STUDIES ON THE FAUNA OF CURAÇAO AND OTHER CARIBBEAN ISLANDS: No. 107.

THE HETEROPTERA OF THE NETHERLANDS ANTILLES - VII

CORIXIDAE

by

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The material studied was mainly collected during Dr. P. WAGENAAR HUMMELINCK's voyages to the West Indies (1930, 1936/37, 1948/49, 1955, 1963/64, 1967), and on a special entomological collecting trip by Dr. Ir. R. H. COBBEN (1956/57). Unless otherwise stated, a date in the years 1956 and 1957 indicates specimens collected by Dr. COBBEN, and a date in another year indicates specimens collected by Dr. WAGENAAR HUMMELINCK. Moreover the Western Hemisphere Corixidae of the Copenhagen Museum were, through the kindness of Dr. N. MØLLER ANDERSEN, put at the author's disposal.

As in the author's paper on Notonectidae (NIESER 1967) THIS CONTRIBUTION ALSO DEALS WITH SPECIMENS COLLECTED ON OTHER CARIBBEAN ISLANDS.

Descriptions of the islands and data on the localities 1930–1949 and 1956–1957 are given in WAGENAAR HUMMELINCK 1933, 1940a-c, 1953 and COBBEN 1960.

Mrs. P. M. T. BRUMMEL-VAN DER LUGT contributed substantially to this paper, allowing the author to include the results of her study on variation and characteristics of the larvae, which she made as a part of her graduate studies.

Thanks are also due to Dr. Ir. R. H. COBBEN (Landbouwhogeschool, Wageningen), Dr. N. MØLLER ANDERSEN (Zoologiske Museum, København) and Dr. P. WAGENAAR

HUMMELINCK (Rijksuniversiteit, Utrecht) for the loan of specimens. Miss E. TAAT (Rijksuniversiteit, Utrecht) kindly read the greater part of the manuscript; the author is to blame for remaining linguistic faults.

The CORIXIDAE can be distinguished from other families of Heteroptera by the fact that their rostrum is apparently unsegmented, although transverse ridges as a rule are present.

According to HUNGERFORD 1948 there are six subfamilies, *three* of which are represented in Central and South America. These can be separated by the following KEY taken from HUNGERFORD 1948.

1a. Scutellum exposed (ocelli absent), length less than 3 mm . . . Micronectinae
1b. Scutellum covered by the pronotum, rarely with apex visible. Length generally over 3 mm 2

2a. With the infraocular portion of the genae very broad, the lower margin of the eye concave, the hypo-ocular suture arising near the subacute production of the inferior angle of the eye; vein M indistinct, parallel and very near to vein Cu . . . . . Heterocorixinae
2b. With the infraocular portion of the genae not broad, or if broad, the hypo-ocular suture when present arising about midway along ventral margin of eye; vein M present through most of the length, usually midway between costal margin and vein Cu and usually fused at apex with Cu. . . . . Corixinae

The subfamily Micronectinae has only one genus, *Tenagobia*, in the region considered; the same applies to the subfamily Heterocorixinae, with the genus *Heterocorixa*.

In the subfamily Corixinae 10 genera are of interest here. These can be separated with the following key modified after HUNGERFORD 1948.

KEY TO CENTRAL AND SOUTH AMERICAN GENERA OF CORIXINAE

1a. Small insects, less than 5.6 mm long; males with sinistral asymmetry and with pala short, triangular, the tibia produced apically over it; females with the apices of clavi not exceeding a line drawn through the costal margins of the hemelytra at the nodal furrows. . . . . *Trichocorixa*
1b. Not as above 2

2a. Inner posterior angle of eye sharply right angulate to acutely produced lower posterior angle of front femur of male produced and bearing several rows of stridulatory pegs . . . . . *Krizousacorixa* and *Trichocorixella*
2b. Not as above 3

3a. Smooth, shining insects, never more than faintly rugulose, 4 to 8.4 mm long; lateral lobe of prothorax typically with sides tapering to a narrowly rounded apex; all but two species with hind femur pubescent ventrally only at base; male pala triangular, about equal in length to tibia, with a row of pegs near dorsal margin and another in or near the upper palmar row of bristles . . . . . *Corisella*

3b. Not as above 4

4a. Length of pruinose area along claval suture less than twice the length of the distance between the shining basal apices of the corium and clavus with the post-nodal pruinose area (as measured from the cubital angle) shorter than or barely equal to the meron; males without a strigil or a strigilar stalk . . . . . *Centrocorisa*

4b. Not as above 5

5a. Short and broad corixids, more than a third as broad as long; distal portion of corium semihyaline with color pattern often effaced; length of pruinose area along claval suture less than twice the length of the the distance between the shining basal pieces of the clavus and corium 6

5b. Not as above 7

6a. Middle femora of both sexes with a longitudinal groove on the ventral surface or with a mat of straw-colored hairs distally on the inner surface: males with a strigil . . . . . *Pseudocorixa*

6b. Middle femora of both sexes with ventral surface not longitudinally grooved; males without a strigil . . . . . *Morphocorixa*

7a. Broad and compact specimens of moderate size, 5.7 to 6.5 mm long; male pala with the upper palmar row of bristles interrupted near distal end and with pegs inserted in opening in two of the three species; regular peg row lying near the dorsal margin of pala . . . . . *Neosigara*

7b. Not as above 8

8a. Upper surface of male pala deeply incised; vertex of male acuminate; both sexes with palar claw serrate at base; hemelytral pattern indistinct or effaced . . . . . *Ramphocorixa*

8b. Not all characters mentioned above are simultaneously present . . *Sigara*

Tenagobia Bergroth, 1899: is restricted to the Western Hemisphere, where it has a wide distribution; most of its species are found in the tropics and subtropics.

Heterocorixa White, 1879: is restricted to the tropical part of the South American continent.

Corisella Lundblad, 1928: is widely distributed in the U.S.A., reaching Southern Canada and Northern México.

Krizousacorixa Hungerford, 1930; *Trichocorixa* Jaczewski, 1931; *Pseudocorixa* Jaczewski, 1931; *Morphocorixa* Jaczewski, 1931; *Neosigara* Lundblad, 1928: are restricted to continental Central America; some species reach the southern U.S.A.

Centrocorisa Lundblad, 1928: is restricted to tropical South America, including the Antilles, and Northern México.

Ramphocorixa Abbott, 1912: occurs in North and Central America including the Antilles.

Trichocorixa Kirkaldy, 1908: is widely distributed in the Western Hemisphere including Hawaii and Galápagos Islands; there is one record from Shanghai, China. As the species of this genus are adapted to saline waters they are the most common Corixids of the Caribbean islands, especially the Lesser Antilles.

Sigara Fabricius, 1775: has a world-wide distribution. This genus is divided in many infrageneric groups which are, for the most part, badly defined and differently interpreted by various authors.

Not mentioned in the key are *Graptocorixa* Hungerford, 1930 and *Neocorixa* Hungerford, 1925 (tribe Graptocorixini, which can be recognized by the narrowly digitiform pala in both sexes) occuring in the western U.S.A. and México.

KEY FOR THE IDENTIFICATION OF ADULT CORIXIDAE ACTUALLY FOUND IN THE NETHERLANDS ANTILLES

1a. Length more than 5 mm 2
1b. Length less than 5 mm 4

2a. Broad and short species; width of head more than 2 mm 3
2b. Slender species; width of head less than 2 mm (1.6–1.9 mm.) . . . . . *Ramphocorixa rotundocephala* Hungerford

3a. Male, right clasper with a relatively thick nob (Fig. 65). Female, hemielytra without patches of hairs on centre of corium and along outer margin of clavus. Northern Antilles . . . . . *Centrocorisa nigripennis* (Fabricius)
3b. Male, right clasper with a relatively fine nob (Fig. 62). Female, hemielytra with a patch of long hairs on centre of corium and a stripe of long hairs along outer margin of clavus (Fig. 63, to be studied on dry specimens). Southern Antilles . . . . . *Centrocorisa kollari* (Fieber)

4a. Male, left posterior lobe of abdomen with sinuated outer border and truncated at apex (Fig. 75). Female, costal margin of hemielytra obliquely grooved before nodal furrow. Southern Antilles . . . . *Trichocorixa orinocoensis* Sailer
4b. Male, left posterior lobe not truncated at apex. Female, costal margin of hemielytra not obliquely grooved 5

5a. Male, left posterior lobe of abdomen with sinuated outer border; strigil straight. Female, ocular index about 1.06,

TABLE 3.

