

STUDIES ON THE FAUNA OF CURAÇAO AND OTHER  
CARIBBEAN ISLANDS: No. 22.

**TENEBRIONID BEETLES OF CURAÇAO, ARUBA,  
BONAIRE, AND THE VENEZUELAN ISLANDS**

by

**GIORGIO MARCUZZI**

(Istituto di Zoologia, Università di Padova)  
Directed by Prof. Umberto D'Ancona

The present paper deals with the results of my investigations on the *Tenebrionidae* of the Leeward Group and the xerophilous regions of Venezuela and Colombia. I am much indebted to Dr P. WAGENAAR HUMMELINCK for giving me the opportunity to study the material he collected during his trips to this area. Some other specimens used were collected by the present writer himself. Material for comparison has been obtained through the courtesy of several people, particularly the Director of the British Museum (N.H.), Mr H. KULZER (Frey collection, Munich), and Prof. E. TORTONESE (Museum of Zoology, Turin University), to all of whom I am deeply obliged. In particular I also wish to thank Prof. E. GRIDELLI, Director of the Natural History Museum, Trieste, to whom I am greatly indebted for his constant help and advice in my work, and to Prof. R. MALARODA, of the Institute of Geology, Padua University, for the useful criticism about my geological considerations. Not the last, I would express my gratitude to Dr E. MACCALLAN of the I.C.T.A. (Trinidad, B.W.I.) for the communication of material of that Institute. — The photographs were made by Dr P. WAGENAAR HUMMELINCK, with the expert assistance of Mr H. VAN KOOTEN, at the Zoological Laboratory of the State University, Utrecht.

The material has been deposited with the Zoological Museum of Amsterdam and the State Museum at Leyde. The material indicated as "Marcuzzi leg." is included in author's private collection, ex-

cepting some specimens which have been given to the Biological Department of the Caracas University, Venezuela.

Dr HUMMELINCK's localities have been described in the 1st, 4th and 17th papers of this series (*Studies* 1 p. 5-24; 2 p. 22-42; 4 p. 3-19).

## TENTYRIINAE

### *Epitragus aurulentus* Kirsch, 1866

KIRSCH, 1866, p. 189; CHAMPION, 1884, p. 23; MARCUZZI, 1949, p. 334.

VENEZUELA mainland: *Morro de Chacopata*, Araya, Sta. 127, 27.VI.1936 (1 ex.); Maiquetía, near La Guaira, 1948 (Marcuzzi leg.) MARGARITA: Atamo, XII.1948 (1 ex., Marcuzzi leg.). ISLA DE PATOS near Trinidad: (1 ex., I.C.T.A.)

Central and South America; Venezuelan mainland and Margarita.

Another three species of this genus, so far unclassified and most probably new to science, were collected in the xerophilous regions of the Leeward Group and the adjacent coast of South America.

### *Epitragus* sp. ex grupo *angustiformis* F. (n.sp.?)

VENEZUELA: Paraguaipoa, La Goajira, I.1950 (1 ex., Marcuzzi leg.). COLOMBIA: *Uribia*, La Goajira, Sta. 288, 17.I.1937 (1 ex.).

These specimens possibly belong to a widely distributed species, or group of species, present all over the xerophilous regions of Venezuela and Colombia.

### *Epitragus* sp.

VENEZUELA mainland: *Morro de Chacopata*, Araya, Sta. 127, 27.VI.1936 (1 ex.). CUBAGUA: N.W. *Cubagua*, Sta. 130, 21.V.1936 (1 ex.). LOS FRAILES: *Puerto* (Isla) *Real*, Sta. 166, 18.VI.1936 (1 ex.).

### *Ecnomosternum vermiculatum* Gebien, 1928

[Plate VI 4]

GEBIEN, 1928, p. 104.

CURAÇAO: *Willemstad*, 31.VIII.1948 (1 ex.); *Piscadera* Hotel, 20.IX.1936 (1 ex.), 13.X.1936 (1 ex.); *Cas Cord*, 26.VIII.1948 (6 ex., on light; Plate VI 4).

Curaçao, Bonaire.

The specimens were compared with the *typus* (coll. Frey). GEBIEN's Catalogue is silent about Bonaire, where the typical material comes from.

TABLE 1.

Geographical distribution of the Tenebrionidae treated in this paper.

Species of <i>Tenebrionidae</i>	Morro de la Iguana + Chiwo		Los Testigos		Los Frates		Los Hermanos		Orchila		Los Roques		Las Aves	
	Tamarindo	Isla de Conejo	Puerto Real	La Pocha	Cominoto	Margarita + I. Blanca	Coché + Cubagua	Morro Pando	Blanquilla	Huespén	Gran Roque	Ave de Barlovento	Bonaire	Klein Bonaire
<i>Epitragus aurulentus</i> . . . . .						X								
<i>E. sp. gr. angustiformis</i> . . . . .														
<i>E. sp.</i> . . . . .			*											
<i>Ecnomosternum vermiculatum</i> . . . . .														
<i>Tapinocomus subnudus</i> . . . . .														
<i>T. relictus</i> n. . . . .														
<i>Stictoderia subseriata</i> . . . . .								*		*				
<i>S. gridellii</i> n. . . . .														
<i>Armalia chiriguensis</i> . . . . .														
<i>Paraguania relicta</i> . . . . .														
<i>P. hummelincki</i> n. . . . .														
<i>Rhypsma venezuelense</i> . . . . .	*		X	X					X					
<i>R. maria-graviae</i> . . . . .														
<i>R. trinitatis</i> . . . . .														
<i>Diastolinus curtus curtus</i> . . . . .														
<i>D. c. goajirus</i> n. . . . .														
<i>D. hummelincki</i> . . . . .														
<i>D. margaritensis</i> . . . . .						X								
<i>D. fairmairei</i> . . . . .	*		X	*	X	*	*							
<i>D. sp. gr. curtus</i> . . . . .														
<i>Opairinus gemellatus</i> . . . . .	*			*										
<i>Ulus margaritensis</i> n. . . . .						X	*							
<i>U. venezuelensis</i> n. . . . .														
<i>Blapstinus buqueti</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>B. relictus</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>B. margaritensis</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>B. paraguanae</i> . . . . .														
<i>B. pseudoaeneus</i> . . . . .						X								
<i>B. curassavicus</i> . . . . .														
<i>B. orchilensis orchilensis</i> . . . . .														
<i>B. o. occidentalis</i> n. . . . .									X					
<i>B. simulans</i> n. . . . .														
<i>B. humboldti</i> n. . . . .														
<i>B. hummelincki</i> n. . . . .														
<i>Austrocaribius n. venezuelensis</i> n. . . . .						X								
<i>Hummelinckia n. caraibica</i> n. . . . .								*	*	*	*	*	*	*
<i>Trichoton lapidicola</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>Ammodonon ciliatus</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>Trichotoides n. hintoni</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>Phaleria angustata</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>Ph. cfr. fulva</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>Ph. chevrolati</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>Ph. sp.</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>Platydema sp.</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>Pl. sp.</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>Pl. sp.</i> . . . . .						X	*	*	*	*	*	*	*	*
<i>Uloma grenadensis</i> . . . . .														
<i>Tribolium castaneum</i> . . . . .						*								
<i>Alegoria dilatata</i> . . . . .														
<i>Alphitobius laevigatus</i> . . . . .														
<i>Ulosonia tricornis</i> . . . . .														
<i>Zophobas cfr. atratus</i> . . . . .	*													
<i>Z. cfr. rugipes</i> . . . . .														
<i>Z. sp.</i> . . . . .														
<i>Phymates sp. gr. tuberculatus</i> . . . . .														
<i>Anaedus sp.</i> . . . . .														
<i>Pyanisia nebolusa</i> . . . . .														
<i>Strongylium sp.</i> . . . . .														

\* according to specimens collected by P. WAGENAAR HUMMELINCK  
 X additional data from the collection of G. MARCUZZI  
 — data from other material  
 . data from literature

**Tapinocomus subnudus** Gebien, 1928

[Plate I 4]

GEBIEN, 1928, p. 103.

BONAIRE: *Kralendijk*, 20.IX.1948 (1 ex.); *Lagoen*, Sta. 309, 14.IX.1948 (2 ex.). CURAÇAO: *Willemstad*, in garbage of hen-house, 2.X.1936 (14 ex.); *Oost Seinpost*, Sta. 204, 9.IX.1936 (7 ex.); *Seroe Djerimi*, Sta. 242, 6.XI.1936 (1 ex.). ARUBA: *Oranjestad*, Pasanggrahan, on light, 12.XII.1936 (1 ex.); Pasanggrahan, 13.XII.1936 (2 ex.; Plate I 4); Pasanggrahan, 15.XII.1936 (2 ex.); *Oranjestad*, XI.1948 (6 ex., A. D. Ringma leg.); *Dakota Airport*, II.1948 (6 ex., A. D. Ringma leg.); *Rooi Prins*, Sta. 246, 9.I.1937 (1 ex.); Cave of *Quadirikiri*, Sta. 250, 9.II.1937 (1 ex.); *Vader Piet*, Sta. 252, 9.II.1937 (36 ex.); *Fontein*, Sta. 252A, 9.II.1937 (1 ex.); *Rooi Spoki*, Sta. 255, 6.II.1937 (3 ex.); *Baranca Alto*, Sta. 260, 29.XII.1936 (1 ex.); *Hooiberg*, Sta. 268, 21.XII.1936 (1 ex.); *Hooiberg*, Sta. 268B, 5.XII.1936 (2 ex.); *Santa Cruz*, Sta. 269, 21.XII.1936 (2 ex.); *Jamanota*, *Seroe Cristal*, Sta. 270A, 10.II.1937 (1 ex.); *Seroe Plat*, Sta. 271, 10.II.1937 (4 ex.); *S. Plat*, 3.I.1949 (6 ex.); *Hudishibana*, Sta. 272, 9.XII.1936 (1 ex.); *Tibushi*, Sta. 273, 9.XII.1936 (2 ex.); *San Michael*, NW of Oranjestad, 3.I.1949 (1 ex.).

Bonaire, Curaçao!, Aruba!

GEBIEN's Catalogue erroneously says „I. Venez.” instead of Bonaire, from where *T. subnudus* has been described.

**Tapinocomus relictus** n.sp.

[Plate I 5]

MARCUZZI, 1951, p. 435 (name only).

Very near *T. subnudus* Geb., from which it differs as follows: More elongated, the outline narrower in correspondence to the humeral region; a less transversal pronotum, which is widest between the middle and the posterior third; sides of pronotum less rounded, in the posterior middle almost parallel, posterior angles more pronounced; pronotum and elytrae more convex, both in cranio-caudal and in perilateral sense. Elytrae widest between the middle and the posterior two thirds. Humeri well developed. Elytral punctation much coarser. The golden setae on the elytrae arranged longitudinally in a more or less rowlike position, while in *T. subnudus* they have a quite irregular distribution. Punctation of abdomen scarcer and shallow. Prosternal appendix oval, posteriorly narrowed, somewhat elevated in relation to prosternum, and prolonged posteriorly in a short point. Size as in *T. subnudus*.

VENEZUELA mainland: *Carirubana*, near Las Piedras, Paraguaná, Sta. 279, 15.II.1937 (9 ex.); Las Piedras, Paraguaná, X.1948 (many spec., Marcuzzi leg., type locality); Santa Ana, Paraguaná, X.1948 (2 ex., Marcuzzi leg.). — Type in author's collection. COLOMBIA: *Laguna de Tucacas*, La Goajira, Sta. 286, 15.I.1937 (8 ex.; Plate I 5).

Venezuelan mainland (Paraguaná)!, Colombia (La Goajira)!

*Tapinocomus relictus* and *T. subnudus* are allopatric species, of which one can be considered to have originated from the other, or both from a common ancestor, after their present areas had been separated. The center of diffusion is probably the Dutch Islands, since it is here where the other two endemic genera of *Epitragini* (*Ecnomosternum* and *Stictoderia*) have originated and where they are localized today.

**Stictoderia subseriata** Gebien, 1928

[Plate I 6-7]

GEBIEN, 1928, p. 101; GEBIEN, 1928, p. 102 (*S. weneri*).

LOS HERMANOS: *Morro Pando*, Sta. 170, 20.VII.1936 (1 ex.). ORCHILA: *Huespén*, Sta. 174, 23.VII.1936 (1 ex.). LOS ROQUES: *Gran Roque*, Sta. 176, 25.VII.1936 (1 ex.). LAS AVES: *Ave de Barlovento*, Sta. 179A, 27.VII.1936 (10 ex.; Plate I 7). BONAIRE: Near *Spelonk*, Sta. 187, 24.III.1937 (1 ex.); *Onima*, Sta. 312, 19.IX.1948 (2 ex.); *Slagbaai*, Sta. 317, 12.IX.1948 (3 ex.; Plate I 6). KLEIN BONAIRE: SE *Kl. Bonaire*, Sta. 199c, 7.IX.1948 (4 ex.). KLEIN CURAÇAO: *Kl. Curaçao*, Sta. 322, 1.X.1948 (4 ex.). CURAÇAO: *Tafelberg S. Barbara*, Sta. 330, 8.XII.1948 (1 ex.).

Curaçao, Klein Curacao!, Klein Bonaire!, Bonaire, Las Aves (*Ave de Barlovento*)!, Los Roques (*Gran Roque*)!, Orchila (*Huespén*)!, Los Hermanos (*Morro Pando*)!

In GEBIEN's Catalogue there is erroneously mentioned „I. Venez.” instead of Bonaire.

An extremely polymorphous species, which has been fragmented in a number of localized populations, which, in my opinion, do not deserve a subspecific name. Furthermore, the study of this extremely interesting material has convinced me that *S. weneri* Gb. could in no way be considered as a species different from *S. subseriata* Gb., since in the Leewards all the possible intergrades between the two hypothetical species are to be found, as can be seen from the following lines.

CURAÇAO: I have seen the typus of *S. subseriata* Gb. (coll. Frey, N. 1337) which corresponds to the original description, with the exception that the elytral rows of punctures show an alternation of big and small punctures respectively, though less marked than in *S. weneri* Gb. Large size; points of pronotum confluent; points of elytrae rather large; clypeus truncate.

