

# THE GERRIDAE (HEMIPTERA) OF BRITISH COLUMBIA

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## ABSTRACT

Eight species of *Gerris* are recorded from British Columbia. The distribution and co-existence is documented and a key to species is included.

## INTRODUCTION

Downes (1927) has reported six species of Gerridae from British Columbia, namely *G. buenoi* Kirk., *G. incognitus* D. & H., *G. incurvatus* D. & H., *G. notabilis* D. & H., *G. remigis* Say and *G. rufoscutellatus* Latr. Drake & Harris (1934) added *G. nyctalis* D. & H. to the list and noted that *G. rufoscutellatus* did not occur in North America; this has been confirmed by Kelton (1961). Three additional species have been recorded from British Columbia in the very early literature, *G. marginatus* Say (Parshley, 1921), *G. dissortis* D. & H. (Criddle, 1926) and *G. gilletti* Leth. & Sev. (Bueno, 1925). However, these latter species have not been recognised in recent studies on the fauna of the province.

In research on the fauna of saline lakes in the interior of British Columbia (Scudder, 1969a), I have discovered two additional species that have not previously been recorded from the Province, namely *G. comatus* D. & H. and *G. pingreensis* D. & H. It thus is appropriate to review the records of this family in British Columbia, to assess their occurrence and distribution, and to give a key to the species.

## MATERIAL AND METHODS

Most of the material considered in this paper is located in the Spencer Entomological Museum at the University of British Columbia (U.B.C.). The waterbodies mentioned in the Cariboo and Chilcotin areas of the interior are listed in full in Scudder (1969a, 1969b). Additional records from insects in the Canadian National Collection (C.N.C.) have also been obtained.

## RESULTS

This study has shown that eight species of *Gerris* are present in British Columbia. The records of *G. dissortis*, *G. gilletti*, *G. marginatus* and *G. rufoscutellatus* have not been confirmed.

The eight species and their distribution are as follows:

### *Gerris buenoi* Kirkaldy

*Gerris buenoi* Kirkaldy 1911, Ent. News 22: 246 (Orig. descr.)

*Gerris buenoi*, Drake & Harris, 1934, Ann. Carnegie Mus. 23: 195 (Descr.)

*Gerris buenoi*, Brooks & Kelton, 1967, Mem. ent. Soc. Can. 51:47 (Descr.)

A small species, recognised by the pale lateral pronotal stripe, and the short and broad genital segments. It is known mostly from macropterous specimens in B.C., but short-winged and apterous individuals also are present. The species is widely distributed in the province on small freshwater lakes and ponds. Observations on the life history of this species have been made by Hoffman (1924) and the fifth instar larva has been described by Sprague (1967).

B.C. Material examined: Brunson L., vi (G.G.E.Scudder); Boitano L., v (G.G.E.S.); Cariboo, 83 mile, v (G.G.E.S.); pothole near Boitano L., vi (G.G.E.S.); Chilcotin — Moon's L., East L., Box 17, Nr. Phal., Crescent pothole, iv-v (G.G.E.S.); Clinton, 6 mile lake, vi (G.G.E.S.); Dutch Creek, vi (G.G.E.S.); Fort St. John, vi (A. B. Acton); Kamloops, ix (G.J.Spencer); Lac du Bois area (LB3) near Kamloops, v (G.G.E.S.); Kinbasket, vi (G.G.E.S.); Loon Lake, v (G.G.E.S.); Malahat, viii, ix (W.Downes); Manning Park, beaver pond, viii (G.G.E.S.); Marion Lake, v (G. Jamieson); McIntyre Lake, vi (G.G.E.S.); Nicola, vii (G.J.S.); Osoyoos, iii (H.B.Leech); Quesnel, vi (G.J.S.); Quick, viii (G.J.S.); Saanich Distr., vi, ix (W.D.); Springhouse, v-vi (G.G.E.S.); Steelhead, ix (G.G.E.S.); Vancouver, ix (W.D.); Victoria, vii (W.D.); Westbank, ix (W.D.); Westwick Lake, v-vi (G.G.E.S.); Williams Lake Distr., v (G.G.E.S.); W. Crescent Valley, v (J. Sheppard) (U.B.C.); Creston, v (G. Stace-Smith); Summerland, iv (A.N.Gartrell) (C.N.C.).

