum of Natural History, and the collection of Andrew R. Park, Jr.

SPECIES NOT SEEN AND NOT INCLUDED IN KEY

EXETASTES CAUDATUS (Provancher)

Banchus caudatus PROVANCHER, Additions et corrections au volume II de la Faune entomologique du Canada . . . , p. 121, 1886; female.

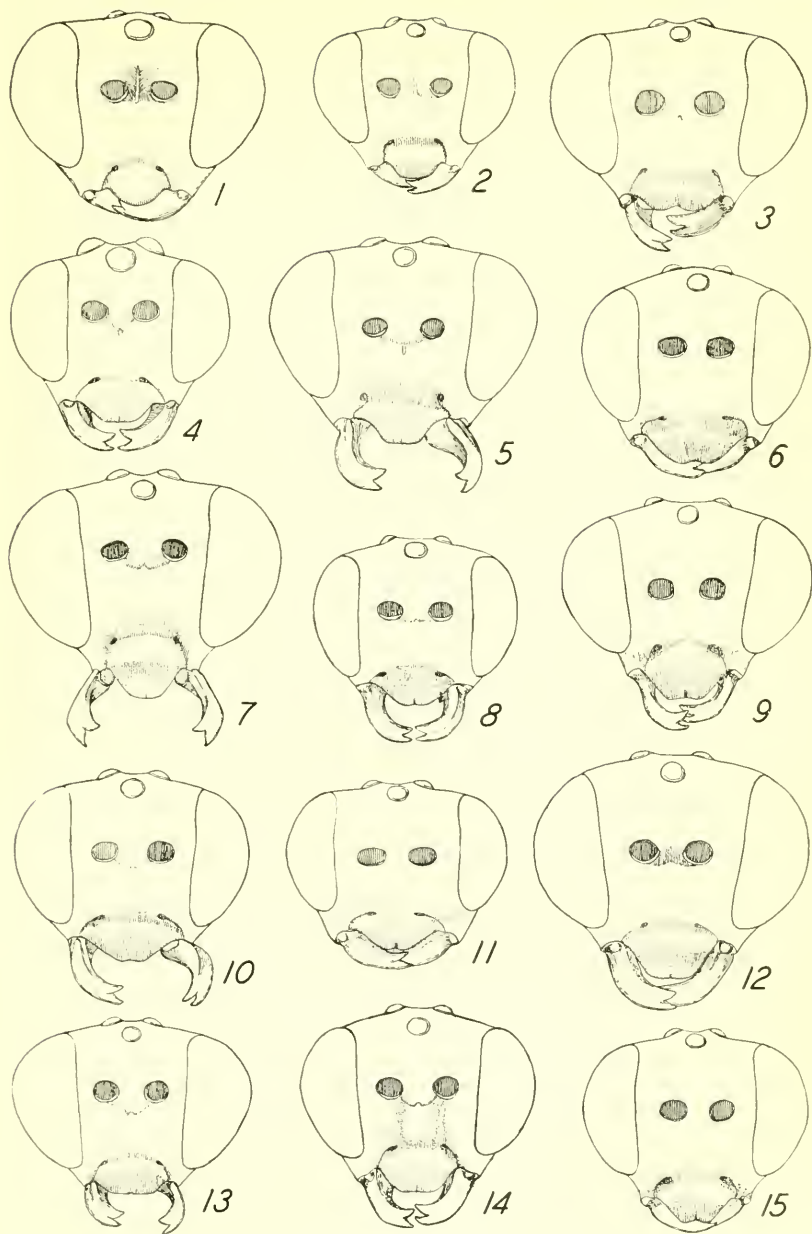
Exetastes caudatus (Provancher) DAVIS, Proc. Acad. Nat. Sci. Philadelphia, vol. 21, p. 189, 1894.

The type of this species had been examined by both A. B. Gahan and C. F. W. Muesebeck. Their notes together with the original description suggest that the species is probably allied to *scutellaris* Cresson. Both Gahan and Muesebeck noted the broad temples characteristic of the *scutellaris* group. Within this group the short malar space, as noted by Muesebeck, and the length of the ovipositor and the hyaline wings recorded by Provancher throw it closest to *scutellaris*.

