

THE GENUS CORIZUS.

With a Review of the North and Middle American Species.

By J. C. HAMBLETON.

INTRODUCTION AND ACKNOWLEDGMENTS.

The writer wishes to express his sincere thanks to those who have contributed to the success of this work by allowing him the use of their collections. Among these should be mentioned first Prof. Herbert Osborn who allowed the use of his private collection as well as that of the Ohio State University. Prof. Comstock sent the collection belonging to Cornell University, and Mr. Heidemann of the National Museum sent his private collection of several hundred specimens. The collection belonging to the Colorado Agricultural College was also at the writer's disposal. Without this extensive material, it would have been impossible to arrive at many definite conclusions concerning the genus.

The first insect of this genus to be described was *crassicornis*. Linneus in 1758 gave it a brief description and included it in his large genus *Cimex*. Fabricius, in 1794, described two more species, *sidæ* and *hyalinus*, under the generic name of *Lygaeus*, but later, in 1803, he changed them to the genus *Coreus*. In 1814 Fallen created the genus *Corizus* and gave it the following limitations: "Corpus oblongum; antennarum basali brevi; ultimo subclavato; thorace planiusculo; hemelytris oblique truncatis; membrana longitudinaliter multinervosa." In 1828, in his *Hemiptera Sueciae*, pages 41 to 45, he includes six species, not all of which, however, have remained in this genus. The only American species included here is *crassicornis*, a very common European insect.

Signoret in 1859, in the *Ann. Soc. Ent. Fr.*, published a monograph of the genus. This is a notable work and has served as the basis of nearly all the work that has been done on the genus since his time. He recognized the practical impossibility of separating the genus into natural groups, or subgenera. He includes fifty-four species from all parts of the world, and describes many new American species, some of which have not withstood the test of time, probably because his material was not abundant enough for him to understand their variations.

Stal, in 1870, in his *Enumeratio Hemipterorum*, Vol. 1, divides the genus into three sub-genera as follows: Liorhyssus, Niesthrea and Arhyssus, and follows this up in the third volume of the same work three years later on pages 97 and 98 by abandoning the genus *Corizus* entirely and creating from it three new genera, Liorhyssus, Peliochrous and Stictopleurus. Fieber, in 1861, had also made three genera of this genus, namely: Rhopalus, *Corizus* and *Brachycarenum*.

Lethierry and Severin in 1893 have abandoned these subdivisions and retained the genera *Corizus* and *Maccavethus*.

DESCRIPTION OF THE GENUS.

Body, narrowly ovate or oblong-ovate. Head short, conically produced in front of the eyes and narrowing abruptly behind. Rostrum reaching the posterior coxae. Antennae slender with first and last segments thickened, the former short, scarcely reaching or but slightly passing the apex of the head. Pronotum trapezoid shaped, crossed near its anterior margin by the transverse suture which is more or less plainly marked, and is interrupted at its middle by the median line. Scutellum a little longer than wide. Membrane with numerous simple veins. Metapleura dilated posteriorly. Legs medium, unarmed, the posterior pair slightly the longest. Body pubescent and punctured.

Taken as a whole the genus is truly cosmopolitan, being found both in the temperate regions and in the tropics. It is probably more abundant in the latter but is widely distributed in the former. One species, *hyalinus*, has been reported from Australia and the Philippines, Europe, Asia, Africa and America. Another species, *crassicornis*, is circumpolar in its distribution, being found in northern and central Europe and in northern North America, and entirely across Siberia. Still other species, such as *scutatus* and *tuberculatus*, as far as known, are confined to comparatively small areas.

Little is known of their habits. They probably hibernate, in temperate regions, in the adult state and deposit their eggs in early summer when their food plants have developed sufficiently to furnish food for their young, and reach maturity in early autumn. None of the species are sufficiently numerous to be of economic importance, though under changed conditions they might easily become so.

BASIS OF SEPARATION OF SPECIES.

Many mistakes have been made in the past by placing too much confidence in color characters in the determination of species. This is very unsafe, as it would be difficult to find a genus more variable and inconstant in this respect. In this paper structural characters alone are used for this purpose. A careful study of an abundance of material has shown that these are reasonably constant. The form and position of the antenniferous tubercles and rostral lobes are excellent characters to separate some of the species. The nature of the transverse suture on the pronotum, and the form of the scutellum serve for others. The genitalia give us excellent characters for several species, and the general form of each species varies but little, though the size may vary, and in several cases is quite distinctive. There is still another character that is good in a number of cases, though it is difficult of access and hence little use has been made of it. This is the nature of the dorsal sutures between the third and fourth, and fourth and fifth segments. It is a character that seems to be quite constant though at times the middle portions of these sutures may be so obliterated that it is difficult to distinguish them.

ARTIFICIAL KEY FOR THE DETERMINATION OF SPECIES.

1. (a) Last segment of abdomen short and broad, truncate in female and rounded in male *hyalinus*
 (b) Not as above 2.
2. (a) Antenniferous tubercles prominent; transverse suture terminating in a loop 3.
 (b) Not as above 4.
3. (a) Insect large. Connexivum spotted *crassicornis*
 (b) Insect small. Connexivum unspotted *viridicatus*
4. (a) Scutellum broad at the tip, rounded 5.
 (b) Scutellum narrow at tip and pointed 6.
5. (a) Antenniferous tubercles broad, sternum not black *scutatus*
 (b) Antenniferous tubercles very long, reaching almost to apex of head *tuberculatus*
 (c) Sternum black *indentatus*
6. (a) Connexivum unspotted *lateralis*
 (b) Connexivum spotted 7.
7. (a) Insect large, light colored *validus*
 (b) Insect medium, dark, last segment in female pointed 8.
 (c) Last segment in female not pointed 9.
8. (a) Last segment very long pointed *punctatus*
 (b) Last segment medium *nigristernum*
9. (a) Abdomen much broader than thorax, with black transverse band. . . *sidae*
 (b) Insect small, antennae short, scutellum large *parvicornis*

DESCRIPTION OF SPECIES.

Corizus hyalinus Fabricius.

Lygaeus hyalinus Fabricius, Ent. Syst., IV, p. 168 (1794).

Coreus hyalinus Fab., Syst. Rhyng., p. 201 (1803).