BONAIRE: I have seen the typus of *S. weneri* Gb. (coll. Frey, N. 1338), which shows the following features: large size, points of pronotum confluent, points of elytrae large, clypeus feebly arcuate. It is remarkable that in Hummelinck's specimen the elytral points are small.

LOS ROQUES and ORCHILA: Large size, points of pronotum more or less confluent, with or without unpunctate spaces; points of elytrae often irregular, generally large, showing a tendency to lose the serial disposition, more especially on the base and medially. Furthermore, I have seen more specimens from these localities, belonging to the collection La Salle (Caracas) or my personal collection, which show the same amplitude of variability.

LAS AVES: Small size (5-6.5 mm, with mean values towards the lower limit), clypeus truncate (as in the typus of *S. subseriata*) or more often arcuate, as in the

remaining populations; points of pronotum very coarse, points of elytrae disposed in an evident alternation of rows of large and small points; upper surface very shining, more than in any other population.

LOS HERMANOS: Large size, points of pronotum relatively small and separate, confluent not even on the sides. Points of elytrae small, but regularly disposed as in the form of Bonaire.

**Stictoderia gridelli** n.sp.

[Plate I 8]

Very near *S. subseriata* Gb., from which it can be differentiated as follows: Pronotum very transverse (length/width ratio 0.46, while in *S. subseriata* the ratio is 0.58–0.66), with the sides much rounded, practically without hind angles; base of pronotum medially expanded in a median lobe, but not bisinuate. Anterior angles slightly obtusangular and blunt. Elytral rows of punctures very fine, often irregularly disposed; the punctuation is denser than in *S. subseriata*, especially towards the base and the apex; furthermore, at the apex the punctures are characteristically pad-like and asperate, as I have never seen in any neotropical *Tenebrionidae*. Fourth and fifth (apparent) urosterna with an extremely fine punctuation. Large size. Punctuation of pronotum confluent or not so.

ARUBA: *Vader Piet*, Sta. 252, 9.II.1937 (2 ex.); Near *Fontein*, Sta. 252A, 9.II.1937 (1 ex.; Plate I 8, type); Reef of *Bucuti*, Sta. 278, 8.II.1937 (1 ex.) — Type in Zool. Museum Amsterdam.

Aruba!

**Armalia chiriquensis** Champion, 1884

[Plate VII 1 and 3]

CHAMPION, 1884, p. 9; MARCUZZI, 1951, p. 435 (*Hylocrinus lagunillas*, name only).

VENEZUELA mainland: *Isla de Caribes*, 2½ km from the Península de Araya, Sta. 128, 26.VI.1936 (2 ex.; Plate VII 3); Lagunillas (de Mérida), I.1950 (in great number, Marcuzzi leg.). COLOMBIA: *Cabo de la Vela*, La Goajira, Sta. 290, 22.I.1937 (2 ex.; Plate VII 1).

Panamá, Colombia, Venezuelan mainland! — The indication of CHAMPION from Bogotá (coll. Bates) might be erroneous, as this species very probably does not reach the height of Bogotá, lacking on the Venezuelan Andes higher than 1000 m.

Slightly different from the typical material in having the sides of pronotum regularly arcuated up to the base, so that the hind angles are obtusangular.

The unusually wide range of distribution of this species may be due to the presence of fully developed wings. The presence of a species common to Lagunillas and NE Venezuela was already known (MARCUIZZI, 1951). This is the first case of a species common to Lagunillas and La Goajira; a distribution of possibly recent origin.

The determination has been checked with typical material from Chiriqui (Panamá), deposited at the British Museum.

**Paraguania relicta** Marcuzzi, 1952

[Plate II 7 and 9]

MARCUZZI, 1951, p. 435 (*Trientoma relicta*, name only); MARCUZZI, 1952, p. 31.

VENEZUELA mainland: Cerro Transverso, E of *Las Piedras*, Paraguaná, Sta. 280, 16.II.1937 (1 ex.; Plate II 9); *Las Piedras*, Paraguaná, X.1948 (1 ex., paratypus, Marcuzzi leg.); Santa Ana, Paraguaná, X.1948 (1 ex., typus, Marcuzzi leg.); Carora, Lara, I.1950 (many spec., Marcuzzi leg.). COLOMBIA: *Laguna de Tucacas*, Sta. 286, 15.I.1937 (1 ex.); *Cabo de la Vela*, Sta. 290, 22.I.1937 (3 ex.; Plate II 7). — Type in author's collection.

Venezuelan mainland (Paraguaná, Lara), Colombia (La Goajira)!

**Paraguania hummelincki** n.sp.

[Plate II 8]

Very near *P. relicta*, from which it differs as follows: Smaller (5.5 mm), slightly more convex, less nitidous, pronotum slightly more transverse, the sides slightly rounded and convergent towards the apex, anterior angles somewhat less prominent than in *P. relicta*; punctation of the head and the pronotum much finer, the former almost simple (instead of wrinkled as in *P. relicta*). Elytrae without the characteristic ridges of external intervals (especially the third, fifth and seventh one), with the external intervals only slightly convex, the alternate not more so than the others. Rows of punctures rather finer, intervals perfectly smooth.

VENEZUELA mainland: *Carirubana*, near *Las Piedras*, Península de Paraguaná, Sta. 279, 15.II.1937 (2 ex.; Plate II 8, type). — Type in Zool. Museum Amsterdam.

Venezuelan mainland (Paraguaná)!

*Paraguania relicta* and *P. hummelincki* are sympatric species, of which one has possibly originated from the other, only in recent times. The older species might be *P. relicta*, whose area of distribution is much larger. *P. hummelincki* should therefore be considered strictly endemic.

**ASIDINAE****Rhyppasma venezuelense** Marcuzzi, 1953

[Plate III 3-5]

MARCUZZI, 1951, p. 435 (name only); MARCUZZI 1953, p. 76.

VENEZUELA mainland: Maracay, Aragua, not far from the coast, V.1936 (1 ex., Vogl leg., Staatssamml. München); Maiquetía, D.F., near La Guaira, VII.1948 (1 ex., Marcuzzi leg.). LOS TESTIGOS: *Chiwo*, Sta. 159, 15.VI.1936 (2 ex.; Plate III 4). LOS FRAILES: La Pecha, 30.XII.1948 (1 ex., type, Marcuzzi leg.; Plate III 5); Isla Real (Puerto Real), 30.XII.1948 (1 ex., Marcuzzi leg.). ORCHILA: Huespén, X.1950 (2 ex., Marcuzzi leg.; Plate III 3). BONAIRE: Tanki *Onima*, Sta. 194, 13.XI.1936 (1 ex.). — Type in author's collection.

Venezuelan mainland (Aragua, Dto. Fed.), Los Testigos (Chiwo), Los Frailes (Isla Real, La Pecha), Orchila (Huespén), Bonaire.

**Rhyasma maria-gratiae** Marcuzzi, 1953

[Plate III 2]

MARCUZZI, 1953, p. 80.

BONAIRE: Rooi *Onima*, Sta. 194A, 19.IX.1948 (1 ♂ type, 1 ♀; Plate III 2). — Type in author's collection.

Bonaire.

**Rhyasma trinitatis** Marcuzzi, 1953

[Plate III 1]

MARCUZZI, 1953, p. 77.

VENEZUELA mainland: Maracay, Aragua, V.1936 (2 ex., Vogl leg., Mus. München). TRINIDAD: St. Augustine, 15.IV.1926 (many specimens, incl. type, British Museum, C. L. Withycombe leg.); *St. Augustine*, Sta. 366, 8.VIII.1948 (1 ex.; Plate III 1). — Type in Brit. Museum.

Venezuelan mainland (Aragua), Trinidad.

**TENEBRIONINAE****Diastolinus curtus curtus** Mulsant et Rey, 1859

[Plate II, 6]

MULSANT &amp; REY, 1859, p. 157; MARCUZZI, 1949, p. 335.

VENEZUELA mainland: *Carirubana*, Péninsula de Paraganá, Sta. 279, 15.II.1937 (4 ♂♂ 2 ♀♀); *Cerro Transverso*, E of Carirubana, Paraganá, Sta. 280, 16.II.1937 (6 ♂♂ 8 ♀♀); *Santa Ana*, Paraganá, Sta. 281, 16.II.1937 (1 ♂ 1 ♀); *Santa Fé*, N of S. Ana, Paraganá, Sta. 282, 18.II.1937 (3 ♀♀); *Moruy*, Sta. 283, 18.II.1937 (2 ♂♂ 2 ♀♀). BONAIRE: *Bronswinkel*, Sta. 198, 27.III.1937 (1 ♂). CURAÇAO: *Koenoeke Abau*, Sta. 222a, 20.VIII.1948 (3 ex.). ARUBA: *Vader Piet*, Sta. 252, 9.II.1937 (1 ex.); *Baranca Alto*, Sta. 260, 29.XII.1936 (1 ex.); *Hooiberg*, Sta. 268, 21.XII.1936 (7 ex.); *Santa Cruz*, Sta. 269, 21.XII.1936 (1 ex.; Plate II 6); *Seroe Cristal*, Sta. 270A, 10.II.1937 (5 ♂♂ 15 ♀♀); *Seroe Plat*, Sta. 271, 10.II.1937 (4 ex.); *Tibushi*, Sta. 273, 9.XII.1936 (2 ex.); *St. Michael*, NW of Oranjestad, in dried flowers of *Acanthocereus*, 3.I.1949 (2 ex.); *Solito*, Sta. 275, 16.XII.1936 (3 ♂♂ 6 ♀♀); *Oranjestad*, XI.1948 (4 ex., A.D. Ringma leg.); *Heintje Croes*, Sta. 276, 14.XII.1936 (15 ♂♂ 7 ♀♀); *Mon Plaisir*, Sta. 277, 15.XII.1936 (6 ex.); *Sabana Blancoe*, Sta. 362, 31. XII.1948 (1 ex.).

Venezuelan mainland (Paraganá), Aruba!, Curaçao, Bonaire!

Specimens collected by the author at different localities in Paraganá, Oct. 1948, were compared with two specimens (probably the types) from the collection Mulsant, which came from Curaçao.

The study of this material has enabled me to differentiate the ♂ from the ♀ as follows: ♂ more elongate, sides of body parallel, upper surface flatter, elytral intervals more convex, anterior tarsus dilated, anterior tibiae distally and medially dilated.

**Diastolinus curtus goajirus** n. subsp.

[Plate II 4]

The new subspecies differs from the typical form in the following characteristics: Pronotum widest between the base and the posterior 2/3 of the middle, sides more rounded, in some specimens feebly sinuate towards the hind angles; both anterior and hind angles more prominent, especially the former, so that the anterior margin is more deeply emarginate than in the typical form. Punctuation of pronotum denser and stronger.

COLOMBIA: *Laguna de Tucacas*, La Goajira, Sta. 286, 15.I.1937 (3 ♂♂ 4 ♀♀, type locality; Plate II 4, type); *Castilletes*, La Goajira, Sta. 287, 14.I.1937 (3 ex.); *Cabo de la Vela*, La Goajira, Sta. 289, 22.I.1937 (1 ex.); *Cabo de la Vela*, Sta. 290, 22.I.1937 (5 ex.); *El Cardón*, La Goajira, Sta. 291, 22.I.1937 (3 ex.); *Rio Hacha*, Sta. 292, 20.I.1937 (2 ex.). — Type in Zool. Museum Amsterdam, Colombia (La Goajira)!

**Diastolinus hummelincki** Marcuzzi, 1949

[Plate II 1]

MARCUZZI, 1949, p. 340; MARCUZZI, 1950, p. 108; MARCUZZI, 1951, p. 435.

VENEZUELA mainland: *Cerro Transverso*, E. of Carirubana, Paraganá, Sta. 280, 16.II.1937 (1 ♀; Plate II 1); Santa Ana, X.1948 (1 ♂, type, Marcuzzi leg.). COLOMBIA: *Cabo de la Vela*, La Goajira, Sta. 290, 22.I.1937 (1 ♀). — Type in author's collection.

Venezuelan mainland (Paraganá), Colombia (La Goajira)!

Both Hummelinck's specimens do not show any appreciable differences. The smaller size, compared to the male type, is owing to the fact that in *Diastolinus* the females are often smaller. The same holds for the other differences, compared with the type, as the less nitidous upper surface, finer punctuation of the pronotum, more convex upper surface and not dilated anterior tibiae.

**Diastolinus margaritensis** Marcuzzi, 1949

[Plate II 2]

MARCUZZI, 1949, p. 339; MARCUZZI, 1950, p. 107.

VENEZUELA mainland: *Morro de Esmerarda* (island, 200 m from mainland), W of Carúpano, Sta. 124, 10.VI.1936 (1 ♀; Plate II 2). MARGARITA: E of El Valle, III.1948 (1 ♂ 1 ♀, types, Marcuzzi leg.). — Type in author's collection. Near Venezuelan mainland (Sucre)!, Margarita.

**Diastolinus fairmairei** Marcuzzi, 1949

[Plate II 3]

MARCUZZI, 1949, p. 336; MARCUZZI, 1950, p. 106.

VENEZUELA mainland: *Morro de Esmerarda* (island, 200 m from mainland), W of Carúpano, Sta. 124, 10.VI.1936 (1 ♀). LOS TESTIGOS: *Morro de la Iguana*,

Sta. 157, 14.VI.1936 (2 ♂♂); Morro de *la Iguana*, Sta. 158, 14.VI.1936 (3 ex.); *Isla de Conejo*, Sta. 165, 17.VI.1936 (2 ex.). LOS FRAILES: *La Pecha*, Sta. 168, 19.VI.1936 (1 ex.); Puerto (Isla) Real and Cominoto, XII.1948 (Marcuzzi leg.). MARGARITA: Between Pampatar and La Asunción, XII.1948; El Valle, III.1948 and I.1949; La Asunción, III.1948; Juan Griego, III.1948 (all Marcuzzi leg.); *Isla Blanca*, near Pampatar, Sta. 156, 9.VI.1936 (7 ♂♂ 6 ♀♀; Plate II 3). — Type in author's collection.

Venezuelan mainland (from Carabobo to Sucre), Margarita (and Isla Blanca), Los Frailes (Isla Real, La Pecha, Cominoto), Los Testigos (La Iguana)!

***Diastolinus* sp. ex grupo *curtus* Mulsant et Rey**

COLOMBIA: S of *Rio Hacha*, La Goajira, Sta. 294, 18.I.1937 (1 ♀).

