

STUDIES ON THE FAUNA OF CURAÇAO AND OTHER  
CARIBBEAN ISLANDS: No. 19.

CARIBBEAN TIGER BEETLES OF THE GENUS  
CICINDELA

by

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The small collection of tiger-beetles, belonging to the genus *Cicindela*, which is the subject of this paper, was made by Dr P. WAGENAAR HUMMELINCK during his visits to the Lesser Antilles and the adjacent South American mainland coast in 1936-'37 and 1948-'49.

The greater part of the material has been deposited at the „Zoölogisch Museum” of *Amsterdam* and the „Rijksmuseum van Natuurlijke Historie” at *Leiden*. Some specimens (14 *C. auraria*, 10 *C. graphiptera* and 9 *C. trifasciata*) were presented to the collections of the *American Museum of Natural History*, *British Museum*, *Deutsches Entomologisches Institut*, Hope Department of Entomology at *Oxford*, The Imperial College of Tropical Agriculture in Trinidad, Institut Royal des Sciences Naturelles de Belgique at *Brussel*, Musée National d'Histoire Naturelle at *Paris*, Natural History Museum of Jamaica at *Kingston*, United States National Museum, and the Zoological Museum (including the collection E. Suenson) at *Copenhagen*, whose keepers kindly entrusted me with some material included in this study. The specimens from the *U.S. Nat. Mus.* were presented to *Amsterdam*, those from the *Amer. Mus.* to *Leiden*.

The writer is specially indebted to Dr HUMMELINCK for criticizing the manuscript and for providing much useful information bearing on this study, including some results of his visits to the British Museum (Natural History) and the University Museum at Oxford. The photographs were made by H. VAN KOOTEN.

TABLE 2.  
Geographical distribution of the *Cicindelids* treated in this paper

Species of <i>Cicindela</i>	Aruba	Curacao	Klein Bonaire	Bonaire	Tortuga	Margarita	Trinidad	Grenada	St. Vincent	Barbados	Martinique	Guadeloupe	Antigua	Barbuda	St. Barts	St. Martin	Anguilla	St. Croix	St. John	St. Thomas	Puerto Rico	Hispaniola	Jamaica	Grand Cayman	Little Cayman	Cuba	Bahamas	Bermudas	U.S.A.	Mexico	Nicaragua	Costa Rica	Panama	Colombia	Venezuela	Cayenne	Brazil	Botswana	Peru			
<i>auraria</i> . . . . .	•																																									
<i>trifasciata trifasciata</i> . . . . .																																										
<i>trifasciata ascendens</i> . . . . .																																										
<i>suturalis</i> f. typ. . . . .																																										
<i>suturalis</i> var. <i>hebraea</i> . . . . .																																										
<i>suturalis</i> var. <i>guadeloupensis</i> . . . . .																																										
<i>graphiptera</i> f. typ. . . . .																																										
<i>graphiptera</i> var. <i>julisdiceps</i> . . . . .																																										

• localities from which material, collected by dr Hummelinck, was studied  
 x according to specimens examined from other sources  
 • from literature  
 ? from literature, but considered as doubtful

The structure of the male genitalia, which probably are of great importance for the classification of Cicindelids, has not been studied, as this would lead me to conclusions which should be left to more expert coleopterists.

**Cicindela auraria** Klug, 1834

[Plate XIII and XIV; fig. 27, 28a-c and 29a]

*Cicindela boops* DEJEAN, 1831, p. 256-260 [Pro parte!; "... M. Schönherr n'en a communiqué un individu venant de Carthagène, sous celui d'*Auraria*."; „*C. Auraria*. SCHÖNHERR.", nomen nudum, erroneously placed in synonymy with *C. boops*.]

*Cicindela auraria* KLUG, 1834, p. 27 [Compares several females, collected by Haer-berlin at Carthagena, Colombia, with specimens of *C. boops* from Port au Prince, Hispaniola, and separates *C. auraria* from *C. boops*. „Erstere, die *C. auraria*, ist, was ihre Gestalt betrifft, immer kürzer und breiter, und die Spitzen der Deckschilde sind, obgleich ausserdem wie bei der *C. boops* beschaf-fen, doch immer weniger schräg abgeschnitten. In Hinsicht der Zeichnung auf den Deckschilden ist zu bemerken, dass die schräge, am Aussenrande entsprin-gende abgekürzte Mittelbinde bei den Exemplaren von Carthagena, der *C. au-raria*, deutlich kürzer als bei der *C. boops* und an der Spitze nicht im geringsten verdickt oder erweitert ist, wie solches bei allen Exemplaren von Port au prince, der *C. boops*, wo auch der aufsteigende Ast des Mondes an der Spitze sich mehr verlängert, unverkennbar der Fall ist."]; BATES, 1881, p. 12 [Matachín, Pana-má, Schunke coll.]; NEERVOORT VAN DE POLL, 1886, p. 227 [Curaçao, Jan. or Febr. 1885; „Un exemplaire de cette espèce, provenant de la Vénézuéla fut redécrit par Putzeys sous le nom de *palliata*. Je possède un exemplaire de cette localité, qui ne diffère de la forme insulaire qu'en ce que le dessous est moins cuivreux. Cette espèce n'est pas du tout commune, je ne la rencontrais que dans la partie centrale de l'île dans la plantation dite „Hermanus", où elle se trouvait seulement à un certain endroit, grand d'environ 50 M<sup>2</sup>, au bord de la saline."]; HORN, 1915, p. 402 [General description; „Panama bis Venezuela, Curaçao."]; HORN, 1938, p. 51, tab. 84 fig. 1-3 [Drawings of elytra.]; BLACK-WELDER, 1944, p. 17.

*Cicindela palliata* PUTZEYS, 1845, p. 366 [„Sub-complanata, subtus cupreo-fulgida lateribus albo-pilosis, supra virescenti-cuprea; elytrorum margine integro valde dilatato, intus tridentato, albido." „Venezuela (Cumana). Se trouve dans l'intérieur sur les terres marécageuses dessechées, où elle est commune."].

MARGARITA: Shore of the *Laguna de las Maritas*, N of Punta Mosquito, 4.VI.1936, near Station 1217, muddy sand near Rhizophora and Avicennia, many specimens observed (1 ♂ 2 ♀♀; Plate XIV 1 ♀); Pampatar, 9.XII.1930, collected by J. G. Myers (I.C.T.A., ♂).

BONAIRE: *Salinja Plenchi*, 3.XII.1930, near Sta. 1089, shore of shallow saltlake with sandy mud and tufa crusts (♂; XIV 4); *Blauwe Pan*, 24.III.1949, shore of saltlake, coll. by A. C. J. Burgers (3 ♂♂ 1 ♀).

KLEIN BONAIRE: N. shore of *Salinja*, 27.XI.1930, near Sta. 320 and 1051, shore of saltlake (17 ♂♂ 28 ♀♀; XIV 2 ♀ 3 ♂ 5 ♀ 6 ♂).

CURAÇAO: *Otrabanda*, Willemstad, 13.I.1952, coll. by B. de Jong (Amster-

dam, ♀); *Hotel Piscadera Baai*, 30.XI.1936 (♂, XIV 7); *Salinja Groot Santa Maria*, 4.XII.1948, shore of saltlake, muddy sand (♀; XIV 8).

ARUBA: *Saltpan W of Oranjestad*, 22.VI.1930, coll. by H. J. MacGillavry (Amsterdam, 2 ♂♂ 3 ♀♀; XIV 9 ♀); *Salinja San José*, N of Palm Beach, 19.I.1949, near Sta. 1012, shore of saltlake, greyish mud (2 ♂♂ 1 ♀); *Tibushi*, 9.XII.1936, Sta. 273, stony, non-calcareous soil, almost without plant life, about 1 km from shore (♀; XIV 11); *Salinia Master*, W of Savaneta, 2.I.1949, near Sta. 360, shore of saltpond, greyish, muddy sand (3 ♂♂ 4 ♀♀; XIII ♀, XIV 10 ♀, fig. 29a).

VENEZUELA (mainland): N. shore of the *Bahía de las Piedras*, Paraguaná, 24.II.1937, many specimens observed on greyish brown, sandy mudflat, separated from sandy beach by 30–50 m of very low dunes, a few spec. obs. on beach, probably blown away by trade-wind (2 ♂♂ 3 ♀♀; XIV 13 ♀ 14 ♂; fig. 28c); „Caraccas” (?) (Brit. Mus., small ♀); Venezuela (D. Ent. Inst., ♀).

COLOMBIA: Sandy mudflat near *Puerto López*, at entrance of Laguna de Tucacas, La Goajira, 15, 27, and 28.I.1937, see fig. 27 (8 ♂♂ 14 ♀♀; XIV 15 ♂ 16 ♂ 17 ♀ 18 ♀, fig. 28a–b); Carthagena (Brit. Mus., ♀); Colombia (Brit. Mus., 3 ♂♂ 5 ♀♀; XIV 12 ♀).

PANAMÁ: Matachín, VII.1877 (Paris, ♀).

**Description** (compared with *C. graphiptera* var. *fulgidiceps*, *C. trifasciata* trif. and *C. suturalis*; based on 40 ♂♂ and 58 ♀♀ from Margarita, Bonaire, Curaçao, Aruba, Paraguaná and La Goajira)

Body length (without labrum) ♂ 8.1–9.6–10.9 ♀ 8.6–9.8–11.0 mm; body width ♂ 3.4–4.0–4.8 ♀ 3.6–4.4–5.0 mm; ♂ 2.2–2.4–2.7 ♀ 2.0–2.3–2.6 times as long as wide.

*Antenna* with its four basal joints shining coppery-green; the other brown, covered with short hairs. First joint with 1 long, erect bristle near the top. Second joint glabrous. Third joint with 2–4 erect bristles on the outside and 2 on the top. Fourth joint with 1 or 2 in the middle and 2 on the top. Next 6 joints with 3 erect, short setae on the top; the last also with some in the middle. Third joint about 0.9 times as long as the fourth one.

*Labrum* (see fig. 28a–c) yellowish white, not very broad, rather short, directed downward, not distinctly roof-shaped. Margin with 1 dark, acute tooth in the middle; on each side of the tooth the margin is weakly curved outwards; central part protruding. Hindborder in the middle slightly curved backwards. On the labrum 6–8 submarginal setae; 2 or 3 near each other on both sides near the middle (sometimes not the same number on each side), and 1 near each lateral front-angle.

*Head*. Clypeus glabrous. Frons coppery-green; the sides shining coppery-green with longitudinal strigae; the middle coppery, more or less punctate, with finer strigae. Vertex with fine longitudinal strigae on the sides, transversal on the hind part, granular on the middle; shining coppery-green, glabrous, except for two supra-orbital hairs on each orbital plate. Eyes strongly protruding. Genae densely clothed with decumbent bristles. Gula nearly smooth, the rest of the underside of the head with transverse wrinkles. Gular suture slightly diverging backwards.

*Mandibles* (see fig. 29a) rather large, about  $3\frac{1}{2}$  times as long as labrum, not strongly bent, with its  $\frac{2}{3}$  protruding from it. The latter part consists of 1 terminal and 3 lateral rather sharp teeth; the central one of the triplet is the shortest, the

proximal one the widest. The basal part has one large recurved tooth which is divided longitudinally and of which both parts are shallowly forked; on this tooth there is also a small, shallowly forked crest.

*Labial palp* yellowish-white; ultimate joint shining coppery-green. Penultimate joint 2 times as long as the last one, with rather long, erect hairs; the other joints glabrous.