Corizus hyalinus Stal, Hem. Fab., I p. 68 (1868); Uhler, Geol. Bull. I, No. 5, p. 34 (1875); Obs. upon Heter. Hem. of Lower Cal., p. 237 (1895); Sum. of Hem. of Japan, Prés. to U. S. Nat. Mus. by Prof. Mitzukuri (1896); List. of Hem. Heter. of Las Vegas Etc., from Proc. U. S. Nat. Mus., XXVII, pp. 349-364 (1894); On Hem. Heter. of Grenada, W. I., pp. 180-181 (1894); Oshanin, Verzeichnis Der Palearktischen Hemiptern. I, p. 227 (1906).

An easily recognized species, with abdomen truncate in female and rounded in male. Transverse suture prominent and black, lateral borders of pronotum light. Length of female, 5.7 to 6.4 mm., width 2.3 to 2.5 mm., male, length, 5.5 to 5.8 mm., width 1.8 to 2 mm.

Head triangular, narrowing from the eyes forward. Antenniferous tubercles not prominent. Rostral lobes well marked, not thickened at extremities. Eyes prominent. First segment of antennae not reaching apex of head.

Pronotum: Transverse suture very wide and close to the anterior border. Scutellum with lateral borders almost straight and slightly elevated except at the tip, which is not excavated, and a poorly defined ridge throughout its length. Abdomen truncate in female and rounded in male; decidedly wider than the thorax especially in the female. Wings longer than the abdomen. Pubescence not abundant and punctuations small.

Color: The color of this species varies exceedingly, even in individuals taken in the same locality, though the markings are quite constant. In general, the ground color may be said to be a pale yellow, though this varies to red on one hand and to dark brown or black on the other.

Head: Transverse line across the base, a curved line backward and downward from the eyes, irregular lines between the eyes and rostral sutures, black. Antennae yellow or brown, pointed with black dots which on the upper surface are sometimes confluent, forming a black line.

Pronotum: Transverse suture, posterior angles, and punctuations except on lateral borders, black. This arrangement of color produces the lighter colored borders, which are so characteristic of this species. Scutellum same as pronotum, with the elevated ridges usually, and the apex always, of a lighter color, usually yellow.

Abdomen: Above, black with several light spots on or near the median line. Connexivum red or yellow, sometimes with a dark spot on each segment. Sixth segment black, with five yellow or reddish spots on the margin in the male, and with margin entirely yellow in the female. This margin is somewhat wider at the apex. Wings hyaline, nerves yellow or reddish. Apex of coreum usually red or brown. Entire under side yellow or reddish, except sternum, which is black.

This is a cosmopolitan, tropical and sub-tropical species, extending as far north in America as South Dakota and Iowa, and south into Mexico, Middle America and the West Indies. It is one of the most common southern European species, and is found south as far as Cape Colony in Africa, and Australia, and has been reported from the Philippines. Specimens are at hand from Colorado, Arizona, Mississippi, Mexico, Wyoming, South

Dakota, Iowa, Ohio, Bermuda and Hayti. It is reported by Uhler from Lower California, New Mexico, and Grenada, W. I. Oshanin in 1906 reports it from southern Russia, Caucasia, Turkestan, Japan and Chili. (For further references and synonymy, see Lethierry and Severin's General Catalogue.)

Corizus crassicornis Linneus.

Cimex crassicornis Linneus, Syst. Nat., 10th Ed., I, p. 448; 12th Ed., I, p. 727;

Faun. Suec., p. 254.

Rhopalus punctiventris Dallas, List. II, p. 526 (1852).

Corizus novaeborecensis Sign., Ann. Soc. Ent. Fr., p. 97 (1859).

Corizus borealis Uhler, Proceed. Acad. Phila., p. 284 (1862).

A large species easily recognized by its broad vertex and spotted connexivum. Length of female, 7.5 to 8.5 mm., width 3 to 3.5 mm. Male, length 6 to 7 mm., width 2.5 to 3 mm.

Head: Vertex broad, due to the thickened rostral lobes which extend almost to the apex. Antenniferous tubercles prominent, angular, and extending well forward. First segment of antennae passing beyond the apex of the head. Eyes not so prominent as in *hyalinus* because of the more prominent antenniferous tubercles.

Pronotum rather sharply angled anteriorly. Transverse suture terminating at either side in a closed loop. Scutellum gently narrowing from base to near the apex, where it expands slightly, and is rounded and excavated; borders slightly raised.

Abdomen rather abruptly widened at the third and fourth segments, especially in the female. Genitalia: Dorsal plate in female broadly triangular and rounded at the apex. Ventral plate compressed laterally, posterior angles rounded. Wings little, if any, longer than the abdomen. Punctuations small and pubescence very short.

Color: Above brownish gray, sometimes nearly black. Broad stripe on first segment of antennae, spots between ocelli and compound eyes, transverse suture on pronotum, black. The scutellum is usually much darker at its base and has the small depression at its apex black. Wing nerves light with few spots.

Abdomen black with three light spots, one occupying the middle of the third, fourth and fifth segments and two on the fifth, whose posterior border is also light. These spots may vary in size and may be fused, forming an inverted V-shaped spot. The sixth has two large yellow spots, one on either side, that reach the extremity. Connexivum light with a dark spot on each segment. Under side and legs yellowish gray, the latter spotted over with black. Large irregular black blotches on inner side of posterior femurs.

The color of this species, as of others, varies greatly. The ocelli may be entirely surrounded by a black spot which reaches the thorax. The transverse suture may be brown or gray, like the rest of pronotum. The black spots on wing nerves, depression at apex of scutellum, and spots on connexivum may be light or reddish brown. In very dark individuals the head, pronotum and scutellum may be heavily spotted with irregular blotches of black, and the black spots on connexivum may extend to the underside, and there may be a few small black spots, one on the posterior border on each side of the first, second and third

segments below. In such cases the spots on the abdomen above may all but disappear, except those on the sixth segment.

Rhopalus punctiventris Dallas and *Corizus novaeborecensis* Sign. should undoubtedly be referred to this species. Specimens from the east and from the west have been carefully compared with European specimens kindly sent by Dr. Horvath from Hungary. They are identical in all structural characters and do not differ more in color than do individuals taken in the same locality.

