



SMITHSONIAN INSTITUTION
U. S. NATIONAL MUSEUM

Vol. 96

Washington: 1945

No. 3193

THE ICHNEUMON-FLIES OF THE GENUS *CRYPTANURA*
BRULLÉ, MAINLY TROPICAL AMERICAN

By R. A. CUSHMAN

BECAUSE of Brullé's mistaken idea that the specimens on which he based the genus *Cryptanura* were females with concealed ovipositors, this genus of ichneumon-flies was misunderstood until Roman (1910) identified it as the male of *Polyaenus* Cresson and synonymized the latter genus with *Cryptanura*.

The genus dates from 1845, when the figure of *Cryptanura nigripes* Brullé was published in the atlas of Lepeletier's "Histoire Naturelle des Insectes," although the description did not appear until the following year. It is therefore a monobasic genus with *nigripes* Brullé as genotype. On this basis, and assuming that *nigripes* and *striata* Brullé are not congeneric, Viereck took exception to Roman's synonymizing of *Polyaenus* Cresson with *Cryptanura*. Viereck's statement that these two species are not congeneric must have been based on the fact that Brullé does not state definitely that *nigripes* has the two small frontal horns characteristic of *striata*; but by inference he certainly does ascribe this character to *nigripes*, for in the description of all the species that follow *striata* he mentions only the characters by which they differ from it and from one another.

Cresson and Cameron were in error in their interpretations of the genus, the species assigned to it by those authors being properly referred to such genera as *Trapezonalis* Szépligeti, *Glodianus* Cameron, *Photocryptus* Viereck, and probably other genera. Roman and Brues appear to be the only ones who have interpreted the genus correctly.

Cryptanura is a large genus apparently confined in its distribution to the Western Hemisphere and there very largely to the tropical region, only two species being known to occur north of the Mexican border.

Three species from the Old World Tropics have been referred to *Polyaenus*: *cingulatus* Tosquinet from New Guinea, *spiniferus* Cameron from Borneo, and *striatus* Szépligetii from Formosa, but none appears to be properly referable to the genus. This is certainly true of *cingulatus* and *spiniferus*, for I have been able to identify the latter definitely and the former without much question in the Baker collection. These species represent an apparently hitherto undescribed genus. It is described in an addendum to this paper.

I have been unable to identify *striatus* Szépligetii, but its smooth and polished mesoscutum, longitudinally impressed propodeum with the apophyses apparently represented only by carinae, and elongate postpetiole would seem to exclude it from *Cryptanura*. Aside from the new genus mentioned above, to which *striatus* obviously does not belong, only one other Oriental genus is known to me that has two frontal horns. This is *Ceratocryptus* Cameron, in which *striatus* appears to be equally out of place.

SPECIES WRONGLY REFERRED TO CRYPTANURA

The following species described in *Cryptanura* by Cresson and Cameron do not belong to the genus. Unfortunately, most of them are unknown to me. The apparently proper status of the few that I have been able to place is indicated.

(*Cryptanura acolhua* Cresson) = *Glodianus acolhua* (Cresson), new combination.

C. albispina Cameron.

C. cinctipes Cameron.

C. curtispina Cameron.

C. delecta Cresson.

C. fasciatipennis Cameron.

C. incauta Cameron.

C. interrupta Cameron.

C. laticarinata Cameron.

C. ornatipennis Cameron.

(*C. pachymene* Cresson) = *Photocryptus pachymene* (Cresson).

C. pedicata Cameron.

(*C. sumichrasti* Cresson) = *Trapczonalis sumichrasti* (Cresson), new combination.

Genus CRYPTANURA Brullé

Cryptanura BRULLÉ, Histoire naturelle des insectes: Hymenoptera, Atlas. pl. 41, fig. 6, 1845; vol. 4, p. 242, 1846.—ROMAN, Ent. Tidsskr., 1910, p. 154.—BRUES, Ann. Ent. Soc. Amer., vol. 5, p. 200, 1912.—TOWNES, Mem. Amer. Ent. Soc. No. 11, pt. 1, p. 288, 1944.

Polyaenus CRESSON, Proc. Acad. Nat. Sci. Philadelphia, 1873, p. 149.—CAMERON, Biologia Centrali-Americana, Hymenoptera, vol. 1, p. 244, 1886; Journ. Roy. Agr. Comm. Soc. British Guiana, ser. 3, vol. 1, p. 166, 1911.—SCHMIEDEKNECHT, Genera Insectorum, fasc. 75, p. 67, 1908.—SZÉPLIGETI, Ann. Mus. Nat. Hungarici, vol. 14, p. 264, 1916.—CUSHMAN, Proc. U. S. Nat. Mus., vol. 74, art. 16, p. 38, 1929.

Polyaenidia VIERECK, Proc. U. S. Nat. Mus., vol. 46, p. 381, 1913.

Mesostenus authors, part.

Head from above transverse, the temples receding; frons with a carina medially and with two small horns, frequently arising from a common base; malar space distinct; clypeus strongly convex; eyes large and strongly convex; antenna in female frequently more or less distinctly thickened between middle and apex, the thickened portion flattened below. Thorax stout; epomia distinct and usually extending to upper margin of pronotum, where they form carinate or conical projections; notaulices deep and complete; scutellum small, usually convex, rarely subconical or flattened; propodeum with basal carina complete, apical carina usually represented only by two prominent apophyses, sometimes, especially in male, distinct and with apophyses less developed; propodeum usually strongly rugose or transversely striate, rarely without sculpture, spiracles elongate; wings large; areolet small, complete, quadrangular, broadening toward apex, recurrent interstitial or somewhat antefurcal; nervulus antefurcal; second discoidal cell broad at base; nervellus broken near bottom and perpendicular or weakly reclivous; legs long and usually rather slender; front tibia in female rarely slightly inflated. Abdomen in female fusiform, in male small and narrow; spiracle of first segment far beyond middle; ovipositor sheath from a half to fully as long as abdomen; ovipositor subsagittate or swordlike at apex.

Head and thorax ornamented with white or yellow on a black or red ground; abdomen black and yellow or largely red; wings immaculate hyaline or dilutely infumate.

The color pattern of the head and thorax nearly throughout the genus is so similar as to constitute almost a generic character. In order to avoid much repetition a description of what may be called the normal or basic color pattern is given here. In the specific descriptions only variations from this pattern are indicated.

Ground color of head and thorax black, rarely red or partly red, with pale-yellow or whitish markings as follows: Orbital ring, broad on cheek, much narrower or interrupted on upper temple and in malar space; face, clypeus (apical margin always dark), labrum, mandible basally, palpi, annulus on antenna; propleura more or less; anterior and humeral margins of pronotum; mesoscutum either immaculate, or with a single spot on disk, or with paired lines along inner margins of lateral lobes, or with a narrow line on each lateral margin oppo-

site tegulae, or with cuneiform markings on anterior margins of lateral lobes, or with combination of two or more of these; scutellum, its subtending carinae, and posterior margin of its frenum; postscutellum and margin of its frenum; tegulae; subalar tubercles; an oblique band on mesopleuron from near anterior margin to middle coxa; a larger or smaller spot on each side of mesosternum; upper division of metapleuron and its lower division largely, the latter with the ground color showing only below; and two broad marks posteriorly on propodeum embracing the apophyses, very rarely confluent anteriorly. In the descriptions this color pattern is referred to as black (or red) with yellow or white markings and the exceptions noted.

The abdomen is either largely red or the ground color is black, typically with broad apical and lateral margins of tergites 1-7, lateral margins of tergite 8, and the petiole more or less yellow or whitish; venter white with sternites darker. In the following descriptions this color pattern is referred to merely as black, the tergites margined with yellow and the exceptions noted.

SPECIFIC CHARACTERS

For the most part *Cryptanura* is a very homogeneous group with few striking structural characters that will serve to divide it into specific groups, and it has been found necessary to depend to a considerable extent on color in the construction of the following key to species.

The form of the scutellum, the structure of the propodeum and pronotum, and the form of the ovipositor have been found useful as group characters, though the last, of necessity unisexual, does not appear to be accompanied by a companion character in the opposite sex.

A considerable number of the described species have not been available for study and have been omitted from the following key, but to assist in the identification of these species I have constructed a key to all the species, based largely on color. This will be found following the descriptions of the species examined.

KEY TO SPECIES EXAMINED

1. Scutellum strongly subconically elevated; metapleuron also with a tuberculate elevation..... 1. *tuberculata*, new species
Scutellum and metapleuron not strongly elevated..... 2
2. Apical carina of propodeum distinct medially at level of apophyses; abdomen polished and unsculptured..... 3
Apical carina usually absent, sometimes distinct in male, but then arching high above apophyses; abdomen usually distinctly, finely sculptured... 5
3. Abdomen and propodeum entirely red..... 2. *dicostata*, new species
Abdomen and propodeum black and yellow..... 4
4. Mesoscutum with yellow marginal markings, but without discal markings.. 5
Mesoscutum with paired discal markings, but without marginal markings.
5. *bicarinata*, new species

5. Mesoscutal markings in form of narrow marginal lines opposite tegulae; tergite 2 yellow at apex, the yellow band broader medially; tegulae yellow basally..... 3. *quadrimaculata*, new species
- Mesoscutal markings in form of cuneiform spots laterad of origins of notaulices; tergite 2 with a uniformly broad subapical yellow band; tegulae entirely black..... 4. *mediostrigosa*, new species
6. Humeral margin of pronotum conically prominent anteriorly; scutellum broad and transversely flat, with coarse, deep punctures; abdomen polished, without trace of sculpture; front tibia in female subinflated; hind femur stout, not or barely two-thirds as long as tibia; pale markings of propodeum extending broadly forward to basal carina..... 7
- Disagreeing with all or nearly all above characters..... 10
7. Abdomen black and yellow (or white)..... 8
- Abdomen largely or entirely red..... 9
8. Legs red, coxae marked with yellow; thorax reddish piceous and yellow.
6. *piceothorax*, new species
- Legs and thorax black and yellow..... 7. *planiscutellata*, new species
9. All coxae and front and middle femora black and yellow.
8. *politigaster*, new species
- Hind coxae and all femora red..... 9. *conica*, new species
10. Epomia not extending upward to humeral margin of pronotum, the humeral margin not at all carinate or tuberculate anteriorly; ventrolateral carina of petiole distinct to base; second tergite with a median white spot at base..... 11
- Epomia forming a carinate elevation on humeral margin of pronotum; ventrolateral carina not distinct to base; second tergite without a median white spot..... 12
11. Head and thorax red and yellow; antenna without white annulus; abdomen polished..... 10. *ruficeps*, new species
- Head and thorax black and yellow; antenna with white annulus; abdomen beyond first tergite opaque shagreened, second and third tergites also punctate..... 11. *septentrionalis*, new species
12. Mesoscutum with two yellow marks discally..... 13
- Mesoscutum with a single median spot, rarely flanked by small traces of yellow on inner margins of lateral lobes..... 16
13. Petiole and hind femur entirely black..... 12. *apophysis*, new species
- Petiole and hind femur partly yellow..... 14
14. Propodeal yellow spots not abruptly narrowed before apophyses, the latter long..... 15
- Propodeal yellow spots abruptly narrowed before apophyses, the latter short..... 15. *bilineata*, new species
15. Petiole yellow above, black below; hind femur entirely black above.
13. *mexicana* (Cresson)
- Petiole black above, yellow below; hind femur with a narrow median yellow line above..... 14. *orizabensis* (Cameron)
16. Thorax red and yellow..... 16. *rufa*, new species
- Thorax black and yellow..... 17
17. Propodeal spots each with a narrow forward extension, sometimes (male) confluent medially..... 18
- Propodeal spots either not extending forward or not abruptly narrowed before apophyses..... 22
18. Abdomen black and yellow..... 19
- Abdomen largely or entirely red..... 20