*Mandibular palp* testaceous; last 2 joints shining dark coppery-green. Ultimate joint glabrous; penultimate joint with 3 or 4 erect setae on the top; next one with scattered hairs over its whole length, chiefly on its distal half.

*Pronotum* strongly rounded, flanks convex, largest width a little above the middle. ♂ 1.4–1.6–1.9 ♀ 1.3–1.6–1.8 mm in length; ♂ 1.9–2.2–2.6 ♀ 2.0–2.3–2.7 mm wide; ♂ 1.3–1.4–1.5 ♀ 1.3–1.5–1.7 times as broad as long, ♂ 1.0–1.1–1.2 ♀ 1.0–1.1–1.4 elytron width. Surface rather strongly domed; median line distinct, slightly shortened by the subbasal transverse furrow, which is sharply indented in the middle. Both transverse furrows pronounced. Whole pronotum granulated in a transverse direction. Front (excepting the middle) and flanks broadly but sparsely clothed with decumbent bristles, mediodorsal and hind part glabrous. Pronotum without a fringe of hairs; with rather small but distinct epipleurae.

*Pro-episternum* clothed with decumbent bristles, especially near the coxae; about 30 parallel transverse strigae near the side of the pronotum.

*Meso-episternum* almost glabrous.

*Meta-sternum* glabrous.

*Legs* shining coppery-green. Hindlegs about 1.1 times as long as body. Coxa I & II with 1 erect, long seta; I with on the front side white decumbent bristles, hind part glabrous or with a few bristles; II on the hind part more densely clothed. Coxa III with 1 erect seta near the middle of the base and a shorter one on the top; only the lateral tip is clothed with decumbent, white bristles. Trochanter I & II with 1 erect, long seta near the top; III without seta. Each trochanter testaceous. Femur III about 0.6 times as long as elytron, laterally and dorsally clothed with white bristles, ventrally mostly with some erect bristles only. Tibia with some rows of short bristles; III about 0.8 times as long as femur. Tarsus III about 0.9 times as long as femur.

*Abdomen* ventrally densely clothed with decumbent bristles, except the median part, which is almost glabrous; the latter part without short and slender hairs and on the side, near the hind border of each segment with 1 or 2 long and slender, erect setae. Segment 1–5 dark coppery-green, the other testaceous.

*Elytron* ♂ 5.4–6.2–7.3 ♀ 5.6–6.5–7.1 mm in length, 3.1 times the width. Lateral side weakly convex, at  $\frac{4}{5}$  of the length rather abruptly turning off to the pointed apex; the last  $\frac{1}{5}$  part rather distinctly curved inwards, its margin finely serrated. Front part of the elytron projecting latero-dorsally. Median margin distinctly thickened, ending in a rather sharply projecting spine. Elytron with small erect setae on the dark area, which are scattered on the proximal part and arranged in a single row towards the apex; on the lateral side another row of such hairs on the white part, very close to the margin. Sculpture of elytron shows a rather dense and coarse punctation (about 90–100 pits per mm<sup>2</sup>), more evident in the dark parts. General impression of dark parts a dull bronze-green; pits of sculpture a shining green or bluish-green, in a coppery field. The yellowish-white elytron marking consists of a wide, uninterrupted marginal area, which extends from shoulder to apex and is more or less tri-lobed within. Near the apex it reaches the median

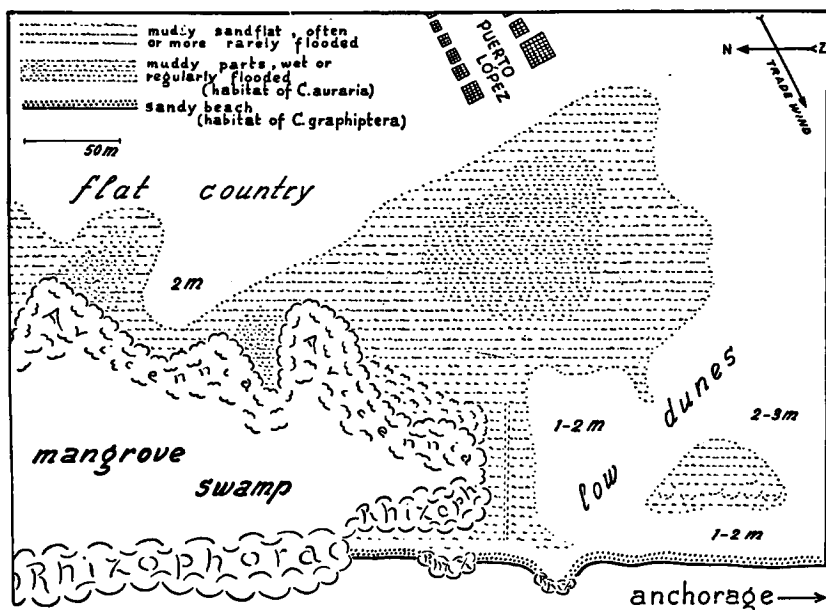


Fig. 27. Sketch map of the habitats of *Cicindela auraria* and *C. graphiptera* var. *fulgidiceps* at Puerto López, La Goajira, as drawn by P. WAGENAAR HUMMELINCK.

margin; on the shoulder it only reaches the spot where the pronotum side meets the elytron (see plate XIV).

**Diagnosis:** Body length (without labrum) ♂ 9.6 ♀ 9.8, body width ♂ 4.0 ♀ 4.4 mm; third joint of antenna about 0.9 times as long as fourth one; margin of labrum curved and central part protruding, 6-8 submarginal setae; clypeus, frons and vertex glabrous; *genae with decumbent bristles*; eyes strongly protruding; mandibula not very slender, rather strongly bent; *last 2 joints of mandibular palp coppery-green*; flanks of pronotum convex, transverse furrows and median line distinct, pronotum without a fringe of hairs, hind side without bristles; propisternum without erect bristles near the coxae; frontal tip of meta-sternum glabrous; hindlegs not very long, trochanter I and II with erect seta, trochanters testaceous, femora I and II ventrally without a row of curved hairs; abdomen with 2-4 erect setae on each segment, without short erect hairs; *elytron with an inward curve in the last  $\frac{1}{5}$  part of the lateral side*, about 90-100 pits per mm<sup>2</sup>; yellowish-white elytron marking consisting of a wide, uninterrupted marginal area, that goes from shoulder to apex and is more or less tri-lobed within.

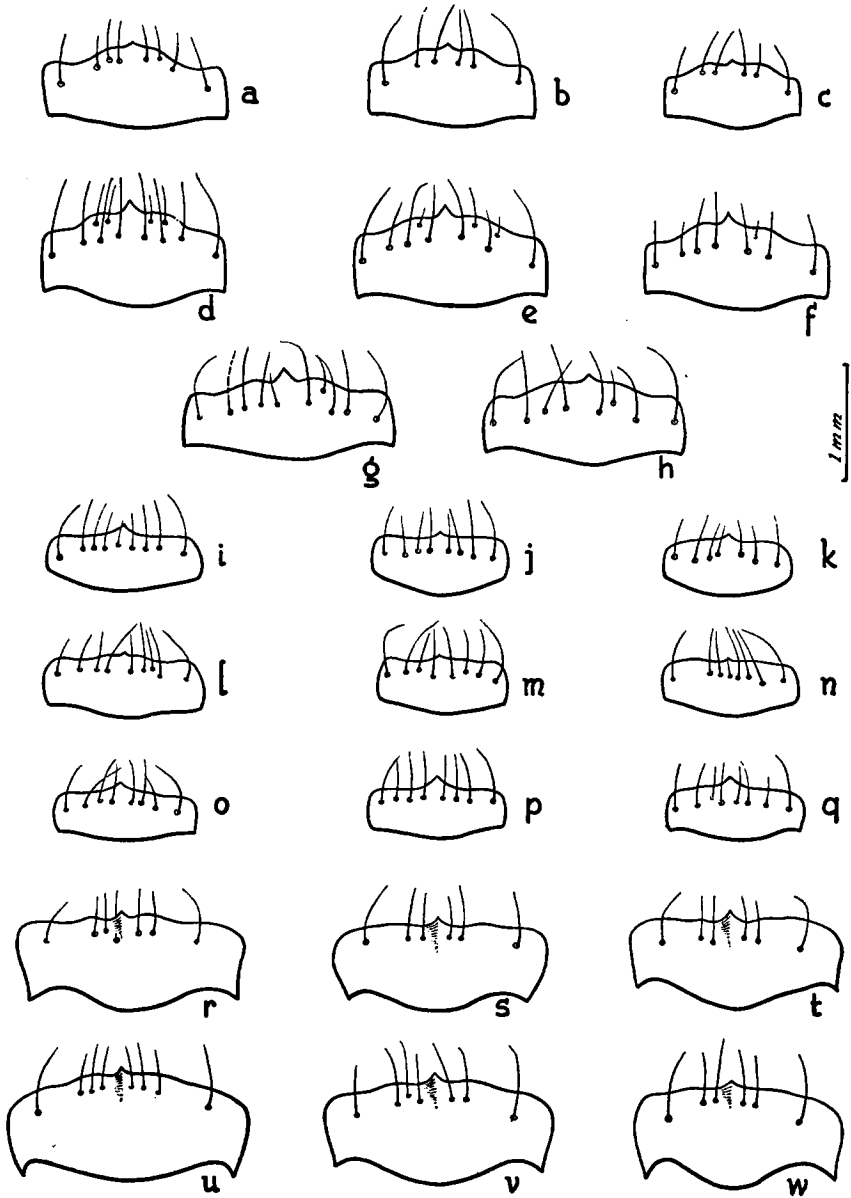


Fig. 28. Labrum of a-c *Cicindela auraria*, d-f *C. trifasciata trif.*, g-h *C. trif. ascendens*, i-k *C. suturalis* typical form, l-n *C. sut. var. hebraea*, o-q *C. sut. var. guadeloupensis*, r-t *C. graphiptera* typical form, u-w *C. graph. var. fulgidiceps*. From u-v Margarita, d and f St. Martin, e and j-k St. Thomas, h U.S.A., r and t Costa Rica, a-b, s and w Colombia, c and l Venezuelan mainland, \* Brasil. (c-e, j-k, m-n, q, t and w ♂♂; a-b, f-i, l, o-p, r-s and u-v ♀♀)

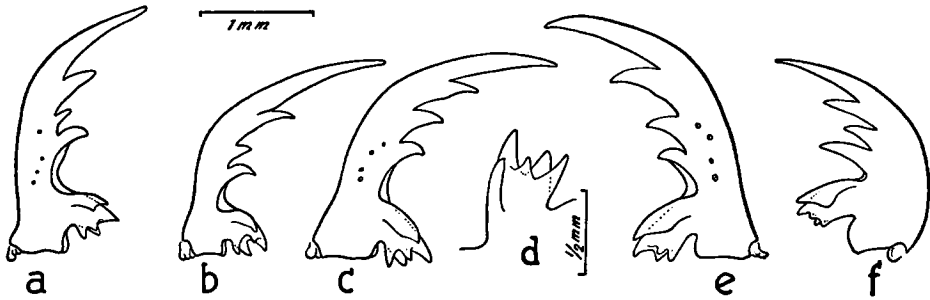


Fig. 29. Left mandible of *a* *Cicindela auraria* ♂ from Aruba, *b* *C. suturalis* typical form ♂, *c* *C. trifasciata trif.* ♂ from St. Martin, *d* basal tooth of *c*; *e* right mandible of *C. trif. ascendens* ♀ from Mexico, *f* *C. graphiptera* var. *fulgidiceps* ♀ from Colombia.