This is also a cosmopolitan species. Oshanin reports it as follows: All of Europe, Canaries, Tunis, Syria, all of Russia, Caucasia, Turkestan, Siberia and Japan. Uhler in various papers reports it from Colorado, Arizona, California, Washington, British America, Walrussia, Canada, Massachusetts, Pennsylvania, New York, Mackenzie River, Yukon, Saskatchewan and Lower California. Specimens are at hand from Washington, Oregon, Utah, British Columbia, California, Wyoming, South Dakota, Ohio, New York, and New Hampshire.

Corizus viridicatus Uhler.

Corizus viridicatus Uhler, Hayden's Survey of Montana, IV. Zool. and Bot., p. 404 (1872).

Corizus hyalinus Uhler, Geolog. Bull. II, No. 5 (1875), pp. 34 and 35.

A slender species, often greenish in color with the black spot on sixth segment quite prominent. Length of female, 5.5 to 6 mm., width 2 to 2.5 mm. Male, length 5 to 5.5 mm., width 1.8 to 2 mm.

The head pronotum and scutellum of this species closely resemble those of its near relative, *crassicornis*. They are, however, smaller, and the scutellum has its narrowest portion a little farther from the apex. The abdomen is but little wider than the thorax, and hence the sides are very nearly parallel.

Genitalia: Dorsal plate of female broadly rounded; ventral plate compressed laterally, uniform in width, posterior angles but little rounded. Dorsal plate of male broadly rounded; ventral plate much narrower at its middle point, and angles rounded. Wings a little longer than the abdomen, and opaque, thus hiding the abdominal picture except the anal spot. Pubescence soft and punctuations small.

Color: Light gray, often tinged with green, both above and below. This color, while predominant in the species, is not universal. Occasionally a specimen may be found with the thorax above, all black, except the scutellum, and the body below a reddish yellow. A broad stripe on basal segment of antennae, ocellar tubercles and a line between them and the eyes, black. Transverse suture and disk of abdomen usually black. Two broad stripes on last segment of abdomen and three spots about the middle of the disk, light. It is not uncommon to find specimens with the light color predominating on the disk, and all color may disappear except the spot on last segment.

This species was described by Uhler in 1872, but later, in 1875, he abandoned it, having come to the conclusion that it was but a variety of *hyalinus*. It now seems best to revive it as it certainly

is not a variety of *hyalinus*, but is closely related to *crassicornis*, from which it differs enough, however, to give it good specific rank. It seems to be confined to the west. Specimens are at hand from Colorado, Utah, California, Wyoming, Nebraska, and Assiniboine, B. A.

***Corizus scutatus* Stal.**

Rhopalus scutatus Stal., Freg. Eug. resa. Inst., p. 239 (1859).
Corizus jactatus Signoret, Ann. Soc. Ent. Fr. p. 81 (1859).

Female, length 8 to 9 mm., width 3 to 4 mm. Male, 7.5 to 8 mm., width 3 to 3.5 mm.

Head: Antenniferous tubercles broad but not long. Rostral lobes clearly marked, narrow and not reaching the apex of the head. The whole upper surface of the head is rough and tubercular. First segment of antennae just reaches the apex of head.

Pronotum: Transverse suture on a tubercular ridge which reaches quite to the borders of pronotum. Scutellum broad and rounded at the apex which is excavated.

Abdomen prominently widened at third and fourth segments, especially in the female. Genitalia: Dorsal plate in the female broadly triangular and gently rounded at the apex. Ventral plate widest at its middle and extending backward almost as far as does the dorsal plate. In the male the middle part of ventral plate is very narrow and the posterior angles rounded. Wings about as long as the abdomen. Punctuations not prominent. The whole insect is covered with a rather thick growth of short hair.

Color: Dull reddish brown above and tinged with yellow below. The median line on pronotum is usually lighter in shade and extends to the depression on the scutellum. In very dark specimens the apex of head and first three segments of antennae are nearly black, and a black line is found between the eye and ocellus. The scutellum may also be very dark except median line and borders. In very light specimens the color is uniform throughout the whole upper surface. Disk of abdomen black, with usually two small yellow spots on anterior borders of second, fifth and sixth segments, and another in the middle of the fourth. The sixth has two yellow stripes, one on either border, which sometimes fuse with the spots. The connexivum is light with a large brownish or reddish spot on each segment. This color sometimes approaches that of the connexivum and they are then almost invisible. Sometimes there is a line on each side of the abdomen below, dark reddish brown. Legs with a few small black points.

This species is not widely distributed, being, so far as known, confined to the western United States. Specimens are at hand from Oregon, Utah, Wyoming and California.

***Corizus indentatus* n. sp.**

Somewhat resembling *scutatus* but smaller and more hairy. Length of female, 4.5 to 6 mm., width 2 to 3 mm. Male, length 4.5 to 5 mm., width 2 to 2.5 mm.

Head: Antenniferous tubercles small but rather sharp, very close to the eyes. Rostral lobes short and obscure. First segment of antennae reaches a little beyond the apex of the head. Upper surface rough and tubercular.

Pronotum tubercular, especially in the region of the transverse suture which is often difficult to trace on this account. This suture forms a rather deep depression on either side of the median line. Scutellum rather broad and rounded at apex, with borders slightly raised near the end which is not excavated.

Abdomen but little wider than pronotum. Genitalia pretty much as in *scutatus*, though the entire sixth segment of the female is relatively shorter, and the ventral plate in the male is not so narrow at its middle point. Wings a little longer than abdomen. Whole insect covered with rather dense hair.

Color, reddish brown with no distinctive markings. The pronotum is sometimes irregularly blotched with black, and its posterior border, with the base of the scutellum may be dark or almost black. Beneath the color is lighter, often tinged with yellow and minutely spotted with red. Sternum black, and often a dark brown line on either side of abdomen below, near the borders. The first and second segments of disk of abdomen are black, and the remaining four may be black also, but usually are brown. The third has two small spots on anterior margin and the fourth a rather large oval spot at its center; the fifth has two smaller oblique spots at its anterior margin and several small round spots below these; the sixth with the conventional yellow lateral stripes and the long black spot between them. Connexivum alternating dark and light, sometimes one predominating and at others the other. The dark portions are frequently ornamented with one or more small round spots of a lighter color. The legs are reddish yellow spotted with brown. Wing veins with a few brown spots. Membrane with a slight reddish tinge.