Range: a transcontinental species occurring throughout the northern part of the United States and southern Canada (Drake & Harris, 1934; Moore, 1950; Strickland, 1953; Brooks & Kelton, 1967; Cheng & Fernando, 1970). I have also seen specimens from Mile 550, Alaska Highway, 31.v.1962 (I. Stirling). Recorded previously from

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Saanich by Parshley (1921) and Vancouver by Downes (1927).

***Gerris comatus* Drake & Harris**

*Gerris comatus* Drake & Harris 1925. Ohio J.Sci. 25:270 (Orig. descr.)

*Gerris comatus*, Drake & Harris, 1934. Ann. Carnegie Mus. 23:193 (Descr.)

*Gerris comatus*, Brooks & Kelton, 1967. Mem. ent. Soc. Can. 51: 46 (Descr.)

This species is without a pale lateral stripe on the pronotum. The male has distinct lateral tufts of long hairs on the genital segment (segment VIII) and the female has the connexivum of segment VII not greatly incurved dorsally. Macropterous insects outnumber micropterous forms (9:1) in the B.C. material studied. The species seems to be confined to the central and northern interior of the province. The fifth instar larva has been described by Sprague (1967).

B.C. Material examined: Brunson L., vi (G.G.E.S.); Cariboo, pothole near Boitano L., vi (G.G.E.S.); Cariboo, Sorenson L., v (G.G.E.S.); Cariboo, Springhouse, v (G.G.E.S.); Cariboo, 155 mile, Old Cariboo Hwy., v (G.G.E.S.); Chilcotin, Moon's L., East Lake, v-vi (G.G.E.S.); Fort St. John, vi (A.B.A.); Stuart L., viii (G.J.S.); Vanderhoof, viii (G.J.S.); Williams Lake Distr. vi (G.G.E.S.) (U.B.C.); Rolla, vii (P.N.Vroom) (C.N.C.).

Range: from the Atlantic coast, east to Montana, being recorded from most of the intervening states (Drake & Harris, 1934). In Canada recorded from Ontario (Drake & Harris, 1934; Cheng & Fernando, 1970), Quebec (Moore, 1950), Alberta (Strickland, 1953), Manitoba, and Saskatchewan (Brooks & Kelton, 1967). Not previously recorded from B.C.

***Gerris incognitus* Drake & Harris**

*Gerris incognitus* Drake & Harris 1925. Proc. Biol. Soc. Wash. 38: 73 (Orig. descr.)

*Gerris incognitus*, Drake & Harris, 1934. Ann. Carnegie Mus. 23: 193 (Descr.)

A species with pale lateral stripe to the pronotum, and male with distinct lateral tufts of long hairs on the genital segment (segment VIII). Macropterous and apterous forms occur in about equal numbers in the material examined. This species has been recorded mostly in the southern parts of the province and on the west coast. However, it does occur in the Kootenays and the interior.

B.C. material examined: Cariboo, 83 mile, v (G.G.E.S.); Courtenay, ii; Galiano Is., iv

(G.G.E.S.); Hat Creek, vii (G.J.S.); Kimberley, North Star Mt., slough at 4,500 ft., v (I. Stirling); Lakelse Lake, v (R. Drent); Kamloops, vi (G.J.S.); Marion Lake, v-vi, viii (J. Maynard; G.J.); Qualicum, v (W.D.); Queen Charlotte Is.: Port Clements, Tlell, iii (A.B.A.); Texada Is., Paxton L., v (G. Larsen); Vancouver, iii, v-vi (G.J.S.; G.G.E.S.; H.B.L.); W. Crescent Valley, v (J.S.) (U.B.C.); Mission City, vi (E. Mason); Mt. Revelstoke, vii (G.J.S.); Squamish, 3200 ft., viii (G.J.S.) (C.N.C.).