19. Front and middle femora red; hind femur red (♀) or entirely black (♂); hind coxa red (♀) or black (♂) with a yellow spot above.
 17. *spinaria* (Brullé)
 All femora black and white, hind femur white below, black above, with a narrow median white line; hind coxa white below and above, black on each side..... 18. *lineatifemur*, new species
20. Hind coxa black and white..... 19. *coxata*, new species
 Hind coxa largely or entirely red..... 21
21. Humeral margins of pronotum prominent, subtuberculate anteriorly; postpetiole red..... 20. *boliviensis*, new species
 Humeral margins of pronotum merely carinate anteriorly, not prominent; postpetiole piceous, margined with yellow..... 21. *isthmus*, new species
22. Ovipositor nearly as long as abdomen, stout, much deeper toward apex than at base, not sagittate at apex..... 23
 Ovipositor slender, its upper and lower margins parallel except at the sagittate apex, usually much shorter than abdomen..... 25
23. Abdomen red..... 22. *excalibur*, new species
 Abdomen black and white..... 24
24. Hind coxa largely and femur red..... 23. *acinaces*, new species
 Hind coxa yellow and black; femur black or piceous above, yellowish below.
 24. *propinqua* (Cresson)
25. Front and middle femora entirely red..... 25. *pretiosa* (Viereck)
 Front and middle femora piceous posteriorly..... 26
26. Hind leg very slender, femur apparently nearly 8 times as long as deep; temples in dorsal view very strongly receding and slightly concave.
 26. *gracilipes*, new species
 Hind leg stouter, femur apparently not more than 6 times as long as deep; temples flat or weakly convex or concave..... 27
27. Temple at middle of eye distinctly more than half as broad as short diameter of eye and very weakly convex..... 28
 Temple not or barely half as broad as short diameter of eye and flat or weakly concave..... 29
28. Head in side view with occipital carina very nearly parallel to posterior margin of eye; apical margin of clypeus weakly curved.
 27. *gracilis*, new species
 Occipital carina and posterior margin of eye distinctly divergent below; apical margin of clypeus perfectly straight..... 28. *genalis*, new species
29. Hind femur rather slender, at least 6 times as long as deep and more than three-fourths as long as tibia; flagellum in female much thickened beyond middle and flattened below, the joints there strongly transverse..... 30
 Hind femur rather stout, distinctly less than 6 times as long as deep and less than three-fourths as long as tibia; flagellum in female only slightly thickened and flattened beyond middle, the joints there weakly transverse..... 32
30. Occipital carina nearly parallel to posterior margin of eye; ovipositor sheath hardly as long as abdomen beyond first tergite.. 29. *variegata* (Brullé)
 Occipital carina and posterior margin of eye distinctly divergent below; ovipositor sheath nearly as long as abdomen..... 31
31. Temple at middle of eye distinctly less than half as broad as short diameter of eye; flagellum very slender at base, first joint more than 6 times as long as thick at middle..... 30. *paranensis*, new species
 Temple about half as broad as short diameter of eye; flagellum stouter, first joint not 6 times as long as thick at middle.
 31. *tenuiterebrata*, new species

32. Face entirely yellow; front and middle coxae piceous behind, yellow in front, metathorax not at all red..... 32. *incerta* (Cresson)
 Face with longitudinal impressions broadly black; front coxa largely piceous, middle coxa entirely red; metapleuron below and metasternum red..... 33. *maculifrons*, new species

I. CRYPTANURA TUBERCULATA, new species

Evidently closely allied to *scutellaris* (Szépligeti) and possibly synonymous with that species. However, it seems unlikely that Szépligeti would have failed to mention the very evident tuberculiform metapleura characteristic of the present species if his species were of similar structure.

Female.—Length 19 mm., antenna 17 mm., ovipositor sheath 8 mm.

Head in dorsal view with temples very slightly concave, occipital carina flangelike, sinuate at lower extremity; frontal horns very small; scrobes very deep; a distinct, radiately rugose impression surrounding the ocelli except behind; postocellar line hardly as long as ocellocular line, stemmaticum longitudinally rugose; eyes parallel within, faintly sinuate opposite frons; face with a median subhemispherical elevation flanked on each side by a transversely rugose impression; clypeus smooth, with scattered punctures, roundly convex with a broad reflexed margin, broadly truncate; malar space very nearly as long as basal width of mandible; antenna only slightly thickened beyond middle, 33-jointed. Thorax polished, with notaulices, margins of mesoscutum, sternaules, and groove along posterior margin of mesopleuron foveolate; scrobe of pronotum, upper anterior portion of mesopleuron, metapleuron, and sides of propodeum obliquely striate; mesopleuron below and sternum sparsely punctate; humeral margin of pronotum smooth, anteriorly tuberculate; scutellum very strongly elevated, subconical, in profile with its posterior slope deeply concave; metapleuron with a high rounded tubercle in the middle; legs very long and slender, hind femur reaching distinctly beyond apex of abdomen and fully eight times as long as deep; coxae polished and sparsely punctate. Abdomen almost exactly as long as head and thorax, rather narrow, very finely shagreened, subopaque beyond first tergite; petiole distinctly depressed; ovipositor rather stout, becoming gradually slightly deeper toward apex, where it is swordlike rather than subsagittate.

Head and thorax black with yellow maculation (see description of color pattern, p. 141), abdomen ferruginous, legs ferruginous and partly yellow and piceous; wings subhyaline, with blackish venation; orbital ring interrupted on upper temples and in malar space; facial impressions and outline of clypeus black; annulus on antenna embracing flagellar joints (5)6–12(13); two yellow lines on disk of mesoscutum; apex and anterior face of the elevated part of scutellum black; sternum yellow only along sternaules; lower division of metapleuron

with only the tubercle and its apex yellow; stripes on propodeum extending only a short distance basad of apophyses. Front coxa behind and all femora behind piceous, this color reduced on hind femur to a narrow stripe on the inner side and the apex; front legs otherwise yellowish, as are also the middle coxa, tibia, and tarsus, the hind tibia except at apex, and a stripe on inner side, which are blackish, and the hind tarsus. Ovipositor sheath black.

Type locality.—St. Laurent du Maroni, French Guiana.

Types.—A holotype and a paratype, both females, taken at the above locality by Audoit in 1862. The type is in the Paris Museum¹ and the paratype in the U. S. National Museum (No. 57080).

The paratype is a little larger than the type but is otherwise like it.

2. CRYPTANURA DICOSTATA, new species

Apparently related to *similis* (Szépligeti) and perhaps the same but having the apical carina of the propodeum more or less distinctly developed, a character not mentioned by Szépligeti.

Female.—Length 12 mm., antennae 11 mm., ovipositor sheath 4 mm.

Temples very narrow and strongly receding, flat; occipital carina neither especially prominent nor sinuate at lower extremity; vertex and frons deeply concave, ocelli distinctly below level of superior tangent of eyes, frontal horns small; face nearly flat, transversely rugulose and very minutely shagreened, subopaque; clypeus strongly convex, with very narrow reflexed margin, polished, with sparse punctures; malar space about two-thirds as long as basal width of mandible, finely opaque; head elsewhere polished; postocellar line and diameter of an ocellus about equal and much shorter than ocellular line; antenna 33-jointed, slender, only slightly thickened and flattened beyond middle. Thorax anteriorly subopaque sculptured, posteriorly polished and almost without sculpture; humeral margin of pronotum smooth, anteriorly angulate, scrobe striate; mesoscutum punctate, prescutum transversely striate on each side next to the notaulices, lobes flattened; scutellum convex, polished, with a few punctures; mesopleuron striatopunctate above, punctate below, smooth posteriorly; sternum punctate; metapleuron polished and sparsely punctate, with a few rugae posteriorly; propodeum smooth and polished, more or less roughened medially between carinae; apical carina distinct and straight between apophyses; basal carina only slightly curved medially; basal area not at all defined; legs long, hind femur about six times as long as deep and reaching slightly beyond apex of abdomen; coxae polished. Abdomen distinctly longer than head and thorax, polished, unsculptured, rather slender; first segment without trace of dorsal carinae, petiole slightly broader than deep,

¹ All specimens indicated as being in, or received from, the Paris Museum are retained in the U. S. National Museum for the duration of the war.

postpetiole barely as wide as long; second tergite as long as first and about twice as long as broad at base; ovipositor sheath shorter than abdomen beyond first segment; ovipositor slender, of even depth throughout, apex weakly subsagittate.

Head and anterior portion of thorax black with yellow markings (see description of color pattern, p. 141); thorax posteriorly, mesosternum, abdomen, and legs ferruginous; antennal annulus embracing flagellar joints (4) 5-11 (12), two narrow yellow streaks on disk of mesoscutum, scutellum yellow only in basal angles and at apex, mesopleuron yellow except the prepectus, the impression below tubercle, and an oblique streak running down from this, which are black; upper division of metapleuron yellow tinged with ferruginous; propodeum, lower section of metapleuron, and sternum, except prepectus, ferruginous; front coxae anteriorly and all tibiae and tarsi yellow; front and middle femora piceous below and behind; wings yellowish hyaline, venation dark brown; abdomen entirely ferruginous, sheath black.

Type locality.—Kamakusa, British Guiana.

Types.—Four females, the holotype and three paratypes in the U. S. National Museum (No. 57058).

The type and two paratypes were taken at the type locality by H. Lang. The third paratype is from Port-of-Spain, Trinidad.

One specimen of what is probably the male of this species was taken by W. M. Mann at Cavinass, Beni, Bolivia, during the Mulford Biological Exploration of 1921-22. It has the mesopleuron and sternum almost entirely yellowish stramineous, the antennal annulus embracing flagellar joints (5) 6-19 (20), and the apical carina of propodeum only faintly indicated medially. It is excluded from the type series.

3. CRYPTANURA QUADRIMACULATA, new species

Apparently closely allied to *ectypa* (Cresson), from the description of which it differs in its possession of yellow lateral lines on the mesoscutum. Also Cresson makes no mention of the presence, in his species, of the apical carina of the propodeum.

Female.—Length 13 mm., antennae (broken), ovipositor sheath 4.5 mm.

Temples flat, short and very sharply receding, occipital carina moderately prominent, bent abruptly inward at its lower extremity to meet the hypostomal carina far back from base of mandible; vertex and frons concave, lateral ocelli slightly below superior tangent of eyes, frontal horns very acute and arising from common base; postocellar line and diameter of an ocellus equal and distinctly shorter than ocellular line; eyes large and bulging, weakly convergent below; face and clypeus minutely shagreened, subopaque, face laterally and clypeus

sparsely punctate, face dorsally irregularly striate; clypeus strongly convex, in profile subnasute; malar space hardly two-thirds as long as basal width of mandible. Thorax rather slender, generally polished; pronotum striate in lower part of scrobe, its upper anterior margin only weakly tumid, smooth, carinately angled; mesoscutum sparsely punctate, rugose in posterior middle, prescutum more densely punctate and transversely striate anteriorly along notaulices, lobes flattened; mesopleuron largely and sternum sparsely punctate, space below tubercle more or less striate; scutellum convex, with scattered punctures; metapleuron very sparsely punctate and with a few vertical striae posteriorly; propodeum with sparse, coarse punctures basally and more or less distinctly longitudinally striate medially behind basal carina, basal area obsolete defined, basal carina bent sharply forward medially, apical carina distinct between apophyses; legs slender but hind femur less than two-thirds as long as tibia and not reaching apex of abdomen; coxae elongate, polished, and sparsely punctate, areolet narrow. Abdomen longer than head and thorax, polished, with scattered punctures on basal tergites; first tergite narrow, petiole not depressed, dorsal carinae absent, postpetiole barely as broad as long, with a median impression between spiracles; second tergite as long as first and nearly twice as long as broad at base; sheath nearly as long as abdomen beyond first tergite; ovipositor slender, of nearly uniform depth, and subsagittate at apex.