This also is a western species, and was recognized as new by Uhler who proposed for it the name *indentatus*, but never published a description. Specimens are at hand from British Columbia, Washington, Oregon, California, Wyoming and Colorado.

Corizus tuberculatus n. sp.

Medium in size, with antenniferous tubercles abnormally long. Rather yellowish in color. Length of female, 6 mm., width 2.7 mm.

Head: Antenniferous tubercles very long, reaching almost to the apex of the head and diverging widely. Rostral lobes small but distinct. First segment of antennae passing the apex of head.

Pronotum: Transverse suture bordered anteriorly by a tubercular ridge. Anterior angles not prominent. Scutellum broad at the apex, rounded and excavated.

Abdomen not much wider than thorax and sides nearly parallel. Genitalia of female very similar to *scutatus*. Wings equal to abdomen in length. Pubescence slight. Punctuations prominent.

Color: Reddish yellow, a little darker above than below. Head a little more tinged with red. Eyes dark. Small black spots between ocelli and eyes. Posterior angles of pronotum darker. Scutellum light, unspotted. Disk of abdomen black with a small elliptical spot at its center and six smaller ones surrounding, and at some distance from it. Several other very small round spots are scattered over the surface. The posterior border of the fifth and all of the sixth segments light. The latter has a darker portion at its middle. This spot has the same form as the black stripe that is so common in this genus but is not black as is usually the case. Beneath, the insect is unspotted except the sternum which is black.

This insect is described from two females taken by Mr. Heidemann at Pullman, Washington.

Corizus lateralis Say.

Coreus lateralis Say, Jour. Acad. Phila., IV, p. 320 (1825); Complete Writings, II, p. 245.

Rhopalus punctipennis Dallas, List., II, p. 526 (1852).

Corizus lateralis Signoret, Ann. Soc. Ent. Fr. p. 97 (1859); Uhler, Hayden's Survey Mont., IV, Zool. and Bot., p. 404; Bull. Geol. and Geog. Survey, II, p. 301, and III, p. 408; Proc. Boston Soc. Nat. Hist. XIX, p. 386. Distant, Biol. Cent. Amer., pl. XVI, fig. 9 and 10 (1881).

This is a light colored species, red and yellow predominating. Eyes prominent and apex of head sharp pointed. Length of female, 5.5 to 6 mm., width 2.5 to 3 mm. Male, length 5 to 5.5 mm., width 2 to 2.5 mm.

Head: Antenniferous tubercles very small and close to the eyes. Rostral lobes prominent though not reaching the apex. First segment of antennae just reaching the apex of the head. Eyes prominent.

Pronotum much narrower in front than behind. Transverse suture reaching to the borders of the pronotum. Scutellum narrowing rather abruptly near the base; slender near the apex which is rather sharp and somewhat elevated. Borders of apical portion raised.

Abdomen but little wider than pronotum. Genitalia: Dorsal plate in female broadly triangular with rounded apex. Ventral plate with posterior angles evenly rounded. Dorsal plate in male produced and spatulate. Ventral plate wider at the edges and middle, almost as long as dorsal plate. Wings as long as or a little longer than the abdomen. Pubescence medium. Punctuations coarse but not tubercular.

Color: This species is so variable in color that little use can be made of this character for the purpose of identification. Red and yellow predominate, and black is usually wanting except on disk of abdomen and wing spots, and even from here it sometimes disappears. The red varies from bright to pale. In some cases the head and thorax are red and the under side of abdomen a bright yellow. Occasionally lateral reddish brown stripes are found on the under side of the abdomen, especially in the males. The color scheme on the disk of abdomen consists of a large transverse spot at the base, two lateral longitudinal areas about the middle, the spot on anal segment and three small spots on the enclosed area, black or reddish. These areas may increase in size until they cover the entire abdomen except the anal segment, or they may entirely disappear. Connexivum, except in very rare cases, without spots. Sternum black, reddish or colorless.

This is a widely distributed species in the U. S. and seems to be more abundant in the south. Specimens are at hand from practically every part of the United States.

***Corizus validus* Uhler.**

Corizus validus Uhler, Proc. Ent. Soc. Wash. p. 370 (1893).

Closely resembling *lateralis* in form and color. Very large. Rare. Length of female, 7 to 8 mm., width 3.5 to 4 mm. Male, length 7 to 7.5 mm., width 3 to 4 mm.

This insect differs so little from *lateralis* that it is doubtful if it should be retained as a separate species. The head and thorax characters are practically identical. The scutellum is a little broader in the last third of its length, and the apex is a little more sharply pointed.

There is little difference in the genitalia, and what is noticeable might disappear if sufficient material were at hand. In the female the posterior angles seem to be rather more rounded than in *lateralis*, and in the male the widening of the middle portion of the ventral plate seems to be a little more pronounced, thus giving it a longer and sharper point when viewed from the side. In the

female the ventral plate is frequently notched at the apex. This rarely occurs in *lateralis*.

In color there is little difference. It has the same variable character, and the dorsal picture is often the same. The connexivum, however, usually has a small spot on each segment, while in *lateralis* this rarely occurs.

It is not widely distributed, and seems to be confined to the mountains. Specimens are at hand from Cal., Utah and Wyo.

Corizus sidae Fabricius.

Lygaeus sidae Fabr., Ent. Syst., IV, p. 169 (1794).

Coreus sidae Fabr., Syst. Rhyng., p. 201 (1803).

Coreus (*Rhopalus*) *sidae*, Guer. in Sagra. Hist. de Cuba Ins. p. 385 (1857).

Rhopalus pictipes Stal, Freg. Eug. resa. Ins. p. 239 (1859).

Corizus sidae Sign., Ann. Soc. Ent. Fr., Ser. 3, VII, p. 95; Stal, Hem. Fabr., I, p. 69 (1868).

Corizus mexicanus Sign. Ann. Soc. Ent. Fr., Ser. 3 VII, p. 95 (1859).

Corizus proximus Sign., Ann. Soc. Ent. Fr., Ser. 3 VII, p. 96 (1859).

Corizus nebulosus Sign., Ann. Soc. Ent. Fr., Ser. 3 VII, p. 98 (1859).

Corizus pictipes Stal, Ent. Zeit. XXIII, p. 307 (1862).