Dr. L. Kelton informs me that the C.N.C. also contains specimens from Rolla.

Range: A western North American species for the most part, being recorded from Washington, Oregon, California, Montana, Idaho, British Columbia (Kaslo) (Drake & Harris, 1934). However, it is also reported from Quebec (Drake & Harris, 1934; Moore, 1950). Recorded from Goldstream in B.C. by Downes (1927).

***Gerris incurvatus* Drake & Harris**

*Gerris incurvatus* Drake & Harris 1925. Proc. Biol. Soc. Wash. 38: 71 (Orig. descr.)

*Gerris incurvatus*, Drake & Harris, 1934. Ann. Carnegie Mus. 23:192 (Descr.)

A moderate sized species, without a pale stripe laterally on the pronotum, and the male without lateral tufts of long hairs on the genital segment. The species is widely distributed in the province. Macropterous and short-winged forms have been examined and the former is most abundant in the B.C. material studied.

B.C. material examined: Endiver, vi (G.G.E.S.); Hat Creek, vii (G.J.S.); Kamloops, vi, viii (G.J.S.); Malahat, ix (W.D.); Marion Lake, iv-viii (J.M.; G.J.); Nicola, vi-vii (G.J.S.); Saanich Distr., ix (W.D.); Saanich Distr., Elk L., iv (W.D.); Vancouver, v-vi (G.J.S.; H.B.L.); Vernon, ix (W.D.); previously determined by H. B. Hungerford as *G. marginatus*; Victoria, vii (W.D.); Wellington, vi; West Vancouver, Lions Bay, v (G.J.S.) (U.B.C.); Copper Mt., v (G.S.S.); Douglas Lake, vii (N.C.); Minnie Lake, vii (N.C.) (C.N.C.).

Material from Summerland and White Lake is also present in the C.N.C.

Range: A western species, recorded from Washington, Oregon, California, Idaho, Montana and British Columbia (Drake & Harris, 1934). Drake & Harris (1934) also record the species from Illinois. It was recorded from Saanich and Vernon by Downes (1927), who also noted that this is the species that was reported from Beaver Lake as *G. marginatus* by Parshley (1921).

***Gerris notabilis* Drake & Hottes**

*Gerris notabilis* Drake & Hottes 1925, Ohio J.Sci. 25:46 (Orig. descr.)

*Gerris notabilis*, Drake & Harris, 1934, Ann. Carnegie Mus. 23: 189 (Descr.)

*Gerris notabilis*, Brooks & Kelton, 1967, Mem.ent.Soc.Can. 51: 45 (Descr.)

A rather large and slender, somewhat rufous species, with sternum VII of male simply emarginate. It is widely distributed in the province. Drake & Harris (1934) note that the species usually inhabits streams and is only known as the macropterous form.