Black and yellow (see description of color pattern, p. 141); cheeks, frontal orbits, an annulus beginning on flagellar joint 6 (missing beyond joint 8) yellow; anterior margin of pronotum black except for a small spot; humeral margin entirely black; narrow lines on lateral margins of mesoscutum above tegulae, only basal angles and apex of scutellum, tegulae basally, and mesopleuron except prepectus largely yellow, the last confluent with mark on sternum, metapleuron except suture between upper and lower divisions and a dash near apex entirely yellow, large yellow spots in basal lateral areas of propodeum, apical markings of propodeum with triangular projection anteriorly, apical bands on basal tergites triangularly broadened medially; petiole yellow above, black below; venter yellow. Legs yellow, with front and middle coxae behind, hind coxa within and medially above, middle trochanter and femur behind, hind trochanter largely, and femur except a yellow streak on each side black or piceous; wings hyaline, venation blackish.

Male.—Essentially like female, the frontal horns much longer.

Type locality.—San Bernardino, Paraguay.

Types.—A female holotype, an allotype, and a female paratype in the U. S. National Museum (No. 57059). All were collected at the above locality by K. Fiebrig.

The paratype female is essentially like the type.

4. CRYPTANURA MEDIOTRIGOSA, new species

Female.—Length 14 mm., antenna 12 mm., ovipositor sheath 4.5 mm.

Differs from the above description of *quadrimaculata* principally as follows: Mesopleuron polished, with a small area of rather coarse punctures anteriorly; metapleuron rather coarsely punctate-rugose over most of its surface; propodeum polished basally, longitudinally striate medially between the transverse carinae and in petiolar area; hind femur fully two-thirds as long as tibia and fully reaching apex of abdomen; abdomen polished and entirely without sculpture; petiole depressed; postpetiole fully as broad as long, flat between spiracles.

Color pattern as in *quadrimaculata* except frontal orbit broader and extending over top of eye; antennal annulus beginning on joint 5; anterior margin of pronotum entirely black, humeral margin with a white mark at the angle; mesoscutum with cuneiform markings extending backward from origins of notaulices; tegulae entirely black; mesopleuron and sternum and metapleuron and sternum stramineous rather than yellow, this color including also most of the prepectus; propodeum dorsally yellow except for a cruciform black mark with its crossbar on the basal carina; yellow bands of abdomen subapical and of nearly uniform width; front and middle legs yellow, with femora posteriorly and apical half or more of tarsi blackish; hind leg stramineous, trochanter and femur black above.

Male.—Essentially like female.

Type locality.—Barro Colorado Island, Canal Zone.

Types.—Two females collected at the type locality by S. W. Frost, the holotype on March 10, the paratype on March 22, 1937; and one male allotype taken by A. Buseck on March 12, 1912, at Alhajuela, Canal Zone. All are in the U. S. National Museum (No. 57060).

5. CRYPTANURA BICARINATA, new species

Though related to *quadrimaculata* in its possession of the distinct apical carina and in its highly polished abdomen, this species is very distinct, especially in the minute frontal horns, stouter body, and different arrangement of color. It seems unlikely that this can be *championi* (Cameron), also from Panama, for it is apparently much stouter and has the black on the inner side of the hind femur rather than on the upper side. Moreover, Cameron does not mention the presence in his species of the apical carina of the propodeum.

Female.—Length 13 mm., antennae 12 mm., ovipositor sheath 5.5 mm.

Temples flat, narrow, sharply receding, occipital carina rather prominent, its lower extremity curving slightly to join the hypostomal carina back from the base of the mandible; vertex and frons con-

cave, ocelli slightly below superior tangent of the eyes; frontal horns obsolete, their common base distinct; eyes large, bulging, very faintly convergent below; face rather flat, with a transversely striate impression on each side of middle, the upper striae extending across middle, laterally opaque-shagreened, medially polished; clypeus polished and sparsely punctate, in profile strongly convex; malar space hardly two-thirds basal width of mandible; antennae 32-jointed, only very slightly thickened, and flattened beyond middle. Thorax rather stout, polished and sparsely punctate except as noted below; humeral margin of pronotum smooth, carinately angled anteriorly, scrobe striate below; lobes of mesoscutum rather flat, prescutum transversely striate along notaulices; scutellum weakly convex; mesopleuron anteriorly and metapleuron in lower posterior angle obliquely striate; propodeum with basal area defined, basal carina arching forward medially, apical carina distinct between the very stout, compressed apophyses, middle of propodeum both before and behind apical carina obsolete transversely rugose, and with a few coarse rugae radiating from the apical margin; legs rather stout, hind femur hardly five times as long as thick, less than two-thirds as long as tibia and barely reaching apex of abdomen; areolet rather broad, its lower side distinctly angled by the strongly antefurcal recurrent. Abdomen polished, stout, petiole distinctly depressed, postpetiole broader than long, dorsal carinae absent; second tergite shorter than first and barely a half longer than broad at base; ovipositor sheath about as long as abdomen beyond first tergite, ovipositor rather slender, of uniform depth, and weakly subsagittate at apex.

Black and yellow (see description of color pattern, p. 141); orbital rings of unusually uniform width behind eyes; annulus embracing flagellar joints (5) 6-10 (12); yellow of anterior margin of pronotum reduced to two small spots near middle; two small streaks on disk of mesoscutum; scutellum with an elongate black mark in basal middle; mesopleuron entirely yellow; yellow spots in basal lateral areas of propodeum and the apical bands extending forward nearly to basal carina; petiole yellow both above and below; broad subapical bands and lateral margins of tergites 2 and 3 yellow, the color extending inward at base of second; remaining tergites entirely and venter yellow. Front and middle legs yellow, with femora and middle trochanters piceous posteriorly; middle coxa piceous on each side above; hind coxa similarly marked but more reddish beneath; trochanter stained with piceous; femur reddish on outer side, piceous within; tibia and tarsus yellow. Wings hyaline, venation black.

Type locality.—Trinidad Río, Panama.

Type.—One specimen taken by August Busck, March 16, 1912. It is in the U. S. National Museum (No. 57061).

6. CRYPTANURA PICEOTHORAX, new species

Female.—Length 12 mm., antennae 8.5 mm., ovipositor sheath 3.5 mm.

Temples narrow, flat, and sharply receding; occipital carina prominent, especially below, where it joins the hypostomal carina not far from the base of the mandible; vertex nearly straight across except for a groove at each side of ocelli; ocelli at level of superior tangent of eyes; frons moderately concave, slightly tumid laterally, horns prominent on a common base; eyes moderately large and somewhat bulging, weakly convergent below; face with a rather deep striate impression on each side of middle, the middle roundly convex and with sparse, coarse punctures; clypeus sculptured like middle of face, strongly convex, in profile subnasute; malar space flat, nearly as long as basal width of mandible; antennae stout, slightly thickened and flattened near apex, 29-jointed. Thorax stout, generally coarsely punctate to striatorugose; pronotum with humeral margin smooth, conically produced anteriorly, scrobes coarsely striate; mesoscutum coarsely punctate, prescutum somewhat rugose, lobes rather flat; scutellum flat and coarsely punctate above, apex rather abrupt and impunctate; frena of both scutellum and postscutellum coarsely foveolate; pleura and propodeum coarsely striatorugose; sternum coarsely punctate; basal areas partly smooth; basal median area partly defined, basal carina nearly straight; legs rather stout, hind femur little more than two-thirds as long as tibia and not extending to apex of abdomen; hind coxa coarsely punctate above; areolet short. Abdomen broad, polished; petiole strongly depressed, postpetiole much broader than long, with a weak elevation on each side of middle between spiracles, but without dorsal carinae; second tergite a little shorter than first and only about a third longer than broad at base; sheath shorter than abdomen beyond first tergite; ovipositor rather thick, in profile rather slender, a little deeper near apex, the apex not at all sagittate.

Head and thorax black to reddish piceous, both with yellow markings (see description of color pattern, p. 141); annulus embracing flagellar joints (5) 6-9 (10); single spot on disk of mesoscutum; only apex of scutellum yellow; most of mesopleuron and sternum and metapleuron except suture separating its two divisions yellow; propodeal marking extending broadly forward to basal carina, but constricted before apophyses. Legs ferruginous, coxae and trochanters partly yellow. Wings hyaline, veins black, stigma brown. Abdomen black with white markings; petiole, except ventrally, white; three spots transversely arranged at base of second tergite and a broad subapical band also white; the extreme apex black.

Type locality.—Baraguá, Camagüey, Cuba.

Types.—Two females, the holotype taken at light June 4, 1932 (Christenson), the paratype at Sole, Cuba, March 2, 1925 (George Salt). Both are in the U. S. National Museum (No. 57063).

The paratype is smaller, with the sculpture less heavy and the dark color of the thorax more reddish.

7. CRYPTANURA PLANISCUTELLATA, new species

Very similar in form, structure, and color pattern to *piceothorax* but at once distinguishable by the color of its thorax, which is not at all red, and of the legs, which are black and yellow. Differs further from *piceothorax* as follows:

Female.—Length 12 mm., antennae 8.5 mm., ovipositor sheath 3.5 mm.

Sculpture of thorax, especially metapleuron and propodeum, including the basal areas, more reticulate-rugose than striatorugose; scutellum less abruptly sloping at apex; postpetiole and tergites 2 and 3 coarsely, sparsely punctate, especially laterally.

Antennal annulus longer, extending to flagellar joint 13; pale markings of abdomen yellow rather than white; legs to apices of femora black and yellow, tibiae and tarsi pale stramineous; front and middle coxae yellow, black behind, hind coxa yellow with base below and streaks on upper and inner sides black; trochanter yellow, basal joint above and apical joint at apex more or less black, hind trochanter with basal joint largely black; front and middle femora yellow, black behind; hind femur yellow on outer and inner sides, black above and below.

Type locality.—Puerto Castilla, Honduras.

Type.—One female dated March 26, 1924. It is in the U. S. National Museum (No. 57062).

This may be the same as *compacta* (Cresson).

8. CRYPTANURA POLITIGASTER, new species

This species is similar in structure and in color pattern of head and thorax to the preceding two species but differs from both in its red abdomen and in other details.

Female.—Length 11 mm., antennae 9 mm., ovipositor sheath 3 mm.