Variation in elytron marking (Plate XIV). There is a great variation in the extending of the marking, especially on the distal half of the elytron, where the dark part often shows a hook which is directed downwards (XIV 2, 3). This hook may disappear altogether (6, 18). The greater part of the specimens from Bonaire and Klein Bonaire shows this hook more or less distinctly. From the specimens from La Goajira there was only one that showed the hook, but very indistinct (15). One specimen from Aruba shows, distally from this hook another hook which is less distinct and not coppery shining (9). — From the British Museum I have seen a specimen from Colombia of which the yellowish-white elytron marking is strongly reduced (12). A marking like this can also be seen in HORN, 1938, tab. 84 fig. 2.

Some secondary sexual characteristics. Apex of elytron in the female a little less pointed than in the male, in which also the spine is often a little longer. First 3 joints of the tarsi of the front legs in the male with a cushion of short hairs on the underside. Meso-episternum in the male slightly strigose, smooth in the female. Male with 7, female with 6 visible abdominal segments.

Difference between *C. auraria* and *C. boops*. Some specimens of *C. auraria* strongly resemble *C. boops* as regards the elytron marking. *C. boops*, however, is more slender, the apex of the elytron is a little more rounded and the lateral side of the elytron is less convex than in *C. auraria*. The elytron marking is also more slender, especially the hook and the yellowish-white part next to it. Very different are the genae, which are glabrous in *C. boops* and clothed with bristles in *C. auraria*. — The description of *C. boops* by DEJEAN (1831, p. 258) is a description of *C. boops* and *C. auraria* together; these two species were separated by KLUG (1834, p. 27). — *C. boops* Dej. occurs in CUBA, HISPANIOLA, Haiti (Brit. Mus.) and Rep. Dominicana (Brit. Mus., Oxford, Leiden), PUERTO RICO, and JAMAICA, Salina at Port Henderson (Kingston).



TABLE 3

Variation in *Cicindela auraria*, *C. trifasciata* and *C. graphiptera*  
(total length and width)

Total length in mm	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2
4													
3													
2													
1							I		I		I		(1)
12.0								II	(1)				
9										(1)			
8									I				
7													
6						II		I	(1)				
5								(2)	(1)				
4								(2)	(1)			(2)	(1)
3						I							
2						I							
1						I		(1)	I (1)	(1)			
11.0								(1)	(1)	(1)			
9					I	(1)			(1)		1 (1)		
8									2				
7						(1)	(2)	(1)		1	1	1	
6						(1)				1	(1)		
5							(1)		1	2			
4					I	I		1	1				
3							(1)	(1)	2				
2			I		I	1 I		2	2				
1				I		1 (1)	1	2 2 (1)	1				
10.0						II	1		2				
9						1 II	1		2				
8			I	I			1	1	1	1			
7			II	I		1	1	2					
6			I				4	2 2	1		1		
5				(1)		I	1	3 1					
4				I		2 2	1	1					
3								1					
2	I	I				2 2	1 1	1					
1						2 2	1 1		1				
9.0			I				1	1					
9			I			1							
8							1						
7						1							
6						1 1							
5													
4													
3													
2	I												
8.1				1									

1, 2, 4 *auraria* ♂♂ } from Margarita, Bonaire, Curaçao, Aruba and La Goajira  
 1, 2, 3 *auraria* ♀♀ }  
 (1), (2) *trifasciata* *trif.* ♂♂ } from St. Martin and Anguilla  
 (1), (2) *trifasciata* *trif.* ♀♀ }  
 I, II *graphiptera* var. *fulgidiceps* ♂♂ } from Margarita, Tortuga, La Guaira and  
 I, II *graphiptera* var. *fulgidiceps* ♀♀ } La Goajira

***Cicindela trifasciata trifasciata* Fabricius, 1781**

[Plate XIII and XVI; fig. 28d-f, 29c-d]

*Cicindela trifasciata* FABRICIUS, 1781, p. 286 [„C. obscura, elytris strigis tribus albis, secunda flexuosa.” „Habitat in America. Parua, supra obscura, subtus aenea nitida. Labium album. Elytra strigis tribus, prima abbreviata, lunulata, secunda flexuosa, tertia apicis.”]; FABRICIUS, 1792, p. 177 [„Habitat in America in Italia paullo minor.” Italia refers to *C. trisignata*!]; FABRICIUS, 1801, p. 242; FLEUTIAUX & SALLÉ, 1889, p. 358 [Guadeloupe.]; HORN, 1907, p. 329-330 [Synonymy.]; HORN, 1915, p. 403 [„Cuba, Jamaica, St.-Thomas, Antigua, Guadeloupe.”]; LENG & MUTCHLER, 1916, p. 692 [„Occurs in Florida, Bahamas, Cuba, Grand Cayman, Hispaniola, Porto Rico, St. Thomas, Jamaica, Barbuda, Antigua and Guadeloupe, so far as known and possibly in many of the smaller islands. On the Atlantic Coast it extends northward to North Carolina (Southern Pines, Manee) also along the Gulf Coast and southward to southern Mexico and in a very slightly modified form it reappears on the Pacific Coast.”; mainland localities probably excepted!]; WOLCOTT, 1936, p. 186 [Puerto Rico.]; HORN, 1938, p. 51, tab. 81 fig. 13-15 [Drawings of elytron.]; WOLCOTT, 1941, p. 81 [Puerto Rico.]; BLACKWELDER, 1944, p. 20 [St. John.].

*Cicindela tortuosa* DEJEAN, 1826, p. 87-88 [„Viridi-obscuro-aenea; elytris margine laterali sinuato, lunula hamata humerali apicalique, strigae media tortuosa incumbente albis.”; detailed description; „Elle se trouve dans l'Amérique septentrionale, et dans les Antilles.”]; CHEVROLAT, 1863, p. 185 [„Cette espèce, d'après l'opinion de quelques entomologistes, serait la véritable *C. trifasciata* de Fab. Son habitat est très étendu. On la rencontre aux États-Unis, au Mexique, aux Antilles, à la Nouvelle-Grenade et au Pérou.”; mainland localities probably excepted!]; BATES, 1881, p. 11 [Mexico: Vera Cruz, near the capital and N.W. frontier; „Cuba, Jamaica, St. Thomas”; mainland localities probably excepted!] — ? non *C. tortuosa* Dej., GUÉRIN, 1830, p. 58 [Perù.]; LECONTE, 1851, p. 172 [Georgia and Louisiana.].

*Cicindela guadeloupensis* Dupont in litt. et *Cicindela lherminieri* Chevrolat in litt., CHAUDOIR, 1854, p. 114 [„... proviennent de Guadeloupe. Je ne pense pas qu'ils diffèrent spécifiquement de la *Trifasciata* ...”; nomina nuda!].

MARGARITA: Shore of the *Laguna de las Maritas*, N of Punta Mosquito, 4.VI.1936, near Sta. 1217, muddy sand near *Rhizophora* and *Avicennia* several specimens observed (♂; Plate XVI 7).

ANTIGUA: June, collected by Stone (Amer. Mus., ♂).

St. BARTHÉLEMY: (Leiden, ♂); St. Barts, coll. by Forsström (Oxford, ♂).

St. MARTIN: Shore of *Great Bay*, E of Philipsburg, 16.V.1949, near Sta. 1127 and 1128, sandy beach near Atwell's Pond (1 ♂ 2 ♀♀); *Atwell's Pond*, E of Philipsburg, 17.V.1949, near Sta. 1133, shore of saltpond with brownish-grey mud (15 ♂♂ 7 ♀♀; XVI 1 ♂ 5 ♂, fig. 28d, f, 29c-d); E. shore of *Great Saltpond*, 25.V.1949, Sta. 463, brownish or blackish mud, rather many spec. obs. (6 ♂♂ 4 ♀♀; XVI 2 ♂ 3 ♂ 4 ♀); *Saline de Grande Case*, 20.V.1949, near Sta. 1140 (3 ♀♀); St. Martin (Leiden, 5 ♀♀); St. Martin, coll. by Forsström (Oxford, 2 ♀♀).

ANGUILLA: *Saltpond of Sandy Ground*, 16.VI.1949, near Sta. 1145 (♂; XVI 6); Anguilla. “common on sand round lagoon” 29.XI(?). 1932, coll. by A. D. Torlesse (Brit. Mus., 3 ♂♂ 2 ♀♀).

ST. CROIX: 10.XII.1940, coll. by H. A. Beatty (U.S. Nat. Mus., ♂ ♀).

ST. THOMAS: (Leiden, ♂; fig. 28e); St. Thomas (D. Ent. Inst., ♂).

PUERTO RICO: Tortugueros Lake, Manati, 20.XI.1925 (Amer. Mus., ♀).

HISPANIOLA: Haiti (Brit. Mus., ♂).

JAMAICA: Wreck Point, St. Catherine, 2.XII.1951, coll. by R. P. Bengry and Audrey M. Wiles (Kingston, 3 ♂♂ 1 ♀); Milk River, Clarendon, 20.I.1952, coll. by R. P. Bengry and Audrey M. Wiles (Kingston, 1 ♂ 3 ♀♀); St. Anns Bay, St. Ann, 4.III.1952, coll. by F. A. McDermott (Kingston, ♂).

GRAND CAYMAN (Cayman Islands): N. coast of Rum Point, 4.VI.1938, coll. by C. B. Lewis and G. H. Thompson (Oxford Univ. Cayman Is. Biol. Exped., 2 ♂♂). LITTLE CAYMAN: S. coast of South Town, 29 and 30.V.1938, coll. by C. B. Lewis and G. H. Thompson, light trap (Oxford, 3 ♂♂ 4 ♀♀).

CUBA: "Mayari (Baie de Nipe) Chaper 1883" (Paris, ♀); Marianao, 21.IX.1930 (coll. C. M. C. Brouerius van Nidek, Netherlands, ♂); Cuba (Oxford, ♀).

FRENCH GUIANA: Cayenne (Brit. Mus., from the F. Bates collection, ♂).

**Description** (compared with *C. auraria*; based on 24 ♂♂ and 16 ♀♀ from Anguilla and St. Martin)

Body length (without labrum) ♂ 9.5–10.8–11.5 ♀ 10.3–11.4–12.4 mm; body width ♂ 3.4–4.0–4.6 ♀ 4.2–4.6–5.2 mm; ♂ 2.4–2.6–2.9 ♀ 2.2–2.4–2.7 times as long as wide.

*Antenna* with its third joint with 3–5 erect bristles on the outside and 2 on the top. Fourth joint with 1 erect bristle and a few little hairs in the middle and 2 erect bristles on the top. Last joint with a wreath of short hairs on its top. Third joint about 1.1 times as long as the fourth one.

*Labrum* (see fig. 28d–f) yellowish-brown, directed slightly to the front. On the labrum 8–12 submarginal setae: 3–5 near each other on both sides near the middle (sometimes not the same number on each side), and one near each lateral front-angle.

*Head*. Frons with very fine longitudinal strigae; not punctate. Vertex with a few coarse and many fine longitudinal strigae, becoming transversal and granular on the median and hind part. Eyes rather strongly protruding. Genae glabrous. Gular suture distinctly diverging backwards.