Type locality.—Anaheim, Calif.

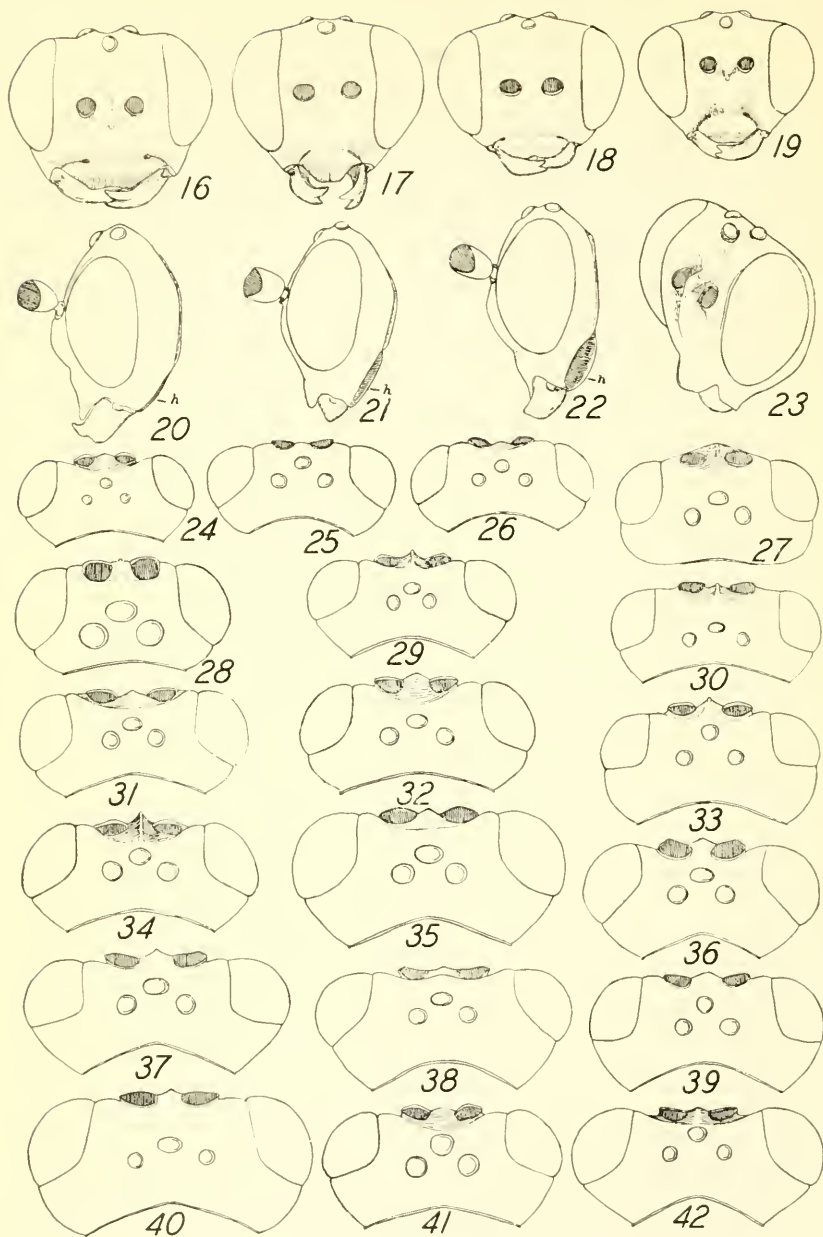
Type.—Public Museum, Quebec.

I have not seen the type nor have I been able to identify the species.