SPECIES AND LOCALITIES OF THE CORIXIDAE TREATED IN THIS PAPER

Species	Puerto Rico	St. Thomas	St. John	Loango	St. Croix	Anguilla	*St. Martin*	St. Barthélemy	Barbuda	Antigua	Martinique	Trinidad	Margarita	Blanquilla	*Bonaire*	*Klein Bonaire*	*Klein Curaçao*	*Curaçao*	*Aruba*	Venezuela (mainland)	Colombia	figures	page
Tenagobia socialis												×										58–59	141
Centrocorisa kollari															×			×	×	×	×	60–63	142
Centrocorisa nigripennis	×			×			×		×	×												64–66, 96	145
Ramphocorixa rotundocephala	×												×		×				×	×		67–71	147
Trichocorixa orinocoensis														×	×	×	×	×	×	×	×	72–76, 92, 95, 97–98	149
Trichocorixa reticulata	×	×	×		×	×	×	×			×				×		×	×	×	×		77–86, 93, 99–100	153
Trichocorixa verticalis					×		×		×			×	×		×		×	×	×			87–91, 94, 101–102	156
							3								*5*	*1*	*3*	*4*	*5*				

Six species have been collected on the Netherlands Antilles (in italics). The main reason for absence of Corixidae on *Saba* and *St. Eustatius* may be the lack of suitable habitats.

second segment of abdomen pointed at hind angles; sharp protrusion generally visible from above if hemielytra closed . . . . . *Trichocorixa verticalis* (Fieber)

5b. Male, left posterior lobe of abdomen convex, not sinuated; strigil slightly curved. Female, ocular index about 1.68; no sharp protrusion from second abdominal segment visible from above . . . . . *Trichocorixa reticulata* (Guérin)

MATERIAL AND METHODS

In general the methods for collecting, preserving and studying Corixidae are the same as with Notonectidae as described in NIESER 1967, only the more important and dissimilar points are revealed here.

Corixidae are frequently attracted to electric lights, which is not generally so with Notonectidae. Killing and storing of samples can be very well done in alcohol of about 70%, the colour pattern remaining intact; with drying of alcohol specimens the hemielytra sometimes tend to curl up.

Measurements were taken with the longitudinal and transverse axes of the animal in a horizontal plane. As in larvae the position of the head relative to the body is very variable, the length of the pterothorax and abdomen is used as indicative of the length (COBBEN & MOLLER PILLOT 1960) This measurement is called (length) LA. Larvae must be preserved and studied in fluids, as they shrivel if dried. Following ŠTYS 1960 the ocular index ($S/\{\frac{1}{2}(D - S)\}$, where S = synthlipsis and D = width of head across eyes) was calculated; this ratio is somewhat more balanced than the ratio synthlipsis: hind border of eye.

In adult Corixidae the males possess several sexual characteristics useful in identification: pala, strigil, dorsal aspect of abdomen and genital capsule, especially the parameres (the morphology of Corixidae is extensively treated in HUNGERFORD 1948, p. 38–41, pl. 3). Females possess far less characteristics, and are often more difficult to deal with. Apart from characters used by HUNGERFORD 1948, the pegs on the hind-legs have been investigated by Mrs. BRUMMEL, with regard to their value as differentiating character-

istics. In larvae important characteristics are the pilosity of the thorax, the openings of the scent-glands, together with the pegs on the hind-legs (COBBEN & MOLLER PILLOT 1960, USINGER 1963, SCUDDER 1966a).

Drawings were made by means of a camera lucida. With the exception of the larger species, clearing is seldom necessary.

To analyze variation the length of the animals and the ocular index have been arbitrarily chosen as variables. Measurements and proportions considered important are given with statistical parameters. The symbols used are $\bar{x}$ = mean value, s = estimate of standard deviation, and n = number of individuals measured.

The synonymy has been given in abridged form; the older references not given are to be found in HUNGERFORD 1948; more recent references have been included.

In the distributional records an exclamation mark (!) indicates a new locality.

COBBEN's collection is at the Entomologisch Laboratorium of the Landbouwhogeschool at Wageningen, together with the greater part of the older materials collected by WAGENAAR HUMMELINCK; the remainder of his material has been presented to the Zoölogisch Museum at Utrecht. The specimens of the Copenhagen Museum are indicated with a K after the name of the collector. Some specimens are in the reference collection of the Zoölogisch Laboratorium at Utrecht and in the author's collection.

Tenagobia Bergroth, 1899

Tenagobia socialis (White, 1897)

Sigara socialis WHITE, 1897, p. 274–275.

Tenagobia socialis (White); CHAMPION 1901, p. 383 (changes *Sigara* in *Tenagobia*, wrong interpretation of species).

Tenagobia socialis; DEAY in HUNGERFORD 1948, p. 82–83, pl. 5 fig. 16; pl. 12 fig. 9, 14; pl. 13 fig. 2.

Tenagobia socialis; HYNES 1948, p. 353 (Trinidad; is referring to *T. incerta* Lundbl., as stated on p. 344).

GUYANA (formerly British Guyana); SURINAME; BRASIL, Amapá, Amazonas; TRINIDAD!

TRINIDAD: Mainroad swamp S. of Point Fortin, *Sta. 795*, 16.I.1964, 1 ♂.

Right and left genital claspers, see Fig. 58–59.

FIGURE 58–59. *Tenagobia socialis*, male, from Trinidad (*795*): 58, right paramere; 59, left paramere.

Centrocorisa Lundblad, 1928

Centrocorisa kollari (Fieber, 1851)

Corisa kollari FIEBER, 1851, p. 17, pl. 1 fig. 7 (the specimens from Brazil only; designated types by HUNGERFORD).
Centrocorisa kollari; LUNDBLAD 1929 (description of genus; not *Kollari* Fieber).
Centrocorisa kollarii; HUNGERFORD 1948, p. 442–445, pl. 70 fig. 2, pl. 72 (México, Guatemala, Costa Rica, Colombia, Ecuador, Brazil, Bolivia, Paraguay).

MÉXICO, Baja California, Sonora, Chihuahua, Jalisco, Morelos, Guerrero, Chiapas; GUATEMALA; COSTA RICA; COLOMBIA; ECUADOR; PERÚ, Tarma, Amazonas; BOLIVIA; PARAGUAY; BRASIL, Pernambuco; BONAIRE!; CURAÇAO!; ARUBA!.

BONAIRE: Dos Poos, *Sta. 45*, 27.III.1937, 2 ♂; Onima, 20.V.1957, 4 ♂; same, 2.VI.1957, 9 ♂, 7 ♀.
CURAÇAO: Hofje v. d. Mark, 27.II.1957, 1 ♂; Klein Sta. Martha, 2.III.1957, 2 ♀; Plantage Noordkant, 27.III.1957, 17 ♂, 31 ♀; same, 20.VI.1957, 3 ♂, 3 ♀.
ARUBA: Tanki Leendert, *100*, 16.XII.1936, 1 ♂, 2 ♀; Tanki Hooiberg, *400e*, 11.V. 1955, 18 ♂, 27 ♀; Seribana, tanki, freshwater, no aquatic vegetation, 23.IV.1957, 1 ♂, 2 lv.; Tanki N. O. Hooiberg, freshwater, poor aquatic vegetation, 28.IV.1957, 1 ♀; Druif, *s.n.*, 26.IV.1955, 1 ♀.
VENEZUELA: Paraguaná, Estanque de Moruy, *108*, 18.II.1937, 1 ♀; Paraguaná, Peila de Buena Vista, *s.n.*, 18.II.1937, 2 ♂, 2 ♀; Caracas, Laguna de Espina, 18.VI.1891, 1 ♂ (lgt. Meinert, K.); Cacao Vanddarn, 20.VI.1891, 1 ♂, 1 ♀ (lgt. Meinert, K.).
COLOMBIA: Nor Cali, 17.VI.1948, 1 ♀ (lgt. E. W. Poulsen, K.).

Adults

Length (in mm)

male $\bar{x} = 6.84$	$s = 0.29$	$n = 30$	*female* $\bar{x} = 7.27$	$s = 0.28$	$n = 30$

Ocular index

male $\bar{x} = 1.51$	$s = 0.22$	$n = 30$	*female* $\bar{x} = 1.54$	$s = 0.16$	$n = 30$

Pronotum without median carina, lightly rastrate. Clavus lightly rastrate, remainder of hemielytron non-rastrate, shiny. Female with patches of long hairs along the border of clavus and on centre of corium (Fig. 63).

Hindlegs: femur dorsally with 10–17, ventrally with 22–26; tibia dorsally with 3–4, laterally with 8–13 pegs.

Male pala Fig. 60; right genital clasper Fig. 61; left clasper Fig. 62.

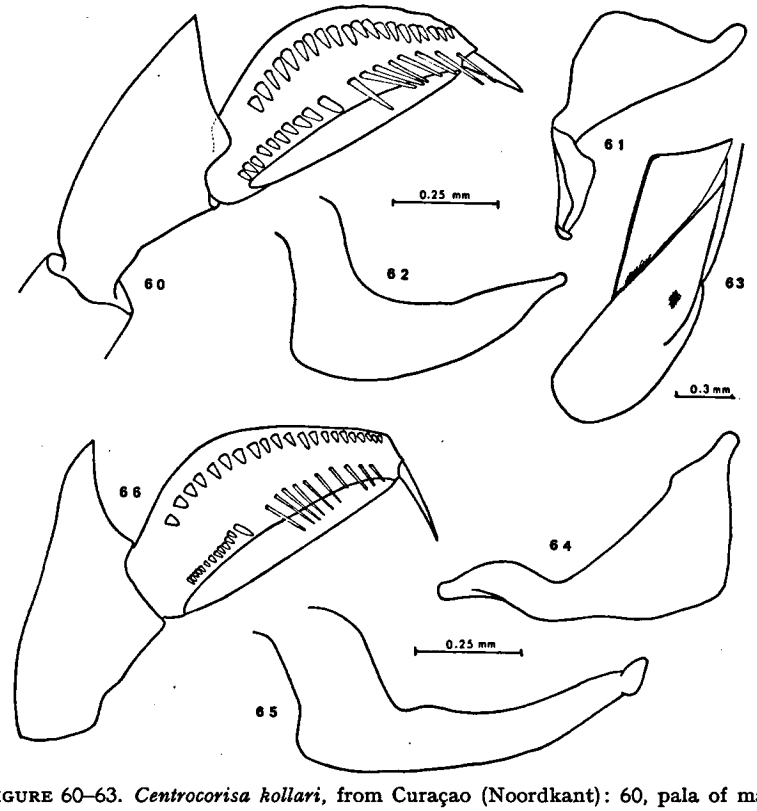

FIGURE 60–63. *Centrocorisa kollari*, from Curaçao (Noordkant): 60, pala of male; 61, right paramere of male; 62, left paramere of male; 63, right hemielytron of female.