*Mandibles* (see fig. 29c–d) about  $2\frac{1}{2}$  times as long as labrum. Both parts of the basal tooth are distinctly forked; the crest is not forked.

*Mandibular palp*. Last joint dark coppery-green. Second joint with scattered hairs over its whole length.

*Pronotum* with flanks a little convex; largest width in the middle. ♂ 1.7–2.0–2.2 ♀ 1.8–2.1–2.3 mm in length; ♂ 2.1–2.4–2.6 ♀ 2.4–2.7–3.0 mm wide; ♂ 1.1–1.2–1.3 ♀ 1.2–1.3–1.4 times as broad as long, ♂ 1.1–1.2–1.3 ♀ 1.0–1.1–1.3 elytron width. Median line distinct, shortened by the supapical transverse furrow, which is sharply indented in the middle. Epipleurae rather small and indistinct.

*Pro-episternum* clothed with bristles, which are for the greater part decumbent, but erect on each side of the coxae; near the side of the pronotum with about 20 shallow, parallel strigae.

*Meta-sternum* with many thin erect hairs on the front side, which are hook-shaped in a distal direction.

*Legs* testaceous, with a green shine. Hindlegs about 1.2 times as long as body. Femur III about 0.6 times as long as elytron; I dorsally and laterally rather

densely clothed with white bristles; ventrally with a row of long, thin hairs, which are distinctly curved and often hook-shaped. Tibia III about 0.9 times as long as femur. Tarsus III about 1.0 times as long as femur.

*Abdomen* ventrally rather densely clothed with decumbent bristles, except on the median part; the latter part with some short and slender hairs and near the hindborder of each segment a row of 8–10 long and slender erect setae. Segments shining dark coppery-green.

*Elytron* ♂ 5.8–7.0–7.5 ♀ 6.6–7.3–7.7 mm in length, ♂ 3.5 ♀ 3.2 times the width. Lateral side weakly convex with a little inward curve just above the middle, at  $\frac{4}{5}$  of the length turning off to the apex, which is rather pointed in the male, rounded in the female; last  $\frac{1}{5}$  part of elytron not curved inward. Sculpture of elytron shows a rather dense and coarse punctation (about 65–80 pits per mm<sup>2</sup>). General impression of the dark parts is a dull dark bronze-green; pits of sculpture shining light green, in a coppery field. The whitish- or brownish-yellow elytron marking consists of: (1) a humeral lunula from which the frontal part reaches the spot at which the side of the pronotum meets the elytron, and the hind part ends in a more or less large spot; (2) a strongly S-shaped middle band which is crenated and sometimes interrupted in the middle; (3) a hooked apical lunula; all these components are joined by a more or less broad marginal area.

*Diagnosis*: Body length (without labrum) ♂ 10.8 ♀ 11.4, body width ♂ 4.0 ♀ 4.6 mm; third joint of antenna about 1.1 times as long as fourth one; margin of labrum curved and central part protruding, 8–12 submarginal setae; clypeus, frons, vertex and genae glabrous; eyes rather strongly protruding; mandibula not very slender, rather strongly bent; last joint of mandibular palp coppery-green; flanks of pronotum a little convex, transverse furrows and median line distinct, pronotum without a fringe of hairs, hind side without bristles; pro-episternum with erect bristles near the coxae; *frontal tip of metasternum with short curved hairs*; hindlegs not very long, trochanter I and II with erect seta, trochanters testaceous, *femora I and II with a row of curved hairs*; abdomen with 8–10 erect setae on each segment, and with some short erect hairs; elytron without an inward curve in the last  $\frac{1}{5}$  part of the lateral side, punctation more evident in dark parts, about 65–80 pits per mm<sup>2</sup>; whitish- or brownish-yellow elytron marking rather wide, consisting of a humeral lunula, a S-shaped middle band and a hooked apical lunula, all these components joined by a more or less broad, uninterrupted marginal area; general impression of dark parts a dull dark bronze green.

*Variation in elytron marking* (Plate XVI 1–7). The variation in elytron marking is not as remarkable as in *C. auraria* and *C. graphiptera* var. *fulgidiceps*. The end of the caudal part of the humeral lunula may be a more or less rounded spot, often extending slightly frontwards (6), caudalwards (2 and 4) or to both sides (3). The middle band is more or less broad and sometimes interrupted (6). The frontal and also the caudal part of the apical lunula is more or less wide, the frontal part sometimes also bended somewhat caudalwards near its end (1 and 2). — The only specimen from Margarita (7) is somewhat different from the other specimens: the colour of the dark parts and especially the underside of the body is more bluish shining, the yellowish-white elytron marking is more extended and the whole insect is a little smaller.

The general impression of the Cayman specimens is, that they are somewhat darker than those of St. Martin.

According to a sketch of Sv. G. LARSSON (fig. 30a-b), the pattern of the left elytra of the two males — attached to the same label, and marked as „type” of *trifasciata* in the FABRICIUS Collection at Kiel — perfectly agrees with the description given above.

Some secondary sexual characteristics. Tarsi, meso-episternum and abdomen as in *C. avaria*. Lateral side of the elytron in the female somewhat more convex than in the male; apex in the female more rounded than in the male, in which the spine is often a little longer.

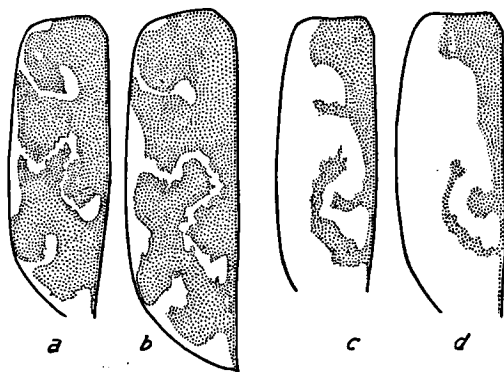


Fig. 30. Elytron marking of the two specimens, indicated as „type” of: a-b *Cicindela trifasciata* in the Fabricius Collection at Kiel, c-d *C. suturalis* in the Sehested & Tønder Collection, Lund, at Copenhagen; from sketches by Sv. G. LARSSON (Copenhagen). Colour: a-b whitish and metallic, c-d yellow and metallic.

***Cicindela trifasciata ascendens* LeConte, 1851**

[Plate XV; fig. 28g-h, 29e]

*Cicindela ascendens* LECONTE, 1851, p. 172-173 [„... supra aenea, capite thoraceque subtilius evidenter rugosis, thorace postice non angustato, lateribus paulo rotundatis, impressionibus transversis profundis, elytris thorace vix duplo latioribus antice vix angustatis, minus dense viridi-punctatis, lunula humerali intus subito flexa, fascia media longius valde tortuosa, cum linea marginali postice dilata coniuncta, lunulaque apicali oblique intus longe ascendente, fere cum fascia coniuncta... Specimen unicum a Georgia, ad maris oras.”].

*Cicindela trifasciata ascendens* LeConte, HORN, 1915, p. 391 [„Neu-Jersey bis Florida, Alabama bis Texas, Ost und Süd-Mexiko, (?West-Mexiko), Bahama-Inseln.”]; CARTWRIGHT, 1935, p. 74 [S. Carolina.]; HORN, 1938, p. 51, tab. 81 fig. 16-17 [Drawings of elytra.]; BLACKWELDER, 1944, p. 20.

HISPANIOLA: Rep. Dominicana (Brit. Mus., ♂).

CUBA: Playa Marianao, 24.VI.1928, collected by Bierig (D. Ent. Inst., ♂ ♀).

BERMUDA: (Brit. Mus., ♂).

MEXICO: Mexico City, coll. by Höge (Brit. Mus., 2 ♀♀); Misantra, Vera Cruz, coll. by Höge (Leiden, ♀; fig. 29e); Acapulco, Guerrero (Brit. Mus., ♂); Mexico (Brit. Mus., 2 ♂♂).

UNITED STATES: Melbourne, Fla., 18.V.1948, coll. by M. Cazier (Amer. Mus., 2 ♂♂; Billy's I., Okefenokee Swamp, Fla-Ga., VI.1912 (Copenhagen coll. Suenson, ♀); Spring Creek, Ga., VI.1912 (Copenhagen coll. Suenson, ♀; fig. 28h); U.S.A. (Paris, ♀; Plate XV).

**Description** (compared with *C. trifasciata trif.*; based on 4 ♀♀ from Spring Creek, Okefenokee Swamp and Misantla)

Body length (without labrum) ♀ 11.2–12.7 mm; body width ♀ 4.6–5.2 mm; ♀ 2.3–2.6 times as long as wide.

*Pronotum*, *pro-episternum*, *legs*, and *abdomen* much more sparsely clothed with bristles as in typical form.

*Elytron* at apex a little wider. General impression of dark parts a dull, blackish green; also head, thorax, legs and abdomen darker. Pits of sculpture shining green in a dark coppery-violet field. The elytron marking is very narrow; from the humeral lunula there are only one spot on the shoulder and one point in the middle of the elytron, between base and middle band, left; the middle band is very narrow and often strongly interrupted; the apical lunula is also very narrow, and the marginal area often strongly interrupted.

**Diagnosis** (compared with *C. trifasciata trif.*): *Elytron marking very narrow*, consisting of a humeral lunula from which there are almost only a few spots left, a strongly interrupted middle band, an apical lunula and a strongly interrupted marginal area; *general impression of dark parts a dull, blackish green*.

A specimen belonging to the British Museum (locality unknown) differs in having a very narrow but complete humeral lunula.

***Cicindela suturalis* Fabricius, 1798 (typical form)**

[Plate XV and XVI 8–10; fig. 28i–k, 29b]

*Cicindela suturalis* FABRICIUS, 1798, p. 62 [„C. viridi aenea elytris albis: sutura lunulaque viridi aeneis. Habitat in America St. Thomas. Parua. Caput viridi aeneum mandibulis atris labioque albo. Thorax viridi aeneus utrinque pilis albis hirtus. Elytra laeunia, alba sutura aenea, quae ad basin valde dilatatur. Praeterea in medio ramum parvulum emittit et pone hanc lunulam retroflexam et ramulum includendum. Corpus aeneum lateribus albo hirtis.”]; FABRICIUS, 1801, p. 242; DEJEAN, 1825, p. 129–130 [„Subcylindrica, viridi-aenea; elytris albis, punctatis sutura ad basin dilatata lunulaque media (saepè obsoleta) cupreo-aeneis”]. Detailed description; 2 females from St. Barthélemy, collected by Schoenherr, and the Latreille collection from Guadeloupe, which were identical; 1 male from Bahía.; HORN, 1915, p. 403 [„St. Thomas, Barbados, ? St. Barthélémy, ? Antigua, ?? Guadeloupe, ? Venezuela, ? Unterer Amazonen-Strom.”]; LENG & MUTCHLER, 1916, p. 693–694 [Short description. „Occurs in Hispaniola, Porto Rico, St. Thomas, St. Bartholomew, Barbuda, Antigua, Guadeloupe, Martinique, Barbados, St. Vincent and Grenada, so far as known; also in Venezuela, Amazon region, Colombia in South America.” Drawing of insect p. 699.]; WOLCOTT, 1936, p. 185 [Puerto Rico.]; HORN, 1938, p. 52 tab. 84 fig. 12 [Drawing of elytron.]; BLACKWELDER, 1944, p. 20 [St. John.].

ANTIGUA: “on coral sand”, 26.I.1932, collected by A. D. Torlesse (Brit. Mus., 2 ♂♂ 3 ♀♀).