B.C. material examined: Adams River, viii (G.J.S.); Aleza Lake, vii (H. Barclay); Cariboo, pothole near Boitano Lake, vi (G.G.E.S.); Brunson Lake vi (G.G.E.S.); Cariboo, Springhouse, v (G.G.E.S.); Cedarvale, viii (G.J.S.); Chilcotin, v-vi (G.G.E.S.); Duncan, ix (W.D.); Endiver, vi (G.G.E.S.); Florence Lake, xi (G.M.Neal); Forbidden Plateau, viii; Goldstream, vii (K.F.Auden); Haney, ix (W.D.); Hat Creek, vii (G.J.S.); Jesse Is., vi (G.J.S.); Kamloops, vi (G.J.S.); Kinbasket, vi (G.G.E.S.); Lake Cowichan, vi-viii (R.W.Pillsbury); 5 mi. E. of Lone Butte, vii (A.Jansson); Malahat, ix (W.D.); Marion Lake, v, viii (J.M.; G.J.); McIntyre Lake, vi (G.G.E.S.); New Westminster, ix (W.D.); Nicola, vii (G.J.S.); 30 Mls. E. of Prince George, viii (G.G.E.S.); Saanich, vi (W.D.); Vancouver, v (G.J.S.); Vancouver, Mt. Seymour, vii (H.B.L.); Vancouver, Mt. Seymour, Nancy Lake, ix (R. Leech); Vernon, x (W.D.); Vanderhoof, vii (G.J.S.); Victoria, ix (G.J.S.); Walhachin, vii (E.R.Buckell); Westwick Lake (outlet of Sorenson Lake), v (G.G.E.S.); W. Crescent Valley, v (J.S.) (U.B.C.); Copper Mt., v (G.S.-S.); Keremeos, vii (J.E.H.Martin); Minnie Lake, vii (N.C.); Mission City, v (G.J.S.); Summerland, ix (A.N.G.); Vaseaux Lake, v (A.N.G.); Westbank, iv (A.N.G.) (C.N.C.).

In the C.N.C. there are specimens also from Kitimat, Mt. Adams, Mt. Revelstoke, Queen Charlotte Is., and Terrace.

Range: California, Oregon, British Columbia, Idaho, Montana, Wyoming, Utah, Colorado, Iowa (Drake & Harris, 1934), Alberta (Brooks & Kelton, 1967). Recorded from Saanich and Vernon by Downes (1927), who notes that this was reported by Parshley (1919) as *G. rufoscutellatus*.

***Gerris nyctalis* Drake & Hottes**

*Gerris nyctalis* Drake & Hottes 1925, Ohio J.Sci. 25: 47 (Orig. descr.)

*Gerris nyctalis*, Drake & Harris, 1934, Ann. Carnegie Mus. 23: 190 (Descr.)

This species is very similar to *G. remigis*, but the male of *G. nyctalis* has a broader keel on the genital segment: usually apterous, but macropterous individuals are known (Drake & Harris, 1934). I have not seen material of this species from British Columbia, but Dr. L. A. Kelton informs me that there is material from Yahk in the C.N.C.

Range: Idaho, Colorado, Montana, Washington, California, eastern British Columbia, Newfoundland (Drake & Harris, 1934), Quebec (Moore, 1950), Alberta (Strickland, 1953).

***Gerris pingreensis* Drake & Hottes**

*Gerris pingreensis* Drake & Hottes 1925, Ohio J.Sci. 25: 49 (Orig. descr.)

*Gerris pingreensis*, Drake & Harris, 1934, Ann. Carnegie Mus. 23: 194 (Descr.)

*Gerris pingreensis*, Brooks & Kelton, 1967, Mem.ent.Soc.Can. 51: 46 (Descr.)

A moderate sized species without long silvery hair tuft on the genital segment of the male, but with a pale lateral stripe on the pronotum and abdominal sternum VII with a median longitudinal impression. The species would seem to be confined to the interior and northern part of British Columbia. Apterous individuals seem to outnumber macropterous forms (3:1).

B.C. material examined: 45 mls. N. of Atlin, vi (A.B.A.); Boitano L., v (G.G.E.S.); pothole near Boitano L., vi (G.G.E.S.); Chilcotin: Barkley Lake, Box 17, Moon's Lake, Round-up Lake, v-vi (G.G.E.S.); Clinton (LE 4), viii (G.G.E.S.); Dease Lake, viii-ix (I.S.); Fort St. John, vi (A.B.A.); Kamloops, Lac du Bois area, v-vi (G.G.E.S.); Loon Lake, v (G.G.E.S.); Meadow Lake, v (G.G.E.S.); Nicola, vii (G.F.S.); Sorenson Lake, v (G.G.E.S.); Westwick Lake, v (G.G.E.S.) (U.B.C.)