FIGURE 64–66. *Centrocorisa nigripennis*, male, from Barbuda (675): 64, right paramere; 65, left paramere; 66, pala.

Variation

If the samples from Aruba, Bonaire and Curaçao are treated separately, the length and the ocular index give the following values:

Length in *males* (in mm)

Aruba	$\bar{x} = 6.95$	$s = 0.283$	$n = 10$
Bonaire	$\bar{x} = 6.62$	$s = 0.207$	$n = 10$
Curaçao	$\bar{x} = 6.95$	$s = 0.368$	$n = 10$

Length in *females* (in mm)

Aruba	$\bar{x} = 7.16$	$s = 0.203$	$n = 10$
Bonaire	$\bar{x} = 7.24$	$s = 0.278$	$n = 10$
Curaçao	$\bar{x} = 7.40$	$s = 0.346$	$n = 10$

Ocular index in *males*

Aruba	$\bar{x} = 1.49$	$s = 0.279$	$n = 10$
Bonaire	$\bar{x} = 1.57$	$s = 0.169$	$n = 10$
Curaçao	$\bar{x} = 1.49$	$s = 0.201$	$n = 10$

Ocular index in *females*

Aruba	$\bar{x} = 1.67$	$s = 0.212$	$n = 10$
Bonaire	$\bar{x} = 1.42$	$s = 0.113$	$n = 10$
Curaçao	$\bar{x} = 1.54$	$s = 0.134$	$n = 10$

The variances do not show significant differences. With the means, only the ocular index in females from Bonaire shows a slightly significant deviation compared with those from Aruba and Curaçao. So there does not exist any important variation between the populations of these islands in regard to the characteristics studied.

Larva

LA (in mm) $\bar{x} = 4.70$ $s = 0.212$ $n = 5$
0.95 confidential limits of mean of LA $4.44 < \bar{x} < 4.96$
Ocular index $\bar{x} = 1.40$ $s = 0.607$ $n = 5$
0.95 confidential limits for mean of ocular index $1.24 < \bar{x} < 1.56$

Ratio LA: width of head about 1.9. Mesothorax with only a few short hairs reaching middle of hind border. Disc of metathorax and abdomen with loose covering of rather long black hairs. Apertures of second and third scentglands rather small (diameter about 0.025 mm), distance between about twice their diameter.

Hindlegs: femur dorsally with 6–9, ventrally with 12–24; tibia dorsally with 3–4, laterally with 11–14 spines.

Centrocorisa nigripennis (Fabricius, 1803)

Sigara nigripennis FABRICIUS, 1803, p. 105 ("West Indies").
Corisae cubae GUÉRIN-MÉNEVILLE, 1843, p. 353, pl. 57 fig. 9 (Cuba).
Corisa kollarii FIEBER, 1851, p. 17 (only those from Cuba).
Corisa irrorata HERRICH-SCHÄFFER, 1853, p. 60–61 (St. Barthélemy).
Corisa cubae; GUÉRIN-MÉNEVILLE 1857, p. 422–423 (Martinique).
Corisa nigripennis; STÅL 1868, p. 138 (St. Barthélemy).
Corisa kollari; LETHIERRY 1881, p. 13 (St. Barthélemy).
Corisa cubae; UHLER 1894, p. 224 (Grenada).
Corisa kollarii; KIRKALDY 1899a, p. 30 (Jamaica).
Corisa kollarii; KIRKALDY 1899b, p. 194 (Guadeloupe).
Arctocorisa antiguensis TORRE-BUENO, 1923, p. 31–32 (Antigua).
Centrocorisa kollari; LUNDBLAD 1929a, p. 311 (description of genus).
Centrocorisa kollari; LUNDBLAD 1929b, p. 277–280, fig. 1, pl. 1 (St. Croix).
Centrocorisa cubae; JACZEWSKI 1933, p. 5 (Martinique).
Centrocorisa nigripennis; HUNGERFORD 1948, p. 437–442, pl. 70 fig. 1, pl. 72 map (Cuba, Jamaica, Haïti, Puerto Rico, Anegada, St. Croix, St. Barthélemy, Antigua, Guadeloupe, Martinique, Barbados, Grenada, Trinidad, U.S.A., México).

U.S.A., Texas; MÉXICO, Tamaulipas, Veracruz, Hidalgo, Chiapas, Campeche, Yucatán; CUBA; JAMAICA; HISPANIOLA, Haïti; PUERTO RICO; ANEGADA; LOANGO!; ST. CROIX; ST. MARTIN!; ST. BARTHÉLEMY; BARBUDA!; ANTIGUA; GUADELOUPE; MARTINIQUE; BARBADOS; GRENADA; TRINIDAD; VENEZUELA!, Paraguaná.

PUERTO RICO: Tanque Papayo, Parguera, *Sta. 707*, 19.IX.1963, 3 ♀.
LOANGO: fresh water pool, 24.III.1906, 1 ♂, 6 ♀, 2 lv (lgt. Th. Mortensen, K.).
ST. MARTIN: St. Peter Slob, *467a*, 29.VI.1955, 3 ♂, 5 ♀; Pond at Point Blanche, 528A, 5.VI.1955, 1 ♀; Pool near Point Blanche, *528Ba*, 25.VII.1955, 4 ♂, 6 ♀; Old Battery Cistern, *529b*, 3.VI.1955, 1 ♂; N.O. (= N.E.) langs Simson Bay Lagoen, 22.XI.1956, 15 ♂, 2 ♀; Cul de Sac, 27.XI.1956, 14 ♂, 31 ♀, 5 lv; Koolbaai, buiten cementen bak, 5.XII.1956, 6 ♂, 13 ♀; Koolbaai, binnenbak, 5.XII.1956, 3♂, 37 ♀; Belvedère, fresh water, 6.XII. 1956, 39 ♂, 35 ♀.
BARBUDA: pool at Warden's, *675*, 5.VII.1955, 5 ♂, 3 ♀, 2 lv.; same *676*, 5.VII.1955, (6 ♂, 16 ♀, 3 lv.).
ANTIGUA: Agricultural Experimental Station, pond, *664*, 15.VII.1955, 1 ♀.

Adults

Length (in mm)

male $\bar{x} = 7.20$	$s = 0.34$	$n = 28$	*female* $\bar{x} = 7.65$	$s = 0.34$	$n = 34$

Ocular index

male $\bar{x} = 1.15$	$s = 0.22$	$n = 29$	*female* $\bar{x} = 1.31$	$s = 0.22$	$n = 40$

Pronotum without median carina, lightly rastrate. Clavus lightly rastrate at base, remainder of hemielytron non-rastrate, shiny. Female without patches of long hairs along the border of clavus and on centre of corium.

Hindlegs: femur dorsally with 14–26, ventrally with 13–22; tibia dorsally with 3–4, laterally with 8–14 pegs.

Male pala Fig. 66, right genital clasper Fig. 64 left clasper Fig. 65.

Variation

If the materials of St. Martin and Barbuda are treated separately, the length and ocular index give the following values:

Length in *males* (in mm)			
St. Martin	$\bar{x} = 7.19$	$s = 0.376$	$n = 21$
Barbuda	$\bar{x} = 7.20$	$s = 0.157$	$n = 7$
Length in *females* (in mm)			
St. Martin	$\bar{x} = 7.69$	$s = 0.535$	$n = 15$
Barbuda	$\bar{x} = 7.62$	$s = 0.236$	$n = 19$
Ocular index in *males*			
St. Martin	$\bar{x} = 1.17$	$s = 0.251$	$n = 19$
Barbuda	$\bar{x} = 1.12$	$s = 0.113$	$n = 10$
Ocular index in *females*			
St. Martin	$\bar{x} = 1.31$	$s = 0.282$	$n = 21$
Barbuda	$\bar{x} = 1.32$	$s = 0.113$	$n = 19$

Although the means are very close in each pair, the variances differ significantly in all four cases. The variability of the Barbuda population seems to be greater, which is remarkable as these animals have been collected in the same pond on one day, whereas the materials of St. Martin studied, were randomly chosen from different stations.