Temples rather long, slightly but distinctly concave, sharply receding, occipital carina high, especially at lower extremity, where it passes over a prominence in the posterior margin of the cheek, and joins the hypostomal carina rather close to the base of the mandible; cheek transversely striate along carina, vertex flat with a shallow groove next to ocelli; frons deeply concave, tumid next to eyes, obliquely striate above, horns small but elevated on a high common base;

eyes large, somewhat bulging, weakly convergent below; face nearly smooth laterally and medially with a rugose impression on each side of middle, the rugae extending across middle at top; clypeus smooth with large scattered punctures, nasute in profile; malar space flat and fully as long as basal width of mandible; antenna rather stout, weakly thickened and flattened near apex, 30-jointed. Thorax stout; humeral margin of pronotum smooth, conically prominent anteriorly, scrobe striate; mesoscutum coarsely punctate, lobes rather flat, prescutum very low anteriorly; scutellum sloping from base to apex, polished, with a few large punctures; frena coarsely foveolate; mesopleuron longitudinally striate below tubercle, obliquely and indistinctly so below, elsewhere polished and sparsely punctate, prepectus rugulose-punctate, sternum polished and sparsely punctate; metapleuron coarsely rugose above, polished and punctate below, as is also its upper division; propodeum largely rugose, more or less transversely so behind apophyses, basal median area defined, basal carina curved medially; legs rather slender but not long, hind femur barely two-thirds as long as tibia and not reaching apex of abdomen; areolet short. Abdomen broad, polished, with a few large punctures at sides of postpetiole and second tergite; first segment stout, petiole flattened above but not distinctly depressed, postpetiole much broader than long, without trace of dorsal carinae; second tergite nearly as long as first, but barely a third longer than broad at base; ovipositor sheath distinctly shorter than abdomen beyond first segment; ovipositor of uniform depth; apex weakly subsagittate.

Head and thorax black with yellow markings (see description of color pattern, p. 141); annulus embracing flagellar joints (5) 6-11 (13); anterior margin of pronotum medially and humeral margins before tegulae black; spot in center of mesoscutum; scutellum yellow only at apex; mesopleural band divided into a large spot anteriorly and a smaller one posteriorly; a large spot on each side of sternum; both upper and lower divisions of metapleuron largely yellow; propodeal markings extending broadly forward to carina but constricted before apophyses. Front and middle legs yellow, with their coxae, trochanters, and femora black behind; hind coxa black and yellow, trochanter and femur ferruginous, tibia and tarsus yellow. Wings hyaline, venation black. Abdomen ferruginous; petiole and apex of first tergite yellow, postpetiole ferruginous and black; sternites pale ferruginous margined with whitish.

Type locality.—Rurrenabaque, Río Beni, Bolivia.

Type.—One female, taken in October by W. M. Mann on the Mulford Biological Exploration of 1921-22. It is in the U. S. National Museum (No. 57065).

9. CRYPTANURA CONICA, new species

Similar to *politigaster* but distinguishable at once by its much more strongly flexed occipital carina and by its entirely red femora and hind coxae.

Female.—Length 12 mm., antennae (tips broken off), ovipositor sheath 3.5 mm.

Temples rather long, slightly concave, and sharply receding; occipital carina high, especially below, where it passes over a strong angulation in the posterior margin of the cheek; vertex concave, ocelli distinctly below superior tangent of eyes; frons moderately concave, with rugae radiating from ocelli, horns small but elevated on a broad common base; eyes bulging, very weakly convergent below; face with a shallow impression on each side of middle, medially coarsely rugose, laterally smooth; clypeus with scattered coarse punctures, in profile subnasute; malar space fully as long as basal width of mandible, flat; antennae distinctly thickened and flattened beyond middle. Thorax stout, largely coarsely sculptured; pronotum with humeral margin transversely striate, conically produced anteriorly, scrobe coarsely striate; mesoscutum coarsely but not densely punctate, lobes, especially prescutum anteriorly, flattened; mesopleuron striate, the sculpture changing to punctation toward lower posterior angle, sternum polished and sparsely punctate; scutellum roundly sloping from base to apex, polished, with sparse punctures, frena foveolate; metapleuron obliquely punctatostriate, its upper division smooth and sparsely punctate; propodeum polished before carina, coarsely rugose behind, the rugosity becoming transverse on apical slope, basal median area defined, basal carina curved forward medially; legs rather slender but not very long, hind femur barely two-thirds as long as tibia and not reaching apex of abdomen, hind coxa polished, with sparse punctures; areolet narrow. Abdomen rather narrow, polished; petiole flat above but not depressed, postpetiole much broader than long, with no trace of dorsal carinae; second tergite about as long as first and about a half longer than wide at base; sheath much shorter than abdomen beyond first tergite; ovipositor slender, of uniform depth, and subsagittate at apex.

Head and thorax black with yellow markings (see description of color pattern, p. 141); orbital ring broadly interrupted on temples; annulus on flagellar joints (5)6–10(13); anterior margins of pronotum entirely and humeral margin posteriorly black; mesoscutum immaculate; apex of tegulae piceous; mesosternum immaculate; yellow marking of lower division of metapleuron reduced to a streak in the dorsoposterior half; propodeal markings extending from apex to basal carina and narrowing and divergent from apophyses to carina. Legs ferruginous, tibiae and tarsi and front and middle coxae ante-

riorly yellow. Wings hyaline, venation black. Abdomen ferruginous, petiole and apex of postpetiole stramineous.

Type locality.—Kamakusa, British Guiana.

Type.—One female taken by H. Lang. It is in the U. S. National Museum (No. 57066).

10. CRYPTANURA RUFICEPS, new species

This and the next following species differ from all others known to me in lacking any trace of angulation of the tumid humeral margin of the pronotum; and the present species is unique in the genus for its red head and is very unusual in its lack of a pale annulus on the antenna.

Female.—Length 13 mm., antennae 10.5 mm., ovipositor sheath 4.5 mm.

Temples short, distinctly convex, sharply sloping, occipital carina rather high, especially at lower end, hypostomal carina very high; vertex straight across, ocelli elevated above general level; frons not deeply excavated, horns very small, on a broad, low, common base; eyes not bulging; parallel within; face subpolished, with coarse punctures, especially in shallow impressions on each side of middle, median portion in profile nearly as strongly convex below as is clypeus, which is not so strongly convex as usual and is sculptured like the face; malar space a little shorter than basal width of mandible; cheeks in front view slightly convex, in side view fully twice as broad as malar space; antenna slightly thickened and flattened beyond middle. Thorax robust, sculpture mostly coarse rugosity; pronotum with scrobe coarsely striate, epomia strong, but terminating below the smooth humeral margin, which is less strongly tumid anteriorly than posteriorly; mesoscutum with lobes very weakly convex and notaulices very shallow, polished and sparsely, coarsely punctate; scutellum strongly convex but not prominently so, polished, with a few punctures, frena foveolate; mesopleuron largely coarsely rugosostriate; sternum coarsely punctate; metapleuron and propodeum, except its punctate basal areas, transversely striate, basal median area not defined, basal carina curved forward medially; apophyses unusually short and obtuse; legs rather slender, hind femur three-fourths as long as tibia and reaching apex of abdomen, hind coxa polished and punctate; areolet broad. Abdomen stout, polished; petiole distinctly depressed, ventrolateral carina strong, with a foveolate groove above it, postpetiole much broader than long, with low rounded elevations representing the dorsal carinae; second tergite about a fourth longer than broad at base; ovipositor sheath not quite so long as abdomen beyond first tergite, ovipositor rather stout, subsagittate at apex.

Head and thorax rufous with yellow markings (see description of color pattern, p. 141); orbital ring not abruptly narrowed on temples; facial impressions, clypeal suture, and margin of clypeus ferruginous; scape rufous, flagellum entirely black; mesoscutum with a single median spot; scutellum with a rufous spot in basal middle; mesosternum and both upper and lower divisions of metapleuron largely rufous; propodeal markings each with a narrow tongue-shaped extension before the apophyses and reaching nearly to basal carina. Antenna black, scape rufous, without white annulus; small areas in rufous coloring of head and thorax more or less piceous; legs entirely ferruginous; wings yellowish hyaline, venation black. Abdomen black and white; three white spots at base of second tergite, the middle one large and broadly transverse, the lateral ones small and longitudinal; venter mostly white; sheath black.

Type locality.—Pico Turquino, Cuba.

Types.—A holotype and four paratypes, all females, collected by S. C. Bruner and C. H. Ballou, July 10–20, 1922, at elevations ranging from 2,900 to 6,000 feet. They are in the U. S. National Museum (No. 57067).

11. CRYPTANURA SEPTENTRIONALIS, new species

Related to *ruficeps* in the lack of the angulation of the humeral margins of the pronotum and in the color pattern of the abdomen, but distinct from that species in the black and white head and thorax and in many details of structure and color.

Female.—Length 15 mm., antennae (broken), ovipositor sheath 4.5 mm.

Differs from *ruficeps* principally as follows: Frons obliquely striate above, horns not on a common base; postvertex densely, temples, cheeks, and sides of frons more sparsely, punctate; face rugose except laterally, less strongly convex medially; malar space much shorter than basal width of mandible; occipital and hypostomal carinae weaker; sculpture of thorax largely coarse punctation, densest and coarsest on mesoscutum and metapleuron, humeral margin of pronotum coarsely punctate; propodeum posteriorly irregularly transversely rugose, scutellum polished; notaulices deep; apophyses longer; abdomen beyond first tergite opaque shagreened, second and third tergites and postpetiole at sides punctate; ventrolateral carinae of petiole subobsolete.

Differs from *ruficeps* in color as follows: Head and thorax black and white; face entirely white; antennal annulus embracing flagellar joints (5) 6–11 (12) and underside of scape white; propodeal white marks narrowly confluent across median line anteriorly; coxae white, the front and middle ones more or less black behind, the hind coxa black on outer and inner sides toward base and with a median black stripe above, trochanters largely white, legs otherwise ferruginous, with tarsi paler.

Type locality.—Cleveland, Ohio.

Types.—One female (the holotype) captured September 19, 1932, by Frank D. DeGant; one female paratype, St. Louis, Mo., June 29, 1938; and one female paratype received from H. A. Scullen, Corvallis, Oreg., but probably eastern. All are in the U. S. National Museum (No. 57068).

This is the second species of this tropical genus to be found in the United States.

12. CRYPTANURA APOPHYSIS, *new species*

Distinct from all the other species known to me in its extraordinarily large propodeal apophyses. It is also almost unique in its entirely yellow front and middle legs and black hind femur.

Female.—Length 15 mm., antennae (missing), ovipositor sheath 5.5 mm.

Temples flat to slightly concave, long, sharply receding; occipital carina very high, but becoming abruptly lower just before its junction with the very high hypostomal carina; vertex concave, top of ocelli below superior tangent of eyes; frons with short rugae radiating from ocelli, deeply concave below, horns short, stout, not on a common base; eyes very large, bulging, very weakly convergent below; face medially elevated, with an impression on each side of middle, opaque shagreened, with sparse punctures, obliquely rugose below antennae; clypeus subnasute, subpolished, with a few coarse punctures; malar space nearly as long as basal width of mandible, straight in front view. Thorax distinctly compressed; pronotum with humeral margin transversely striate, carinately angulated anteriorly, scrobe striate; mesoscutum subpolished and rather densely and coarsely punctate, lobes low, notaulices deep and narrow; scutellum strongly convex, polished, very sparsely punctate; mesopleuron subpolished, sparsely punctate below, scrobe polished below and striate above; mesosternum more densely punctate; upper division of metapleuron coarsely punctate, lower division coarsely obliquely rugosostriate; propodeum rugose laterally and between carina and apophyses, otherwise largely polished, apophyses very large, long, conical, nearly twice as long as their distance from basal carina; legs very slender, hind femur fully eight times as long as deep and reaching beyond apex of abdomen; areolet elongate. Abdomen slender, finely shagreened and subopaque beyond first tergite; petiole almost exactly square in cross-section, postpetiole nearly as long as broad; second tergite fully two-thirds longer than broad at base; sheath as long as abdomen beyond first tergite; ovipositor rather stout, distinctly subsagittate at apex.