Very near *D. curtus goajirus*, but punctation of pronotum still stronger than in this subspecies; elytral intervals from the third onwards very convex, the most lateral one subcarinate.

Though I have found no intermediate between the present form and the true *goajirus*, I would rather consider it as belonging to the „Rassenkreis“ *curtus*. Nevertheless, since I have only one specimen, which, furthermore, comes from the same area occupied by another subspecies (*goajirus*), nothing definite can be established at the moment.

***Opatrinus gemellatus* Olivier, 1795**

[Plate VI 3]

MULSANT & REY, 1853, p. 299; MARCUZZI, 1949, p. 341.

VENEZUELA mainland: *Morro de Puerto Santo* (island 200 m from mainland), E of Carúpano, Sta. 126, 12.VI.1936 (1 ex.). TRINIDAD: St. Augustine (3 ex., I.C.T.A.). LOS TESTIGOS: Morro de *la Iguana*, Sta. 158, 14.VI.1936 (2 ex.; Plate V 3). LOS FRAILES: *La Pecha*, Sta. 168, 19.VI.1936 (1 ex.). MARGARITA: Pampatar, XII. 1948; El Valle, III. 1948 and I.1949; Salamanca, XII.1948; Cerro de Copey, I.1949; San Antonio, I.1949 (all Marcuzzi leg.); Near *Cueva Honda del Piache*, near El Valle, Sta. 141A, 10.VII.1936 (1 ex.); near La Asunción, Sta. 148, 12.VII.1936 (4 ex.).

Guianas, Venezuelan mainland (from Carabobo to Sucre), Trinidad, Guadeloupe, Margarita, Los Testigos (La Iguana), Los Frailes (La Pecha)!

The specimens from the smallest islands (Testigos and Frailes) are slightly smaller than the other individuals.

***Ulus margaritensis* n.sp.**

[ Plate I 1–2]

Short, very convex, regularly rounded at the sides; elytrae acuminate at the apex. Black; mouth parts, antennae and legs ferruginous, slightly shining; clothed with an extremely dense golden recumbent pubescence; the latter is particularly long at the sides of the pronotum, where it forms a very characteristic fringe.

Head semicircular, clypeus slightly emarginate, eyes small, punctation rather dense and strong, though almost completely masked by the pubescence. Mentum small, subcircular, gula anteriorly punctate, posteriorly polished and smooth. Pronotum transverse (typus, ♂), trapezoidal, with the sides anteriorly slightly rounded, in the hind half sinuate, so that anterior angles slightly obtusangular, and not very prominent, hind angles acute and very sharp. Base deeply bisinuate, medially expanded in a medial lobe. Punctation of pronotum very dense and relatively strong, punctures simple and homogeneous; spaces microreticulated. Elytrae short, posteriorly gradually convergent, striato-punctate, third, fifth and seventh intervals slightly wider and more convex than the remaining intervals. Intervals finely and rather scarcely punctate, nitidous. Prosternum clothed with a golden pubescence, finely and densely punctate, prosternal process sharply produced posteriorly, metasternum coarsely and densely punctate, spaces polished, but when seen from beneath the punctation is practically concealed by the dense pubescence; the metasternum is medially impressed, the impression being deeper posteriorly. Urosteron scarcely and finely punctate, especially posteriorly, pubescence relatively scarce. Anterior tibiae brusquely dilated distally and externally in a tooth, but less than in *U. hirsutus*.

Measurements: length 5 mm, width 2.5 mm (typus).

Affinities: Very similar to *U. hirsutus* — of which I saw specimens from Mexico (Tehuacan and Vera Cruz) and Guatemala (San Gerónimo) — but shorter and more convex, the golden light pubescence very dense; pronotum trapezoidal, at the base deeply bisinuate, with hind angles very sharp and more finely punctate than in *hirsutus*; elytral intervals almost smooth, third, fifth and seventh wider and more convex than the others; eyes smaller.

MARGARITA: West of Porlamar, III.1948 (many ♂♂ and ♀♀, Marcuzzi leg.; Plate I 1-2). — Type in author's collection.

Margarita!

#### ***Ulus venezuelensis* n.sp.**

[Plate I 3]

Black; antennae (proximally) and mouth parts ferrugineous; legs reddish-brown; slightly shining, rather convex (but less than in *U. margaritensis*), short, with the habitus and size of *U. margaritensis*; clothed with a golden pubescence apparently scarcer than in *margaritensis*. Head semicircular, rather deeply emarginate, eyes large (distinctly larger than in *margaritensis*, but not more than in *hirsutus*). Punctation dense and strong, but not confluent; spaces polished. Pronotum very transverse (more than in *margaritensis*) with the sides regularly convergent from the base to the apex, in the hind middle almost straight, anteriorly slightly rounded, so that the anterior angles are acute though very blunt, and the hind angles rectangular or scarcely acute, relatively sharp. Base bisinuate, punctation very dense and rather strong, but not coarse, tending to converge on the disc and posteriorly. Interspaces microreticulated. Punctures simple and homogeneous; lateral fringe of pubescence rather short. Elytrae short, convex, polished, but with no aeneous tinge; striato-punctate, third, fifth and seventh intervals only scarcely wider than the remaining and never more convex. Intervals irregularly and finely punctate, the punctures denser than in *margaritensis*, but scarcer than in *hirsutus*. Anterior tibiae almost regularly dilated distally and externally, so that

there is not an evident tooth as in *margaritensis*. Prosternum much the same as in *margaritensis*; metasternum rather densely and finely punctate, much polished, with a very scarce pubescence. Urosterna with a rather strong punctuation, visible also on the last urosternum (apparent), highly polished, pubescence almost absent.

Measurements: length 5.25 mm, width 3 mm.

VENEZUELA mainland: Maiquetía, near la Guaira, 24.IX.1948 (3 ex., Marcuzzi leg.; Plate I 3, type). — Type material in author's collection.

Venezuelan mainland (Dto. Federal).

Affinities: Near to *U. hirsutus*, but shorter and broader, less convex; elytrae posteriorly less acuminate, almost rounded, with no aeneous tinge. Pronotum more transverse with the angles less prominent, punctuation much finer. Punctuation of elytral intervals scarcer and finer. From *margaritensis*, furthermore, it is distinguishable by the aedeagus with shorter parameres, at the apex widely truncate.

It is noteworthy that the species of the genus *Ulus* in U.S.A. and Central America inhabit both the beach and inland localities, while in South America they are to be found exclusively on the beach. Furthermore, according to CHAMPION (1885, p. 133) they occur in Northern and Central America „beneath stones”, while in South America they are found buried more or less deeply in the sand. (In U.S.A., according to HORN, 1870, p. 415, *Ulus elongatus* can live also in clay).

The distribution of the genus is widely extended by the new data cited above, and so is its ecological valence. This fact shows that the last is a function of the known range of distribution (fig. 1).

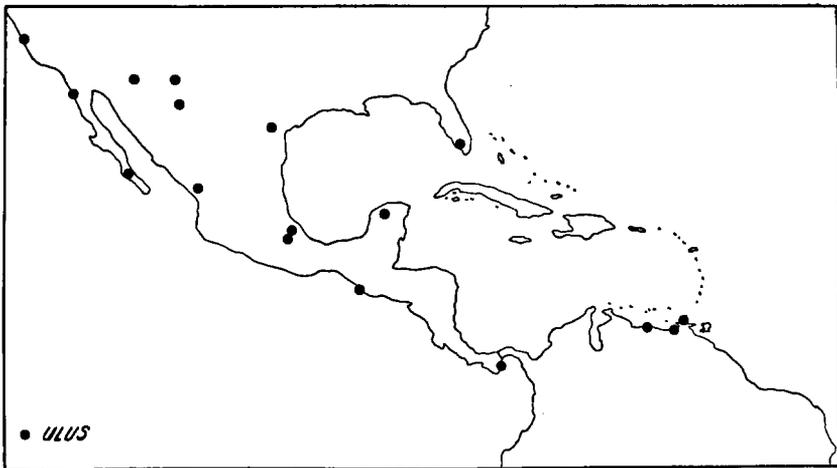


Fig. 1. Distribution of the genus *Ulus*.

***Blapstinus buqueti* Champion, 1885**

[Plate V 1-3]

CHAMPION, 1885, p. 128; FAIRMAIRE, 1892, p. 82 (*B. piliferus*); MARCUZZI, 1939, p. 345 (*B. piliferus*); MARCUZZI, 1951, p. 75.

VENEZUELA mainland: Maiquetía, near La Guaira, XI.1948 (6 ex., Marcuzzi leg.); *Carirubana*, near Las Piedras, Paraguaná, Sta. 279, 15.II.1937 (1 ex.); *Santa Fé*, Paraguaná, Sta. 282 (1 ex.; Plate V 3). COLOMBIA: S. of *Río Hacha*, La Goajira, Sta. 293 (1 ex.). MARGARITA: Porlamar, III.1948; El Valle, III.1948 and I.1949; Cerro de Copey at base, III.1948 (all Marcuzzi leg.). CURAÇAO: Hofje *Hato*, Sta. 216, 13.X.1936 (1 ex.); Hofje *Groot Piscadera*, Sta. 334, 27.I.1949 (7 ex.; Plate V 2). ARUBA: Hofje *Westpunt*, Sta. 274, 9.XII.1936 (1 ex.; Plate V 1); *Solito*, Sta. 275, 16.XII.1936 (2 ex.).

Central America, South America from Colombia to French Guiana, Margarita Curaçao!, Aruba!

**Blapstinus relictus** Marcuzzi, 1951

[Plate V 4]

MARCUZZI, 1951, p. 70.

VENEZUELA mainland: *Morro de Esmeralda* (island 200 m from mainland), W. of Carúpano, Sta. 124, 10.VI.1936 (1 ex.). MARGARITA: El Valle, III.1948 (1 ♀, type, Marcuzzi leg.; Plate V 4); *El Piache*, SE of El Valle, Sta. 140, 10.VII.1936 (type locality, 1 ex.). — Type in author's collection.

Venezuelan mainland (Sucre), Margarita.

**Blapstinus margaritensis** Marcuzzi, 1951

[Plate V 6]

MARCUZZI, 1951, p. 68.

MARGARITA: La Asuncion, III.1948 (2 ex., Marcuzzi leg.; Plate V 6, type); El Valle, XII.1948 (1 ex., Marcuzzi leg.). COCHE: *El Guamacho*, Sta. 129, 25.VI.1936 (1 ex.). — Type in author's collection.

Margarita, Coche!

**Blapstinus paraguanae** Marcuzzi, 1951

[Plate IV 3]

MARCUZZI, 1951, p. 64; MARCUZZI, 1951, p. 435.

VENEZUELA mainland: *Carirubana*, near Las Piedras, Paraguaná, Sta. 279, 15.II.1937 (2 ex.); *Santa Fé*, Paraguaná, Sta. 282, 18.II.1937 (2 ex.); *Moruy*, Paraguaná, Sta. 283, 18.II.1937 (4 ex.; Plate IV 3). COLOMBIA: Cabo de la Vela, La Goajira, Sta. 289, 22.I.1937 (1 ex.); *El Cardón*, La Goajira, Sta. 291, 22.I.1937 (5 ex.); *Río Hacha*, La Goajira, Sta. 292, 20.I.1937 (1 ex.); *Río Hacha*, Sta. 293, 18.I.1937 (1 ex.); S. of *Río Hacha*, Sta. 294, 18.I.1937 (3 ex.). — Type in author's collection.

Venezuelan mainland (Paraguaná), Colombia (La Goajira)!

**Blapstinus pseudoaeneus** Fairmaire, 1892

FAIRMAIRE, 1892, p. 81; MARCUZZI, 1949, p. 346. Provisionally considered as a synonym of *B. injimus* Fairmaire.

VENEZUELA mainland: Maiquetía, near La Guaira, whole year round, 1948 (many spec., Marcuzzi leg.). MARGARITA: Porlamar, III.1948; Pampatar — La Asunción, XII.1948; El Valle, I.1949 (all Marcuzzi leg.).

Venezuelan mainland, Margarita.

**Blapstinus curassavicus n. sp.**

[Plate IV 1-2]

Middle sized; dull; black, legs, antennae and mouth parts brownish black. Wings strongly reduced. Head with a punctation relatively strong but rather scarce; median depression (between the clypeus and the frons proper) feebly differentiated. Eyes not prominent; outline of the head semicircular, sides feebly rounded; clypeus feebly emarginate. Labrum scarcely visible from above, very sclerified and darkly coloured. Mentum very small, cordate; gula densely and coarsely punctate. Antennae slender and elongate, all joints longer than wide. Pronotum only somewhat transverse, with the sides strongly and regularly rounded, widest exactly in the middle. Anterior margin scarcely narrower than the hind one, the latter only slightly bisinuate, so that there is no true median lobe. Disk very flat, densely punctured; the points all of the same kind, at the sides not denser than on the disk, interspaces reticulate. Hind margin, sides and lateral parts of anterior margin narrowly beaded; anterior angles well pronounced but blunt, hind angles obtusangular. Scutellum transverse, small. Elytrae rather elongate, flat, posteriorly gradually acuminate, widest somewhat behind the middle. Striae well impressed, deeper at apex, finely punctate, the punctures bigger only towards the base. Interstriae flat, rather densely but finely punctate, the surface finely reticulate (as that of the pronotum). Prosternum densely and coarsely punctate, towards the sides wrinkled; the process strongly built, well prominent posteriorly, seen in profile brusquely truncate. Metasternum coarsely punctate, medially scarcely, towards the sides more densely wrinkled; short (a little shorter than the first apparent urosternum); abdominal process broadly ovate, almost truncate. Punctuation of urosterna rather fine and not very dense, towards the sides wrinkled longitudinally.

Measurements: 5.5-7.5 mm in length.