Larva

LA (in mm) $\bar{x} = 5.10$ $s = 0.47$ $n = 6$

0.95 confidential limits for mean of LA $4.60 < \bar{x} < 5.60$

Ocular index $\bar{x} = 1.39$ $s = 0.175$ $n = 6$

0.95 confidential limits for mean of ocular index $1.21 < \bar{x} < 1.57$

Ratio LA: width of head about 2. Mesothorax, only a few short hairs reaching middle of hind border. Disk of metathorax and abdomen with loose covering of rather long black hairs. Apertures of second and third scent glands rather small (diameter about 0.025 mm), distance between about twice their diameter.

Hind legs: femur dorsally with 9–12, ventrally with 15–25; tibia dorsally with 4, laterally with 12–14 pegs.

The larvae of *C. kollari* and *C. nigripennis* cannot be separated on the characters studied, although the mean length of LA in a sample is generally greater in *C. nigripennis*, For the Netherlands Antilles the fact, that *C. nigripennis* is confined to the northern Island of St. Martin where *C. kollari* does not occur, is a favourable circumstance.

Ramphocorixa Abbott, 1912

Ramphocorixa rotundocephala Hungerford, 1927

Ramphocorixa rotundocephala HUNGERFORD, 1927 p. 1–2 (Cuba, Haïti).
Ramphocorixa rotundocephala; GRIFFITH 1945, p. 258 (Puerto Rico).
Ramphocorixa rotundocephala; HUNGERFORD 1948, p. 452–454, pl. 71 fig. 2 (Cuba, Haïti, Puerto Rico).

U.S.A., Arizona; MÉXICO, Jalisco, Sonora, Sinaloa, Veracruz, Chiapas; VENEZUELA!, Paraguaná; CUBA; HISPANIOLA, Haïti; PUERTO RICO; MARGARITA!; BONAIRE!; ARUBA!.

PUERTO RICO: Parguera, Tanque Papayo, *Sta 707*, 19.IX.1963, 1 ♀.
MARGARITA: Poza de la Laguna Dulce, Macanao, *19*, 20.V.1936, 1 ♀.
BONAIRE: Dam N. Wanapa, 6.V.1957, 12 ♂, 4 ♀; Guatemala, Seroe Grandi, 13.V. 1957, 5 ♂, 4 ♀; Onima, 20.V.1957, 3 ♂; same, 21.V.1957, 3 ♂, 3 ♀, 2 lv; Tanki West of Rincón, 26.V.1957, 2♀.
ARUBA: Tanki Leendert, *100*, 16.XII.1936, 1 ♀; Siribana, 28.IV.1957, 5 ♂, 41 ♀.
VENEZUELA: Paraguaná, Estanque de Moruy, *108*, 18.II.1937, 2 ♂, 2 ♀.

Adults

Length (in mm)

male $\bar{x} = 5.52$	$s = 0.130$	$n = 13$	*female* $\bar{x} = 5.70$	$s = 0.228$	$n = 19$

Ocular index

male $\bar{x} = 1.23$	$s = 0.047$	$n = 13$	*female* $\bar{x} = 1.20$	$s = 0.059$	$n = 19$

Pronotum without median carina, rastrate. Clavus rastrate over greater part, remainder of hemielytra non-rastrate, shiny. Female with dark brown to black lateral bands on last two or three sternites.

Hindlegs; femur dorsally with 3–5, ventrally with 3–4 rather small, tibia dorsally with 8–10, laterally with 16–21 spines.

Male pala with incised upper border, Fig. 68, right genital clasper Fig. 69, left genital clasper Fig. 70.

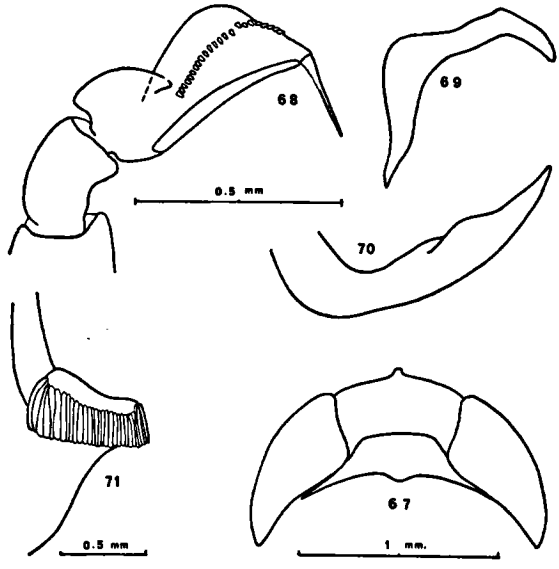

FIGURE 67–71. *Ramphocorixa rotundocephala*, male, from Bonaire (Dam N. Wanapa): 67, head dorsally; 68, pala; 69, right paramere; 70, left paramere; 71, strigil.

Variation

As there were only three males from Aruba in condition to be measured, comparison between the populations of Aruba and Bonaire is only done with females.

Length in *females* (in mm)

Aruba	$\bar{x} = 5{,}61$	$s = 0{,}321$	$n = 10$
Bonaire	$\bar{x} = 5{,}80$	$s = 0{,}124$	$n = 9$

Ocular index in *females*

Aruba	$\bar{x} = 1{,}18$	$s = 0{,}0538$	$n = 10$
Bonaire	$\bar{x} = 1{,}22$	$s = 0{,}0680$	$n = 9$

In both cases there were no significant differences between the values of these populations.

Larva (based on 2 specimens from Bonaire)

LA (in mm), 2.92–3.10

Ocular index 1.0 –1.1

Ratio LA: width of head 2.3–2.4. Mesothorax, few or no hairs reaching middle of hind border. Disk of metathorax and abdomen finely pubescent, no distinct black hairs. Apertures of scent glands with diameter about 0.03 mm, distance between about twice the diameter.

Hind legs, femur dorsally with 4–5, ventrally with 11–13, tibia dorsally with 6–9, laterally with 11–12 spines.

Trichocorixa Kirkaldy, 1908

Trichocorixa orinocoensis Sailer, 1948

Trichocorixa orinocoensis SAILER, 1948 [in HUNGERFORD 1948], p. 339–341, pl. 49 fig. 33–36, pl. 55 fig. 162, pl. 57 fig. 184, pl. 61 map (Colombia, Venezuela, Suriname, Brasil, Trinidad).

COLOMBIA, dept. Atlantico; SURINAME; BRASIL, Parahiba; VENEZUELA; TRINIDAD; BLANQUILLA!; BONAIRE!; KLEIN BONAIRE!; KLEIN CURAÇAO!; CURAÇAO!; ARUBA!.

BLANQUILLA: Poza de Aguada, *Sta. 38*, 22.VII.1936, 77 ♂, 11♀, 17 lv.

BONAIRE: Tanki Kerkhof, Kralendijk, *51*, 31.III.1937, 3 ♂, 1 ♀; Pos Ichi, Kralendijk, *52*, 14.XI.1936, 1 ♂, 1 ♀; same *52a*, 31.III.1937, 1 ♂, 4 ♀, 2 lv; Pos Baca, Kralendijk, *53*, 14.XI.1936, 1 ♀; same, *53g*, 4.XII.1963, 4 ♂, 3♀, 2 lv; Pos Baca Chikitoe, Kralendijk, *54*, 14.XI.1936, 20 ♂, 23 ♀, 6 lv; *54f*, 4.XII.1963, 2 ♂, 2 ♀; Blauwe Pan, near wall, 120 g Cl/l, *1076*, 1.IX. 1949, 1 ♀; Pos Baca Grandi, *379*, 2.IX.1948, 6 ♂, 2 ♀, 2 lv.; same, *379g*, 4.XII.1963, 20 ♂, 19 ♀, 38 lv.; surroundings of Kralendijk, first days of V.1957, 12 ♂, 3 ♀; Playa Grandi, tanki, freshwater, 4.V.1957, 10 ♂, 4 ♀; naar Lagoen, 13.V.1957, 3 ♂, 12 ♀; Rooi naar Lagoen, rather brackish, 13.V.1957, 1 ♂, 6 ♀; Onima, freshwater, 6 ♂, 1 ♀; same, 21.V.1957, 1 ♂; same, 2.VI.1957, 8 ♂, 7 ♀; Rooi Americano, freshwater, 26.V.1957, 1 ♂, Tanki west van Rincón, 26.V.1957, 4 ♀; Dam N. of Wanapa, 20.VI.1957, 1 ♂, 1 ♀; Rooi Huba, Slagbaai, clear fresh water, 22.VI.1957, 1 ♂.

KLEIN BONAIRE: Klein Bonaire, *63*, 15.XI.1936, 2 ♂; Pos Calbas, 30.III.1955, 7 ♂, 3 ♀.

KLEIN CURAÇAO: Pos N. vuurtoren, *64*, 29.VIII.1936, 9 ♂, 40 ♀; Pos, *387*, 1.X.1948, 1 ♂, 2 ♀, 1 lv; Klein Curaçao, 23.VI.1957, 9 ♂, 6 ♀.