Black and yellow (see description of color pattern, p. 141); orbital ring nearly interrupted in upper temple and in malar space; two

narrow lines on disk of mesoscutum; a large spot anteriorly on mesopleuron and a smaller one before middle coxa; yellow of lower division of metapleuron reduced to a large spot in the middle of its upper margin; propodeal spots extending only a short distance anterior to apophyses; front and middle legs except their coxae at base behind, a large spot on upper side of hind coxa, hind tibia except narrowly at base and broadly at apex, and probably hind tarsi (though these are missing) yellow; petiole entirely black; wings yellowish hyaline, venation blackish.

Male.—Essentially like female, but more highly polished; the propodeum with striae radiating from bases of apophyses, which are somewhat more slender than in female; postpetiole fully as long as broad and second tergite fully twice as long as broad at their junction; legs even more slender.

The antennae, though not entire, exhibit a yellow annulus beginning on the eleventh flagellar joint, and the hind tarsus is entirely yellow.

Type locality.—Colombia.

Allotype locality.—Huascarán, Peru.

Types.—One of each sex, the type female, having no further data; the allotype taken September 21, 1911, by C. H. T. Townsend. Both are in the U. S. National Museum (No. 57069).

13. CRYPTANURA MEXICANA (Cresson), new combination

Mesostenus mexicanus CRESSON, Proc. Acad. Nat. Sci. Philadelphia, 1873, p. 157, female, male (part).

Cresson's type series was not all of the same species, for a male eotype in the National Collection is referable to *orizabensis* (Cameron). A female cotype agrees with Cresson's description, and apparently is the true *mexicana*.

Three additional specimens are before me as follows: Argas, Panama, April 28, 1911 (A. Busck); Costa Rica and Santa Marta, Colombia, 1852 (Fontanier), the last belonging to the Paris Museum.

Female.—Length 14 mm., antennae 14 mm., sheath 5.5 mm.

Temples flat or slightly concave, occipital carina high, slightly sinuate below; vertex weakly concave, ocelli a little below superior tangent of eyes; postocellar line much shorter than ocellocular line; frons moderately concave, with a few rugae radiating from the ocelli, horns short and broad, not on a common base; eyes large, bulging, weakly convergent below; face convexly elevated medially, polished and sparsely punctate, with a transversely striate impression on each side of middle; clypeus strongly convex but not subnasute, polished and sparsely punctate; malar space nearly as long as basal width of mandible, in front view straight; antenna about 38-jointed, strongly thickened and flattened below beyond middle. Thorax stout; humeral margin of pronotum transversely striate, carinately

angled anteriorly, scrobe striate; mesoscutum polished, sparsely coarsely punctate, notaulices deep and narrow; scutellum narrow, convex, polished, with a few punctures; mesopleuron obliquely striate above, the striation changing gradually to punctation below, sternum punctate; upper division of metapleuron punctate, lower division coarsely, obliquely rugosostriate; propodeum with basal median area obsolete defined, basal carina curving forward medially, apophyses long and slender, basal areas punctate and posteriorly more or less rugose, space between carina and apophyses with oblique striae converging toward middle, posterior face more coarsely, transversely striate; legs long and slender, hind femur reaching apex of abdomen, hind coxa sparsely, coarsely punctate; areolet elongate. Abdomen beyond first tergite finely shagreened, subopaque; petiole not depressed, postpetiole broader than long, with median and lateral shallow impressions; sheath a little longer than abdomen beyond first tergite; second tergite about a half longer than broad at base; ovipositor subsagittate at apex.

Black with yellow markings (see description of color pattern, p. 141); orbital ring interrupted in upper temples; annulus embracing flagellar joints (5) 6-10 (12); two elongate marks on disk of mesoscutum; scutellum yellow only at apex, mesosternum largely yellow; lower division of metapleuron very largely yellow; propodeal markings extending forward nearly to carina; petiole yellow above, black below. Legs yellow; front and middle coxae and femora behind, base of hind coxa and a broad stripe above, and apical joint of hind trochanter and the femur above black. Wings hyaline, narrowly, weakly infumate apically, venation blackish.

I have not seen a male of this species, but according to Cresson it differs from the female in being more slender, with antennae and legs longer, the knees and the apex of the hind tibia black.

14. CRYPTANURA ORIZABENSIS (Cameron), new combination

Mesostenus mexicanus CRESSON, Proc. Acad. Nat. Sci. Philadelphia, 1873, p. 157, male (part).

Polyacnus orizabensis CAMERON, Biologia Centrali-Americana, Hymenoptera, vol. 1, 1886, p. 246, female.

As stated above, the National Museum male cotype of *mexicana* (Cresson) belongs to this species. A female, also from Mexico, from the C. F. Baker collection is also before me.

The female differs from that of *mexicana* in structure principally as follows: Occipital carina not sinuate below; postocellar line nearly as long as ocellocular line; frontal horns longer and more acute; sculpture at middle of propodeum irregularly transverse rugosity; ovipositor and sheath distinctly shorter; areolet shorter, with recurrent interstitial.

Differs from *mexicana* in color as follows: Mesosternum yellow only along sternaules; propodeal markings extending only a little before apophyses; hind coxa black above with a large oval yellow spot; basal joint of hind trochanter largely black, apical joint yellow, hind femur black above but with a narrow median yellow line, hind tibia somewhat blackish or brownish at base and apex; petiole black above, yellow below.

The male is very much like the female but has the frontal horns longer and more acute and the hind tibia more broadly black at apex.

15. *CRYPTANURA BILINEATA*, new species

Very similar to the two preceding species, but distinct from both in the form of the propodeal markings, which extend forward to the carina but are abruptly narrowed before the apophyses; in the less distinctly thickened and flattened antennae; in having the frontal horns set rather high on a common base; in the broader and more weakly convex scutellum; and in the short, obtuse apophyses. It is like *mexicana* in general in the color of the legs but has the hind coxa colored as in *orizabensis*; the petiole is, as in *mexicana*, yellow above and black below; and the mesosternum, as in *orizabensis*, is yellow only along the sternaules. In the long postocellar line and in the sculpture of the propodeum it is more like *orizabensis* and in the length of the ovipositor and in venation of the wings it agrees with *mexicana*.

Type locality.—Cuernavaca, Morelos, Mexico.

Type.—One female in the U. S. National Museum (No. 57064), taken by E. G. Smyth.

16. *CRYPTANURA RUFA*, new species

Distinct from all other species known to me and apparently from all other described species in the arrangement of color, black and yellow head, red and yellow thorax (not black dorsally), and entirely red abdomen.

Female.—Length 14 mm., antennae 12 mm., ovipositor sheath 5 mm.

Temples weakly convex, occipital carina not high, with a shallow notch just before its junction with the hypostomal carina; vertex flat, ocelli as high as superior tangent of eyes; frons rather weakly concave, with rugae radiating from ocelli, horns short, stout, rather widely separated; eyes weakly convergent below; face polished and sparsely punctate, weakly convex medially, with a shallow, transversely striate impression on each side of middle; clypeus polished and sparsely punctate, subnasute in profile; malar space three-fourths as long as basal width of mandible; cheeks in front view weakly convex. Thorax robust; humeral margin of pronotum transversely striate, carinately angled anteriorly, scrobe sparsely striate; mesoscutum rather densely

punctate, notaulices deep and narrow, lobes rather flat; scutellum convex, polished, and obsoletely punctate; mesopleuron obliquely striate, this sculpture changing below and posteriorly to rather sparse punctation, sternum more densely punctate; upper division of metapleuron polished and sparsely punctate, lower division coarsely, obliquely rugosostriate; propodeum polished and punctate before and transversely rugosostriate behind carina, posterior face transversely striate, apophyses moderately long and slender; legs rather stout, hind femur hardly reaching apex of abdomen, hind coxae polished and sparsely punctate. Abdomen subpolished, inconspicuously shagreened beyond first tergite; petiole slightly depressed, postpetiole much broader than long, with faint rounded elevations between the spiracles; second tergite about a third longer than broad at base; sheath shorter than abdomen beyond first tergite, ovipositor rather stout, subsagittate at apex.

Head black (see description of color pattern, p. 141) with orbital rings interrupted in upper temple and in malar space; facial impressions and outline of clypeus piceous. Thorax ferruginous, slightly stained with piceous in postscutellar frena and in speculum and with yellow markings; single spot on disk of mesoscutum; scutellum yellow only at apex; upper division of metapleuron and dorsal half of its lower division yellow; propodeal markings including the apophyses and two small spots just in front of and mesad of these. Front and middle legs yellow, with front coxa, trochanter, and femur piceous behind, middle coxa ferruginous with yellow spot in front; hind leg ferruginous with tibia and tarsus yellow. Wings hyaline, venation blackish. Abdomen entirely red.

Type locality.—Estero de São Paulo, Brazil.

Types.—A female holotype and two female paratypes taken in 1910 by E. R. Wagner. The holotype and one paratype are in the Paris Museum, and the second paratype is in the U. S. National Museum (No. 57081). There is also a female with broken antennae in the Paris Museum, taken in 1910 at Chaco de Santiago del Estero, Argentina.

17. CRYPTANURA SPINARIA (Brullé)

Mesostenus spinarius BRULLÉ, Histoire naturelle des insectes, Hyménoptera, vol. 4, p. 227, 1846, female.

Mesostenus albopictus CRESSON (not Smith), Proc. Ent. Soc. Philadelphia, vol. 3, p. 312, 1864, male.

Mesostenus delawarensis DALLA TORRE, Catalogus hymenopterorum, p. 540, 1901-02.

Polyacus spinarius SCHMIEDERNECHT, Genera Insectorum, fasc. 75, p. 68, 1908.

Mesostenus spinarius VIEBCK, in Smith, Insects of New Jersey, p. 630, 1910.

Mesostenidea (Polyacus) spinaria VIEBCK, The Hyménoptera or wasp-like insects of Connecticut, p. 320, 1917.

Polyacus spinarius CUSHMAN, Journ. Washington Acad. Sci., vol. 15, p. 391, 1925;

Proc. U. S. Nat. Mus., vol. 74, art. 16, p. 38, figs. 1d, 3k, 6f, 1929.

Cryptanura spinaria TOWNES, Mem. Amer. Ent. Soc., No. 11, pt. 1, p. 288, 1944.

I have described this North American species too recently and too fully to make further discussion necessary here. It may well be mentioned, however, that the mesoscutum frequently has, in addition to the single median yellow spot, traces of the yellow lines along the inner margins of the lateral lobes and sometimes those along lateral margins next to the tegulae.

18. *CRYPTANURA LINEATIFEMUR*, new species

Female.—Length 14 mm., antennae 11 mm., sheath 5 mm.

Except that it has a single median spot on the mesoscutum instead of two yellow lines and that the propodeal markings extend narrowly forward to the basal carina, this species is very similar in color and in large part in structure also to the three species *mexicana*, *orizabensis*, and *bilineata*. The hind legs are colored exactly like those of *orizabensis*, as is the mesosternum, while the abdomen is colored like that of *mexicana*. The temples are not at all concave, the cheeks are more convex, the vertex is flat, the occipital carina is lower, the antennae are shorter, the petiole is thicker, with the lateral carinae, both dorsal and ventral, more distinct, and the ovipositor longer; otherwise very similar to *orizabensis*.

Type locality.—La Caja, near San José, Costa Rica.