BONAIRE: *Deenterva*, Sta. 186, 25.III.1937 (1 ex.); *Bronswinkel*, Sta. 198, 27.III.1937; *Lagoen*, Sta. 309, 14.IX.1948 (2 ex.); *Boca Onima*, Sta. 310, 19.IX.1948 (1 ex.). KLEIN BONAIRE: Near *Cas Kl. Bonaire*, Sta. 199c, 7.IX.1948 (1 ex.). CURAÇAO: *Seroe Pretoe*, Sta. 213, 9.X.1936 (11 ex., type locality; Plate IV 1, type); *Kleine Berg*, Sta. 343, 24.VIII.1948 (7 ex.; Plate IV 2); *Martha Koosje*, Sta. 344, 24.VIII.1948 (5 ex.); *Plaja Djerimi*, Sta. 352, 11.XII.1948 (1 ex.); *Seroe Baha So*, Sta. 354, 16.II.1949 (4 ex.). — Type in Zool. Museum, Amsterdam.

Bonaire!, Klein Bonaire!, Curaçao!

**Blapstinus orchilensis orchilensis** Marcuzzi, 1951

[Plate V 7]

MARCUZZI, 1951, p. 74.

ORCHILA: Huespén, X.1950 (2 ex., Marcuzzi leg.; Plate V 7, type) — Type in author's collection.

Orchila (Huespén).

**Blapstinus orchilensis occidentalis** subsp. n.

[Plate V 8-9]

Extremely variable. Distinct from the type material from Orchila by the golden pubescence, recumbent, more or less abundant on all the upper surface; the pronotum a little less transverse, with the punctures slightly scarcer and bigger, circular in shape; the punctuation of the elytrae slightly coarser, towards the base sometimes transverse and closely approximate. Other characters: the form of the pronotum, the punctuation of the latter; the tenth and ninth antennal joints transverse, eleventh joint oval, the eighth scarcely longer than wide.

VENEZUELA mainland: *Santa Fé*, Paraguaná, Sta. 282, 18.II.1937 (11 ex.). COLOMBIA: Punta *Tucacas*, La Goajira, Sta. 285, 14.I.1937 (19 ex.); *Uribia*, La Goajira, Sta. 288, 17.I.1937 (1 ex.). BONAIRE: *Fontein*, Sta. 191, 30.III.1937 (3 ex.); Hofje *Fontein*, Sta. 193A, 11.IX.1948 (15 ex.; Plate V 9); Tanki *Onima*, Sta. 194, 13.XI.1936 (5 ex.); Rooi *Onima*, Sta. 194A, 19.IX.1948 (1 ex.); *Bronswinkel*, Sta. 198, 27.III.1937 (3 ex.); Boca *Onima*, Sta. 310, 19.IX.1948 (2 ex.); near *Pos Dominica*, Sta. 313, 15.IX.1948 (4 ex.). CURAÇAO: N of *Tafelberg* S. Barbara, Sta. 205, 4.IX.1936 (3 ex.); Hofje *Hato*, Sta. 216, 13.X.1936 (1 ex.); Hofje *St. Kruis*, Sta. 245, 24.X.1936 (25 ex.); Hofje *Groot St. Joris*, Sta. 223A, 9.IV.1949 (1 ex.); Hofje *Groot Piscadera*, Sta. 334, 27.I.1949 (14 ex.); Hofje *Groot Piscadera*, Sta. 337, 27.I.1949 (26 ex.); Hofje *Groot Piscadera*, Sta. 339A, 27.I.1949 (1 ex.); Rooi *Cajoeda*, Sta. 350, 17.VIII.1948 (5 ex.; Plate V 8); *Seroe Baha So*, Sta. 353, 16.II.1949 (4 ex.); Hofje *Groot S. Martha*, Sta. 356, 4.XII.1948 (3 ex.). ARUBA: *Vader Piet*, Sta. 252, 9.II.1937 (type locality, 1 ex.); Hofje *Fontein*, Sta. 359, 30.XII.1948 (8 ex.); *Seroe Canashito*, Sta. 267, 7.XII.1936 (1 ex.); *Seroe Cristal*, Sta. 270A, 10.II.1937 (8 ex.); *Seroe Plat*, Sta. 271, 10.II.1937 (7 ex.); *Solito*, Sta. 275, 16.XII.1936 (6 ex.); *Heintje Croes*, Sta. 276, 14.XII.1936 (2 ex.); Reef of *Bucuti*, Sta. 278, 8.II.1937 (1 ex.); *Bucuti*, Sta. 278A, 17.I.1949 (2 ex.). — Type in Zool. Museum Amsterdam.

Venezuelan mainland (Paraguaná)!, Colombia (La Goajira)!, Bonaire!, Curaçao!, Aruba!.

**Blapstinus simulans** n. sp.

[Plate IV 4]

Very similar to *B. paraguanae*. Black; antennae, mouth parts and legs brownish black. Rather opaque, glabrous, medium sized. Head laterally rounded; clypeus feebly emarginate; labrum strongly sclerotized. Eyes small, sunk; frons extremely finely punctated, the punctures being visible only with a particular incidence of light, and with a slight medial depression. Antennae relatively slender, last joint subglobular, tenth transverse, eighth and ninth as long as wide, the remaining more or less elongate. Mentum rather cordate; labial palpes elongate, well developed; maxillar palpes securiform. Pronotum slightly transverse, subrectangular, very

scarcely rounded at the sides, the latter more distinctly rounded towards the anterior angles (which are pronounced and rectangular), almost parallel or scarcely convergent towards the hind angles, which are somewhat prominent backwards and almost rectangular. It follows that the anterior margin is somewhat emarginate, the hind margin bisinuate. There is no true median lobe. Hind margin, sides and lateral parts of anterior margin beaded. Punctuation very fine (finer than in *B. paraguanae*) and rather dense (almost as in *paraguanae*). Disk very flat, scutellum rather large, transverse, triangular, smooth. Elytrae relatively long, widest in the middle, posteriorly gradually acuminate, rather convex, with the median intervals flat and the lateral convex. Striae well impressed, more distinctly so towards the apex, with rows of closely placed, short, longitudinal impressions towards the suture and anteriorly, punctate towards the sides; the punctures are stronger towards the base. Interspaces reticulate but unpunctate. Prosternum rather densely and strongly punctate, the punctuation partly concealed by the dense recumbent and golden pubescence. Metasternum rather finely and not very densely punctate, clothed with a recumbent pubescence highly characteristic. Urosteron very finely and rather scarcely punctate, clothed with the characteristic golden pubescence.

Measurements: 5-6 mm in length.

VENEZUELA: *Isla de Caribes*, 2½ km off the Península de Chacopata, Pen. de Araya, Sta. 128, 26.VI.1936 (5 ex.; Plate IV 4, type). — Type in Zool. Museum Amsterdam.

Venezuela (*Isla de Caribes*, in Sucre)!

Affinities: To be looked for in the *B. brunripes* m.-group, although the morphological aspect is nearer to *B. paraguanae*. On purely zoogeographical grounds, *B. simulans* should be considered as a species formed from the *brunripes*-stem, which is a common species all through the Venezuelan mainland and is absent in the Leewards.

#### ***Blapstinus humboldti* n. sp.**

[Plate V 5]

Small, black; mouth parts, legs and extremity of the last antennal joint brownish black; rather polished; upper surface clothed with a very fine and short, whitish recumbent pubescence, which is highly characteristic. Convex, with a very characteristic ovoidal form, anteriorly narrowed more or less as posteriorly. Head transverse, at the sides rounded and only slightly angular in the middle; clypeus widely and deeply emarginate. Eyes small, not prominent; frons densely and strongly punctate, the punctures nevertheless being visible only with a particular incidence of light, and partly being concealed by the pubescence. Antennae slender, only the club incrassate; eleventh joint subcircular, tenth transverse, ninth as long as wide, the remaining more or less elongate. Mentum transverse, subcordate; gula medially nitid; unpunctate. Pronotum transverse, subrectangular, disk relatively flat, at the sides abruptly declivous; sides slightly rounded (typus) or subparallel in the hind half (paratypus), widest in the middle (typus and a paratypus), or corresponding to all the hind half (another paratypus). Anterior margin distinctly narrower than hind margin, slightly emarginate; anterior angles feebly pronounced and obtusangular; posterior margin deeply bisinuate, so that there is a distinct median lobe; hind angles rectangular, prominent backwards. Sides beaded,

hind margin and lateral parts of anterior margin extremely finely beaded. Punctures strong and extremely dense, with a tendency to confluence, nevertheless interspaces polished. Scutellum small, strongly transverse. Elytrae ovoidal-abbreviated, convex, interstriae medially flat, laterally convex, striae well impressed, especially towards the apex and provided with punctures gradually stronger towards the base. Interstriae finely and densely punctate, but punctation irregular in size. Prosternum closely and strongly punctate, dull, clothed with a recumbent light pubescence; metasternum scarcely but strongly punctate, medially with a longitudinal impression, clothed, especially towards the sides, with a scarce recumbent pubescence. Urosterna subnitid, densely but finely punctate, only scarcely clothed with the characteristic pubescence.

Measurements: 3.5 mm in length.

VENEZUELA mainland: *Cabo Blanco*, W. of La Guaira, Sta. 121, 19.VIII.1936 (3 ex.; Plate V 5, type). — Type in Zool. Mus. Amsterdam.

Venezuelan mainland (Dto. Federal)!

Affinities: *B. humboldti* is perhaps near *B. pseudoaeneus*, although some morphological peculiarities point to gr. *margaritensis-relictus*. In any case, it should belong to a typically continental group of species, which can reach eastward as far as Margarita island.

***Blapstinus hummelincki* n.sp.**

[Plate IV 5]

Small, dull, glabrous, only the elytrae with an extremely fine, short and recumbent pubescence, which is visible only with a particular incidence of light. Black; palpes, antennae and legs piceous, last antennal joint brownish red. Head semi-circular; clypeus somewhat emarginate; labrum very sclerified, blackish, without any median depression. Eyes not prominent. Punctuation moderately fine and dense, punctures homogeneous in regard to size. Antennae slender, last joint subglobular, tenth transverse, ninth subquadrate, the remaining longer than wide. Mentum very transverse, subcordate. Gula medially nitid, smooth, at the sides punctate. Maxillary palpes relatively large, securiform. Pronotum feebly transverse, sides rounded (although less than in *B. curassavicus*), towards the anterior and hind angles subsinuate; anterior margin feebly emarginate; with the angles obtusangular and very little pronounced, hind margin almost truncate, laterally slightly sinuate, hind angles obtusangular. Disk scarcely convex (♂) densely and strongly punctate, interspaces rather polished. Scutellum very small, triangular, transverse. Elytrae elongate, posteriorly acuminate, relatively convex, interstriae very convex; elytral striae punctate, the striae are very deeply impressed, especially caudally, the punctures strong, especially anteriorly. Interstriae punctate, scarcely in typus (♂), and in the paratypus ♀, evidently in the paratypus ♂. Prosternum strongly and densely punctate at the sides the punctation is confluent; process posteriorly well developed, in profile brusquely truncate. Mesosternum densely punctate or wrinkled, anteriorly with a median longitudinal keel. Metasternum short, shorter than the first (apparent) urosternum, flat, posteriorly and medially depressed, provided with a longitudinal linear impression slightly evident; punctures scarce though strong, at the sides dense not even. Urosterna rather nitid, scarcely and finely punctate, the punctation towards the sides is scarcer.

Measurements: 4–5 mm in length.

BONAIRE: E of *Punt Vierkant*, Sta. 304, 5.IX.1948 (1 ex.); Boca *Onima*, Sta. 312, 19.IX.1948 (3 ex.). CURAÇAO: *Schaarloo*, Sta. 211, 26.X.1936 (1 ex.); *Seroe Pretoe*, Sta. 213, 9.X.1936 (1 ♂, typus); Top of *Seroe Christoffel*, Sta. 234c, 11.II.1949 (2 ex.); NW. slope of *S. Christoffel*, Sta. 235A, 23.XII.1948 (1 ex.), Sta. 235B, 23.XII.1948 (2 ex.); *Seroe Djerimi*, Sta. 242, 6.XI.1936 (1 ex.); *Tafelberg S. Barbara*, Sta. 328, 10.IV.1949 (2 ex.; Plate IV 5) *Martha Koosje*, Sta. 344, 24.VIII.1948 (1 ex.); *Seroe Baha So*, Sta. 353, 16.II.1949 (2 ex.). — Type in Zool. Museum Amsterdam.

Bonaire!, Curaçao!

***Austrocaribius* n. gen. ex affin. *Blapstini***

Winged. Antennal joints eighth-eleventh transverse, sixth and seventh more or less square, the remaining longer than wide. Intercoxal process of prosternum much developed posteriorly in an oval-lanceolate point, seen in profile very prominent and abruptly truncate. Penis widely projecting between the parameres, with the part visible from above oval elongate and the apex acuminate. Parameres brusquely sinuate before the apex, which is truncate, and contiguous. Aedeagus seen in profile regularly arcuate. Size normal (see Plate IV 6-7).

***Austrocaribius venezuelensis* n.sp.**

[Plate IV 6-7; fig. 2a-c]

Piceous-brown, anterior margin of the head, mouth parts, antennae, legs and under surface of the body red-ferrugineous. Subnitid, glabrous, with exception of a short brownish recumbent pubescence on the sides of the elytrae and the pronotum. Head very wide, semicircular in outline, slightly rounded at the sides, widest in the posterior third; clypeus deeply emarginate, so that the slightly sclerotized labrum is well visible from above. Eyes relatively small, not prominent, circular. Clypeo-genal suture indistinct. Upper surface (of the head) strongly and scarcely punctate on the disk, more densely and finely at the margins. Antennae short, not reaching the posterior margin of the pronotum, gradually incrassate from the base, third joint longer than the fourth, fifth-seventh scarcely longer than wide, trapezoidal, eighth transverse, eleventh subcircular. Mentum cordate, maxillary palps securiform, relatively large; gula (or gulo-submentum) strongly and rather densely punctate, polished posteriorly, with a transverse unpunctate area. Pronotum transverse, widest in the posterior 2/3, sides parallel in the posterior 2/3, anteriorly convergent. Anterior margin deeply emarginate, so that anterior angles very prominent and sharp, posterior margin bisinuate, so that posterior angles somewhat prominent posteriorly, subrectangular; pronotum regularly beaded, rather strongly and densely punctate, the points are no denser at the sides than on the disk. Interspaces subnitid. Scutellum very transverse, triangular, very finely punctate. Elytrae oval, widest in the anterior half, slightly convex; striae deeply impressed, especially at the sides and posteriorly, strongly punctate; the points are more evident at the base and medially. Intervals basally and medially flat, towards the sides and posteriorly more convex, so that the most external intervals are almost carinate. Elytral surface with extremely fine and scarce points. Prosternum wrinkled and opaque, excepted the medial part, where it is scarcely

punctate and more nitid. Intercoxal process much developed; mesosternum relatively opaque, wrinkled at the sides, medially with a triangular excavation to receive the intercoxal process of the prosternum. Metasternum polished, about as long as the first (apparent) urosternum, strongly and densely punctate, at the sides only feebly tending to longitudinal confluence, medially with a longitudinal groove. Urosterna with a punctation becoming finer gradually towards the posterior end, nitid, clothed with a golden pubescence, wholly recumbent and therefore feebly evident. Legs relatively stout, anterior tarsi ( $\delta$ ) very dilated, anterior tibiae not dimorphous.