ST. BARTHÉLEMY: coll. by Schönherr (Leiden, ♀; Plate XVI 10); St. Barts (Brit. Mus., 1 ♂ 3 ♀♀).

ST. MARTIN: coll. by Rijgersma (Leiden, ♀).

ST. THOMAS: 3.I.1925 (Amer. Mus., ♂); St. Thomas (Brit. Mus., ♂ ♀; fig. 28e); St. Thomas (Leiden, 2 ♂♂; XVI 9, fig. 28j–k).

HISPANIOLA: Haiti (Paris, ♂).

Unknown locality: (Leiden, 2 ♂♂ 4 ♀♀; XV ♀, XVI 8 ♀).

Description (compared with *C. auraria*; based on 7 ♂♂  
and 7 ♀♀ for the greater part from St. Thomas, St. Martin, St. Barts  
and Hispaniola)

Body length (without labrum) ♂ 8.2-8.4-9.0 ♀ 8.2-8.7-9.7 mm; body width ♂ 2.8-3.2-3.4 ♀ 3.0-3.2-3.6 mm; ♂ 2.5-2.6-2.8 ♀ 2.4-2.6-2.8 times as long as wide.

*Antenna* with its third joint with 4-7 erect bristles on the outside and 2 on the top. Fourth joint with 1 or 2 in the middle and 2 on the top. Next 6 joints with 3 erect, very short setae on the top; the last without these setae. Third joint about 1.2 times as long as the fourth one.

*Labrum* (see fig. 28i-k). Margin nearly straight with 1 small tooth in the middle. On the labrum 8-10 submarginal setae: 3 or 4 near each other on both sides of the middle (sometimes not the same number on each side) and 1 near each lateral front-angle.

*Head*. Frons with fine longitudinal strigae; indistinct punctate in the middle. Vertex with fine longitudinal strigae, becoming transverse and wavy on the hind part. Eyes rather strongly protruding. Genae glabrous. Gular suture distinctly diverging backwards.

*Mandibles* (see fig. 29b) very slender and long, about 4 times as long as labrum, rather strongly bent, especially the distal tooth long and sharp. From the lateral triplet the central one is the shortest. The 4 tops of the distinctly cleaved tooth on the base are slightly curved; the crest is not forked.

*Labial palp* rather short.

*Mandibular palp* with its last joint dark coppery-green. Penultimate joint with 2 or 3 erect setae on the top; next one with scattered hairs over its whole length.

*Pronotum* not strongly rounded, flanks nearly straight; largest width in the middle. ♂ 1.4-1.5-1.7 ♀ 1.5-1.6-1.7 mm in length; ♂ 1.7-1.8-1.9 ♀ 1.9-2.0-2.1 mm wide; ♂ 1.1-1.2-1.2 ♀ 1.2-1.2-1.3 times as broad as long, ♂ 1.1-1.1-1.2 ♀ 1.1-1.2-1.3 elytron width. Median line rather distinct, a little shortened by the sub-basal transverse furrow. Surface rather strongly domed. Front (excepting the middle) and the flanks broadly and rather densely clothed with decumbent bristles. Epipleura very small and indistinct.

*Pro-episternum* clothed with bristles which are for the greater part decumbent, but erect on each side of the coxae; near the side of the pronotum with about 20 shallow, parallel strigae.

*Meso-episternum* with its dorsal part glabrous and its ventral part densely clothed with decumbent bristles.

*Meta-sternum* with some bristles on its sides; on its frontal tip glabrous.

*Legs* shining coppery-green or red. Trochanter I and II with 1 erect long seta near the top; III without setae; the setae of II often absent in dried specimens. Trochanters testaceous with a green shine. Femur III about 0.5 times as long as elytron; I with ventrally a row of decumbent bristles which are often curved. Tibia III about 1.0 times as long as femur.

*Abdomen* ventrally densely clothed with decumbent bristles, except the median part; the latter part without short and slender hairs, with a row of 4-8 long and slender erect setae near the hindborder of each segment. Segments shining dark coppery-green.

*Elytron* ♂ 5.0-5.3-5.9 ♀ 5.2-5.6-6.1 mm in length, ♂ 3.3 ♀ 3.5 times the width. Lateral side weakly convex, at  $\frac{3}{4}$  of the length turning off to the truncated apex;

the last  $\frac{1}{4}$  not curved inwards, its margin finely serrated. Median margin ending in a sharply projecting spine. Sculpture of elytron shows a very dense punctation (about 185–200 pits per  $\text{mm}^2$ ), often locally somewhat grooved by a certain arrangement of the pits; punctation of the white parts almost as evident as of the dark parts. General impression of the dark part a shining coppery-green or -red; pits of sculpture shining green in a coppery-red field. The yellowish-white elytron marking is dominating to such an extent that there is only left one elongate subtriangular sutural mark of about  $\frac{3}{5}$  elytron length, which arises from a trapezium-like base which is as wide as about  $\frac{2}{3}$  part of the width of the proximal part of the elytron. The top of this sutural mark is abruptly widened and often partly enclosed by a narrow, more or less irregular line.

**Diagnosis:** Body length (without labrum) ♂ 8.4 ♀ 8.7 mm, body width ♂ 3.2 ♀ 3.2 mm; third joint of antenna about 1.2 times as long as fourth one; margin of labrum nearly straight, 8–10 submarginal setae; clypeus, frons, vertex and genae glabrous; eyes rather strongly protruding; *mandibles very slender*, rather strongly bent; last joint of mandibular palp coppery-green; flanks of pronotum nearly straight, transverse furrows and median line rather distinct, pronotum without a fringe of hairs, hindside without bristles; pro-episternum with erect bristles near the coxae; frontal tip of metasternum glabrous; hindlegs not very long, *trochanter I and II with erect seta*, trochanters testaceous with a green shine, femora I and II ventrally with a row of curved hairs; abdomen with 4–8 erect setae on each segment, without short erect hairs; elytron without an inward curve in the last  $\frac{1}{5}$  part of the lateral side, *punctation in dark parts not more evident, about 185–200 pits per  $\text{mm}^2$* , yellowish-white elytron marking dominating, from dark parts only left one elongate subtriangular sutural mark, with an abruptly widened and partial enclosed top; general impression of dark parts a shining coppery-green or -red.

**Variation in elytron marking** (Plate XVI 8–10). Some variation in elytron marking may be observed in the top of the sutural mark, which is more or less widened, while the line, partly enclosing it, may disappear altogether (10).

According to a sketch of Sv. G. LARSSON (fig. 30c–d), the pattern of the left elytra of the two females — marked as type of *suturalis* in the collection of Sehested & Tønder, Lund, both to be found in the Copenhagen Museum — perfectly agrees with the description given above. The single label reads: „St. Thomas/Mus. T. Lund/Cicindela/suturalis F.”

Some secondary sexual characteristics. Tarsi, meso-episternum and abdomen as in *C. auraria*. In both sexes the apex of the elytron is truncated, in the male in an exactly transversal way, in the female following a somewhat oblique line.

***Cicindela suturalis* var. *hebraea* Klug, 1834**

[Plate XIII; fig. 28 l–n]

*Cicindela trifasciata* DEJEAN, 1825, p. 85–86 [„Subcylindrica, viridi-cupreo-aenea; elytris margine laterali, lunula hamata humerali alteraque apicis dentata, strigae media tortuosa incumbente albis.” Detailed description; „Il est très-possible que cette espèce ne soit pas la même que celle décrite sous ce nom par les auteurs...”; „Elle se trouve à Cayenne...”].



- Cicindela hebraea* KLUG, 1834, p. 20 [Name only; „*C. hebraea* Mus. Berol. (*C. trifasciata* Dej. Sp. I. p. 85. n. 69.)”].
- Cicindela hieroglyphica* KLUG, 1834, p. 30–31 [Detailed description; „Ein einzelnes Männchen von Parà in Brasilien.”].
- Cicindela suturalis* forma *hebraea* Klug, HORN, 1915, p. 403 [„completa-Form”; „Porto Rico, Venezuela bis Ceara, bis Espirito Santo, Obidos, Manaos, Teffe, Rio Madeira, Antigua, Martinique, ??Guadeloupe.”].
- Cicindela suturalis* var. *hebraea* Klug, LENG & MUTCHLER, 1916, p. 694 [Short description. Collected at Puerto Plata, St. Domingo and at Anasco, Puerto Rico; in Harris coll. specimens from Anasco, Colombia and Brazil.]; WOLCOTT, 1936, p. 185–186 [Puerto Rico.].
- Cicindela suturalis* subsp. *hebraea* Klug, HORN, 1938, p. 52, tab. 84 fig. 13 [Drawing of elytron.].
- Cicindela suturalis* phase *hebraea* Klug, BLACKWELDER, 1944, p. 20. [Bolivia.].

TRINIDAD: Chupara Bay, 3.III.1940, collected by E. McC. Callan (I.C.T.A., ♂ ♀); Cocos (Cocal?) Beach, 1924, coll. by S. H. Evelyn (Brit. Mus., 3 ♂♂ 1 ♀); Trinidad, 3.II.1929, coll. by J. G. Myers (I.C.T.A., ♀); Trinidad (Brit. Mus., 3 ♂♂).

BARBADOS: Calais, IX.1901, coll. Imp. Dep. Agr. W.I. (Brit. Mus., ♂); Calais Beach, 31.I.1933 (U.S. Nat. Mus., ♂ ♀).

St. VINCENT: (Brit. Mus., ♀).

GUADELOUPE: (Brit. Mus., ♂ ♀); Guadeloupe (Leiden, ♂).

HISPANIOLA: Puerto Plata, Rep. Dominicana, V.1915 (Amer. Mus., ♀).

COLOMBIA: (Brit. Mus., ♂ ♀); Colombia (D. Ent. Inst., ♀).

VENEZUELA: Ciudad Bolivar, 24.IV.1898 (Brit. Mus., ♂); San Fernando de Apure, 3.X.1897 (Paris, ♀; fig. 281).

FRENCH GUIANA: Cayenne (Copenhagen, ♀); Cayenne (Leiden, ♂); Cayenne (Brit. Mus., 1 ♂ 5 ♀♀).

BRASIL: Para (Brit. Mus., 2 ♂♂ 2 ♀♀); Obidos (Leiden, 2 ♂♂ 1 ♀; plate XIII ♀, fig. 28n); Obidos (Brit. Mus., ♀); Cannavieras (D. Ent. Inst., ♀); Ega, Amaz. (Brit. Mus., 2 ♀♀); Teffe, Amaz. (Brit. Mus., ♂); Amazonas (Brit. Mus., 3 ♂♂ 3 ♀♀); Brasil (Brit. Mus., ♂); Brasil (Copenhagen, ♀).

PERU: (Brit. Mus., ♀).

**Description** (compared with *C. suturalis* typical form; based on 6 ♂♂ and 5 ♀♀ from Guadeloupe, Venezuela, Cayenne and Brasil)

Body length (without labrum) ♂ 8.2–9.0 ♀ 8.2–9.3 mm; body width ♂ 3.2–3.6 ♀ 3.2–3.8 mm; ♂ 2.5–2.6 ♀ 2.4–2.8 times as long as wide.

*Elytron* with the spine of the median margin mostly a little longer. Punctuation of elytron denser (about 195–220 pits per mm<sup>2</sup>) and also more grooved. The yellowish-white elytron marking is less dominant and consists of: (1) a humeral lunula from which the frontal part reaches the spot at which the side of the pronotum meets the elytron, and the hind part is abruptly enlarged in its end; (2) a sharply tortuous middle band which is more or less enlarged in the longitudinal direction at the spot where it meets the median margin; (3) a rather large and strongly hooked apical lunula. All these components are joined by a more or less broad marginal area.