CURAÇAO: Tanki Martha-Koosje, *397g*, 28.X.1963, 1 ♂, 1 ♀, 7 lv.; Santa Martha, X.1956, 19 ♂, 14 ♀; Christoffel, 21.X.1956, 9 ♂, 8 ♀; Westpunt, richting vuurtoren, freshwater, 1.XI.1956, 4 ♂, 2 ♀; Willemstad, Marchena, klein vuil poeltje (small dirty pond), freshwater, 10.XI.1956, 1 ♂; Piscadera Binnenbaai, 13.XI.1956, 54 ♂, 62 ♀, 5 lv.; Rio Canario, at light, II.1957, 2 ♀; Hofje v. d. Mark, 27.II.1957, 3 ♂, 2 ♀; Klein Santa Martha, bij hoge dam (near high dam), 1.III.1957, 2 ♂, 5 ♀; Plantage Noordkant, freshwater, 27.III.1957, 3 ♂, 4 ♀; Julianadorp, at light, lgt. B. de Jong, 1 ♂, 1 ♀; Julianadorp, at light, V/VI.1957, lgt. v. Ypenburg, 1 ♂, 1 ♀; Rio Magdalena, 20.VI.1957, 1 ♂; Salinja Savonet, 1.VII.1957, 4 ♂, 4 ♀.

ARUBA: Tanki Chikitoe, W. Rooi Lamoenchi, *96*, 12.II.1937, 32 ♂, 11 ♀, 17 lv.; Oranjestad, Tanki Mon Plaisir, *97*, 15.XII.1936, 1 ♂; Tanki Leendert, *100*, 16.XII.1936, 7 ♂, 7 ♀; Bron di Pos di Noord, *102*, 30.XII.1936, 1 ♀; same, *102A*, 30.XII.1936, 2 ♂, 1 ♀, 2 lv.; Bron di Rooi Bringamosa, *103*, 6.I.1937, 7 ♂, 12 ♀; Salinja Balashi, *103a*, 1.V.1955, 63 ♂, 59 ♀, 23 lv.; Spaans Lagoen, saline, 5.IV.1957, 3 ♂, 2 ♀; Pova Beach, saline, 16.IV.1967, 1 ♂, Andicouri, saline, 24.IV.1967, 15 ♂, 9 ♀; Tanki N. O. Hooiberg, 28. IV.1957, 5 ♂, 6 ♀; Siribana, 28.IV.1957, 21 ♂, 30 ♀; San Nicolas, XII.1963, lgt. D. Smits, 1 ♂, 3 ♀.

VENEZUELA: Paraguaná, Estanque de Moruy, *108*, 18.II.1937, 3 ♂, 2 ♀; Paraguaná, Estanque de Sta. Fé, N. E. Moruy, *109*, 18.II.1937, 2 ♂, 1 ♀, 1 lv.; Paraguaná, Peila, 18.II.1937, 1 ♂; Lago de Valencia, 29.XII.1891, 1 ♂, 8 ♀, 2 lv. (Meinert, K.); Puerto Cabello, 3.I.1892, 2 ♀ (Meinert, K.).

COLOMBIA: La Goajira, Río Hancha, Laguna de la Rita, *s.n.*, brackish water, 18.I.1937, 6 ♂, 2 ♀.

Adults

Length (in mm)

male	$\bar{x} = 4.33$	$s = 0.165$	$n = 20$	*female*	$\bar{x} = 4.67$	$s = 0.205$	$n = 20$

Ocular index

male	$\bar{x} = 1.16$	$s = 0.133$	$n = 40$	*female*	$\bar{x} = 1.19$	$s = 0.213$	$n = 37$

Pronotum not carinate, very slightly rastrate, yellow transverse bands rather regular and most often narrower than the alternating dark bands (Fig. 87). Hemielytra non-rastrate, shiny.

Hindlegs, femur dorsally with 4–8, ventrally with 11–19, tibia dorsally with 4–7, laterally with 9–11 spines.

MALE. Vertex slightly protruding before eyes. Pala Fig. 72. Strigil rather large and curved, left posterior lobe of abdomen with sinuated outer margin and truncate apex (Fig. 75). Left genital clasper, very characteristic, Fig. 73; right clasper Fig. 74.

FEMALE. Vertex not or hardly produced. Pronotum slightly but distincty elbowed on anterolateral edge (Fig. 87). Hemielytra with border of shiny margin along embolium anterior to nodal furrow

thickened so as to suggest a groove, obliquely ascending posteriorly. Second abdominal segment with acute lateroposterior angles, which are apressed, not pointing out at sides of hemielytra as seen from above.

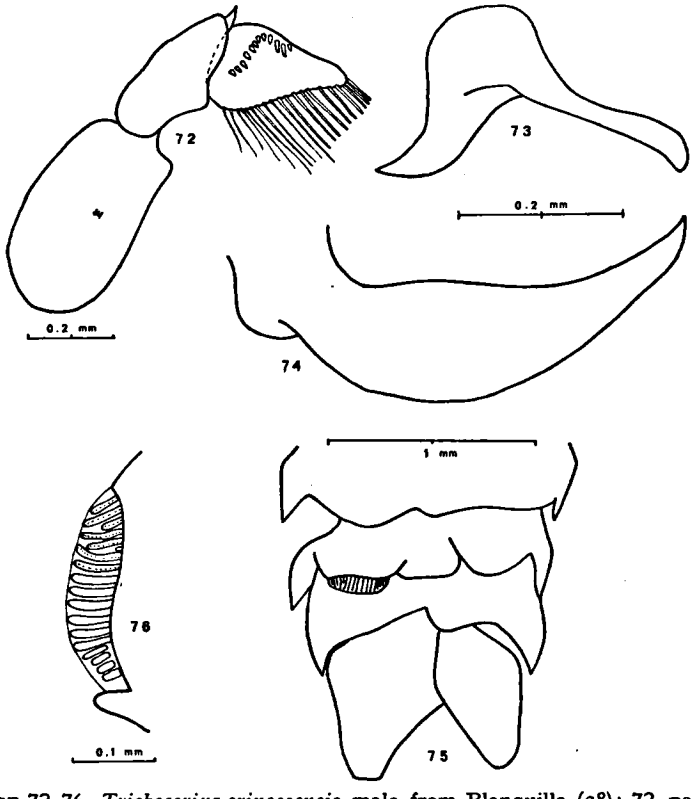

FIGURE 72–76. *Trichocorixa orinocoensis*, male, from Blanquilla (*38*): 72, pala; 73 right paramere; 74, left paramere; 75, dorsum of abdomen; 76, strigil.

Variation

In studying variation, we found that variation in length in the species of *Trichocorixa* studied was more strictly correlated with habitat than with geographical origin. There exist indications that the salt-content of the habitat has a rather strong influence on the length of the specimens (smaller with higher salinity) but this has

to be proved in a special study. DAVIS 1966 found also retardation in development at very high salinities in *Trichocorixa reticulata* G.–M. In that study was shown that in salinities over 43‰ hatching was postponed until dilution of the brine took place. Eggs with developed embryos, however, could endure considerable dehydration.

The ocular index did not vary noticeably in correlation with salt-content. For this reason only variation of ocular index was worked out.

Ocular index in *males*

Aruba	$\bar{x} = 1.202$	$s = 0.084$	$n = 10$
Blanquilla	$\bar{x} = 1.223$	$s = 0.176$	$n = 10$
Bonaire	$\bar{x} = 1.077$	$s = 0.164$	$n = 10$
Curaçao	$\bar{x} = 1.153$	$s = 0.079$	$n = 10$

Ocular index in *females*

Aruba	$\bar{x} = 1.229$	$s = 0.212$	$n = 10$
Blanquilla	$\bar{x} = 1.225$	$s = 0.161$	$n = 7$
Bonaire	$\bar{x} = 1.199$	$s = 0.308$	$n = 10$
Curaçao	$\bar{x} = 1.127$	$s = 0.093$	$n = 10$

The variances showed significant differences. In *males* of Blanquilla and Bonaire the variance is greater than in those from Aruba and Curaçao. In *females* the variance of the Bonaire sample is rather diversified. The means did not show significant differences.

Larva

LA (in mm)

$\bar{x} = 3.00$ $s = 0.185$ $n = 10$ 0.95 confidence limits of mean $2.87 < \bar{x} < 3.13$

Ocular index

$\bar{x} = 1.44$ $s = 0.085$ $n = 10$ 0.95 confidence limits for mean $1.25 < \bar{x} < 1.63$

Ratio LA: width of head about 2.2. Mesothorax, only a few short hairs reaching middle of hind border (Fig. 90). Disk of metathorax and abdomen bare. Apertures of second and third scent-glands relatively large (ø = 0.03 mm), distance between about 1.1–1.4 times their diameter.

Hind legs: femur dorsally with 3–8, ventrally with 7–18; tibia dorsally with 5–7, laterally with 10–11 spines.