Measurements: length 5.5 mm, width 2.5 mm (typus).

VENEZUELA mainland: Maiquetía, near La Guaira, D.F., 15.X.1948 (1  $\delta$  typus, Marcuzzi leg.); Cariaco, Lara, IX.1948 (1  $\delta$ , Marcuzzi leg.); Santa Fé, Paraguaná, Falcon, Sta. 282, 18.II.1937 (1  $\delta$ ; Plate IV 7). MARGARITA: El Valle, III.1948 (1  $\delta$ , Marcuzzi leg.). COLOMBIA: Rio Hacha, La Goajira, Sta. 294, 18.I.1937 (1  $\delta$ ; Plate IV 6). — Type in author's collection.

Venezuelan mainland (Sucre, Dto. Fed., Paraguaná), Margarita!, Colombia (La Goajira)!

Affinities: Different from *Blapstinus* for the antennal joints eighth-eleventh transverse, sixth and seventh more or less square, the remaining longer than wide; intercoxal process of prosternum much developed posteriorly in an oval point; parameres brusquely sinuate laterally before the apex, which is truncate and shorter than in *Blapstinus*. Parameres contiguous up to the apex.

#### **Hummelinckia n. gen.**

Apterous; intercoxal process of first (apparent) urosternum anteriorly truncate, anterior and middle ( $\delta$ ) tarsi dilated, scutellum much reduced, strongly transverse; antennae slender, all the joints, with exception of the tenth, longer than wide.

#### **Hummelinckia caraibica n. sp.**

[Plate VII 2; fig. 2 g-i]

Black, slightly nitid; mouth parts, tarsi and antennae brownish, upper surface of the elytrae with a scarce but long erect pubescence. Body elongate, relatively depressed, sides subparallel. Head very wide, the sides somewhat anteriorly to the eyes slightly angular, so that the genae are almost straight anteriorly to the eyes. Clypeus feebly emarginate, so that the labrum is scarcely visible from above. Clypeo-genal suture well preserved. Upper portion of eyes small, rounded. Sides of head abruptly sinuate behind the eyes, so that the head is posteriorly somewhat narrow. Upper surface, anteriorly, with an asperate punctation, strong and relatively dense; posteriorly with an extremely fine and simple punctation. Antennae slender, about as long as the head and the pronotum; third joint longer than  $1\frac{1}{2}$  times the fourth, all successive joints elongate, with exception of the tenth, about as long as wide. Mentum subcircular, anteriorly scarcely emarginate; labial palps securiform, but not very large. Pronotum transverse, widest in the middle, anteriorly and posteriorly truncate, sides regularly rounded, anterior angles slightly prominent, obtusangular, posterior angles obtusangular but not prominent. Hind margin,

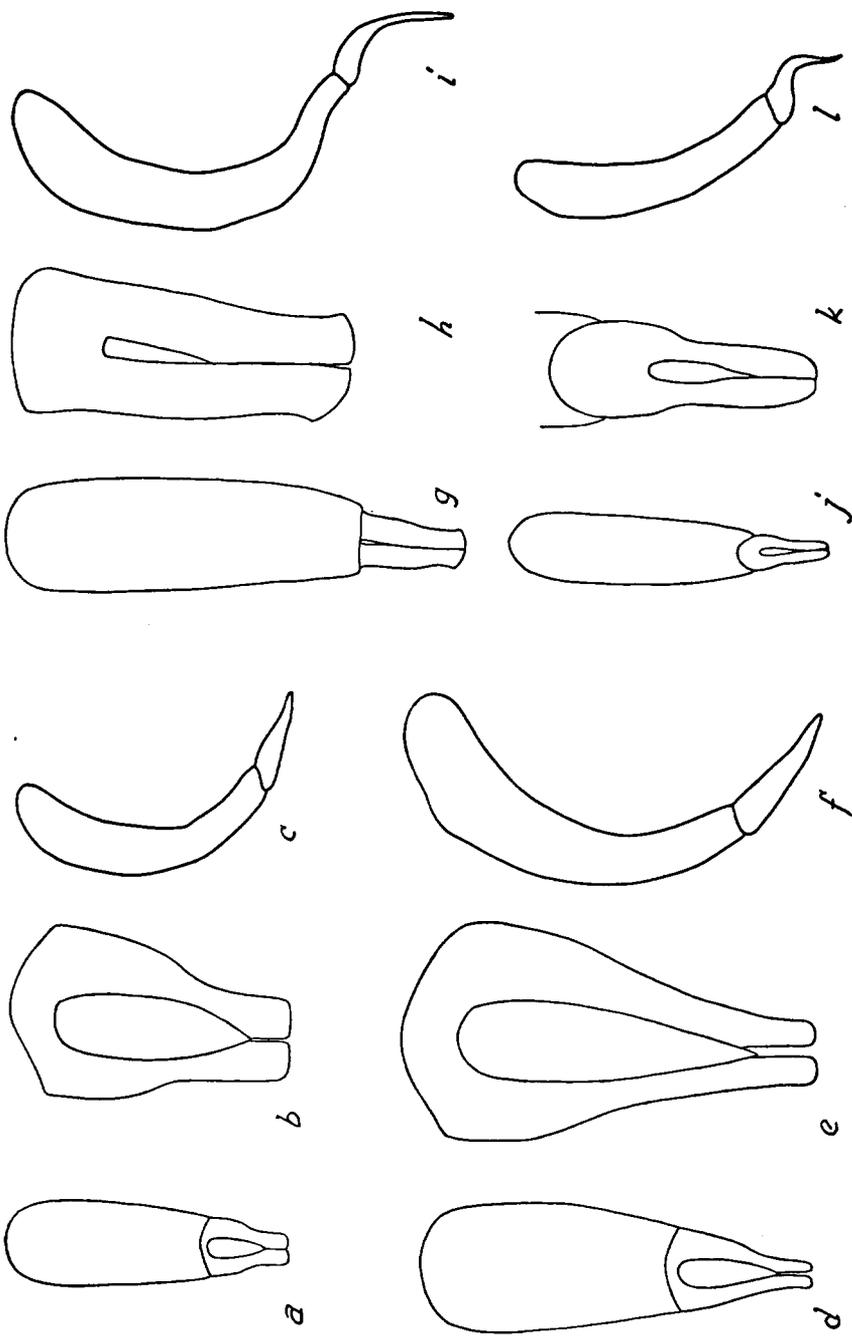


Fig. 2. Aedeagus of *Austrocaribius venezuelensis* (a-c) and *Hummelinckia carabica* (g-i) in dorsal view (a, g), with extremity of the same (b, h) and in profile (c, i). The same of *Blapstinus opatrinooides* (d-f) and *Notibius rugipes* (j-l) are represented for comparison.

sides and lateral parts of anterior margin narrowly beaded. Double punctation: on the disk simple, fine and relatively scarce, on the sides asperate, strong and rather dense; the two punctations are rather well separate. Interspaces reticulate, though subnitid. Scutellum triangular, very transverse, small, polished. Elytrae elongate, widest between the anterior 2/3 and the middle; sides subparallel. Striae well impressed only posteriorly, where they are unpunctate, anteriorly finely punctate but almost faded. Interstriae anteriorly flat, posteriorly and especially towards the suture convex, so that the suture is almost carinate. Punctation extremely scarce and rather fine. Intervals reticulate more closely than the surface of the pronotum and therefore more opaque. Pubescence scarce but erect and bristly, blackish brown. Under surface polished; prosternum finely punctate medially, wrinkled towards the sides; intercoxal process well raised but feebly produced posteriorly, where it forms a sort of keel. Mesosternum medially rather strongly but scarcely punctate, towards the sides wrinkled. Metasternum still more strongly punctate, short, slightly shorter than the first (apparent) urosternum, in the ♂ deeply impressed. Urosterna with a relatively dense punctation, tending, especially basally, to form longitudinal wrinkles. Intercoxal process of the first (apparent) urosternum truncate; in the ♂ the basal urosterna form a deep medial depression. Legs relatively slender, anterior tibiae (♂) only scarcely dilated.

Measurements: (typus, ♀) length, 5.5 mm; width of elytrae 2 mm, of pronotum 1.5 mm.

LOS HERMANOS: *Morro Pando*, Sta. 170, 20.VII.1936 (1 ♂ 1 ♀; Plate VII 2, type). BLANQUILLA: *El Jaque*, Sta. 172B, 22.VII.1936 (1 ♂). — Type in Zool. Museum Amsterdam.

Los Hermanos (Morro Pando)!, Blanquilla!

The ♂ from Blanquilla is smaller (4 mm) than the topotype from Los Hermanos.

Affinities: Different from *Notibius* and *Nocibiotes* on account of dilated anterior tarsi (♂), from *Mecysmus* on account of the absence of wings. Possibly the new genus has some resemblance to *Cenophorus* Muls. et Rey, for the absence of wings; pronotum basally truncate, intercoxal process of first urosternum truncate, anterior tarsi (♂) dilated. The structure of the aedeagus at the same time points to an affinity with *Notibius* (*N. rugipes* Cha.), on account of the noticeable similarity in the two genera: elongate, basal piece much longer than parameres, the latter, seen in profile, very strongly incurved; the penis scarcely visible from above and restricted to a small linear surface visible between the parameres.

### ***Trichoton lapidicola* Champion, 1885**

[Plate VII 4]

CHAMPION, 1885, p. 126; MARCUZZI, 1949, p. 347.

VENEZUELA mainland: *Morro de Esmeralda* (island 200 m from mainland), W. of Carúpano, Sta. 124, 10.VI.1936 (2 ex.; Plate VII 4); *Morro de Puerto Santo* (island 200 m from mainland), E of Carúpano, Sta. 126 (1 ex.); *Morro de Chacopata*, Pen. de Araya, Sta. 127, 27.VI.1936 (2 ex.); *Isla de Caribes*, 2½ km off the Península de Chacopata, Araya, Sta. 128, 26.VI.1936 (17 ex.). MARGARITA: El Valle, III.1948 and I.1949 (many spec., Marcuzzi leg.). BLANQUILLA, *Valuchu*, Sta. 171, 21.VII.1936 (4 ♀♀).

Central America, Venezuelan mainland (Sucre), Margarita, Blanquilla!

The population of Blanquilla differs from the others in the following: shorter, more rounded; pronotum more transverse, with the angles (both anterior and posterior) less prominent; sides of pronotum less brusquely differentiated from the disk by means of the longitudinal lateral impressions; elytral striae much finer, almost faded.

This population is certainly a peculiar geographical race, which, however — on account of the small number of specimens, and the absence of males amongst them — I do not find advisable to be described as new.

***Ammodonus ciliatus* (Champion, 1896)**

CHAMPION, 1896, p. 9 (*Scaptus ciliatus*).

MARGARITA: W of Porlamar, III.1948; Juan Griego, III.1948; Puerto Fernin, III.1948 (in great number, well buried in the sand at the beach; all Maruzzi leg.).

St. Vincent (CHAMPION), Guadeloupe? (CHAMPION), Margarita! (See fig. 3).

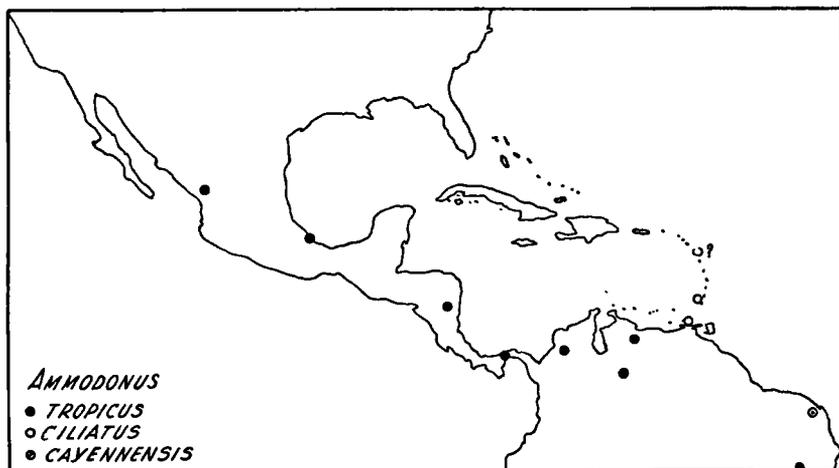


Fig. 3. Distribution of *Ammodonus*: *A. tropicus*, *A. ciliatus* and *A. cayennensis*.

Another species from Venezuela has been brought to my attention; it is present possibly only in the mainland, *A. tropicus* Kirsch (*squamulatus* Cha.): Alto Apure and San Felipe de Yaracuy. The specimens have been compared with material of the British Museum, from México (Presidio), Guatemala and Brasil (Santarem). — In French Guiana another species, *Ammodonus cayennensis* Cha., occurs. I saw two specimens of this species (coll. Brême) which correspond perfectly to CHAMPION's description. — The three species may be differentiated as follows:

1a Length 4.3–6.0 mm; hairs at the sides of pronotum and elytrae very short, stiff, and curved; insects from inland situations. . . . . *A. tropicus*

- b Length 3.5–4.5 mm; hairs always definitely longer, especially those on the elytrae . . . . . 2
- 2a Length 4.5 mm; hairs rather short, especially on the pronotum, rather stiff, somewhat curved; width of elytrae exceeding that of pronotum, widest slightly behind the middle; prothorax widest at the base; sides of pronotum slightly rounded, never sinuate towards the base . . . . . *A. cayennensis*
- 2b Length 3.5–4.25 mm; hairs longer, less stiff, straight, whitish, those on the elytrae wavy; width of elytrae not exceeding that of pronotum, widest at the base; pronotum sometimes widest a little above the base, sides rounded, sometimes sinuate before the base; insects from near the sea, sometimes buried in the sand of the beach . . . . . *A. ciliatus*

**Trichotoides** n. gen. ex affin. *Opatrini*

Antennae gradually incrassate, the seventh joint also takes part so as to form the club; anterior tibiae regularly dilated, with the external (extensor) margin scarcely sinuate, widest at the apex, so that the external and apical margins include a large angle, acutangular but blunt; intercoxal process of first (apparent) urosternum oval-obtusangular- Epipleurae in the ♀ broad, with the sides parallel up to the apex, where they are enlarged and thence brusquely narrowed, so that the apex is acuminate as normally (see fig. 4a). The preapical enlarged part of epipleurae is furthermore provided with a small tooth, erect and prominent ventrally and posteriorly. In the ♂ the epipleurae are regularly narrowed towards the apex as in all the genera of neotropical *Tenebrionidae* I have seen so far.