Corizus anticus Sign., Ann. Soc. Ent. Fr., Ser. 3 VII, p. 99 (1859).

Corizus ventralis Sign., Ann. Soc. Ent. Fr., Ser. 3 VII, p. 92 (1859); Distant, Biol. Cent. Amer. pl. XV, fig. 23.

Small pointed head; abdomen broad and short. Abdominal picture appearing as a dark band across the middle of abdomen. Length of female, 5.6 to 6.3 mm., length of male, 4.4 to 5.5 mm. Female, width 2.9 to 3.1 mm., male, width 2 to 2.5 mm.

Head narrowly triangular. Antenniferous tubercles scarcely visible and placed very close to the eyes. Rostral lobes short but well defined. First segment of antennae scarcely reaching apex of the head.

Pronotum narrowing decidedly anteriorly and quite convex. Transverse suture bordered in front by a tubercular ridge. Scutellum rather sharply pointed and excavated at the tip.

Abdomen short and much wider than thorax, narrowing rapidly from fourth segment, and becoming depressed. Genitalia: Dorsal plate in female broadly rounded at the apex. Ventral plate short, uniform in width, posterior angles round. Dorsal plate in male convex, short. Ventral plate much narrower at the middle than at the edges. Wings longer than the abdomen. Pubescence soft on the body and heavier on the legs. Punctuations rather coarse.

The general color varies from dark brown to gray or reddish yellow, usually rather thickly covered over with very small brown or bright red spots, and often with both colors intermingled. The whole insect, especially in the tropics, often has a metallic luster, making it the most beautiful of the genus when viewed under the lens. A dark line begins on the head and extends backward on the pronotum, where it widens and is lost.

The abdominal picture varies greatly, but the first segment is usually darker while the second is light except at its middle where there are frequently three small spots. The third, fourth and fifth are nearly always dark, and often black; the fifth having a light spot at its center. The sixth segment is all light in the female and with a dark stripe at its middle in the male. Connexivum light; the third, fourth and fifth segments having each a darker spot which usually has a light spot or line at its center. This latter may be absent, as also the dark spot on the third segment. Sternum black. On the legs, the small spots that cover the body, form well marked rings.

This species is widely distributed in tropical America. Berg, in his *Hemiptera Argentina*, p. 93 (1879), reports it from the Argentine Republic, Patagonia and Brazil. Uhler in various articles reports it from Texas, Indian Territory, Arizona, Mexico, Brazil, Maryland (once only), and Lower California. Specimens are at hand from Georgia, Florida and Arizona, in the United States, and from Mexico, Guatemala, Cuba, Hayti, Trinidad and St. Vincent.

***Corizus parvicornis* Signoret.**

Corizus parvicornis Sign., Ann. Soc. Ent. Fr., p. 301 (1859).

Very small. Short and thick in appearance. Neck short. Length of female 3.5 to 5 mm., width 2 to 2.5 mm. Male, length 3 to 4 mm., width 1.5 to 2 mm.

Head: Antenniferous tubercles short and rounded. Rostral lobes small and obscure. Antennae short. First segment reaching apex of head. Head narrowing very abruptly behind the eyes, thus bringing the latter very close to the angles of the prothorax.

Pronotum short. Transverse suture much curved and bordered anteriorly by a prominent ridge. Scutellum large, about one-third as long as the abdomen; apex broad though rather abruptly drawn to a point; the borders about the large excavation prominently raised.

Abdomen a little wider than prothorax. Genitalia: Dorsal plate in the female a little produced and broadly rounded. Ventral plate widest at its middle with posterior angles broadly rounded. In the male the dorsal plate is much produced, and the ventral is equal in width throughout. Wings, little if any longer than the body, and sometimes not reaching the extremity of the abdomen. The whole insect has a short thick appearance which is very characteristic. It is thinly covered with rather long hair. Punctuations large.

Color: Varying from gray to almost black, without distinctive markings except on the disk of the abdomen, which is black or brown. There is a small obscure light spot about the middle of the fourth segment, and two each on the anterior borders of the third and fifth. The transverse suture, and a few spots on the wing veins are black. The sixth segment has the common black spot in the middle and sometimes the light borders may be divided by the enlargement of this spot, thus forming two light spots at the anterior margin. Connexivum spotted. The sternum is black and the legs are spotted with the same color or with brown. These spots usually form pretty well pronounced rings. In very dark specimens the whole under side is covered over with dark or black blotches.

This is the smallest species of the genus and seems to be rather rare. Specimens are at hand from California, Texas and Mexico.

***Corizus nigristerium* Signoret.**

Corizus nigristerium Sign., Ann., Soc. Ent. Fr., p. 100 (1859).

Corizus Bohemani Sign., Ann. Soc. Ent. Fr., p. 86 (1859).

Very dark in color. Spot on abdomen above, in form of an X. Length of female 5.5 to 6 mm., width 3 mm. Length of male 5 to 5.5 mm., width 2.5 to 3 mm.

Head: Eyes rather prominent. Antenniferous tubercles small and close to the eyes. Rostral lobes short, clearly marked.

Pronotum decidedly narrower in front than behind. Transverse suture a slender line bordered anteriorly by a slight elevation. Median line prominent.

Scutellum sharp pointed and not excavated. Lateral borders raised, except at their middle points.

Abdomen but little wider than prothorax. Genitalia: Dorsal plate in female a little broader than long; apex pointed. Ventral plate widest at its middle, and the posterior angles practically wanting. Dorsal plate of male somewhat produced and broadly rounded; ventral plate widest at the middle; posterior angles rounded. Punctuations normal. Pubescence short and soft. Wings about as long as the body.

Color: Rather dark reddish or yellowish brown, frequently almost black. Apex of head, and small spots between ocelli and eyes, black. Median line of pronotum light, extending onto scutellum, the borders of which are also light on the elevated portions. Disk of abdomen dark brown or black, with a light spot, near its middle, in the form of an X. This spot may be much reduced, or it may be enlarged to form a large irregular blotch. Last segment light, with a black stripe very much enlarged laterally, enclosing two light spots at its anterior border. This enlargement is often obscure or wanting, especially in the female. Connexivum, light, spotted with black. Beneath, uniform light yellow or reddish brown. Sternum black. Wing veins spotted with dark red or black. Legs yellowish with dark spots.