Trichocorixa reticulata (Guérin-Méneville, 1857)

Corisa reticulata GUÉRIN-MÉNEVILLE, 1857, p. 432 (Cuba).
Corisa mariae CHAMPION, 1901, p. 378 (Tres Marias Islands).
Trichocorixa mariae; JACZEWSKI 1927, p. 257 (brings this species in *Trichocorixa*).
Trichocorixa reticulata; SAILER 1946, p. 617–620 (extensive discussion of synonymy).
Trichocorixa reticulata; SAILER 1948, p. 343–348; pl. 50, fig. 44–47; pl. 52, fig. 94; pl. 54, fig. 134–150; pl. 56, fig. 172–178; pl. 59, fig. 196–199; pl. 61 map (Cuba, Haiti, Puerto-Rico, St. Croix, St. Thomas, Grenada, Tres Marias Islands).
Trichocorixa reticulata; BARBER 1954, p. 18 (N. Bimini Island).
Trichocorixa reticulata; WILSON 1958, p. 158.
Trichocorixa reticulata; BACHMANN 1962, p. 142.
Trichocorixa reticulata; USINGER 1963, p. 194.
Trichocorixa reticulata; DAVIS 1966, p. 850–852 (Jamaica).

CHINA, Shanghai; HAWAIIAN ISLANDS, Honolulu, Waipahu, Molohai; U.S.A., Nevada, Kansas, Florida, Texas, New Mexico, California; MÉXICO, Baja California, Sinaloa, Islas Tres Marias, Tamaulipas, Oaxaca, Chiapas; COLOMBIA; ECUADOR; GALÁPAGOS ISLANDS, James Island, Indefatigable Island; PERÚ, Lima; VENEZUELA; SURINAME; N. BIMINI; CUBA; JAMAICA; HISPANIOLA, Haiti; MONA; PUERTO RICO; ST. THOMAS; ST. JOHN!; ST. CROIX; ANGUILLA!; ST. MARTIN!; ST. BARTHÉLEMY; MARTINIQUE!; GRENADA; BONAIRE!; KLEIN BONAIRE!; KLEIN CURAÇAO!; CURAÇAO!; ARUBA!.

PUERTO RICO: Tanque Papayo, Parguera, *Sta. 707*, 19.IX.1963, 1 ♂; Saliña Papayo, Parguera, *1426B*, 13.IX.1963, 36 ♂, 30 ♀, 23 lv, many younger larvae.
ST. THOMAS: 1.II.1891, 42 ♂, 19 ♀, 1 lv. (lgt. Meinert, K.).
ST. JOHN: 31.I.1892, 1 ♂ (lgt. Meinert, K.).
ST. CROIX: Lagoon south, brackish, 27.II. 1906, 68 ♂, 61 ♀, numerous larvae (lgt. Th. Mortensen, K.).
ANGUILLA: Saltpond of Sandy Ground, *1144*, 16.VI.1949 (ditch with *Ruppia*, 46 g Cl/l), 6 ♂, 10 ♀, 2 lv.
ST. MARTIN: Pond of Point Blanche, 528b, 27.IX.1963, 1 ♂, 3 ♀; Pond near Point Blanche, *528B*, 5.VI.1955, 18 ♂, 8 ♀; same, *528Ba*, 25.VII.1955, 2 ♀; Fish nursery, trough, *678a*, 28.IX.1963, 5 ♂, 1 ♀; Simson Bay Lagoon, near former bridge, *1130B*, 16.X.1963, 14 ♂, 11 ♀, 8 lv; Atwell's Pond, 31 g Cl/l, *1133*, 17.V.1949, 210 ♂, 214 ♀, 16 lv; Pond N. Fort Amsterdam, 37 g Cl/l, *1139*, 24.VII.1949, 171 ♂, 56 ♀; Rolandus Canal near Welvaartsbrug (muddy pond, some Ruppia), *1430*, 28.IX.1963, 13 ♂, 11 ♀, 8 lv; Langs Simson Bay Lagoen, N.O., 22.XI.1956, 4 ♂, 1 ♀; Point Blanche, zout poeltje (saline pool), 24.XI.1965, 6 ♂, 4 ♀; Simson Bay, brug, binnenzijde, 26.XI.1956, 42 ♂, 121 ♀; Cul de Sac, 27.XI.1956, 1 ♀; Koolbaai, buiten cementen bak, geen kroos (outside of concrete tank, no duckweed), 5.XII.1956, 1 ♂, 1 ♀.

St. BARTHÉLEMY: Grande Saline (pool in ditch), *1122*, 3.VI.1949, 7 ♂, 14 ♀, 3 lv.
MARTINIQUE: Fossé du Baie de Tartane, Carvelle, *767*, 9.II.1964, 1 ♀.
BONAIRE: Pos Baca Chikitoe, Kralendijk, *54*, 14.XI.1936, 1 ♂; Salinja Paloe Lechi, W. corner (large pool near wall, 93 g Cl/l), *1072*, 24.II.1949, 5 ♂, 4 ♀, 6 lv, many fragments; Witte Pan, at wall, running water, 21 g Cl/l, *1083b* 1.IX.1949, 2 ♂, 3 lv; Tanki near Salinja Slagbaai, *1100*, 2.VI.1930, 30 ♂, 48 ♀; Goto, Lagoen, bron Riscado, overflowing pool, *1106A*, 2.IX.1949, 2 ♂, 1 ♀, Entriol, at light, IV.1957, 1 ♀. S. Kralendijk, Sabana, *s.n.*, 22.VIII.1955, 2 ♂, 1 ♀.
CURAÇAO: Westpunt, richting vuurtoren, zoet (fresh water), 1.XI.1956, 2 ♂, 5♀; Santa Cruz, brak (brackish), 7.XI.1956, 7 ♂, 5 ♀; Willemstad, Marchena, vuil poeltje (small dirty pond), zoet (fresh), 10.XI.1956, 2 ♂, 1 ♀; Hofje v. d. Mark, 27.II.1957, 4 ♂, 4 ♀.
KLEIN CURAÇAO: N. of Lighthouse, pool, 18 g Cl/l., *1047*, 1.X.1948, 92 ♂, 100 ♀, 35 lv.
ARUBA: Pova Beach, zout (saline), 16.IV. 1957, 6 ♂, 7 ♀.
VENEZUELA: Puerto Cabello, 3.I.1892, 1 ♂, 1 ♀ (lgt. Meinert, K.).

Adults

Length (in mm)

male	$\bar{x} = 3.84$	$s = 0.154$	$n = 60$	*female*	$\bar{x} = 3.82$	$s = 0.381$	$n = 50$

Ocular index

male	$\bar{x} = 1.64$	$s = 0.228$	$n = 36$	*female*	$\bar{x} = 1.68$	$s = 0.277$	$n = 40$

Pronotum not carinate, slightly rastrate, shiny; yellow transverse bands irregular and most often broader than the alternating dark bands (Fig. 88). Hemielytra, clavus slightly rastrate; remainder non-rastrate, shiny.

Hindlegs: femur dorsally with 3–10, ventrally with 12–27; tibia dorsally with 4–7, laterally with 8–13 spines.

MALE. Vertex protruding before eyes. Pala Fig. 77. Strigil not large, and only slightly curved, left posterior lobe of abdomen with convex, not sinuated, outer margin (Fig. 85). Left genital clasper Fig. 21–24, right clasper Fig. 82–84.

FEMALE. Vertex not or hardly produced. Pronotum slightly but distinctly elbowed on anterolateral edge (Fig. 88). Posterior angles of second abdominal segment protruded, most often not very acutely, with points apressed; not pointing out at sides of hemielytra as seen from above.

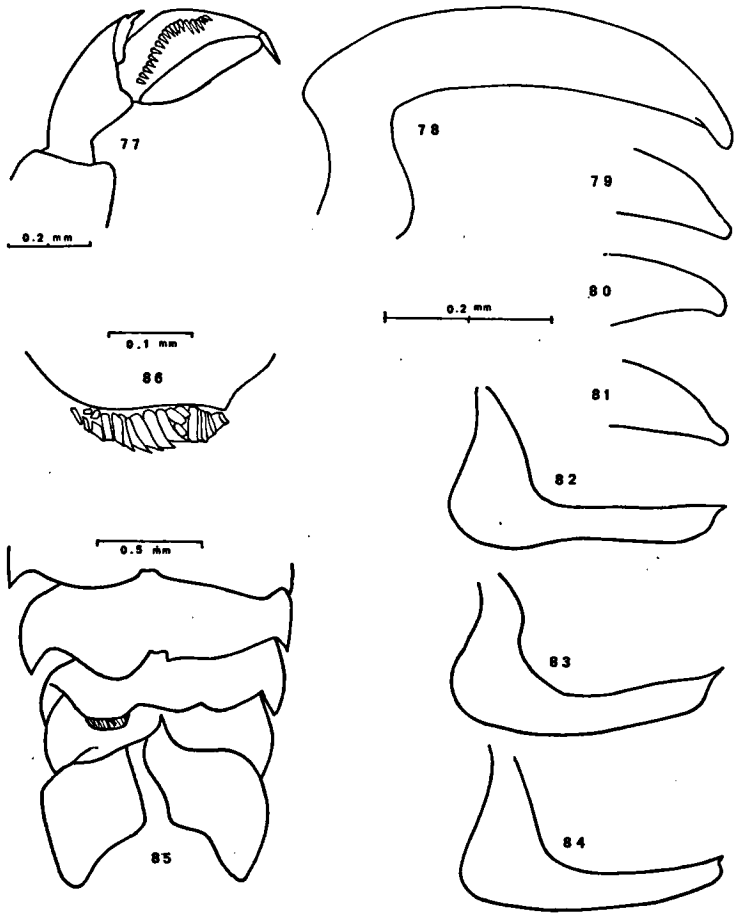

FIGURE 77–86. *Trichocorixa reticulata*, male from St. Martin (*1130B*, *1133*, *1139*): 77, pala; 78–81, left paramere; 82–84, right paramere; 85, dorsum of abdomen; 86, strigil.