**Trichotoides hintoni** (Kaszab, 1949)

[Plate VII 5–6; fig. 4]

KASZAB, 1949, p. 775 (*Scaptis hintoni*).

Winged, oval, regularly acuminate anteriorly and posteriorly. Black; labrum, mouth parts, antennae and tarses ferrugineous. Upper surface with an extremely dense pubescence, consisting of white-yellowish squamulae (setae-squamulae), recumbent on head and pronotum, erect on the elytrae, which give the animal

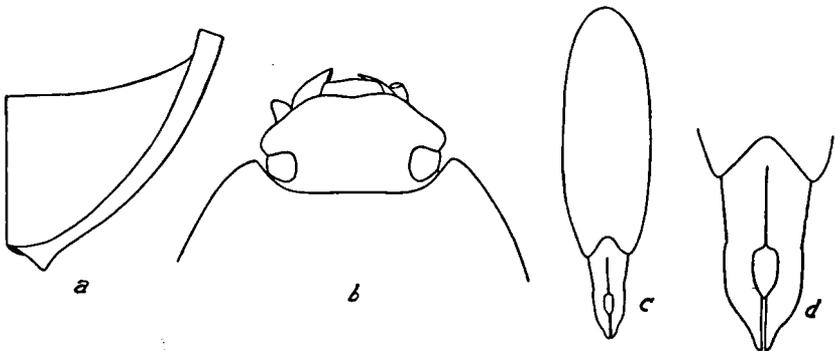


Fig. 4. *Trichotoides hintoni*: a extremity of ♀ epipleura; b head and pronotum; c–d aedeagus in dorsal view.

a general grey-yellowish colour. Is such pubescence removed, so the tegument of the animal appears as subnitid. Head (fig. 4b) very transverse, irregularly semi-circular, sides angular; genae much more prominent than eyes, so that the latter are quite sunk, partly hidden by the pronotum, as in the near genus *Ammodonus*. Clypeus feebly emarginate; labrum slightly sclerotized, shining, in immature individuals testaceous. Upper surface of head, when deprived of the characteristic pubescence, shining, scarcely punctate; the punctation is simple medially, asperate and coarse at the sides and towards the base. Antennae slender, but short, fourth to seventh joints longer than wide, eighth about as long as wide, trapezoidal; ninth and tenth transverse, eleventh subcircular. Mentum extremely reduced, subcircular, gula transversally deeply impressed. Pronotum transverse, widest at the base, at the sides much and regularly rounded, anteriorly deeply emarginate, posteriorly slightly bisinuate. Anterior angles prominent, subacute, though blunt, posterior angles posteriorly feebly prominent, subacute and sharp. Sides and lateral parts of anterior margin beaded; punctation extremely fine and scarce, only towards the posterior and anterior margins a little stronger. Scutellum large, triangular, slightly transverse. Elytrae oval, posteriorly regularly acuminate, widest in the anterior half; striae punctate; the rows of points are almost faded posteriorly, while the striae are scarcely impressed towards the suture, stronger towards the sides. Points very strong and rather contiguous. Intervals flat, very finely and scarcely punctate. Intercoxal process of prosternum oval-lanceolate, when seen in profile obviously protuded posteriorly and pointed. Mesosternum with a deep triangular impression to receive the prosternal process. Metasternum large, longer than the first (apparent) urosternum, with a very strong punctation, rather dense and asperate, medially with a longitudinal impression, the latter is deeper posteriorly. Urosterna with a punctation relatively dense, similar to that of the metasternum, gradually finer towards the posterior extremity. Intercoxal process of first (apparent) urosternum oval. Legs relatively short, anterior tibiae gradually dilated outwards from the base, external angle somewhat prolonged forwards, though much less than in *Ammodonus*. No sexual dimorphism noticed. Middle and hind tibiae normal (for the aedeagus, see fig. 4c).

Measurements: length 7.5 mm, width 4.5 mm.

VENEZUELA mainland: Cumaná, Sucre, IX.1948 (many spec., Marcuzzi leg.; Plate VII 5, descr. ♂); Las Piedras, Paraguaná, X.1948 (1 ex., Marcuzzi leg.); E of Santa Ana, Paraguaná, at sea shore, X.1948 (1 ex., Marcuzzi leg.). COLOMBIA: *Castilletes*, La Goajira, Sta. 287, 14.I.1937 (1 ex.; Plate VII 6). MARGARITA: Juan Griego, salina, III.1948 (1 ex., Marcuzzi leg.).

Venezuelan mainland (Sucre, Paraguaná)!, Colombia (La Goajira), Margarita!

Halophile, living exclusively in muddy soils, absent at Maiquetia (intensively explored by the author) possibly because of the lack of muddy soils in this region. This habit may possibly be correlated to incipient adaptiveness of legs to fossorial habits (only anterior tibiae dilated, and outer angles only slightly prominent).

Affinities: Only in appearance near to *Trichoton*, due to the dense covering of setae (squamae) and relatively large size, but actually near to *Ammodonus*, from which the new genus is distinguishable through the differently built anterior tibiae, the narrower squamae of upper surface, the lack of a fringe on the sides of pronotum and elytrae, the epipleurae dilated at the apex in the ♀, normal in ♂.

I have seen the holotypus in the British Museum, and I am sure that this new material belongs to the same species described by Dr KASZAB from "Colombia".

**Phaleria angustata** Chevrolat, 1878

CHEVROLAT, 1878, p. ccxlviii; WOLCOTT, 1936, p. 234.

VENEZUELA mainland: Maiquetía, near La Guaira, VII.1948 (many spec., Marcuzzi leg.); Cumaná, IX.1948 (Marcuzzi leg.); Carúpano, IX.1948 (Marcuzzi leg.). MARGARITA: Juan Griego, III.1948 (Marcuzzi leg.); Porlamar, III.1948 (Marcuzzi leg.). TRINIDAD: Toco (many spec., sent by E. MacCallan, of the Inst. Trop. Agric.). PUERTO RICO: (many spec., sent by G. N. Wolcott, of the Agric. Exp. Sta., and named by E. A. Schwarz of U.S. Nat. Museum.)

Jamaica, Puerto Rico, Trinidad!, Venezuelan mainland (Sucre, Dto. Federal)!, Margarita!

**Phaleria** cfr. **fulva** Fl et S, 1889

FLEUTIEUX & SALLÉ, 1889, p. 423; CHAMPION, 1896, p. 10.

VENEZUELA mainland: Paraguaipoa, La Goajira, I.1950 (many spec., Marcuzzi leg.); Cumaná and Carúpano IX.1948 (many spec., Marcuzzi leg.). MARGARITA: Porlamar, Juan Griego, III.1948, common on sandy beaches (Marcuzzi leg.).

Guadeloupe (GEBIEN's Catalogue), Grenada and Grenadines (CHAMPION), Venezuelan mainland (Sucre, La Goajira)!, Margarita!.

The material examined — collected all along the Venezuelan coast — corresponds in every character to the original description of *P. fulva*, but without a comparison with the typical material an exact and decisive determination is impossible.

**Phaleria chevrolati** Fleutiaux et Sallé, 1889

FLEUTIAUX & SALLÉ, 1889, p. 422; CHAMPION, 1896, p. 9.

VENEZUELA mainland: Maiquetía, near La Guaira, 1948–1949, very common on the beach (many spec., Marcuzzi leg.).

Guadeloupe (GEBIEN's Catalogue), Grenada and Grenadines (CHAMPION), Venezuelan mainland (Dto. Federal).

**Phaleria** sp.

MARGARITA: Puerto Fermin, III.1948, on the beach (many spec., Marcuzzi leg.).

Practically the same species is classified in the Brême collection as *P. maculipennis* Latr., specimens from „Cayenne". As in GEBIEN's Catalogue there is no *P. maculipennis*, I consider this name as a nomen nudum. I do not know whether this species can be considered as the *Phaleria cayennensis* Lap. or not: only a comparison with the typical material would permit the solving of this question. Should this material no longer be available, the specimens from Puerto Fermin could be unhesitatingly considered a new species.

**Platydema** sp. (sp. n.?)

MARGARITA: Cerro de Copey, III.1948, lower rain forest, at some 500 m (1 ex., Marcuzzi leg.).

**Platydema** sp.

TRINIDAD: *St. Augustine*, Sta. 366, 8.VIII.1948 (2 ex.). — Not in Frey-collection, München.

**Platydema** sp.

TRINIDAD: *St. Augustine*, Sta. 366, 8.VIII.1948 (1 ex.). — Another species, missing from the Frey-collection.

**Uloma grenadensis** Champion, 1896

CHAMPION, 1896, p. 23.

TRINIDAD: N. Range, 2000 feet (1 ex., I.C.T.A.).  
Grenada, Trinidad!

**Tribolium castaneum** Herbst, 1797

[Plate II 5]

SEIDLITZ, 1898, p. 581; MARCUZZI, 1949, p. 348.

VENEZUELA mainland: Maiquetía, near La Guaira, (1 ex., Marcuzzi leg.).  
MARGARITA: Porlamar, III.1948 (1 ex., Marcuzzi leg.); *Porlamar* Sta. 155, 25.V.1936 (1 ex.). CURAÇAO: *Willemstad*, 2.X.1936 (4 ex.; Plate II 5).  
Venezuelan mainland, Margarita, Curaçao!; cosmopolitan.

**Alegoria dilatata** Laporte, 1840

LAPORTE, 1840, 2 p. 221; GEBIEN, 1928, p. 130; MARCUZZI, 1949, p. 348.

TRINIDAD: Brasso (1 ex., I.C.T.A.).  
Central and South America, Trinidad!

**Alphitobius laevigatus** Fabricius, 1781

SEIDLITZ, 1898, p. 606; MARCUZZI, 1949, p. 349.

VENEZUELA: Las Piedras and Pueblo Nuevo, Paraguaná, X.1948 (Marcuzzi leg.). TRINIDAD: Marasca Bay (1 ex., I.C.T.A.). CURAÇAO: Agric. Exp. Station *Cas Cord*, Sta. 331, 11.XII.1948 (2 ex.); *Willemstad*, in garbage of hen house, 2.X.1936 (11 ex.).  
Venezuela, Curaçao!; cosmopolitan.

**Ulosonia tricornis** Laporte, 1840.

CHAMPION, 1886, p. 163; MARCUZZI, 1949, p. 350.

CURAÇAO: Specimens collected by Hummelinck (which got lost).  
Central America and Antilles, Curaçao!

**Zophobas** cfr. **atratus** Fabricius, 1775

[Plate VI 2]

KRAATZ, 1880, p. 128 (*Z. morio*); MARCUZZI, 1949, p. 350 (*Z. atratus*).

TRINIDAD: St. Augustine (2 ex., I.C.T.A.); LOS TESTIGOS: *Tamarindo*, Sta. 162, 16.VI.1936 (1 ♀). MARGARITA: Base of *Cerro del Piache*, Sta. 140, 10.VII.1936 (1 ♂); *Cueva del Piache*, Sta. 141, 10.VII.1936 (1 ♂ 4 ♀♀); *El Piache*, Sta. 141A, 10.VII.1936 (1 ♀); *Cueva del Piache*, Sta. 142, 10.VII.1936 (16 ♂♂ 6 ♀♀; Plate VI 2). LOS HERMANOS: *Morro Pando*, Sta. 170, 20.VII.1936 (1 ♀). ARUBA: *Oranjestad*, 12.XII.1936 (1 ♀). — I have many specimens in my collection, identified as the same species, from several Venezuelan localities.

Los Testigos (Tamarindo)!, Margarita!, Los Hermanos (Morro Pando)!, Aruba!  
— *Z. atratus*: Central and South America, Venezuela, Antilles; St. Helena, Guinea;  
new for the Leeward Group.

**Zophobas** cfr. **rugipes** Kirsch, 1866

KRAATZ, 1880, p. 130.

VENEZUELA: *Morro de Esmeralda* (island 200 m from mainland), E of Carúpano, Sta. 124, 10.VI.1936 (2 ♂). CURAÇAO: *Willemstad*, 2.II.1949 (1 ♂ 1 ♀); *Willemstad* 10.II.1949 (43 ♂♂); *Groot Piscadera*, Sta. 335, 27.I.1949 (1 ♂).

Venezuela (Sucre), Curaçao! — *Z. rugipes*: Central and South America.

**Zophobas** sp. (sp. n.?)

[Plate VI 1]

BONAIRE: *Fontein*, Sta. 191, 30.III.1937 (1 ♀; Plate VI 1); *Hofje Fontein*, Sta. 193A, 11.IX.1948 (1 ♀); *Boca Onima*, Sta. 310, 19.IX.1948 (1 ♂).

Although these specimens show a series of good taxonomic characteristics, the lack of mature ♂♂ prevents me to describe them as a new species.

**Isicrdes** sp.

TRINIDAD: St. Augustine (1 ex., I.C.T.A.).

**Phymatestes** sp. ex grupo **tuberculatus** Fabricius, 1792

LAPORTE, 1840, 2 p. 256.

TRINIDAD: St. Augustine (1 ex., I.C.T.A.).

Trinidad! — *P. tuberculatus*: Cayenne.**Anaedus** sp.

TRINIDAD: *St. Augustine*, Sta. 366, 8.VIII.1948 (3 ex.). — A species not present in the Frey-collection, München.