Types.—Two females, the holotype and a paratype, taken at the above locality by M. Valeria on July 1, 1931, at an altitude of 900 meters, and one female paratype captured by Schaus and Barnes at Cayuga, Guatemala. All are in the U. S. National Museum (No. 55071).

The Costa Rican paratype is smaller and the Guatemalan paratype larger than the type, but otherwise they are similar.

Mesostenus veraepacis Cameron, which seems to be a *Cryptanura*, appears to be very similar to this species but differs in that the hind femur is entirely black above without the yellow median line.

19. *CRYPTANURA COXATA*, new species

Female.—Length 16 mm., antennae 12 mm., ovipositor sheath 5.5 mm.

Temples flat, short, and very strongly receding, occipital carina moderately high, somewhat higher and slightly sinuate below; vertex nearly straight across; frons rather deeply concave above, with striae radiating from ocelli, horns short and broad, close together but not on a common base; eyes slightly bulging, weakly convergent below; face polished and sparsely punctate, somewhat rugose below antennae, impressed on each side of middle; clypeus strongly convex, polished, sparsely punctate; malar space about two-thirds basal width of mandible; cheeks in front view weakly convex; antenna 32-jointed, distinctly broadened and flattened beyond middle. Thorax stout; humeral margin of pronotum transversely striate, carinate anteriorly,

scrobe striate; mesoscutum polished and sparsely punctate, lobes somewhat flattened; scutellum convex, polished, very sparsely punctate; upper division of metapleuron polished and sparsely punctate, lower division coarsely, obliquely rugosostriate; propodeum transversely striate behind apophyses, before which it is irregularly rugose, basad of carina polished medially and rugosopunctate laterally, apophyses rather long and slender; legs rather stout, hind femur hardly reaching apex of abdomen. Abdomen stout, subopaque shagreened beyond first tergite; petiole depressed, postpetiole much broader than long with two rather prominent elevations between spiracles; second tergite hardly a third longer than broad at base; sheath much shorter than abdomen beyond first tergite, ovipositor rather stout, subsagittate at apex.

Head and thorax black with yellow markings (see description of color pattern, p. 141); orbital ring interrupted in upper temple; annulus embracing flagellar joints (5)6-10(12); a single spot in center of mesoscutum; large spot on each side of sternum; propodeal markings abruptly narrowed but not constricted before apophyses, and curving toward each other just behind the carina. Front and middle legs yellow, the coxae, trochanters, and femora black behind; hind coxa yellow below and in middle above, black above on outer and inner sides, trochanter black basally, reddish apically, femur ferruginous, tibia and tarsus yellow; wings yellowish hyaline, venation blackish. Abdomen ferruginous, first segment black with petiole dorsally and apical margin yellow.

Male.—Much smaller than female, with apical carina complete and strongly arched forward medially, the apophyses reduced to higher elevations in the carina, rugosity of thorax, except in petiolar area, largely replaced by punctation; abdomen much smaller and narrower, legs relatively longer and more slender; clypeus entirely yellow except apical margin; scape beneath; annulus in flagellar joints (10)11-17(18); propodeal markings confluent anteriorly; all abdominal segments beyond first more or less blackish basally.

Type locality.—Trinidad Río, Panama.

Types.—Two females and one male, the holotype and allotype, taken March 27 and 20, 1912, by August Busck, and a paratype female by W. M. Mann at Ixiamas, Bolivia, in December 1921, on the Mulford Biological Exploration. All are in the U. S. National Museum (No. 57070).

20. CRYPTANURA BOLIVIENSIS, new species

Very closely related to *coxata*, from which it can at once be distinguished by the entirely red hind coxa and trochanter and first tergite.

Female.—Length 15 mm., antenna 11.5 mm., ovipositor sheath 5 mm.

Differs further from *coxata* as follows: Temples longer and less sharply receding; humeral margins of pronotum subtuberculate

anteriorly; lateral lobes of mesoscutum nearly impunctate; scutellum impunctate; thorax laterally much less strongly striate, mesopleuron mostly punctate rather than striate; abdomen narrower; petiole not depressed, postpetiole not especially broad, though somewhat broader than long, second tergite more than a half longer than broad at base.

Antennal annulus embracing flagellar joints (4) 5-11 (14); propodeal markings strongly constricted before apophyses and not curving mesad anteriorly; middle coxa and trochanter ferruginous behind.

Type locality.—Rosario Lake, Rogagua, Bolivia.

Type.—One female taken in November 1921 by M. R. López, on the Mulford Biological Exploration. It is in the U. S. National Museum (No. 57072).

21. CRYPTANURA ISTHMUS, new species

Female.—Length 15 mm., antenna 12 mm., ovipositor sheath 5 mm.

Structurally almost identical with *coxata*, but differing in color as follows: Mesosternum yellow only along sternaules; propodeal markings constricted basad of apophyses and not curving toward each other anteriorly; hind coxa ferruginous, with an indistinct yellow spot at base above; petiole stramineous, postpetiole piceous with apical margin yellow, second tergite obsoletely yellow just before apex.

Type locality.—Trinidad Río, Panama.

Types.—Two females, the holotype and a paratype, taken by August Busck at the type locality on March 16 to 19, 1912; and one female paratype taken by C. T. Greene at Ancon, Canal Zone, May 17, 1926. They are in the U. S. National Museum (No. 57073).

22. CRYPTANURA EXCALIBUR, new species

This and the next following two species and probably *Mesostenus platyrurus* Brullé form a group distinct from the rest of the genus in the long, stout ovipositor which in side view is almost clavate, becoming gradually much deeper toward the apex. Brullé's species is not known to me, but it may be distinguished from the present species by its red propodeum.

Female.—Length 16 mm., antennae 13 mm., ovipositor sheath 9 mm.

Temples very weakly convex, rather short, occipital carina high, especially just before joining hypostomal carina; vertex straight across; frons rather shallowly concave, with rugae radiating from ocelli, horns short, thick, separate; eyes very weakly convergent below; face subpolished, sparsely punctatorugose above, somewhat elevated medially, with a shallow impression on each side of elevation; clypeus strongly convex, polished and sparsely punctate; malar space two-thirds basal width of mandible; cheeks in front view convex; antenna 36-jointed, very slightly thicker and flattened toward apex. Thorax stout; humeral margin of pronotum transversely striate, carinately angled anteriorly, scrobe striate; mesoscutum subpol-

ished and coarsely punctate, lobes weakly convex; scutellum strongly convex, polished, nearly impunctate; mesopleuron obliquely striate above, rather densely punctate below, sternum similarly punctate; upper division of metapleuron polished and sparsely punctate, lower division coarsely, obliquely rugosostriate; propodeum striate behind, the striations becoming somewhat confused above, basad of carina laterally rugose, medially polished and sparsely punctate; apophyses rather stout; legs stout, femur hardly reaching apex of abdomen. Abdomen very finely shagreened and subopaque beyond first tergite; petiole slightly depressed, postpetiole distinctly broader than long, a shallow impression on each side above spiracle; second tergite more than a half longer than broad at base; ovipositor sheath nearly as long as abdomen, ovipositor very stout, nearly twice as deep near apex as at base.

Head and thorax black with yellow markings (see description of color pattern, p. 141); occipital ring nearly or quite interrupted on temple; annulus on flagellar joints (5)6-11(13); scape entirely black; mesoscutum with a single median spot; mesosternum yellow only along sternaules; propodeal markings extending broadly forward from apophyses but not reaching carina. Front and middle legs yellow, the coxae, trochanters, and femora black behind; hind leg ferruginous, a small spot at base of coxa above and the tibia and tarsus yellow. Abdomen ferruginous, postpetiole apically and laterally yellow; sheath black.

Type locality.—Trinidad Río, Panama.

Types.—Three females, all collected by August Busck, the holotype on March 29, one paratype on March 23, 1912, at the type locality, and a paratype on June 3, 1907, at Tabernilla, Canal Zone. They are in the U. S. National Museum (No. 57074).

The paratypes are slightly smaller than the type but otherwise much the same.

23. CRYPTANURA ACINACES, new species

Female.—Length 15 mm., antennae (broken), ovipositor sheath 8 mm.

Structure very similar to that of *excalibur*, but abdomen black with yellow markings. From the above description of *excalibur* the present species differs principally as follows: Temples very distinctly convex; horns on a common base; sculpture throughout thorax denser and coarser; apophyses short and stout.

Head and thorax black and yellow (see description of color pattern, p. 141); mandibles entirely black; scape yellow below; annulus on flagellar joints (5) 6-12 (13); orbital ring entire; mesoscutum with a single median yellow spot; scutellum entirely yellow; mesosternum yellow only along sternaules; propodeal markings extending broadly

forward from apophyses, but not reaching carina. Legs ferruginous, tibiae and tarsi yellowish; front coxa yellow in front, black behind; middle coxa yellow in front, piceous to ferruginous behind; hind coxa ferruginous, with a large yellow spot above and a small piceous spot in apical middle; wings yellowish, venation brownish; abdomen black and yellow, petiole entirely black.

Type locality.—Colima Volcano, Mexico.

Type.—One female in the U. S. National Museum (No. 57075), collected by L. Conrad.

24. CRYPTANURA PROPINQUA (Cresson), new combination

Mesostenus propinquus CRESSON, Proc. Acad. Nat. Sci. Philadelphia, 1873, p. 152.

Female.—Length 13–16 mm.

Structurally very similar to *acinaces* but with temples weakly convex; apophyses rather slender.

Body color almost exactly as in *acinaces* except that the mandibles apparently are always yellow at the base and the orbital rings are very narrow or even interrupted in the temples, and the scutellum is more or less black at the base; but the legs are yellow, with the front and middle coxae, trochanters, and femora piceous behind, the hind coxa with a broad piceous stripe on the outer side of the upper surface and a shorter one on the inner side, the hind trochanter piceous with a trace of yellow on the upper and lower surfaces of the basal joint, and the hind femur piceous above and on the inner surface.

Before me are a paratype and another female from Mexico (Frontera, Tabasco); a pair from San José, Costa Rica (M. Valerio, No. 101); two females from Costa Rica (Paul Serre, 1920); and one female from Nicaragua (Muiszech, 1871), the last three received from the Paris Museum.

The male has the malar space shorter, the frontal horns more slender and separated, the apophyses reduced to high elevations in the apical carina, which is distinct and sharply angulated medially, the petiolar area defined laterally by curved carinae, the apical slope of propodeum not distinctly transversely striate and the space between the carinae longitudinally striate, and the abdomen small and slender and subpolished.

25. CRYPTANURA PRETIOSA (Viereck), new combination

Polyaenidia pretiosa VIERECK, Proc. U. S. Nat. Mus., vol. 46, p. 382, 1913.

This species differs from all the other species with red abdomen which follow it in the present arrangement in its entirely red front and middle femora and in the form of the yellow marking of the lower division of the metapleuron. The latter is in the form of an oval spot extending forward from the hind coxa, whereas in the other species it either extends the entire length of the sclerite or has an angular forward extension above.

The type and allotype are in the Königliche Zoologische Museum, Berlin, the material examined in this study consisting of a male paratype from Villa Mora, Paraguay, and a female from Georgetown, British Guiana, identified by myself. The latter specimen agrees perfectly with the original description.

This is probably synonymous with *spilonota* (Cameron).

26. CRYPTANURA GRACILIPES, new species

Notable principally for its very slender legs.

Female.—Length 14 mm., antenna 12 mm., ovipositor sheath 5.5 mm.