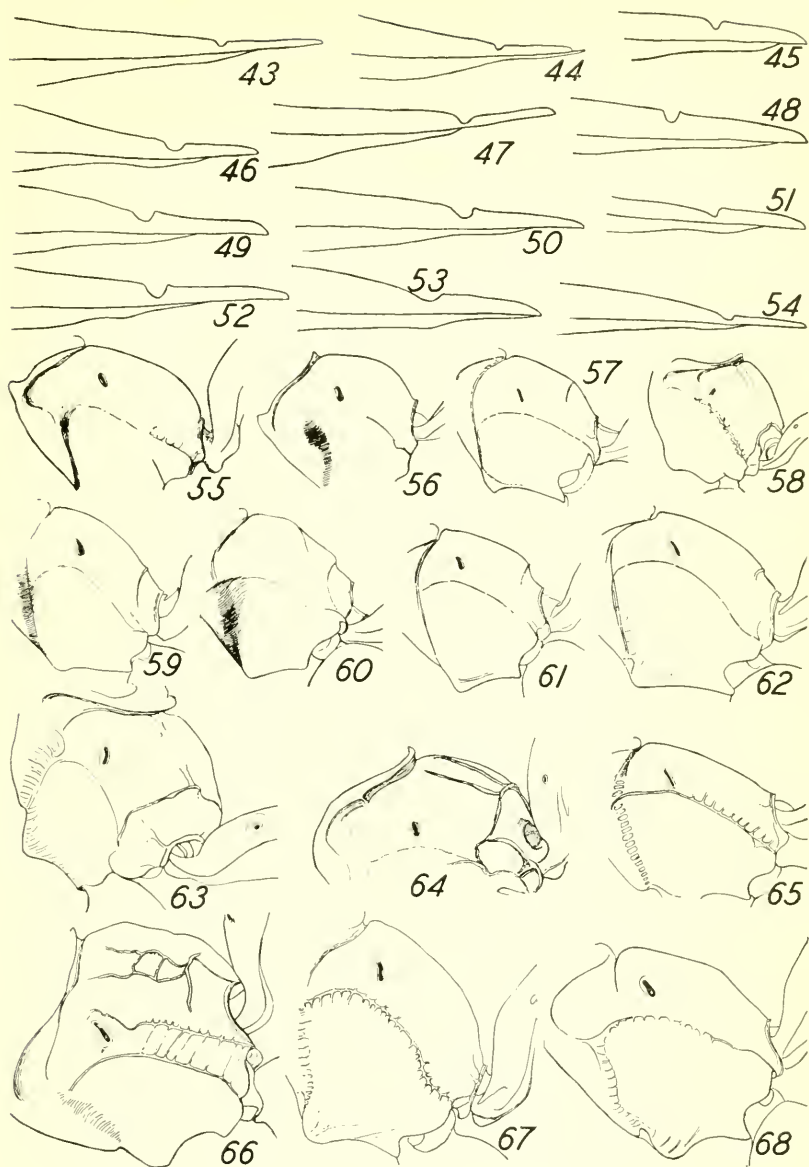
HEADS OF EXETASTES.

- 1, *carinatifrons*; 2, *septum*; 3, *rugosus*; 4, *flavus*; 5, *bituminosus*; 6, *ignicipennis*; 7, *suarcollens*; 8, *propinquus*; 9, *matricus*; 10, *affinis*; 11, *bifenestratus*; 12, *zelotypus*; 13, *ornatus*; 14, *dilutipes*; 15, *angustoralis*.