This species is eastern in its distribution, and apparently does not extend far south. Uhler has reported it from the east and also from the south-west, Arizona, Texas, California, and Lower California, but the species to which he refers here is probably *indentatus*, which has a slight superficial resemblance to *nigristernum*. Specimens are at hand from Canada, Ohio, Pennsylvania, New York, West Virginia, Virginia, Maryland, District of Columbia and Missouri.

Signoret evidently had two extreme types of this insect and hence described it twice as different species.

***Corizus punctatus* Signoret.**

Corizus punctatus Sign., Ann. Soc. Ent. Fr. p. 81 (1859).—Distant, Biol. Cent. Am., pl. XVI, fig. 8 (1881).

Somewhat resembling *nigristernum* in general shape and color, but with last segment of abdomen much more produced. Length of female 5.5 mm., width 2.5 mm. Length of male 4.5 mm., width 2 mm.

Head: Eyes very prominent. Antenniferous tubercles short and broad, rounded at the tips. Rostral lobes slender but reaching almost to the apex of the head, but not clearly marked. First segment of antennae slightly passing the apex.

Pronotum much narrower in front than behind. Region of transverse suture not tubercular. Scutellum rather sharp with a very small excavation at the apex.

Abdomen very little wider than the thorax. Sixth segment very long, pointed. Both dorsal and ventral plates in the female are sharply triangular, and the ventral is but little shorter than the dorsal. In the male the dorsal is somewhat produced with apex rounded. Ventral plate much widest at its middle point. Wings about as long as the abdomen. Pubescence short and soft. Punctuations normal.

Color, dark reddish brown or almost black above, and reddish yellow or yellow, below. The eyes and ocelli are red, the latter bordered by a black spot. The head has a blackish longitudinal line running throughout its length. Wing

veins sparingly spotted with black. Abdomen above, black with three small light spots, one on the fourth segment and two on the fifth, the sixth has the conventional black stripe bordered by lighter color. The connexivum is light with a small black spot on each segment.

Too much confidence should not be placed in this color description. The insect is rare, at least in collections, and material at hand was not sufficient to determine the limits of its variation. It is however, easily distinguished from all others by its genitalia. Specimens are at hand from Texas, Mexico and Hayti.

PHYLOGENY.

Any attempt to trace the lines of dispersal or phylogeny of this genus must be merely tentative until more is known of their life histories, food plants, etc. As far as known at the present time, *hyalinus* is by far the most widely distributed member of the genus, and from the fact that it is found in the tropics and sub-tropics, completely around the earth, we must concede to it very great antiquity. It probably penetrated into the United States by way of Mexico, and thence spread over the entire southern half of the country.

Sidae undoubtedly has originated in Central America or the West Indies, and has spread as far north and south as the climate or its food plant will permit. *Parvicornis* is rather an extreme type that is difficult to account for, though it is probably an offshoot from *sidae*, as it seems to be more closely related to it than to any other.

Crassicornis is circumpolar in its distribution, being found entirely around the earth in the north temperate zone, and even far into the boreal regions of North America and Eurasia. It is probable that it originated in the latter continent and thence found its way to America. The winds and tides would favor a migration in this direction, rather than in the opposite. *Viridicatus* is plainly a mountain offshoot from this species.

Scutatus, *indentatus* and *tuberculatus* are three species that in many respects, are closely related, and seem to have sprung from a common type. They are all western, and as far as known, not widely distributed, and occupy the same territory. The remaining four species, namely, *lateralis*, *validus*, *nigristernum* and *punctatus*, form one lateral branch that seems to have sprung from the *hyalinus* type. *Lateralis* is the most widely distributed and occupies, practically, all of the United States. *Validus* is a mountain form very closely related to *lateralis*, and is not com-

mon nor widely distributed. *Nigristernum* occupies the eastern United States and Canada, while its closely related species, *punctatus*, is from the southwest, Mexico and the West Indies.

Hyalinus and *crassicornis* are the only American species that are also found in the Old World. It seems more than probable that these have both emigrated to this country, *hyalinus* by the southern route and *crassicornis* by the northern, and here given rise to our peculiarly American species. From the latter, undoubtedly we get *viridicatus*, while all the remaining species seem to have sprung from the *hyalinus* stock.

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EXPLANATION OF PLATES.

PLATE VIII.

Corizus hyalinus ♀
 " *crassicornis* ♀
 " *tuberculatus* ♀
 " *sidae* ♂

PLATE IX.

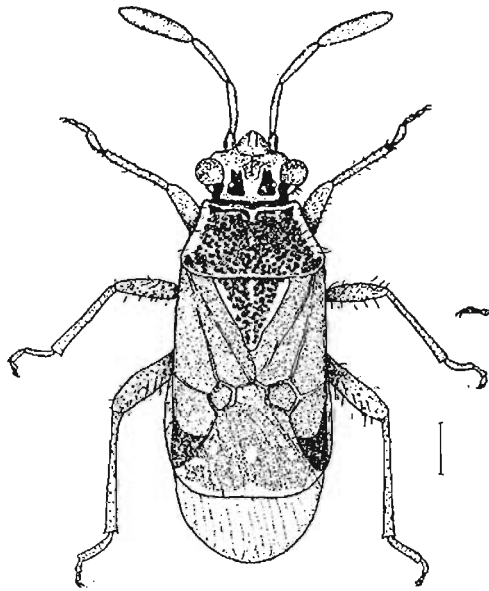
FIG. 1. Abdominal disk of *hyalinus* ♀
 " 2. " " " *crassicornis* ♀
 " 3. " " " *viridicatus* ♀
 " 4. " " " *scutatus* ♀
 " 5. " " " *indentatus* ♀
 " 6. " " " *tuberculatus* ♀
 " 7. " " " *parvicornis* ♀
 " 8. " " " *lateralis* ♀
 " 9. " " " *validus* ♂
 " 10. " " " *sidae* ♀
 " 11. " " " *punctatus* ♀
 " 12. " " " *nigristernum* ♀

PLATE X.