Temples distinctly concave; occipital carina high, especially at lower end, where it curves sharply mesad to join the hypostomal carina far back from the base of the mandible; vertex in front view slightly concave; frons with a few short striae radiating from ocelli; horns short and stout; eyes bulging, weakly convergent below; face somewhat elevated medially, polished and very sparsely punctate, somewhat rugose above and in a shallow impression on each side of middle; clypeus polished and sparsely punctate, subnasute in profile; malar space nearly as long as basal width of mandible; cheeks in front view nearly straight; antenna 35-jointed, slender, distinctly though not strongly thickened and flattened toward apex. Thorax rather unusually smooth, pronotum with humeral margin carinately angled anteriorly, upper portion, including humeral welt, polished and sparsely punctate, scrobe striate; mesoscutum polished, sparsely punctate, lobes weakly convex; scutellum narrow, convex, polished; mesopleuron polished and punctate below, obliquely striate above; sternum and upper division of metapleuron polished and sparsely punctate; lower division of metapleuron coarsely obliquely rugosostriate; propodeum basad of carina polished medially, rugose laterally, behind carina with striae radiating from between apophyses, posterior face transversely striate, basal median area defined, apophyses long and slender; legs very slender, hind femur about eight times as long as deep, more than three-fourths as long as tibia, reaching beyond apex of abdomen. Abdomen rather slender, subpolished; first tergite polished, petiole not depressed, postpetiole broader than long but not abruptly widened at spiracles, rather weakly convex; second tergite about three-fourths longer than broad at base; ovipositor sheath distinctly shorter than abdomen beyond first segment; ovipositor slender and of uniform depth to the distinctly subsagittate apex.

Head and thorax black and yellow, abdomen largely ferruginous (see description of color pattern, p. 141); orbital ring broadly interrupted in temple and narrowly so in malar space; scape entirely black; annulus on flagellar joints (5)6-10(12); mesoscutum with a single discal spot; scutellum black basally; tegula with a broad stramineous and piceous margin; mesosternum yellow only along sternalices;

metapleuron broadly black along lower and anterior margins; propodeal markings barely including apophyses; front and middle legs yellow with femora and front coxa black behind, middle coxa ferruginous behind, hind leg ferruginous, the tibia and tarsus and a small spot at base of coxa above yellow, femur with a narrow dark streak above; wings hyaline, venation brownish; petiole yellow, postpetiole piceous with apical margin narrowly yellow.

Male.—Like female but smaller and more slender; frontal horns longer and more slender; antenna 38-jointed; propodeum with apophyses short and thick, apical carina distinct and bent abruptly forward medially; abdomen much more slender, second tergite more than twice as long as broad at base. Annulus on flagellar joints (9)10–16(18); postpetiole only very narrowly yellow at apex.

Type locality.—Trinidad Río, Panama.

Types.—Two of each sex, a holotype female, allotype male, and a male and a female paratype, all collected at the above locality by August Busck, March 17–30, 1912. They are in the U. S. National Museum (No. 57076).

The paratypes are somewhat smaller than the type and allotype.

27. CRYPTANURA GRACILIS, new species

Female.—Length 14 mm., antenna 12 mm., ovipositor sheath 5 mm.

Temples very weakly convex, more than half as broad as short diameter of eye; occipital carina moderately high, curving slightly inward at lower extremity, in side view very nearly parallel to posterior margin of eye; vertex straight across; frons with striae radiating from ocelli, horns short and thick, separated; eyes weakly convergent below; face polished, sparsely punctate, transversely striate above and in a shallow impression on each side of a low median elevation; clypeus polished, sparsely punctate, very strongly convex; malar space nearly as long as basal width of mandible; cheek distinctly less than twice as broad as malar space; antenna 38-jointed, slender, barely thickened and weakly flattened toward apex, the joints in the thickened portion fully as long as thick. Thorax distinctly compressed; humeral margin of pronotum transversely striate and with a strong carinate angle anteriorly, scrobe striate; mesoscutum coarsely and rather densely punctate, scutellum narrow; mesopleuron obliquely striate above, finely punctate below; sternum finely punctate; upper division of metapleuron punctate, lower division coarsely obliquely rugosostriate; propodeum with median basal area defined, lateral areas largely rugose but polished and punctate in middle; area behind carina irregularly rugose, posterior face coarsely transversely striate, apophyses long and slender; legs slender, hind femur fully six times as long as deep, and fully three-fourths as long as tibia, but not quite reaching apex of abdomen. Abdomen subopaque, finely shagreened beyond first tergite,

narrow, petiole not distinctly depressed, postpetiole as long as broad, weakly convex; second tergite about three-fourths longer than broad at base, and hardly a half broader at apex than at base; sheath distinctly shorter than abdomen beyond first segment, ovipositor slender, of nearly uniform depth to the subsagittate apex.

Head and thorax black with yellow markings (see description of color pattern, p. 141); orbital ring interrupted in temple; clypeus yellow only in middle, the black of the suture extending upward in the facial impressions; scape entirely black; annulus on flagellar joints (6) 7-19 (12); mesoscutum with a single median spot; scutellum black in basal middle; mesosternum with a small trace of yellow next to sternaules; metapleuron broadly black below and anteriorly; metapleuron posteriorly and metasternum ferruginous; propodeal markings extending only a short distance before apophyses; front and middle legs yellow, black or piceous behind to apices of femora, middle coxa ferruginous behind, hind leg ferruginous with tibia and tarsus yellow; wings hyaline, venation blackish; abdomen entirely ferruginous.

Type locality.—Villa Lutecia, near San Ignacio, Misiones, Argentina.

Type.—One female in the U. S. National Museum (No. 57083) taken by E. R. Wagner in 1910.

28. CRYPTANURA GENALIS, new species

Female.—Length 13 mm., antennae 11.5 mm., ovipositor sheath 5.5 mm.

Very similar to *gracilis*, differing principally as follows: Occipital carina very high, in side view diverging below from posterior margin of eye; frontal horns on a low common base; eyes parallel; clypeus only moderately convex; cheeks strongly convex and fully twice as broad as malar space; antenna 32-jointed, stouter and more distinctly thickened toward apex, the joints in the thickened portion distinctly transverse; mesoscutum very sparsely punctate, prescutum not striate along notaulices; lobes not flattened; scutellum broader; lower division of metapleuron punctatorugose; propodeum without a basal median area, basal region polished, sparsely punctate behind, more densely and coarsely punctate behind carina, rugosopunctate laterally, posterior face closely transversely striate, apophyses very short and thick; legs stouter, hind femur not nearly six times as long as deep and barely two-thirds as long as tibia. Abdomen stouter, postpetiole much broader than long, second tergite barely a half longer than broad at base; sheath as long as abdomen beyond first tergite.

Orbital ring not interrupted in temple; black of clypeal suture not meeting in middle and not extending upward into facial impressions; annulus on flagellar joints (5) 6-11 (13); mesosternum conspicuously yellow along sternaules; propodeal markings triangularly produced

anteriorly; petiole tinged with yellowish and postpetiole with apical margin yellow.

Type locality.—Venodio, Sinaloa, Mexico.

Type.—One specimen in the U. S. National Museum (No. 57077) received from B. Preston Clark.

29. *CRYPTANURA VARIEGATA* (Brullé), new combination

Mesostenus variegatus BRULLÉ, Histoire naturelle des insectes, Hymenoptera, vol. 4, 1846, p. 277, pl. 40, fig. 3.

Closely related to the two preceding species and differing from the above description of *gracilis* only as follows: Temple flat, hardly half as broad as short diameter of eye; clypeus only moderately convex; antenna 32-jointed, distinctly thickened and flattened toward apex, the joints there strongly transverse; scutellum rather broad and more weakly convex; propodeum without defined median basal area, lateral areas largely polished and sparsely punctate, rugose only laterally. Abdomen rather broad, postpetiole broader than long, second tergite more than a half broader at apex than at base.

Clypeus black only apically and laterally, the black not extending upward into the facial impressions; metapleuron and sternum not at all red; annulus on flagellar joints (4) 5-10 (12); propodeal markings extending triangularly nearly to basal carina.

One female in the U. S. National Museum, taken in October 1922 by H. Lang at Kamakusa, British Guiana.

30. *CRYPTANURA PARANENSIS*, new species

Female.—Length 13 mm., antennae (tips broken off), ovipositor sheath 6 mm.

Very closely related to *variegata*, from which it is distinguishable by its distinctly longer ovipositor sheath and by the fact that the occipital carina diverges more strongly below from the posterior margin of the eye. From *variegata* it differs further as follows: Frontal horns on a common base; thorax laterally less strongly sculptured, the striation of mesopleuron confined to the upper anterior portion, the punctation of the lower portion and of the sternum finer, and the lower anterior portion of metapleuron smooth and polished; scutellum yellow only at apex and in basal angles; mesosternum entirely black; propodeal markings extending only very slightly forward from apophyses; abdomen somewhat more slender.

Type locality.—Peixe Boi, Pará, Brazil.

Type.—One female in the U. S. National Museum (No. 57078) taken November 27, 1907, by Miss H. B. Merrill.

What may be the male is represented by three specimens received from the Paris Museum and collected by Manger in Brazil. The labels also bear the figures 11-53. In these specimens the propodeum has a distinctly defined petiolar area from the anterior end of which the apical carina extends laterally and forward to the bases of the

apophyses. The only complete antenna is 43-jointed with the annulus on flagellar points (10) 11-16 (18). The postpetiole is piceous, the middle coxae are very largely ferruginous, while two of the specimens have the mesosternum largely yellowish.

31. CRYPTANURA TENUITEREBRATA, new species

Female.—Length 17 mm., antennae 15 mm., ovipositor sheath 9 mm.

Conspicuous for its large size and long slender ovipositor, this species is, nevertheless, very closely allied to *paranensis* and *variegata*, differing from the former principally by the characters employed in the key. In structure and sculpture it agrees very well with *variegata*, while in detail of color, especially of scutellum and propodeum, it is more like *paranensis*. The flagellum is somewhat stouter basally than in either of the other two species, the first joint of the flagellum being distinctly less than six times as long as thick, and the antenna is 38-jointed, with the annulus embracing flagellar joints (5) 6-19 (14). The ovipositor sheath is nearly as long as the abdomen and the ovipositor very slender, and of uniform depth to the distinctly subsagittate apex.

Type locality.—Rurrenabaque River, Beni, Bolivia.

Types.—Two females, the holotype captured in November 1921 by W. M. Mann on the Mulford Biological Exploration; the paratype from Sapucay, Paraguay, October 19, 1902. They are in the U. S. National Museum (No. 57079).

32. CRYPTANURA INCERTA (Cresson), new combination

Mesostenus incertus CRESSON, Proc. Acad. Nat. Sci. Philadelphia, 1873, p. 161, female.

This and the species next following differ from the preceding six species in the much shorter and stouter hind femur, which is barely two-thirds as long as the tibia. The antenna in this group is somewhat more slender and less strongly thickened and flattened toward the apex. Otherwise these species are, in structure and color pattern, very similar to the preceding group.

Female.—Length 11 mm., antennae 11 mm., ovipositor sheath 4 mm.