Variation

Ocular index in *males*

St. Barthélemy	$\bar{x} = 1.81$	$s = 0.189$	$n = 6$
St. Croix	$\bar{x} = 1.49$	$s = 0.264$	$n = 10$
St. Martin	$\bar{x} = 1.69$	$s = 0.217$	$n = 10$
Klein Curaçao	$\bar{x} = 1.65$	$s = 0.221$	$n = 10$

Ocular index in *females*

St. Barthélemy	$\bar{x} = 1.93$	$s = 0.260$	$n = 10$
St. Croix	$\bar{x} = 1.45$	$s = 0.131$	$n = 10$
St. Martin	$\bar{x} = 1.81$	$s = 0.388$	$n = 10$
Klein Curaçao	$\bar{x} = 1.53$	$s = 0.269$	$n = 10$

In testing the variances, no differences were found in males, in females the variance of the St. Martin sample deviates significantly. In testing the means, a highly significant difference was found between the samples of St. Barthélemy and St. Croix. The others did not show significant differences, so probably this one significant value has no meaning.

Larva

Length LA (in mm) $\bar{x} = 2.52$ $s = 0.145$ $n = 10.$ 0.95 confidence limits for mean $2.42 < \bar{x} < 2.62$.

Ocular index $\bar{x} = 1.82$ $s = 0.170$ $n = 10.$ 0.95 confidence limits for mean $1.70 < \bar{x} < 1.94$.

Ratio LA: width of head is about 2.2. Mesothorax, only a few short hairs reaching middle of hind border. Disc of metanotum and abdomen bare. Apertures of second and third scent-glands relatively large (ø = 0.03 mm), distance between about 1.5 times their diameter.

Hindlegs: femur dorsally with 6–10, ventrally with 16–21; tibia dorsally with 5–7, laterally with 8–11 spines.

Trichocorixa verticalis verticalis (Fieber, 1851)

Corisa verticalis FIEBER, 1851, p. 24.
Corisa pygmaea FIEBER, 1851, p. 24.
Trichocorixa pygmaea; KIRKALDY 1908, p. 118 (brings this species in *Trichocorixa*).
Corixa sellaris ABBOTT, 1913, p. 85–86, fig. 9.
Corixa verticalis; ABBOTT 1913, p. 87.
Trichocorixa verticalis; SAILER 1946, p. 618.
Trichocorixa verticalis; RAMOS 1946, p. 27 (Mona Island).
Trichocorixa verticalis verticalis; SAILER 1948, p. 350–351, 358–361; pl. 51 fig. 64–67; pl. 52 fig. 86, 95–98; pl. 53 fig. 106–111; pl. 54 fig. 165–166; pl. 57 fig. 179; pl. 60 fig. 200, 204; pl. 62 map (Bermuda, Cuba, Haïti, Jamaica, Little Cayman, Puerto Rico, St. Thomas, Guadeloupe, Grenada).
Trichocorixa verticalis var. *sellaris*; SAILER 1948, p. 361–362; pl. 51 fig. 77–80; pl. 52 figs. 99–100; pl. 60 fig. 205–206, pl. 62 map.
Trichocorixa verticalis; HYNES 1948, p. 353–354 (Trinidad).
Trichocorixa verticalis; HERRING 1951, p. 27,

Trichocorixa verticalis; BARBER, 1954, p. 18 (N. & S. Bimini Islands).
Trichocorixa verticalis; ROBACK 1958, p. 6.
Trichocorixa verticalis; WILSON 1958, p. 158.
Trichocorixa verticalis; BACHMANN 1962, p. 142.

CANADA, Ontario; U.S.A., Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Virginia, North Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, New Mexico; MÉXICO, Tamaulipas, Sinaloa, Jalisco, Michoacán, Hidalgo, Campeche, Yucatán; BRITISH HONDURAS; BERMUDA; N. and S. BIMINI; CUBA; JAMAICA; LITTLE CAYMAN; HISPANIOLA, Haïti; PUERTO RICO; MONA; ST. THOMAS; ST. CROIX!; ST. MARTIN!; BARBUDA!; GUADELOUPE; GRENADA; TRINIDAD; MARGARITA!; BONAIRE!; KLEIN CURAÇAO!; CURAÇAO!; ARUBA!.

ST. CROIX: Lagoon South, brackish, 27.II.1906, 277 ♂, 256 ♀, numerous larvae (Lgt. Th. Mortensen, K.).

ST. MARTIN: Devils Hole Swamp, *Sta. 542a*, 26.VII.1955, 1 ♀; same, *542b*, 14.X.1963, 41 ♂, 24 ♀ 22 lv, Simson Bay Lagoon, near former bridge, *1130B*, 16.X.1963' 114 ♂, 11 ♀, 8 lv.; Devils Hole Swamp, 27.XI.1956, 31 ♂, 11 ♀.

BARBUDA: Pool at Warden's, *675*, 5.VII.1955, 1 ♂, many young larvae; N. of Castle landing, *s.n.*, 24.VII.1967, 10 ♂, 19 ♀, 4 lv.

TRINIDAD: Icacos Swamp, 1 km from shore, *793*, 16.I.1955, 7 ♂, 7 ♀; same, 2½ km from shore, *794*, 16.I.1955, 4 ♂, 1 lv.; Caroni Swamp, 3.X.1956, 7 ♂, 6 ♀, 2 lv.

MARGARITA: Poza en el Río, Porlamar, *s.n.*, 18.V.1936, 5 ♂, 2 lv.

BONAIRE: Salinja Punt vierkant, *382d*, 6.IV.1955, 1 ♂; Salinja Martinus, S. corner *1074*, 27.II.1949, 79 g Cl/1, 2 ♀; Goto, Lagoen, bron Riscado, overflowing pool, *1160A*, 2.IX.1949, 6 ♂, 6 ♀, Lac, Punta Wanapa, creeks in *Salicornia* plain, *1604*, 18.VIII. 1967, 9 ♂, 3 ♀, many larvae; Lac, Awa Lodo di San José, 45–50 g Cl/1, *1607*, 28.VIII.1967, 7 ♂, 20 ♀, many larvae; Lac, artificial pool E. of Cai (1), sand, 27 g Cl/l, *1611*, 9.IX.1967, 2 ♂, 3 ♀, 3 lv; Lac., art. pool E of Cai (4), coral debris, 23 g Cl/l, *1614*, 9.IX.1967, numerous adults and larvae; Bonaire, at light, III.1957, 1 ♂.

KLEIN CURAÇAO: *387*, 1.X.1948, 1 ♀, 1 lv.

CURAÇAO: Caracasbaai, vrij zoute poel (rather saline pool), 29.XII.1954, 1 ♂ (Zaneveld lgt.); Santa Cruz, brak, (brackish), 7.XI.1956, 2 ♂; Nieuwpoort, 12.III.1957, 1 ♀.

ARUBA: Tanki Leendert, *100*, 16.XII.1936, 1 ♂, 4 ♀; Tanki di Rooi Canashito, *101*, 7.XII.1936, 4 ♂, 1 ♀; Bron di Rooi Bringamosa, *103*, 6.I.1937, 10 ♂, 4 ♀, 15 lv.; Rooi Andicuri, *640*, 11.V.1964, 3 ♀; Salinja Balashi, pool, *Ruppia*, 45 g Cl/l, *1013*, 15.I.1949, 4 ♂, 4 ♀.

Adults

Length (in mm)
male $\bar{x} = 3.93$ $s = 0.268$ $n = 20$ *female* $\bar{x} = 4.16$ $s = 0.373$ $n = 20$

Ocular index
male $\bar{x} = 1.14$ $s = 0.189$ $n = 20$ *female* $\bar{x} = 1.06$ $s = 0.210$ $n = 20$

Pronotum not carinate, very slightly rastrate, shiny; yellow transverse bands rather regular, widths generally about equal to

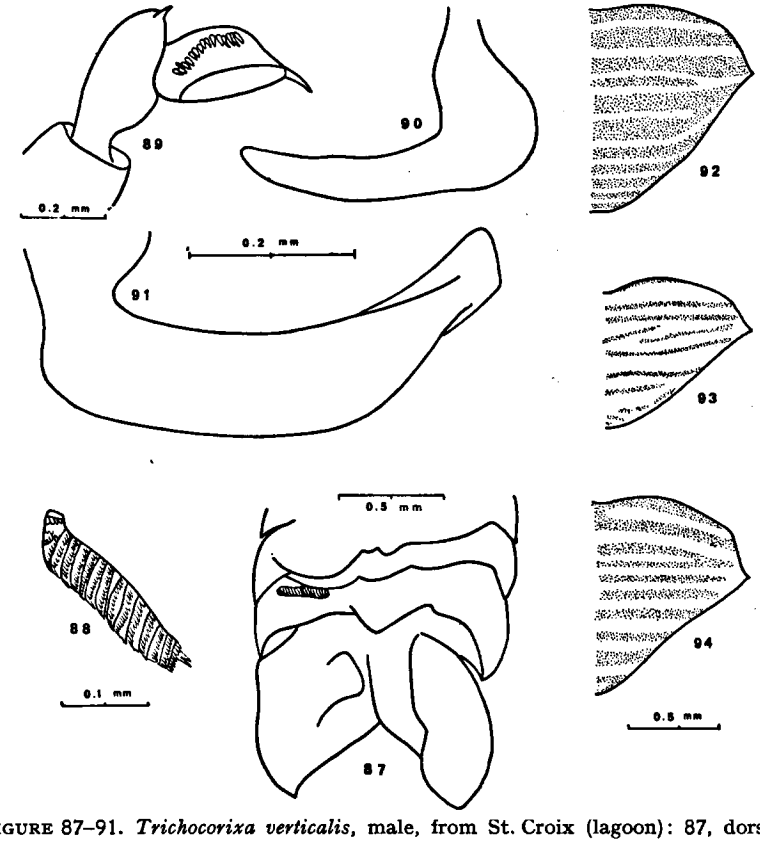

FIGURE 87–91. *Trichocorixa verticalis*, male, from St. Croix (lagoon): 87, dorsum of abdomen; 88, strigil; 89, pala; 90, left paramere; 91, right paramere.