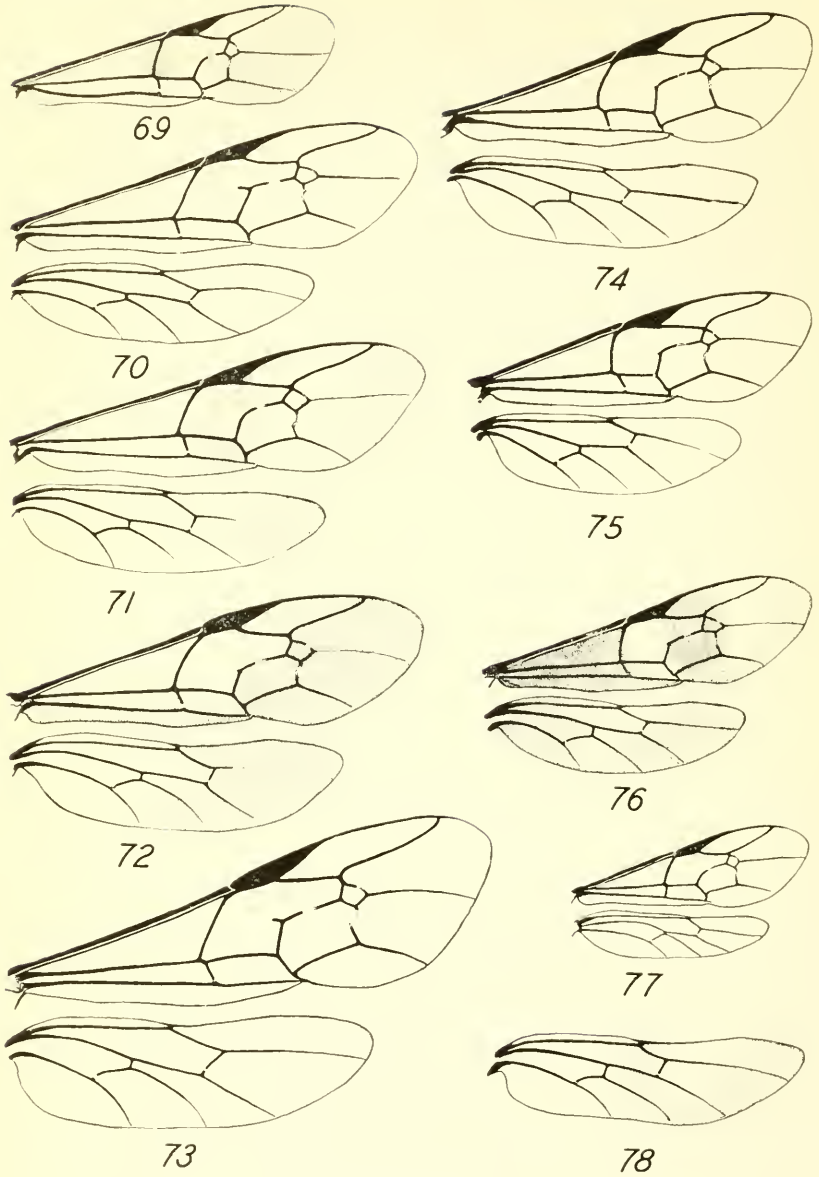
HEADS OF EXETASTES.

- 16, *lasius*; 17, *ruficorialis*; 18, *illinoiensis*; 19, *bioculatus*; 20, *dilutipes* (h=hypostomal carina); 21, *abdominalis*; 22, *matricus*; 23, *carinalifrons*; 24, *bioculatus*; 25, *ruficorialis*; 26, *illinoiensis*; 27, *propinquus*; 28, *flavus*; 29, *septum*; 30, *lasius*; 31, *angustioralis*; 32, *bifenestratus*; 33, *igneipennis*; 34, *carinalifrons*; 35, *suaveolens*; 36, *ornatus*; 37, *bituminosus*; 38, *rugosus*; 39, *dilutipes*; 40, *zeilotypus*; 41, *affinis*; 42, *matricus*.