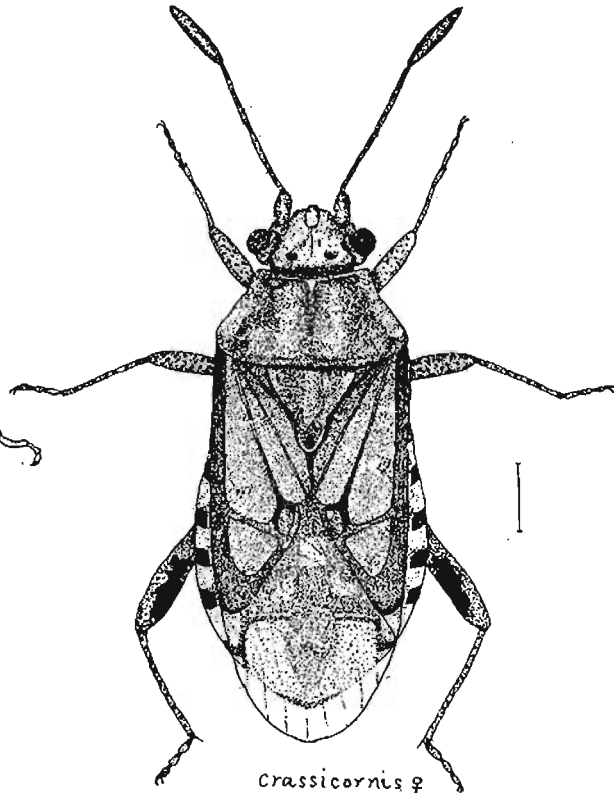
FIG. 1a ♂, 1b ♀, genitalia, side view, 1c, head, 1d, scutellum of *hyalinus*..
 " 2a ♂, 2a ♀, " " " 2c, " 2d, " *crassicornis*..
 " 3a ♂, 3b ♀, " " " 3c, " 3d, " *viridicatus*..
 " 4a ♂, 4b ♀, " " " 4c, " 4d, " *scutatus*..
 " 5a ♂, 5b ♀, " " " 5c, " 5d, " *indentatus*..
 " 6a ♀, " " " 6b, " 6c, " *tuberculatus*..

PLATE XI.

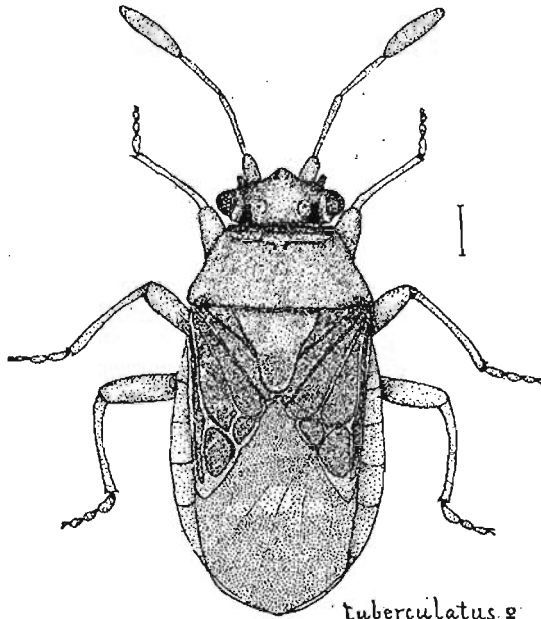
FIG. 7a ♂, 7b ♀, genitalia, side, view 7c head 7d, scutellum of *parvicornis*..
 " 8a ♂, 8b ♀, " " " 8c, " 8d, " *lateralis*..
 " 9a ♂, 9b ♀, " " " 9c, " 9d, " *validus*..
 " 10a ♂, 10b ♀, " " " 10c, " 10d, " *sidae*..
 " 11a ♂, 11b ♀, " " " 11c, " 11d, " *punctatus*..
 " 12a ♂, 12b ♀, " " " 12c, " 12d, " *nigristernum*..