**Pyanisia** **nebulosa** (Fabricius, 1781)LAPORTE, 1840, 2 p. 235 (*Helops undatus*); MARCUZZI, 1949, p. 351.

TRINIDAD: Arena Forest Reserve (1 ex., I.C.T.A.).

Central and South America, Trinidad!

**Strongylium** sp.

TRINIDAD: St. Augustine (1 ex., I.C.T.A.).

## ZOÖGEOGRAPHICAL REMARKS

The following table (Table 2) analytically shows the distribution of the *Tenebrionidae* of the Leeward Group. Only the well classified species are here considered, excluding all halophile forms (which have a peculiar distribution of their own), cosmopolitan species (such as *Tribolium castaneum* and *Alphitobius laevigatus*), as well as an imported species (*Ulosomia tricornis*) at present bound to crops

From this table the following is evident:

- 1) Species not occurring in the oriental islands (from Margarita eastwards), but present in the occidental ones . . . . . 15
- 2) Species not occurring in the occidental islands (from Los Hermanos westwards), but present in the oriental ones . . . . . 10
- 3) Species common to both groups of islands . . . . . 4  
(of these 4 species, *Trichoton lapidicola* reaches as far West as Blanquilla).

The tenebrionid fauna of these two geographical territories are therefore quite different. This difference is still more marked when we consider the genera present on the western territory, and absent on the eastern one: *Ecnomosternum*, *Tapinocomus*, *Stictoderia*, *Paraguania* and *Hummelinckia*, all highly endemic elements. An eastern genus, absent in the West (*Opatrinus*) is known also from Colombia, so that we cannot consider it as limited to eastern Venezuela or the eastern Caribbean (*Epitragus* is represented also in the western territory) (fig. 5-10).

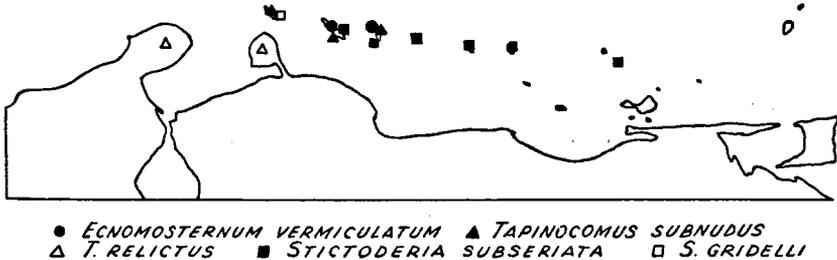


Fig. 5. Distribution of the endemic genera of *Epitragini*: *Ecnomosternum*, *Tapinocomus* and *Stictoderia*.

It appears, therefore, that the only well characterized territory is the western, while the eastern has a fauna essentially South American as regards their origin and composition, containing no or few endemics. A clear difference between the two territories is also revealed by an examination of the distribution of the genera *Diastolinus* and *Blapstinus*: in the former there is no species common to East and West, there being two species in the eastern territory and two in the western; in the latter only one species (*B. buqueti*, a typically euryecious species) is common to both areas, while 4 species are limited to the West, and 5 to the East (fig. 7-9).

Let us now consider the index of endemicity of each insular (or in general geographical) unit, as revealed by the percentage of endemic species relative to the total number: we obtain for the West percentages as high as 42 (Bonaire plus Curaçao), 37 (Paraguana plus La Goajira), 33 (Orchila), 20 (Aruba, over against the low values of the East, as 10 (Margarita and Coche) or 11 (Sucre plus Isla de Caribes). At this point the relatively high index of endemicity of such xerophilous continental regions as Lagunillas de Mérida (20%) or Maiquetia (14%) is worth recording.

TABLE 2.

Geographical distribution of the well classified species of Tenebrionidae of the Leeward Group, excluding all halophile, cosmopolitan and imported species.

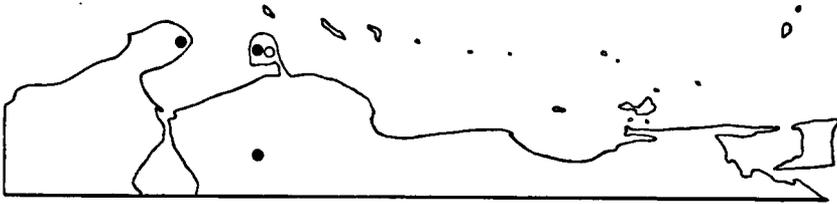
Species of <i>Tenebrionidae</i> (those occurring in the Leeward Group in <i>italics</i> )	La Goajira	Paraguana	Aruba	Curaçao	Bonaire	Las Aves	Los Roques	Orchila	Blanquilla	Los Hermanos	Margarita	Los Frailes	Los Testigos	Coche	Sucre	Venezuel. mainland	South America	Trinidad	Lesser Antilles	Central America
<i>Epitragus aurulentus</i> . . . . .																				
<i>Ecnomosternum vermiculatum</i> . . . . .																				
<i>Tapinocomus subnudus</i> . . . . .																				
<i>T. relictus</i> . . . . .	x	x																		
<i>Stictoderia subseriata</i> . . . . .																				
<i>S. gridellii</i> . . . . .																				
<i>Armalia chiriquensis</i> . . . . .	x	x																		
<i>Paraguania relictica</i> . . . . .	x	x																		
<i>P. hummelincki</i> . . . . .																				
<i>Rhyppasma venezuelense</i> . . . . .																				
<i>Diastolinus curtus</i> . . . . .	x	x																		
<i>D. hummelincki</i> . . . . .	x	x																		
<i>D. margaritensis</i> . . . . .																				
<i>D. fairmairei</i> . . . . .																				
<i>Opairinus gemellatus</i> . . . . .																				
<i>Blapstinus buqueti</i> . . . . .	x	x																		
<i>B. relictus</i> . . . . .																				
<i>B. margaritensis</i> . . . . .																				
<i>B. paraguanae</i> . . . . .	x	x																		
<i>B. pseudoaeneus</i> . . . . .																				
<i>B. curassavicus</i> . . . . .																				
<i>B. orchilensis</i> . . . . .	x	x																		
<i>B. simulans</i> . . . . .																				
<i>B. humboldti</i> . . . . .																				
<i>B. hummelincki</i> . . . . .																				
<i>Austrocaribius venezuelensis</i> . . . . .	x	x																		
<i>Hummelinckia caribica</i> . . . . .																				
<i>Trichoton lapidicola</i> . . . . .																				

(1) According to GEBIEN, 1928; (2) Isla de Caribes and Lagunillas de Mérida; (3) Carora in the State of Lara; (4) Maiquetía and Maracay, Aragua; (5) Isla de Caribes only; (6) Maiquetía.

Fig. 10 graphically shows the index of endemicity of the different regions, and comparison with fig. 11 shows the relationship between endemicity and the total number of species of each island or sector of adjacent coast.

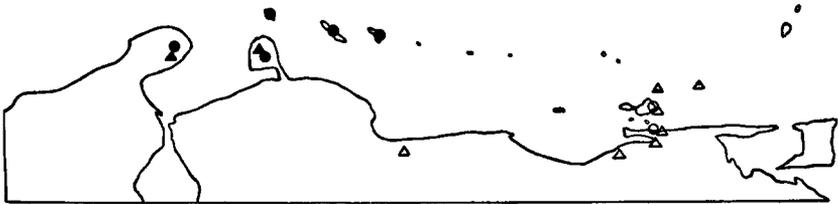
The scarcity of *Tenebrionidae* (with no endemic in it) in the State of Lara — apart from the fact that this area is less known as to its fauna — may depend on the relatively recent origin of this region, which has prevented an interchange with the East, or with the North-West. The only species that reaches Lara (Carora) from the North is *Paraguania relictica*.

From examination of the number of species common to two contiguous areas, and computing the percentage of common species relative to the total number of the two territories, several island groups are shown to be more or less united to one another according to the greater or lesser percentage of species in common. Such relation may more or less represents the length of period during which the two contiguous territories have been united. We should obviously bear in mind the relative abundance of species of each island; furthermore, we must not forget that some species are more „vagile” than others.



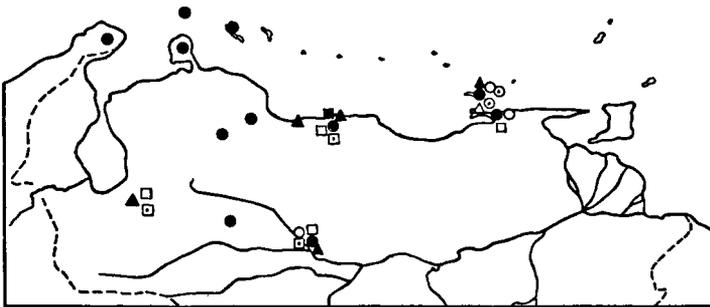
● *PARAGANIA RELICTA* ○ *P. HUMMELINCKI*

Fig. 6. Distribution of the endemic genus of Trimyitini: *Paragania*.



△ *DIASTOLINUS FAIRMAIREI* ● *D. CURTUS*  
○ *D. MARGARITENSIS* ▲ *D. HUMMELINCKI*

Fig. 7. Distribution of the xerophilous species of *Diastolinus* of Southern Caribbean region.



● *BLAPSTINUS BUQUETI* ○ *B. RELICTUS* ○ *B. MARGARITENSIS*  
▲ *B. PSEUDOAEENEUS* △ *B. SIMULANS* ■ *B. HUMBOLDTI*  
□ *B. BRUNNIPES* □ *B. OPATRINOIDES*

Fig. 8. Distribution of the species of *Blapstinus* present on the eastern islands of the Leeward Group and adjacent coast (incl. Maiquetía). *B. brunnipes* and *B. opatrinoides* are present in Maiquetía, but have not been collected by Dr Hummelinck. Only the Venezuelan localities are considered.

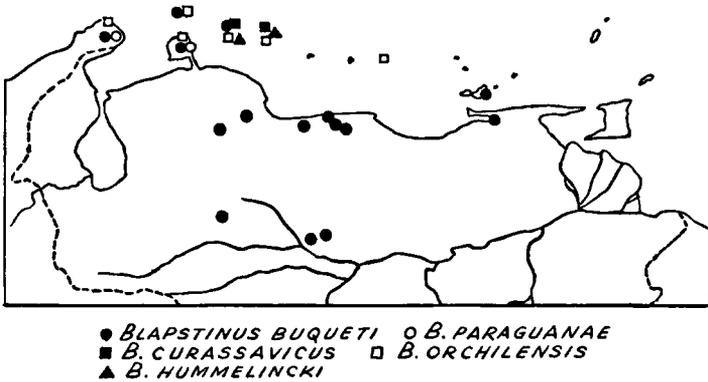


Fig. 9. Distribution of the species of *Blapstinus* present on the western islands of the Leeward Group and the peninsulæ of Paraguaná and La Goajira.



Fig. 10.

Fig. 11.

Fig. 10. Endemicity referred to the *Tenebrionidae* of each insular or continental unit, represented by means of circles with a diameter corresponding to the percentage of endemics. In the compute of endemicity some contiguous regions are considered together, as Paraguaná and La Goajira, Curaçao and Bonaire, Margarita and Coche, mainland of Sucre and Isla de Caribes.

Fig. 11. Total number of species of *Tenebrionidae* of each insular or continental unit, represented by means of circles with a diameter corresponding to the number of species. The species of Margarita and Coche, resp. Sucre and Isla de Caribes, are considered together.

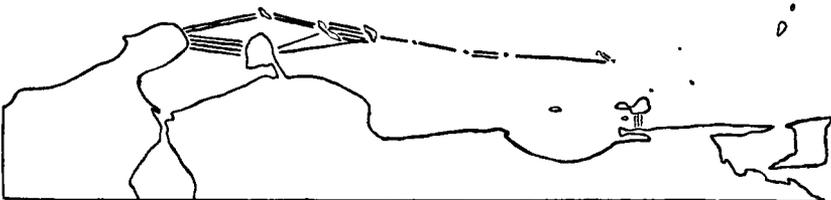


Fig. 12. Faunistic affinities of contiguous territories represented by means of a number of lines corresponding to the percentage of species common to two contiguous territories.

In spite of all these difficulties I think we may reach some satisfactory — though preliminary — conclusions, in studying the following representation of percentages (compare fig. 12).

	Number of species of two contiguous areas		Total number of species	Number of species in common	Species percentage	
La Goajira	9	Paraguaná	9	10	8	80
La Goajira	9	Aruba	5	11	3	27
La Goajira	9	Curaçao	8	14	3	21
Paraguaná	9	Curaçao	8	14	3	21
Aruba	5	Curaçao	8	9	4	44
Curaçao	8	Bonaire	7	8	7	87
Paraguaná	9	Bonaire	7	14	2	14
Bonaire	7	Las Aves	1	7	1	14
Bonaire	7	Los Roques	1	7	1	14
Bonaire	7	Orchila	3	8	2	25
Las Aves	1	Los Roques	1	1	1	100
Los Roques	1	Orchila	3	3	1	33
Orchila	3	Blanquilla	2	5	0	0
Orchila	3	Los Hermanos	2	4	1	25
Blanquilla	2	Los Hermanos	2	3	1	33
Blanquilla	2	Margarita	10	11	1	9
Los Hermanos	2	Margarita	10	12	0	0
Blanquilla	2	Sucre	9	10	1	10
Margarita	10	Sucre	9	12	7	58

The value — in this connection — of *Trichoton lapidicola* as being the only species in common to Margarita and Blanquilla is very doubtful. Up till now this species has only been known from Guatemala and Venezuela. In any case the present known distribution of this element is of relictual type.

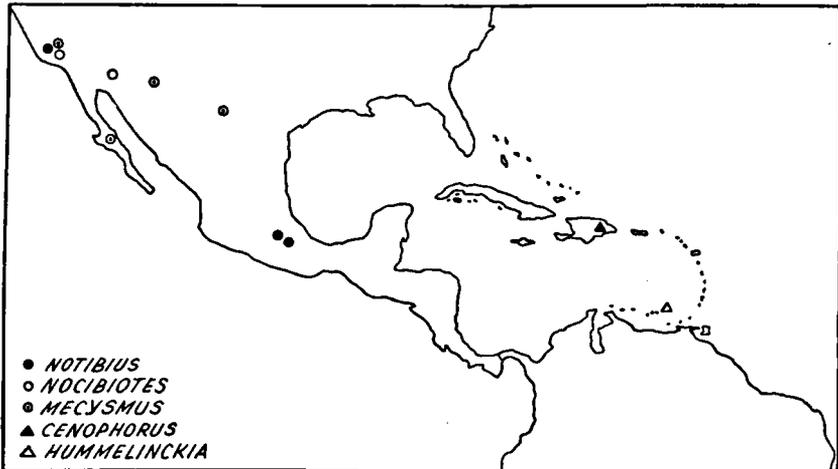


Fig. 13. Distribution of the related genera: *Hummelinckia*, *Cenophorus*, *Notibius*, *Mecysmus* and *Nocibiotus*.