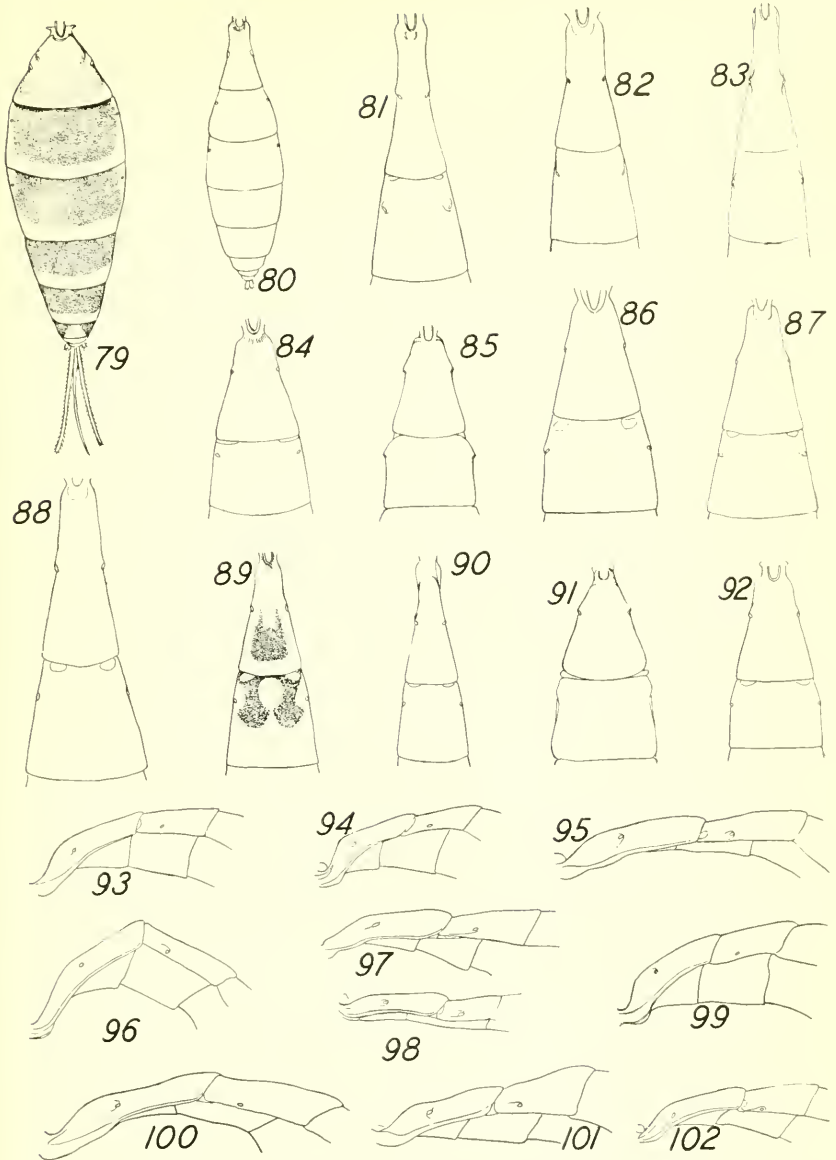
OVIPOSITORS AND PROPODEA OF EXETASTES

43, *bituminosus*; 44, *obscurus*; 45, *ornatus*; 46, *angustoralis*; 47, *pectinatus*; 48, *propinquus*; 49, *suaveolens*; 50, *zelotypus*; 51, *septum*; 52, *rugosus*; 53, *carinatifrons*; 54, *ruficoxalis*; 55, *ridens*; 56, *lasius*; 57, *propinquus*; 58, *bioculatus*; 59, *flavus*; 60, *ignicipennis*; 61, *bifenestratus*; 62, *affinis*; 63, *matricus*; 64, *carinatifrons*; 65, *rugosus*; 66, *suaveolens*; 67, *bituminosus*; 68, *zelotypus*.