**Diagnosis** (compared with *C. suturalis* typical form): Elytron with about 195–220 pits per mm<sup>2</sup>; *elytron marking not dominant*, consisting of a humeral lunula, a sharply tortuous middle band and a rather large and strongly hooked apical lunula, all these components are joined by a more or less broad marginal area.

***Cicindela suturalis* var. *guadeloupensis* Fleutiaux et Sallé, 1889**  
[Plate XV; fig. 280–q]

*Cicindela trifasciata* var. *guadeloupensis* Chev., DEJEAN, 1837, p. 4 [Name only, nomen nudum; Guadeloupe.].

*Cicindela hebraea* Klug, FLEUTIAUX & SALLÉ 1889, p. 358–359 [„Variété presque noire; ponctuation des élytres plus serrée que chez le type; dessins blancs étroits comme chez les individus de Colombie, tandis que chez les exemplaires des autres parties des Antilles, du Brésil et de Cayenne, ils sont plus larges et vont jusqu'à envahir presque complètement les élytres (v. *suturalis* Fab.).” Guadeloupe s.s.].

*Cicindela suturalis* forma *guadeloupensis* Fleutiaux et Sallé, HORN, 1915, p. 403 [„dilacerata-Form”].

*Cicindela suturalis* var. *guadeloupensis* Fleutiaux et Sallé, LENG & MUTCHLER, 1916, p. 694–695 [„We regard the supposition of the identity of *guadeloupensis*, described from Guadeloupe, with *nocturna*, described from South America, as questionable but our inability at present to inspect M. Fleutiaux's type prevents further investigation.”].

*Cicindela suturalis* phase *nocturna* Steinheil, BLACKWELDER, 1944, p. 20 [„?Colombia, Guadeloupe.”], p. p.

I accept FLEUTIAUX et SALLÉ, 1889 — who cite „v. *guadeloupensis* Chv., Dej. Cat., 3e éd., 1837, p. 4” in synonymy — as the authors of *C. hebraea* var. *guadeloupensis*, following HORN and LENG & MUTCHLER.

GUADELOUPE: (Brit. Mus., Bowring, ♀).

FRENCH GUIANA or Brasil: „Cayenne. Amazons.” (Brit. Mus., Fry coll., ♂).

BRASIL: (Brit. Mus., F. Bates coll., ♂).

Unknown Locality: (Brit. Mus., Bowring, ♀); (Copenhagen coll. Suenson, ♀); (Leiden, 2 ♂♂, 3 ♀♀; plate XV ♂, fig. 280–q).

**Description** (compared with *C. suturalis* typical form;  
based on 4 ♂♂ and 6 ♀♀ from Guadeloupe, Cayenne?, Brasil  
and unknown locality)

Body length (without labrum) ♂ 7.4–8.5 ♀ 8.0–8.9 mm; body width ♂ 2.8–3.2 ♀ 2.9–3.4 mm; ♂ 2.3–2.8 ♀ 2.5–2.7 times as long as wide.

Elytron with the spine of the median margin a little longer. Punctuation of elytron denser as in typical form and var. *hebraea* (about 200–230 pits per mm<sup>2</sup>) and also more grooved. Pits of sculpture a dark violet in a dark and dull brownish- or blackish field. Also head, thorax, legs and abdomen darker as in typical form. The yellowish-white elytron marking is like that of var. *hebraea*, but all the components are a little more narrow.

**Diagnosis** (compared with *C. suturalis* typical form): Elytron with about 200–230 pits per mm<sup>2</sup>; elytron marking consisting of a humeral lunula, a sharply tortuous middle band and a rather large and strongly hooked apical lunula, all these components rather narrow and joined by a marginal area; general impression of *dark parts a dark and dull brownish-violet or black*, darker as in typical form.

The specimens cited above agree in having a dull, almost blackish colour, in contrary with all other specimens considered as var. *hebraea*, which are shining coppery-green or -red, just as in the typical form of *C. suturalis*.

STEINHEIL's description of *C. nocturna* (1875, p. 96) from Colombia does not encourage an identification of the var. *guadeloupensis* with *C. suturalis* var. *nocturna*.

***Cicindela graphiptera* Dejean, 1831 (typical form)**

[Plate XV; fig. 28r–t]

*Cicindela graphiptera* DEJEAN, 1831, p. 257–258 [„*Cicindela graphiptera*. Klug.”; „Subcylindrica, supra obscure viridi-aenea; elytrorum basi, margine laterali, lunula humerali, apicali hamata, strigae media tortuosa interrupta incumbente albis; pedibus posticis longissimis.”; detailed description; „Elle se trouve dans la Colombie, et elle m'a été envoyée par M. Klug, sous le nom que le lui ai conservé, comme venant des environs de Carthagène.”]; KLUG, 1834, p. 26 [„*C. graphiptera* Kl.”, name only.]; BATES, 1881, p. 11 [Specimens from Nicaragua; compares animals from Colombia which must be identified, however, as *C. graph.* var. *fulgidiceps*.]; HORN, 1915, p. 410, p. 35 fig. 123 [„Columbia, Venezuela”; schematic drawing of elytron.]; HORN, 1938, p. 53, tab. 86 fig. 27 [Drawing of elytron.]; BLACKWELDER, 1944, p. 18.

COSTA RICA: “Puerto Limón, Atlantique” (Brussel, ♂ ♀; Plate XV ♂; fig. 28r, t).

COLOMBIA: San Juan de Córdova Ciénaga, 1909 (Paris, ♀; fig. 28s).

**Description** (compared with *C. graphiptera* var. *fulgidiceps*;  
based on 1 ♂ and 2 ♀♀ from Costa Rica and Colombia)

Body length (without labrum) ♂ 10.1 ♀ 11.4 and 9.9 mm; body width ♂ 3.8 ♀ 4.2 and 3.8 mm.

*Pronotum* with each side sparsely clothed with decumbent bristles.

*Pro-episternum* rather densely clothed with decumbent bristles.

*Meso-episternum* with its ventral part densely clothed with decumbent bristles.

*Abdomen* ventrally densely clothed with decumbent bristles.

*Elytron* with pits of sculpture shining bluish-green in a dark brownish-bronze field. General impression of dark parts a dull dark brown or brownish-green.

The marking of the elytron consists of: (1) a narrow humeral lunula from which the frontal part nearly reaches the scutellum and the hind part the median margin, turning latero-frontalwards; (2) a middle band, first part V-shaped, last part going backwards, often interrupted and at last going frontalwards along the median margin; (3) an apical lunula with its hind part going frontalwards along the margin, and with a frontal projection on its frontal part; these three components are joined by a marginal area.

**Diagnosis** (compared with *C. graphiptera* var. *fulgidiceps*): *Pronotum sides less densely clothed with bristles; elytron marking not dominant*, consisting of a narrow humeral lunula, a strongly tortuous middle band with its first part V-shaped and an apical lunula with a frontal projection on its frontal part, all these components joined by a marginal area; general impression of dark parts of elytron a dull dark brown or brownish-green.

***Cicindela graphiptera* var. *fulgidiceps* Putzeys, 1845**

[Plate XIII and XVII; fig. 28u–w, 29f]

*Cicindela fulgidiceps* PUTZEYS, 1845, p. 367 [„Viridi-aenea, capite antice et inter oculos cupreo-aureo; pronoto subquadrato, antice paulo angustiore, margine omni albo-piloso; elytris albidis, sutura antice, fasciis duabus angustis abbreviatis, macula media communi, lineisque duabus flexuosis hamatis, viridi-aeneis.”; detailed description; „Venezuela (Cumana). Cet insecte habite exclusivement le bord de la mer, dans les endroits sablonneux”].

*Cicindela graphiptera* forma *fulgidiceps* Putzeys, HORN, 1915, p. 410 [„dilatata-Form”; „Costa Rica bis Venezuela.”].

*Cicindela graphiptera* var. *fulgidiceps* Putzeys, HORN, 1938, p. 53, tab. 86 fig. 28–29 [Drawings of 2 elytra.].

*Cicindela graphiptera* phase *fulgidiceps* Putzeys, BLACKWELDER, 1944, p. 18.

VENEZUELA (mainland): *Cabo Blanco*, W of La Guaira, 19.VIII.1936 (2 ♂♂ 1 ♀; Plate XVII 15♂); Caracas [?], 12.IX.1914 [or 1924] (Copenhagen coll. Suenson, ♀); Venezuela (Brit. Mus., 2 ♀♀); Venezuela (Paris, Chaper coll. 1885, ♂).

MARGARITA: *Playa Brava*, between Punta Mosquito and Porlamar, 4.VI.1936, narrow beach of whitish sand, very many specimens observed (1 ♂ 5 ♀♀; XVII 1 ♀ 2 ♀ 3 ♂; fig. 28 u–v).

TORTUGA: *SW. Tortuga*. 1.VIII.1936, beach of coral sand (2 ♂♂ 1 ♀; XVII 4 ♀ 5 ♂).

COLOMBIA: *Punta Tucacas*, near Puerto López, La Goajira, 14.I.1937, near Sta. 285, 3–5 m wide beach of whitish sand (10 ♂♂; XIII ♂ XVII 6 ♂); *Puerto López*, 27 and 28.I.1937, 3–5 m wide beach of whitish sand, see fig. 27 (5 ♂♂ 9 ♀♀; XVII 7 ♀ 8 ♂ 9 ♀); NE of Río Hacha, 20.I.1937, beach of yellowish sand (4 ♂♂ 6 ♀♀; XVII 11 ♀ 12 ♀ 13 ♂ 14 ♀; fig. 28w, 29f); Río Hacha, 21.VII.1920, collected by F. M. Gage (Amer. Mus., ♀); Colombia (Copenhagen coll. Suenson, ♀); Colombia (Oxford, ♂).

**Description** (compared with *C. auraria*; based on 24 ♂♂ and 22 ♀♀ from Cabo Blanco, Margarita, Tortuga and La Goajira)

Body length (without labrum) ♂ 8.2–9.7–10.4 ♀ 9.5–11.7–12.3 mm; body width ♂ 2.8–3.4–3.8 ♀ 3.2–4.0–4.8 mm; ♂ 2.4–2.8–3.3 ♀ 2.5–2.9–3.2 times as long as wide.

*Antenna* with its third joint with 3–6 erect bristles on the outside and 2 or 3 on the top. Fourth joint with 1 or 2 in the middle and 5–7 flattened and often curved bristles on the top. Next 6 joints with 3 erect, very short setae on the top, the last without setae. Third joint about 0.9 times as long as the fourth one.

*Labrum* (see fig. 28u-w) very broad, somewhat directed to the front, somewhat roof-shaped. Margin hardly curved near the tooth, central part not strongly protruding. Hind border in the middle strongly curved backwards. The lateral sub-marginal setae at about  $\frac{3}{5}$  of half the width of the labrum from the middle, and more caudalwards than the other 4-6.

*Head*. Frons distinctly strigose, also in the middle, hardly punctate. Vertex with coarse longitudinal strigae, becoming transverse and wavy on the hind part. Eyes not strongly protruding. Genae glabrous. Gula smooth, the rest of the underside of the head almost smooth.