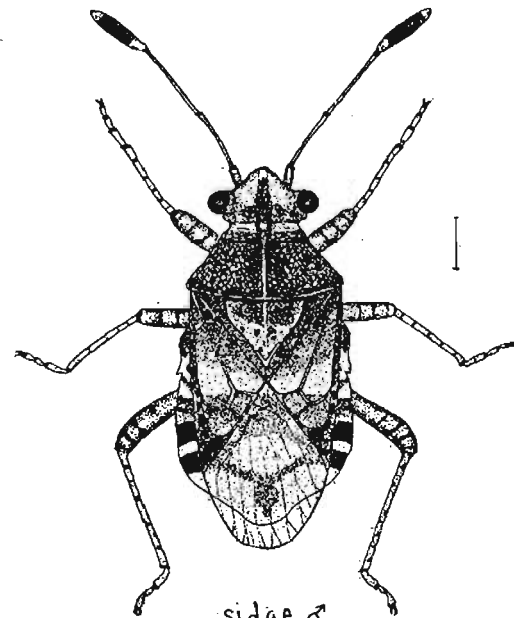
hyalinus ♀



crassicornis ♀

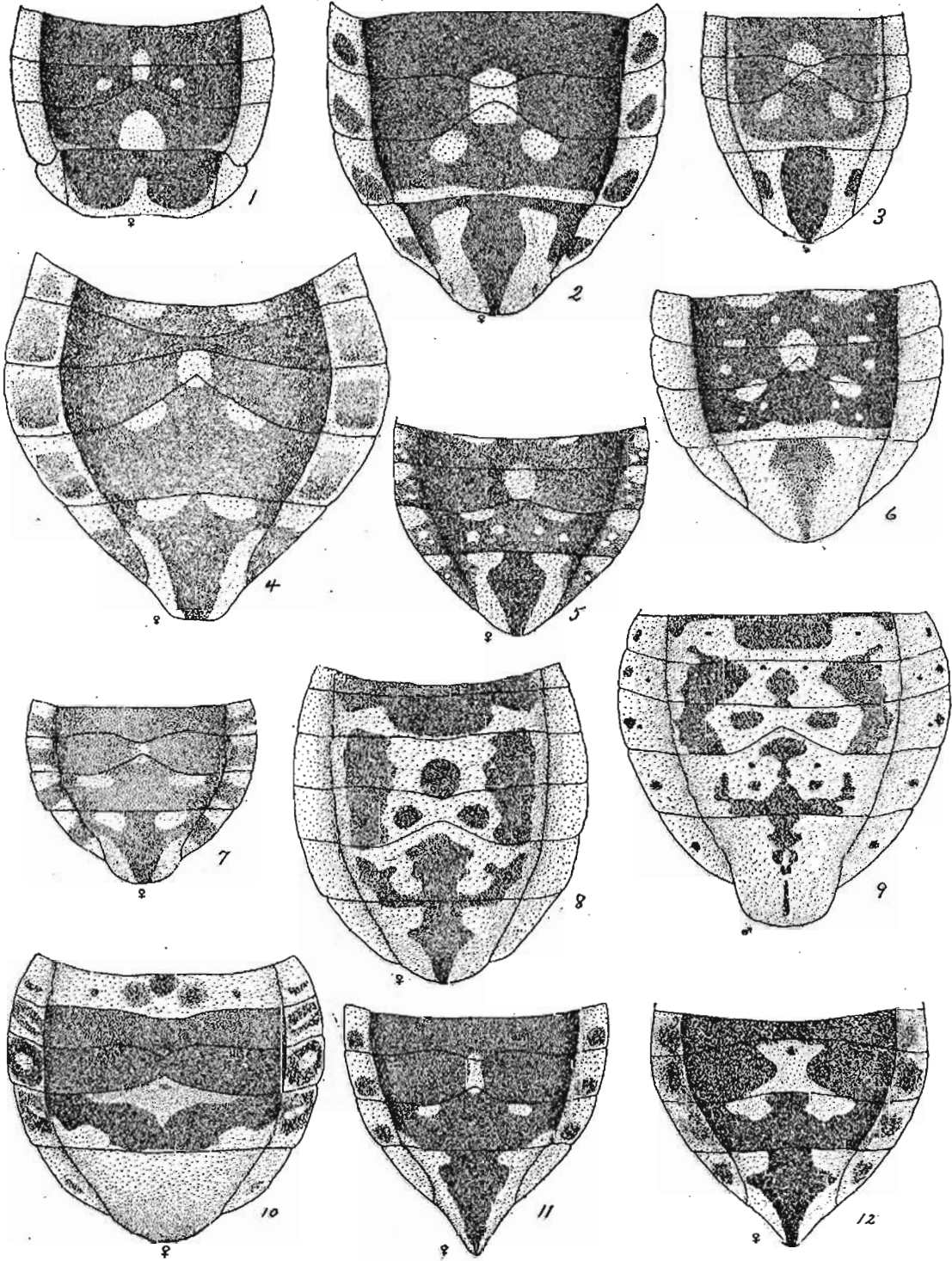


tuberculatus ♀

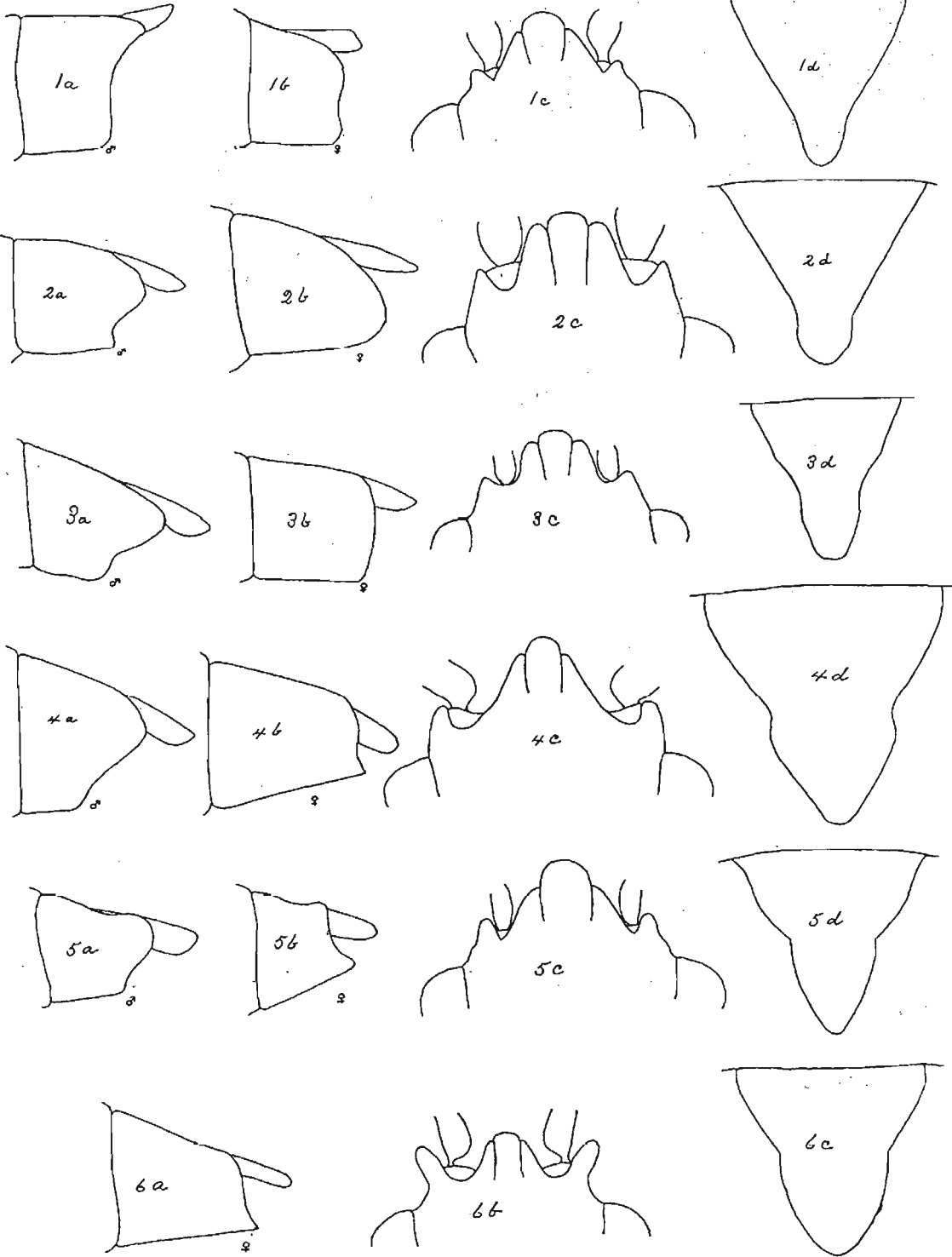


sidae ♂

Hambleton, del.



Hambleton, del.



Hambleton, del.