FIGURE 92–94. Right half of pronotum of female *Trichocorixa*: 92, *T. orinocoensis*; 93, *T. reticulata*; 94, *T. verticalis*.

those of the alternating dark bands (Fig. 94). Hemielytra nonrastrate, shiny.

Hindlegs: femur dorsally with 3–5, ventrally with 11–16; tibia dorsally with 5–7, laterally with 9–12 spines.

MALE. Vertex generally strongly protruded before eyes. Pala Fig. 89, strigil not great, rather straight, left posterior lobe of abdomen with sinuated outer margin, apex rounded, not truncate (Fig. 87). Left genital clasper Fig. 90, right clasper Fig. 91.

FEMALE. Vertex most often distinctly produced before eyes. Pronotum rather strongly elbowed on anterolateral edge (Fig. 94). Posteriolateral angles of second segment acutely pointed, points standing out, most often pointing out at sides of hemielytra as seen from above.

Variation

Ocular index in *males*

St. Croix	$\bar{x} = 1.19$	$s = 0.154$	$n = 10$
St. Martin	$\bar{x} = 1.09$	$s = 0.201$	$n = 10$

Ocular index in *females*

St. Croix	$\bar{x} = 1.09$	$s = 0.178$	$n = 10$
St. Martin	$\bar{x} = 1.03$	$s = 0.244$	$n = 10$

The variances of these samples show significant differences in both cases; the means did not show significant differences.

Larva

Length LA (in mm) $\bar{x} = 2.88$ $s = 0.151$ $n = 10$ 0.95 confidence limits for mean $2.77 < \bar{x} < 2.99$

Ocular index $\bar{x} = 1.13$ $s = 0.087$ $n = 10$ 0.95 confidence limits for mean $1.07 < \bar{x} < 1.19$

Ratio LA: width of head about 2.3. Mesothorax, only a few short hairs reaching middle of hind border. Disc of metanotum and abdomen bare. Apertures of second and third scent-glands relatively large ($\varnothing = 0.03$ mm), distance between about 1.5 times their diameter.

Hindlegs: femur dorsally with 3–6, ventrally with 11–16; tibia dorsally with 4–6, laterally with 9–10 spines.

Discussion

The analysis of variability in these Corixidae gives a less clear picture than those in *Buenoa* (Nieser 1967). Frequently there occur significant differences between variances without significant differences between means. This might indicate that the influence of the habitat on the dependent variables is greater than the possible influence caused by geographical variation (i.e. the dependent variable is improperly chosen). The difference between Corixidae and *Buenoa* in this respect may be due to two causes: 1) the fact that the Corixidae are far more eurytopic than the *Buenoa* species (a salient example is the tolerance of various *Trichocorixa* in relation to salinity) and 2) the less marked isolation of populations on different islands in Corixidae as compared with *Buenoa* (which partly is a function of condition 1).

Except in *T. reticulata* and *T. verticalis* the distances between the islands where each species has been found are not great.

The identification of 5th instar larvae of the species involved is rather difficult if based on morphological characteristics alone. The genera can be separated with the following key.

Key to 5th instar larvae of genera of Corixidae occurring in the Netherlands Antilles

1a. LA more than 4 mm (if measured as mean of sample). Disk of metathorax and abdomen covered with loosely spread, rather strong black hairs (Fig. 96) . . . . . *Centrocorisa*

1b. LA less than 4 mm (generally about 3 mm). No rather strong black hairs on disc of metathorax and abdomen . . 2

2a. Distance between apertures of second and third scent-glands about twice their diameter. Abdomen with quite distinct pubescence . . . . . *Ramphocorixa*

2b. Distance between apertures of second and third scent-glands about 1.5 times their diameter. Abdomen nearly bare . . . . . *Trichocorixa*

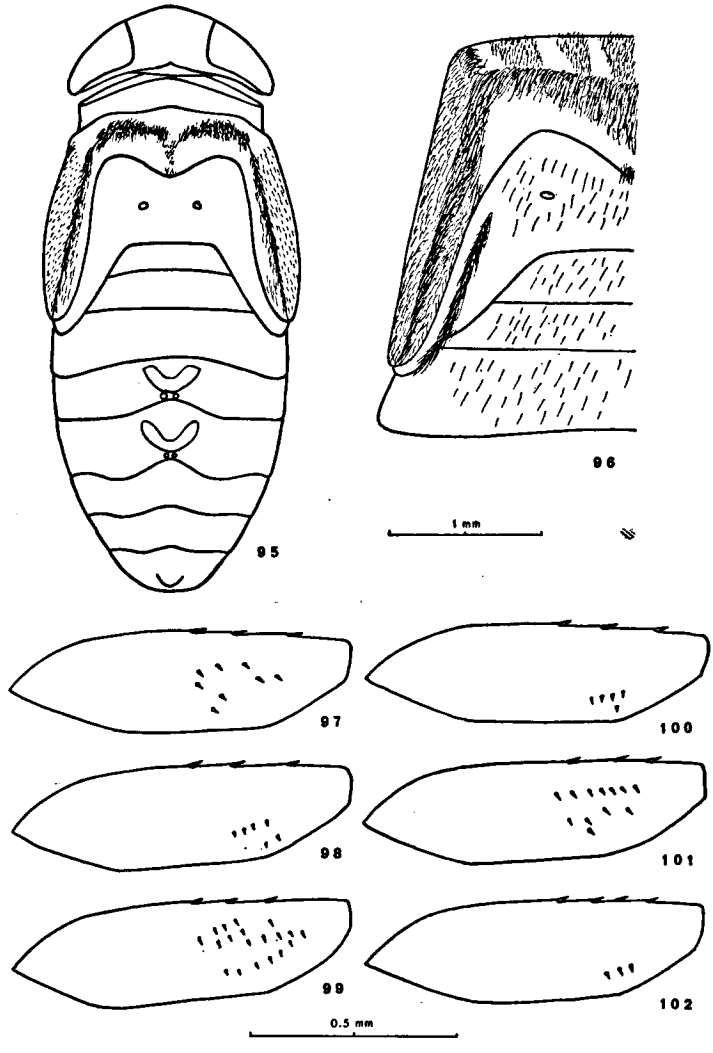

FIGURE 95. Fifth instar larva of *Trichocorixa orinocoensis*, from Blanquilla (*38*).

FIGURE 96. Left half of pterothorax of fifth instar larva of *Centrocorisa nigripennis*, from St. Martin.

FIGURE 97–102. Hindfemur of *Trichocorixa*: 97–98, *T. orinocoensis*; 99–100, *T. reticulata*; 101–102, *T. verticalis*; 97, 99, 101, ventral view; 98, 100, 102, dorsal view.

The only species of *Ramphocorixa* known to occur on the Netherlands Antilles is *R. rotundocephala*. In *Centrocorisa*, specimens from St. Martin and neighbouring islands are *C. nigripennis* whereas those from the Leeward Islands belong to *C. kollari*. Moreover the length LA is on the average distinctly less in *C. kollari* than in *C. nigripennis*.

Larvae of *Trichocorixa* cannot be identified with certainty by the characteristics studied in many cases. The following notes may assist in identification of part of the material or in pointing out to which species the greater part of a population belongs.

The spines on the tibia do not give any characteristics. The spines on the dorsal side of hind femur are of little value. Only in *T. verticalis* three spines in one row do occur regularly, whereas the other species nearly always have a more angular spine out of the main row (Fig. 98, 100, 102). The spines on the ventral surface of the hind femur give some more possibilities for identification. They are most numerous in *T. reticulata* (Fig. 99) and are generally arranged in two rather distinct rows here. In *T. verticalis* the number of spines is, on the average, somewhat less, and the posterior row is less distinct as it counts less spines (Fig. 101). In *T. orinocoensis* the number of spines is about the same as in *T. verticalis* but they are (especially the posteriors) still less distinctly in rows (Fig. 97).

Finally, it must be noted that the spines are often rather difficult to count, unless slides are made of femurs cleared in KOH.

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