*Mandibles* (see fig. 29f) about  $2\frac{1}{2}$  times as long as labrum, strongly bent, the protruding part is almost parallel with the labrum. The first four teeth slender and sharp. The tooth on the base is very slightly divided and forked, the 4 tops are blunt; the crest is rather large and not forked.

*Labial palp* with many long hairs on the penultimate joint.

*Mandibular palp*. Last joint shining dark coppery-green. Second joint with scattered hairs over its whole length.

*Pronotum* not strongly rounded, front side a little more narrow than hind side, flanks nearly straight. ♂ 1.3-1.5-1.7 ♀ 1.5-1.7-1.9 mm in length; ♂ 1.9-2.3-2.6 ♀ 2.2-2.6-3.0 mm wide; ♂ 1.3-1.5-1.7 ♀ 1.5-1.5-1.6 times as broad as long, ♂ 1.2-1.3-1.6 ♀ 1.1-1.3-1.5 elytron width. Hind angles a little projecting backwards, front angles frontalwards; they are almost not rounded. Surface not strongly domed. Median line frequently indistinct; transverse furrows not pronounced and a little indented in the middle. Each side of the pronotum broadly and rather densely clothed with decumbent bristles. Front- and hindborder with a fringe of short, slender hairs. Pronotum with very small epipleurae.

*Pro-episternum* very densely clothed with decumbent bristles. Near the side of the coxa with about 40 parallel strigae.

*Meso-episternum* with its dorsal part glabrous and its ventral part densely clothed with decumbent bristles. Mesosternum near the coxae and the frontal part with small and slender hairs.

*Meta-sternum* on the frontal part with small and slender, straight hairs.

*Legs* shining coppery-green or -red. Hindlegs of a noticeable length, about 1.4 times as long as body. Trochanters shining coppery-green, without setae. Femur III about 0.9 times as long as elytron; I with ventrally a row of erect bristles. Tibia III about 0.6 times as long as femur; I rather densely clothed with bristles. Tarsus III about 0.6 times as long as femur; rather densely clothed with bristles.

*Abdomen* ventrally densely clothed with decumbent bristles, median part almost glabrous; the latter part with some slender, short hairs and on the sides near the hindborder of each segment with 1-3 long and slender setae. Segments dark shining coppery-green or -red with a violet reflection.

*Elytron* ♂ 5.6-6.3-6.9 ♀ 6.3-7.5-8.2 mm in length, 3.7 times the width. Lateral side nearly straight, at  $\frac{3}{4}$  of the length turning off to the apex; the last  $\frac{1}{4}$  part not with a weak inward curve, its margin finely serrated. Median margin a little thickened. Sculpture of elytron shows a rather dense and coarse punctation (about 115-130 pits per mm<sup>2</sup>). Pits of sculpture shining coppery-green in a field of nearly the same colour. The yellowish-white elytron marking is dominating in such an extend that from the dark parts there are only a few character-like figures left.

**Diagnosis :** *Body length* (without labrum) ♂ 9.7 ♀ 11.7, *body width* ♂ 3.4 ♀ 4.0 mm; third joint of antenna about 0.9 times as long as fourth one; margin of labrum nearly straight, 6–8 submarginal setae; clypeus, frons, vertex and genae glabrous; eyes not strongly protruding; *mandibles* rather slender, *strongly bent*; last joint of mandibular palp coppery-green; flanks of pronotum nearly straight, transverse furrows and median line rather indistinct, *pronotum with a fringe of hairs on front- and hindborder, hindside with bristles*; pro-episternum without erect bristles near the coxae; *frontal tip of metasternum with short straight hairs*; *hind-legs very long*; *trochanters without setae, coppery-green*; femora I and II ventrally without a row of curved hairs; abdomen with 2–6 erect setae on each segment, and with some short erect hairs; elytron without an inward curve in the last  $\frac{1}{5}$  part of the lateral side, about 115–130 pits per mm<sup>2</sup>; yellowish-white *elytron marking dominant*, from the dark parts only a few character-like figures left; general impression of dark parts of elytron a dull bronze green.

**Variation in elytron marking** (Plate XVII). A large variation may be observed in the extension of the yellowish-white elytron marking. The ends of the humeral lunula may meet each other so that the dark part of the frontal part of the elytron may be isolated (2, 3, 4, 5, 10, 14). The strongly tortuous middle band is often interrupted in several places (1, 4, 6, 11, 13, 14). Between the middle band and the apical lunula, from which the frontal part goes far frontwards, and the marginal area, there is a large character-like figure, which is often strongly reduced (3, 5, 9). With increasing elytron marking it seems that the dark parts persist the longest along the median margin, in the isolated part of the frontal part of the elytron, a transversal part between humeral lunula and middle band, and the median longitudinal line of the character-like figure (5).

**Some distinct secondary sexual characteristics.** Tarsi, meso-episternum and abdomen as in *C. auraria*. A distinct difference is shown in the apex of the elytron which is strongly truncated in the female and has a little inward curve near the median margin; in the male the apex is slightly pointed. Often the flattened bristles on the top of the fourth joint of the antenna are yellowish with a dark tip, all together resembling a brush in the male. Usually the female is larger than the male.

#### KEY

- 1 a Two front trochanters with erect setae; hindlegs not extremely long; front border of pronotum without a fringe of slender hairs . . . . . 2
- b Two front trochanters without erect setae; hindlegs extremely long; front border of pronotum with a fringe of slender hairs . . . . . 7
- 2 a Genae with decumbent bristles; front and middle femora ventrally without a row of curved hairs . . . . . *C. auraria*
- b Genae glabrous; front and middle femora ventrally with a row of curved hairs . . . . . 3
- 3 a Punctuation of elytron more evident in the dark parts, about 65–80 pits per mm<sup>2</sup>; front margin of labrum in the middle distinctly protruding; mandible not very slender . . . . . 4
- b Punctuation nearly as evident in the yellowish-white as in the dark parts, about 185–230 pits per mm<sup>2</sup>; front margin of labrum nearly straight; mandible very slender . . . . . 5

- 4 *a* Elytron marking wide, with an uninterrupted marginal area and a distinct humeral lunula . . . . . *C. trifasciata trifasciata*  
*b* Elytron marking very narrow, marginal area strongly interrupted, humeral lunula indistinct and mostly consisting of two spots only . . . . .  
*C. trifasciata ascendens*
- 5 *a* Yellowish-white elytron marking strongly dominant, of the dark parts there is left only a subtriangular sutural mark with expanded top, which is often partly enclosed by a dark line; elytron with about 185–200 pits per mm<sup>2</sup>.  
*C. suturalis* typical form  
*b* Elytron marking less dominant, consisting of apical and humeral lunula, tortuous middle band and marginal area; elytron with about 195–230 pits per mm<sup>2</sup> . . . . . 6
- 6 *a* Dark parts of elytron, head, thorax and abdomen as a rule shining coppery-green or -red . . . . . *C. suturalis* var. *hebraea*  
*b* Dark parts of elytron, head, thorax and abdomen as a rule dark brownish-violet or black . . . . . *C. suturalis* var. *guadeloupensis*
- 7 *a* Pronotum sides narrowly clothed with decumbent bristles; yellowish-white elytron marking not dominant . . . . . *C. graphiptera* typical form  
*b* Pronotum sides broadly clothed with decumbent bristles; yellowish-white elytron marking strongly dominant, of the dark parts only a few character-like figures left . . . . . *C. graphiptera* var. *fulgidiceps*

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PLATE XIII

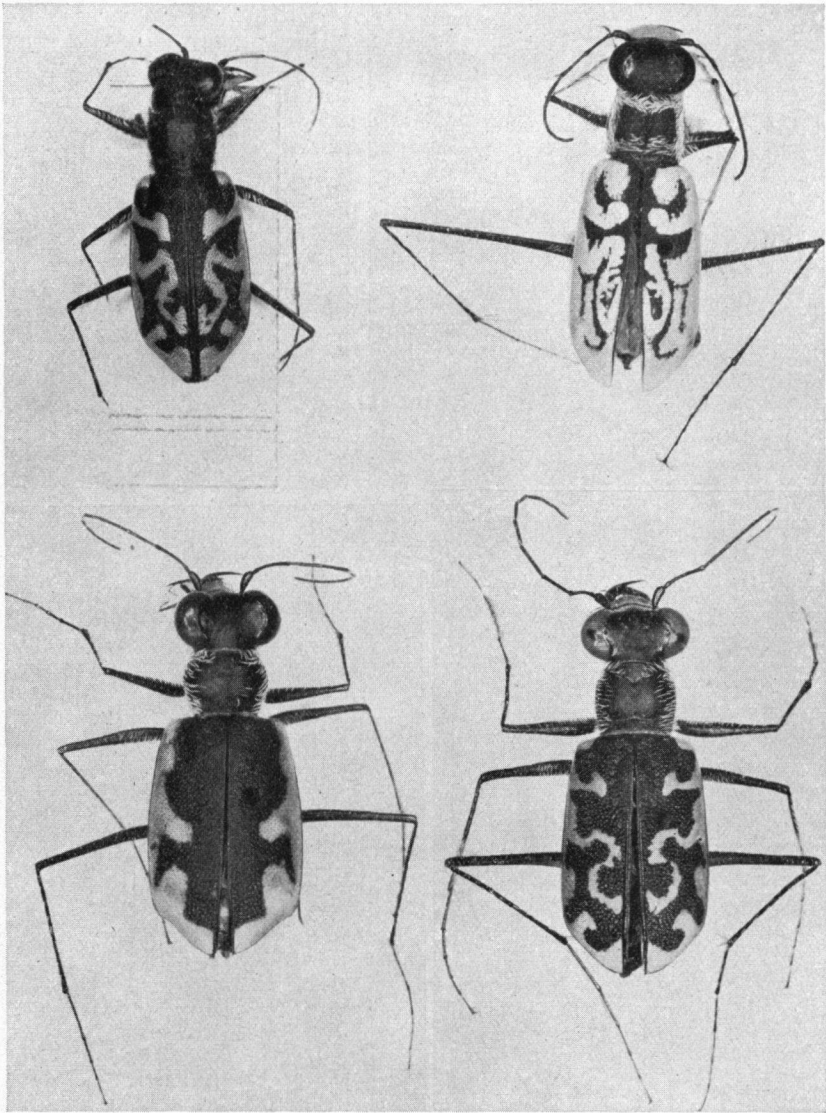


PLATE XIII (top left) *Cicindela suturalis* var. *hebraea* from Brasil, ♀. (top right) *C. graphiptera* var. *fulgidiceps* from La Goajira, Colombia, ♂. (bottom left) *C. auraria* from Aruba, ♀. (bottom right) *C. trifasciata trifasciata* from St. Martin, ♂.