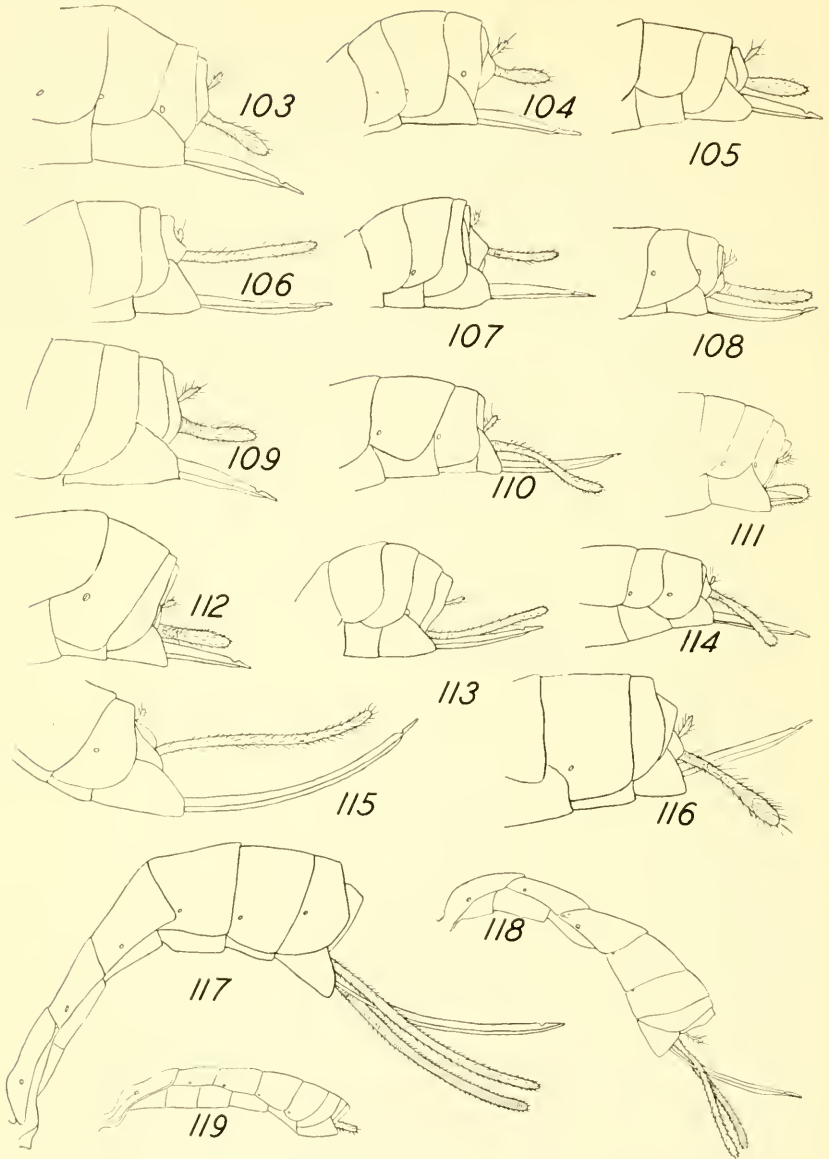
WINGS OF EXETASTES.

69, *septum*; 70, *crassisculptus*; 71, *angustoralis*; 72, *igneipennis*; 73, *persimilis*; 74, *rudens*; 75, *lasius*; 76, *bifemestratus*; 77, *bioculatus*; 78, *carinatifrons*.



ABDOMENS OF EXETASTES.

79, *lasius*; 80, *bioculatus*; 81, *rugosus*; 82, *dilutipes*; 83, *ornatus*; 84, *bifenestratus*; 85, *septum*; 86, *ignicipennis*; 87, *angustoralis*; 88, *suaveolens*; 89, *flavus*; 90, *ruficaxalis*; 91, *ridens*; 92, *propinquus*; 93, *angustoralis*; 94, *bifenestratus*; 95, *rugosus*; 96, *ornatus*; 97, *dilutipes*; 98, *propinquus*; 99, *septum*; 100, *suaveolens*; 101, *ignicipennis*; 102, *ruficaxalis*. (79 and 80 entire; 81-92, base in dorsal view; 93-102, base in lateral view.)



ABDOMENS OF EXETASTES.

103, *persimilis*; 104, *rugosus*; 105, *ornatus*; 106, *dilutipes*; 107, *propinquus*; 108, *angustoralis*; 109, *suaveolens*; 110, *obscurus*; 111, *carinatifrons*; 112, *zelotypus*; 113, *septum*; 114, *ruficervalis*; 115, *pectinatus*; 116, *bituminosus*; 117, *ridens*; 118, *lasius*; 119, *bioculatus*. (Lateral views: 103-116, apices; 117-119, entire.)