Temple flat, very strongly receding, distinctly less than half as broad as short diameter of eye; vertex very weakly convex; frons with striae radiating from ocelli, horns very small, on a common base; eyes weakly convergent below; face polished and sparsely punctate, striate above and in longitudinal impressions; clypeus very strongly convex, polished and sparsely punctate; malar space nearly as long as basal width of mandible; much more than half as long as cheek; antenna slender, weakly thickened and flattened toward apex, the joints in the thickened portion weakly transverse. Thorax distinctly compressed; humeral margin of pronotum transversely rugose and carinately prominent anteriorly, scrobes striate; mesoscutum with lobes flattened, polished, sparsely and coarsely punctate; scutellum narrow,

moderately convex, polished, with scattered punctures; mesopleuron striate above, polished and sparsely punctate below, as are also the sternum and the upper division of the metapleuron; lower division of metapleuron coarsely, obliquely striatorugose; propodeum with basal median area defined, lateral areas polished and coarsely, sparsely punctate to rugose, area behind carina irregularly rugose, posterior face transversely striate, apophyses rather long and slender. Abdomen rather stout, minutely alutaceous subopaque, petiole not depressed, postpetiole broader than long; second tergite little more than a half longer than broad at base, its sides broadly divergent; ovipositor sheath hardly as long as abdomen beyond first segment, ovipositor slender, of uniform depth to the subsagittate apex.

Head and thorax black and yellow (see description of color pattern, p. 141); mesoscutum with a single median spot; propodeal markings obliquely truncate shortly anterior to apophyses. Front and middle legs yellow, with coxae, trochanters, and femora black posteriorly; hind leg ferruginous with femur more or less piceous apically, tibia entirely and tarsus except the more or less blackish apex yellow. Wings slightly infumate, especially around apical margin. Abdomen ferruginous, usually with apex of tergite 1 narrowly yellow and postpetiole piceous, though sometimes entirely ferruginous.

Of this species I have examined six females and one male as follows: The National Museum female cotype from Mexico; a female and a male taken by August Busck, March 23 and 27, 1912, at Trinidad Río, Panama; a female from Alhajuelo, Panama, April 7, 1911, A. Busck; and two females from an altitude of 2,000–3,000 feet, "Pinches & Perene Vs," Peru, received from the Geographical Society of Lima.

The Peruvian specimens have the white markings somewhat less extensive, with mandibles and sternum entirely black, and the first tergite entirely red.

33. CRYPTANURA MACULIFRONS, new species

Female.—Length 11.5 mm., antennae (gone), ovipositor sheath 4 mm.

Similar to *incerta*, from which it differs virtually only as follows: Mesopleuron obliquely striate over most of its surface; face white only medially and in orbits, mandibles entirely black; propodeum dorsally, metapleuron below, and metasternum entirely reddish piceous to ferruginous; white markings of thorax as in *incerta* except that the mesosternum is entirely black; legs as in *incerta* except that the front coxa is very largely piceous and the middle coxa is entirely ferruginous, as is also the abdomen.

Type locality.—Misiones, "Env. de San Ignacio, Villa Lutecia," Argentina.

Type.—One female in the U. S. National Museum (No. 57082) labeled "E. R. Wagner, 1900."

18. Propodeum with yellow spots basally..... *uniformis* Brues
 Propodeum with reddish spots basally..... *rugosa* Brullé
19. Middle femur entirely black..... *fusciventris* (Cameron)
 Middle femur not entirely black..... 20
20. Front femur and usually middle femur black or piceous behind or below... 21
 Front and middle femora entirely red..... 32
21. Propodeal markings each with a narrow, tongue-like forward extension
 before apophyses..... 22
 Propodeal markings truncate basally..... 23
22. Postpetiole red; upper margin of pronotum tuberculate on each side anteriorly.
boliviensis Cushman
 Postpetiole piceous; upper margin of pronotum merely carinate anteriorly.
isthmus Cushman
23. Mesosternum white at least along sternalices..... 24
 Mesosternum not at all white..... 29
24. Hind legs very slender, femur apparently nearly 8 times as long as deep;
 temples in dorsal view very sharply receding and slightly concave.
gracilipes Cushman
 Hind legs stouter, femur apparently not more than 6 times as long as deep;
 temples flat or weakly convex..... 25
 [*variegata* (Brullé) varieties, *nigripes* Brullé, and *striata* Brullé run
 to 24 but not farther by the descriptions.]
25. Hind femur short, distinctly less than two-thirds as long as tibia; ovipositor
 sheath barely twice as long as first abdominal segment... *incerta* (Cresson)
 Hind femur at least two-thirds as long as tibia; ovipositor sheath distinctly
 more than twice as long as first segment..... 26
26. Cheeks fully twice as broad as malar space; temple rather broad, its angle
 with the longitudinal axis less than 45 degrees; ovipositor sheath much
 shorter than abdomen..... 27
 Cheeks much narrower; temple narrower, its angle with the longitudinal axis
 more than 45 degrees; ovipositor sheath nearly or quite as long as
 abdomen..... 28
27. Apophyses short conical; lobes of mesoscutum strongly convex and sparsely
 punctate; postpetiole broader than long, margined with yellow.
genalis Cushman
 Apophyses long; lobes of mesoscutum flattened and densely punctate; post-
 petiole as long as broad, not margined with yellow.... *gracilis* Cushman
28. Hypostomal carina distad of occipital carina shorter than malar space; ovi-
 positor slender and of nearly uniform depth except at apex.
tenuiterebrata Cushman
 Hypostomal carina distad of occipital carina as long as malar space, very
 high; ovipositor stout, much deeper near apex than at base.
excalibur Cushman
29. Head in dorsal view with temples concave and much less than half as long
 as short diameter of eye; scutellum black medially... *paranensis* Cushman
 Temples flat and nearly half as long as short diameter of eye; scutellum
 entirely yellow..... 30
30. Middle coxa black and yellow; face entirely yellow.... *atripectus* Cushman
 Middle coxa red; face with a black stripe on each side of middle..... 31
31. Ovipositor as long as abdomen and much deeper apically than basally.
platyurus (Brullé)
 Ovipositor much shorter than abdomen and of uniform depth.
maculifrons Cushman

32. Propodeal spots with tongue-shaped extensions anteriorly_	<i>variegata</i> (Brullé)	
Propodeal spots without such extensions anteriorly or, if extending forward from apophyses, the extensions truncate or tapering.....		33
33. Mesosternum black.....		34
Mesosternum at least partly yellow.....		35
34. Postpetiole black.....	<i>hyalina</i> Brullé	
Postpetiole red.....	<i>conica</i> Cushman	
35. Probably synonymous.....	<i>silonota</i> (Cameron)	
	<i>pretiosa</i> (Viereck)	
36. Propodeum with two yellow spots basally.....		37
Propodeum immaculate basally.....		42
37. Mesoscutum immaculate discally though sometimes with yellow marginal markings.....		38
Mesoscutum with two small markings discally.....		41
38. Mesoscutum immaculate.....	<i>ectypa</i> (Cresson)	
Mesoscutum with yellow marginal markings.....		39
39. Mesoscutum with yellow lines laterally opposite tegulae.		
	<i>quadrimaculata</i> Cushman	
Mesoscutum with cuneiform markings on anterior lateral margin.....		40
40. Preseutum yellow on each side.....	<i>nitidiuscula</i> (Cameron)	
Preseutum immaculate.....	<i>mediostrigosa</i> Cushman	
41. Hind femur black posteriorly.....	<i>bicarinata</i> Cushman	
Hind femur with a black line above.....	<i>championi</i> (Cameron)	
42. Mesoscutum with a single median spot or immaculate, rarely (<i>spinaria</i>) the median spot flanked on each side by a small mark on inner margin of lateral lobe.....		43
Mesoscutum with two discal marks.....		51
43. Mesoscutum immaculate.....	<i>ablata</i> (Cresson)	
Mesoscutum maculate.....		44
44. Propodeal spots with tongue-shaped anterior extensions, which rarely become confluent across median line.....		45
Propodeal markings without such extensions.....		49
45. Hind coxa red (♀) or black with a yellow spot above (♂).		
	<i>spinaria</i> (Brullé)	
Hind coxa yellow with black markings above.....		46
46. Hind femur red.....	<i>septentrionalis</i> Cushman	
Hind femur black and yellow.....		47
47. Hind femur black both dorsally and ventrally.....	<i>planiscutellata</i> Cushman	
Hind femur black only dorsally.....		48
48. Hind femur with a narrow median yellow line dorsally.		
	<i>lineatifemur</i> Cushman	
Hind femur entirely black dorsally.....	<i>veraepacis</i> (Cameron)	
49. Hind coxa and femur red.....	<i>acinaces</i> Cushman	
Hind coxa and femur black and yellow.....		50
50. Mesosternum yellow; ovipositor sheath shorter than abdomen.		
	<i>lamentaria</i> (Cameron)	
Mesosternum yellow only laterally and on each side of middle posteriorly; ovipositor sheath subequal to abdomen in length....	<i>propinqua</i> (Cresson)	
51. Mesopleuron with a large yellow spot anteriorly and a small one posteriorly; sternum, petiole, and hind femur entirely black.....	<i>apophysis</i> Cushman	
Mesopleuron with a single large oblique mark, joined posteriorly to a yellow line on sternum; petiole partly yellow; hind femur black only above....		52

52. Petiole black above, yellow below; hind femur with a median yellow line above ----- *orizabensis* (Cameron)
 Petiole black below, yellow above; hind femur entirely black above----- 53
53. Mesosternum largely yellow; propodeal spots broadly truncate before apophyses, the latter long----- *mexicana* (Cresson)
 Mesosternum yellow only along sternaules; propodeal spots narrowed and tongue-like before apophyses, the latter short----- *bilineata* Cushman

ADDENDUM

CREMNOCRYPTUS, new genus

Genotype.—*Polyaenus spiniferus* Cameron.

This genus will run in all existing keys to (*Polyaenus* Cresson) = *Cryptanura* Brullé, but the frontal horns are of quite different form, being flattened below and compressed above and separated by a deep groove. It also differs by the following characters: Ocelli situated on the sides of a distinct, sometimes very high, elevation; antenna in female only slightly thickened, slightly flattened on the outer upper side but not below; occipital carina strongly sinuate at lower extremity; mandible distinctly tumid at upper basal angle; upper margins of pronotum tumid, but not angulated anteriorly by the epomia, which are weak or obsolete; notaulices shallow and extending only about halfway to scutellum; sternaules short and shallow; scutellum very broad, very weakly convex, and with sparse, coarse punctures; nervulus interstitial or very nearly so; abdomen coarsely and deeply punctate on basal three tergites, male abdomen fusiform; ovipositor neither distinctly subsagittate nor swordlike, but rather tapering and distinctly flattened above at apex.

CREMNOCRYPTUS SPINIFERUS (Cameron), new combination

Polyaenus spiniferus CAMERON, Journ. Straits Branch Roy. Asiatic Soc., No. 46, p. 117, 1906.

Five specimens of each sex from Borneo, one female from Mindanao, and two females and one male from Singapore are before me. These agree exactly with Cameron's description.

CREMNOCRYPTUS CINGULATUS (Tosquinet), new combination

Polyaenus cingulatus TOSQUINET, Mem. Soc. Ent. Belgique, vol. 10, p. 45, 1903.

There can be no doubt that this New Guinea species is congeneric with the genotype. A considerable series, including both sexes, from Mindanao, Basilan, Samar, and Luzón belong, I suspect, to the species, though I hesitate definitely to identify them as such. They differ from *spiniferus* in having the stemmaticum strongly elevated above the ocelli; the thorax, especially the posterior face of the propodeum, much more sparsely sculptured; the basal tergites more coarsely and less densely punctate; the antennal annulus constantly shorter; and from all but the Mindanao specimen in the blackish color of the entire inner side of the hind tibia.