PLATE XIV

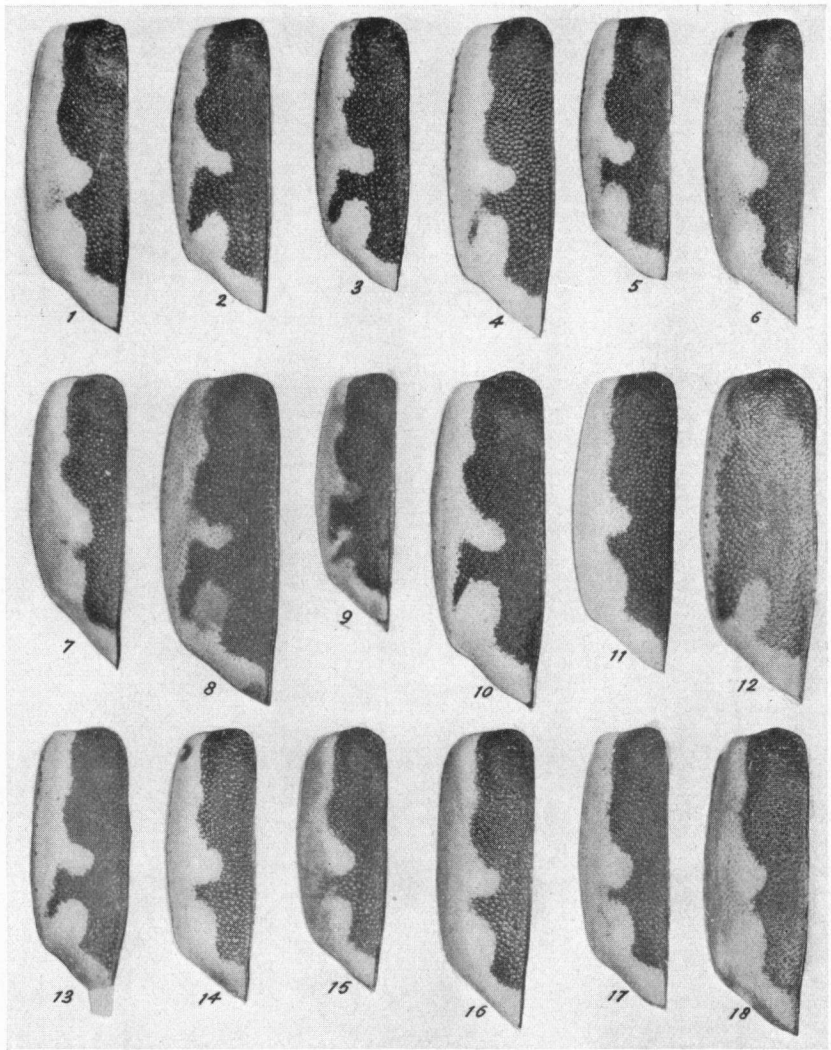


PLATE XIV *Cicindela auraria*, left elytra, from 1 Margarita, 2-6 Bonaire, 7-8 Curaçao, 9-11 Aruba, 12 Colombia, 13-14 Paraguaná, and 15-18 La Goajira; 3-4, 6-7, 14-16 ♂♂, the other ♀♀.

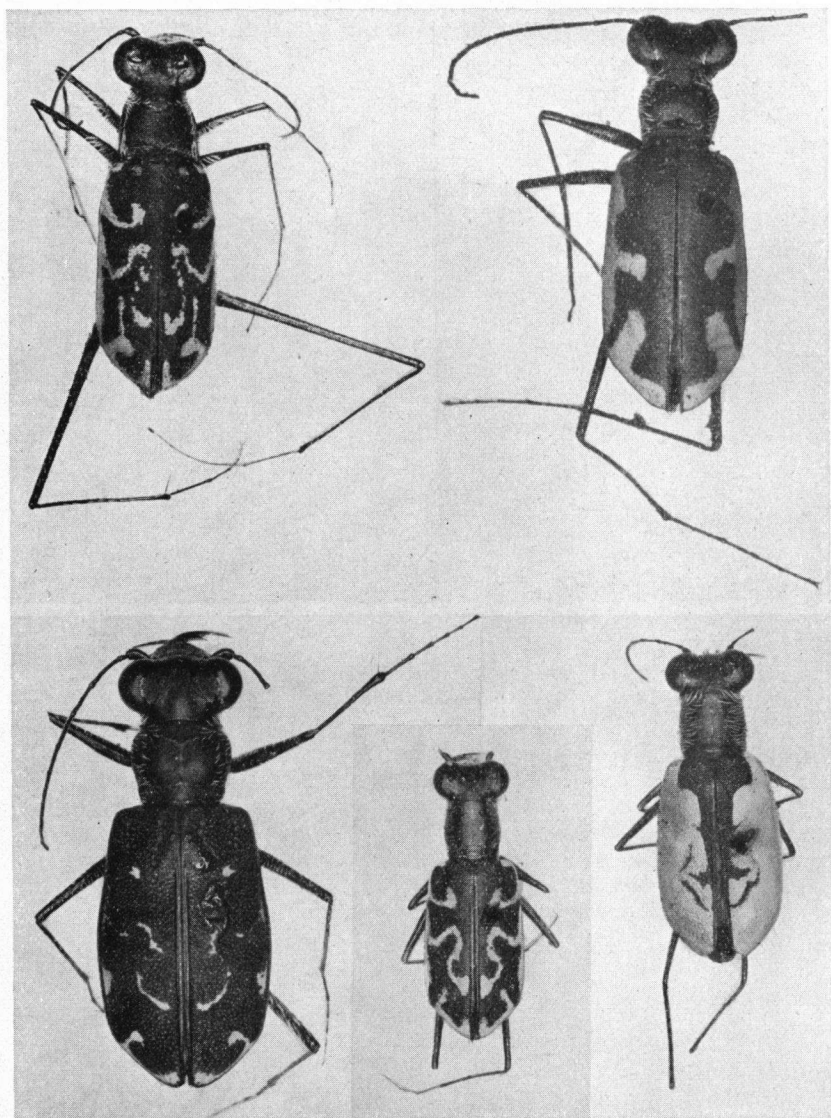


PLATE XV (top left) *Cicindela graphiptera* typical form from Costa Rica, ♂. (top right) *C. boops*. (bottom left) *C. trifasciata ascendens* from U.S.A., ♀. (bottom centre) *C. suturalis guadeloupensis*, ♂. (bottom right) *C. suturalis* typical form, ♀.

PLATE XVI

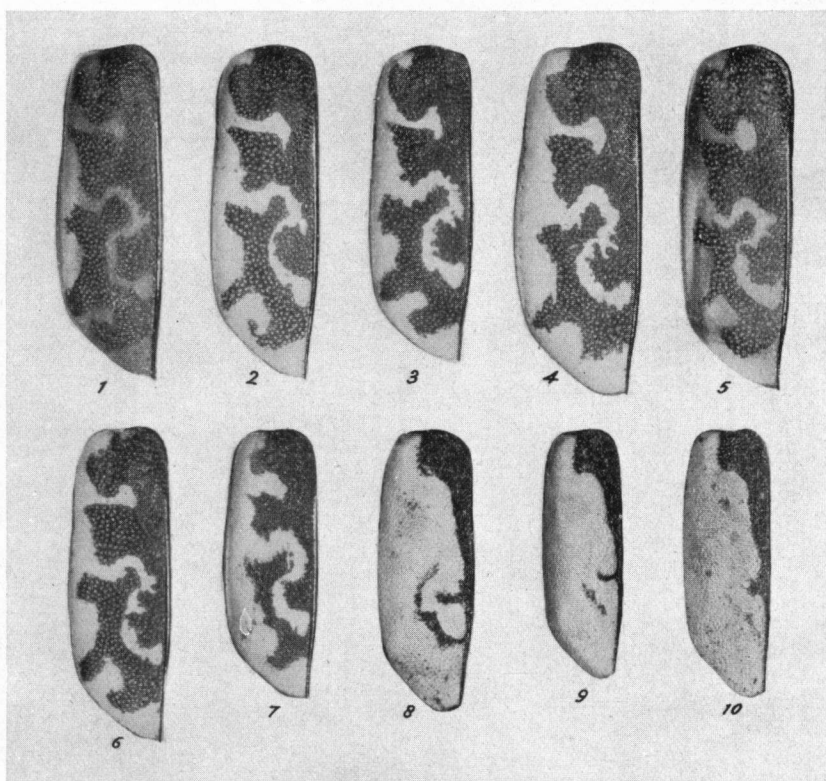


PLATE XVI *Cicindela trifasciata trifasciata*, left elytra, from 1-5 St. Martin, 6 Anguilla, and 7 Margarita. *C. suturalis* typical form from 8 unknown locality, 9 St. Thomas, and 10 St. Barts; 1-3, 5-7 and 9 ♂♂, the other ♀♀.

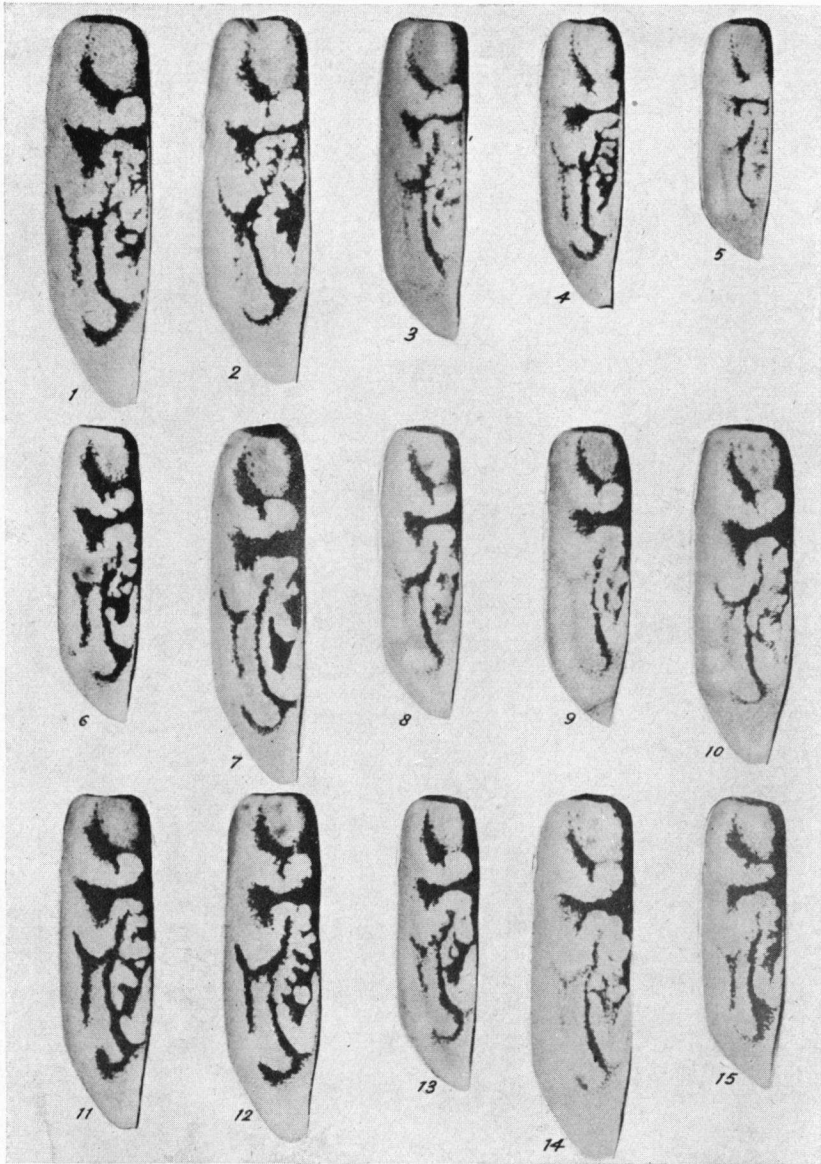


PLATE XVII *Cicindela graphiptera* var. *fulgidiceps*, left elytra, from 1-3 Margarita, 4-5 Tortuga, 6-14 La Goajira, and 15 Venezuelan mainland near La Guaira; 3, 5-6, 8, 10, 13, and 15 ♂♂, the other ♀♀.