The oldest separation should be that of Bonaire from Paraganá.

In a following period probably a separation of Paraganá and La Goajira from Curaçao took place, La Goajira still being united with Aruba. Not much later, Orchila was separated from Los Hermanos, after which *Blapstinus orchilensis* reaches up to (or originates in) Orchila. At the same times Bonaire was loosed from the Las Aves–Roques–Orchila area. Before this separation, *Stictoderia subseriata* was already differentiated, since it migrated as far as Los Hermanos, but the presence of wings and its semi-halophile habits may explain its present distribution in a different way (passive transport). This separation would prevent a possible passage of *Hummelinckia* from Los Hermanos to Orchila.

In the same epoch, or a little later, the old land of the Dutch Islands and the present peninsulæ of La Goajira and Paraganá was split into two blocks: a northern island, formed by Bonaire, Curaçao and Aruba, and a southern area, formed by La Goajira and Paraganá. Following this segregation, in the northern block a new genus (*Ecnomosternum*, still winged), *Tapinocomus subnudus* and some endemic species of *Blapstinus* originated, while in the southern block the new genus *Paraguania*, *Tapinocomus relictus* and some endemic species of *Blapstinus* are formed. The formation of *Stictoderia* is perhaps still younger (fully winged, semi-halophile). We might assume that Aruba will be united to Curaçao for a long time yet.

The separation of Bonaire from the islands of the East is highly problematic, owing to the presence on Las Aves of only one species (*Stictoderia subseriata*) and on account of the geology of this archipelago. Somehow we have to assume that after this period no more exchanges will be possible between Bonaire and the neighbouring islands towards the East.

In a following period we accept the separation of Orchila from Los Roques (after which no western element can reach Orchila, while the peculiar population of *Blapstinus o. orchilensis* is formed), and that of Blanquilla from Los Hermanos. The absence in Los Hermanos of *Trichoton lapidicola* — if not caused by insufficient researches — may be due to the difficulty exhibited by this species to adapt itself to different habitats (stenotop). As to *Hummelinckia*, its formation must be previous to the separation of Blanquilla from Los Hermanos.

Some time afterwards the separation of Aruba from Curaçao took place, with the consequent formation, in Aruba, of *Stictoderia gridellii*, a very young species, which may be considered as a limit case („Grenzfall“) in RENSCH' sense (no more a subspecies and not yet a species), provided that the tempo of evolution be the same in all the complex *Stictoderia subseriata*.

In recent times there was the separation of Margarita and Sucre, while Isla de Caribes has possibly been separated somewhat earlier (judging from the presence of a endemic in it, *Blapstinus simulans*). Coche is still united to Margarita (presence of *Blapstinus margaritensis* on both islands, lacking in Sucre).

After this no more new species are to be expected: the two populations of *Trichoton lapidicola* segregated in Margarita and in Sucre respectively, are scarcely different (insular population slightly smaller); *Opatrinus gemellatus* also shows a very little difference between the populations of Margarita and of Los Testigos (the latter somewhat smaller).

The last geological event accepted, is the separation of Paraganá from La Goajira, and of Bonaire from Curaçao. The former has been followed by the formation of an endemic in Paraganá (*Paraguania hummelincki*, another case that can be considered as a limit between subspecies and species) and of a subspecies

of *Diastolinus curtus*, peculiar to La Goajira. On the other hand no species are to be found which are peculiar to Curaçao or Bonaire. — Of course, in this hypothetical chronology of the origin of each island, we assume „a priori” that the tempo of evolution within a species (and in general also within a genus) is the same all over its habitats. The relative uniformity of climate and soil all over the Leewards is not against such a uniformity in the tempo of speciation.

A phenomenon still occurring today, is the formation of new reefs. Only the fully winged species could have colonized such islets (as *Phaleria*, and, in some cases, *Stictoderia*). It is interesting to observe that in Los Roques, *Stictoderia subseriata* is present in the oldest island, and absent in the younger ones.

Little is known about the extinct land fauna that could inform us about the time during which all these changes occurred. For the other Antilles, about which there is an enormous mass of work done on faunistics, geology and paleogeography, there is anything but agreement on what have been the greatest paleogeographical changes and still less in regard to the respective times. For the Leeward Group, however, our knowledge is much more limited, HUMMELINCK's „Zoogeographical remarks” (in vol. I of this series) being the most valuable paper regarding this subject.

The probable age of the mollusks genera *Microceramus* and *Cerion*, common to the Leeward Group and the Greater Antilles, is Eocene or Oligocene, since they are also present in Florida, and, according to SCHARFF (1911) the connection between Florida and the West Indies existed during the Eocene. Some living species of *Microceramus* — according to SCHARFF — existed in Florida since Oligocene time. Since no *Tenebrionidae* are common to Florida and the Leeward Group, we probably may conclude that the present species of Tenebrionids have originated after the Paleogene. (Possibly some American genera, as *Cnemeplatia* and *Opatrinus*, have existed since Cretaceous time, as they are in common to the Old and New World, and according to the most accredited authors the connections between the two continents lasted until that time.)

As we have demonstrated that our species can not be as old as Paleogene, and since all the present Tenebrionids of the Leeward Group are xerophilous, we should go back as far as Miocene, when the climate was most probably drier than today, and certainly the driest of the whole tertiary period. (KÖPPEN & WEGENER admit during Miocene an aridity in the southern U.S.A. In Plio-Quaternary this area moved towards the South. According to JOLEAUD (1938) the Pontic upper Miocene should be an epoch in which the arid and semi-arid areas of North, Central and northern South America possibly originate. According to AXELROD, there began during upper Oligocene and lower Miocene a cooler and more arid climate.)

At that Miocene time we should assume the Leeward Group to be already separated from the Greater Antilles, since no Tenebrionids are common to these two territories.

Considering now that species never originate during recent epochs, and almost never since Pleistocene, we might postulate a separation of the various islands older than Pleistocene. As a matter of fact, Trinidad, which, according to GUPPY (1910), was not separated from Venezuela until post-pliocene time (Pleistocene), apparently has no endemic *Tenebrionidae*.

Thus, the probable age of the various endemic genera and species of the Leeward Group, and consequently of the separation of the various geographical units, may be concluded to be Mio-Pliocene. The most recent segregations, such as those of Margarita and Sucre, Paraganá and La Goajira, or Bonaire and Curaçao, could possibly

date back only to the early Pleistocene. As far as Margarita is concerned, we should bear in mind AGUERREVERE's opinion, that the raising of the island during Pliocene, possibly corresponds to the submerging of the interconnection between Margarita, mainland and Coche.

#### Conclusions

From the exposed we deduce the land connection between the Leeward Group and the „territory inhabited by an ancient antillean fauna" to have existed during early Tertiary. It might not be impossible that, also during the acme of the marine transgression of the Dutch Leeward Islands during the upper Eocene, some small elevated areas of these islands stuck out and maintained their original faunas. Anyway, the Leeward Group seems not to have been wholly submerged since early Oligocene time. The connections between the Americas admitted by RUTTEN during lower Oligocene, could be responsible for the contributing of North (and Central) American elements to the Leeward Group. During Oligocene (if we must admit a whole subsidence during upper Eocene) the common stocks of the Greater Antilles and Leewards would pass from one territory to the other.

In Miocene, while the islands were all united to one another, the ridge of the Leewards has been separated definitely from the Greater Antilles. All the geological evidence point to the fact that during Miocene there was a larger land mass than at present. Successively a slow fragmentation occurred, with consequent formation of new genera and species. This fragmentation lasted until the Pleistocene.

During Quaternary again there was some period in which a general emersion of lands occurred, accounting, perhaps, for the great resembling of the fauna of Margarita and Sucre, Paraguaná and La Goajira, or Bonaire and Curaçao. These communications could depend partly on the glacial eustatismus, for which the sea was lowered some 100 m, so that the bottom of the shallow seas was wholly emerged (the present depth of the sea between La Goajira and Paraguaná and between Sucre and Margarita is more or less 50 m).

The Lesser Antilles were possibly not concerned in the problem of the population of the Leeward Group, since the antillean genera inhabiting these islands are common only to the latter and the Greater Antilles, reaching as far South as Paraguaná (*Microceramus*, cf HUMMELINCK 1940a), owing to the fact that Paraguaná was the southern limit of the old antillean region.

## REFERENCES

### Taxonomical part

- CHAMPION, G. C., 1884-1893. Coleoptera. *Biol. Centr. Amer., Zoologia, Insecta*, 4 part 1.
- CHAMPION, G. C., 1896. On the Heteromorous Coleoptera of St. Vincent, Grenada and the Grenadines. *Trans. Ent. Soc. London*, 1, p. 1.
- CHEVROLAT, A., 1878. Diagnoses de Phaleria nouvelles. *C. R. Soc. Ent. Belg.* 1878, p. (248).
- FAIRMAIRE, L., 1892. Voyage de M. E. Simon au Venezuela, Coleopt. Heterom. *Ann. Soc. Ent. Fr.* 91, p. 77.
- FLEUTIAUX, E. & SALLÉ, A., 1890. Liste des coléoptères de la Guadeloupe . . . *Ann. Soc. Ent. Fr.* (6) 9 (1889), p. 421.
- GEBIEN, H., 1928. Ueber einige Gruppen Amerikanischer Tenebrioniden, I. *Stett. ent. Zeitung* 89, p. 97.

- GEBIEN, H., 1937. Katalog der Tenebrioniden. I, *Pubbl. Museo Ent. P. Rossi*, Duino, 2, p. 505.
- GEBIEN, H., 1938/42. Katalog der Tenebrioniden. II, *Mitt. Münch. Ent. Ges.* 28/32, p. 49; III, *ibid.* 32/34, p. 729.
- HORN, G. H., 1870. On the revision of the Tenebrionidae of America, north of Mexico. *Trans. Amer. Phil. Soc. (n.s.)* 14, 2.
- KASZAB, Z., 1949. Vier neue exotische Tenebrionidae (Coleoptera). *Ann. Mag. Nat. Hist.* 1949, p. 775.
- KIRSCH, T., 1866. Beiträge zur Käferfauna von Bogotá. *Berl. Ent. Zeitschr.* 10, p. 173.
- KRAATZ, G., 1880. Die Arten der Tenebrionidengattung Zophobas. *D. Ent. Zeitschr.* 1880, p. 121.
- LAPORTE DE CASTELNAU, F., 1840. *Histoire naturelle des Coleoptères*. Paris, 2 vol.
- LENG, C. W. & MUTCHLER, A. J., 1914. A preliminary list of the Coleoptera of the West Indies . . . *Bull. Amer. Mus. Nat. Hist.* 33, 30, p. 391.
- MARCUZZI, G., 1949. Contribución al conocimiento de los Tenebrionidae de Venezuela. *Memorias Soc. Cienc. Nat. La Salle*, Caracas, 9, 25, p. 333.
- MARCUZZI, G., 1950. Descrizione di cinque nuove specie di Tenebrionidae del Venezuela. *Memorie Soc. Ent. Ital.* 29, p. 105.
- MARCUZZI, G., 1951. I Tenebrionidi come indicatori del clima. *Rivista Biol (n.s.)* 43, p. 399.
- MARCUZZI, G., 1951. Contributi alla conoscenza dei Tenebrionidi venezuelani. *Atti Museo St. Nat. Trieste* 18, p. 61.
- MARCUZZI, G., 1952. Un nuovo genere di Tenebrionidae del Venezuela. *Memorie Museo St. Nat. Trieste* 3, p. 31.
- MARCUZZI, G., 1953. Contributi alla conoscenza dei tenebrionidi sud-americani, V. Nuove specie del genere *Rhyppasma*. *Atti Museo St. Nat. Trieste*, 19, p. 73.
- MULSANT, M. E. & REY, C., 1859. Essay d'une division des derniers melasomes. *Opuscula ent.* 9, p. 65.
- SEIDLITZ, G., 1898. In KIESENWETTER & SEIDLITZ, *Naturgeschichte der Insecten Deutschlands* I Coleopt., 5.
- WOLCOTT, G. N., 1936. Insectae Borinquensis. *J. Agric. Univ. Puerto Rico* 20, 1.

#### Zoogeographical part

- AGUERREVERE, P. I., 1936. Notas geológicas sobre Margarita y Coche. *Bol. Soc. Venez. Cienc. Nat.* 3, p. 397.
- AXELROD, D. I., 1939. A Miocene flora from the Western border of the Mohave desert. *Carn. Inst. Publ.* 516.
- GUPPY, R. J. L., 1910. The growth of Trinidad. *Trans. Canad. Inst.* 8, p. 137.
- JOLEAUD, L., 1938. Paléogéographie du Sahara, in: La vie dans les régions désertiques de l'ancien monde. *Soc. Biogeogr. Paris*, 6, p. 21.
- KÖPPEN, W. & WEGENER, A., 1926. *Die Klimat der geologische Vorzeit*.
- RUTTEN, L., 1935. Alte Land- und Meeresverbindungen in West Indien und Zentral-Amerika. *Geol. Rundschau* 26, p. 65.
- SCHARFF, R. F., 1911. *Distribution and origin of life in America*.
- WAGENAAR HUMMELINCK, P., 1940. Zoogeographical remarks. *Studies fauna Curaçao* 1, p. 109.
- WAGENAAR HUMMELINCK, P., 1943. Zoögeografische opmerkingen over de Nederlandsche Benedenwindsche Eilanden. *Vakblad voor Biologen* 24, p. 31.
- WAGENAAR HUMMELINCK, P., 1943. Zoögeografische opmerkingen over de Nederlandsche Benedenwindsche Eilanden. *West-Indische Gids* 25, p. 168.