Range: streams and lakes at higher altitudes of Montana, Colorado, Idaho, Alberta (Drake & Harris, 1934; Strickland, 1953), Alberta, Saskatchewan, Manitoba (Brooks & Kelton, 1967), Quebec (Moore, 1950), Yukon-NWT, 4.vii .1944 (P.A.Larkin). Not previously recorded from British Columbia.

***Gerris remigis* Say**

*Gerris remigis* Say 1832, Heter, New Harmony: 35 (Orig. descr.)

*Gerris remigis*, Drake & Harris, 1934, Ann. Carnegie Mus. 23: 189 (Descr.)

*Gerris remigis*, Brooks & Kelton, 1967, Mem.ent.-Soc.Can. 51: 45 (Descr.)

A large and robust species, with pronotum rather brownish. It is widely distributed in the province: both apterous and macropterous forms are present, but the former predominate by far. The life history and habits of the species have been studied by Bueno (1917) and Riley (1921, 1922). This species frequents small brooks with rapid current (Sprague, 1967). The fifth instar larva is described and figured by Sprague (1967).

B.C. material examined: Alta Lake, v (J. Scudder); Cultus Lake, iv, viii, x (J. Boone; R.D.; G.G.E.S.); Cayuse River, vii (G.S. Brown); Coal Creek, 1.5 mls. S. Pt.-no-Pt., v (R.D.); Courtenay; Departure Bay, vi (G.J.S.); Hatzie Prairie, ix; Jordan River, vi (K. Taylor); Kelsey Bay, vii (G.G.E.S.); Lakelse Lake, v (R.D.); Lynn Valley, vii (H.B.L.); Marion Lake, ii, v, viii (G.J.; J.M.); Milner, viii (G.G.E.S.); Nanaimo, vi (G.J.S.); Nicola, vii (G.J.S.); Osoyoos, v (M. H. Ruhman); Paul Lake (Kamloops), viii (W. A. Clemens); Pavilion Lake, vi (G.G.E.S.); Penticton, iv (E.R.B.); 9m. and 12m., E of Princeton, iii (H.B.L.); Roberts Lake (Vancouver Is.), vii (G.G.E.S.); Royal Oak, vii (G.J.S.); Saanich Distr., x (W.D.); Salvus, viii (G.J.S.); Sweltzer Creek, iv (R.D.); Trout Lake, x (M. Miyaona); Vancouver, viii (K.F.A.); Vernon, ix (H.B.L.); Victoria, vii (K.F.A.; G.J.S.); Walhachin, vi (G.J.S.); W. Crescent Valley, v (J.S.) (U.B.C.); Errock Lake, nr. Deroche, vii (G.J.S.); Keremeos, vii (J.E.H.M.); Mission City, vii (W.R.M.Mason); Oliver, ix (C.B.Garrett); Qualicum Bay, vi (R. Coyles); Summerland, viii (A.N.G.) (C.N.C.).

In the C.N.C there is also material from Kleena Kleena.

Range: widely distributed in North America, and recorded from Canada in the north to Mexico and Guatemala in the south (Drake & Harris, 1934). Recorded previously from Vernon and Saanich by Downes (1927), and Jordan Meadows by Hardy (1949).

## KEY TO GERRIDAE OF BRITISH COLUMBIA

### Males

1. Venter with sternum VII simply emarginate (Fig. 1) ..... *notabilis* D. & H.
- Venter with sternum VII double emarginate . . . . . 2.
2. Larger species (over 11.00 mm.); first genital segment with a strong keel . . . . . 3.
- Smaller species (under 11.00 mm.); first genital segment with a weak keel . . . . . 4.
3. Species 11.50 - 16.0 mm. in length and brownish on the pronotum; genital keel narrower (Fig. 2) ..... *remigis* Say
- Species 11.50 - 13.0 mm. in length and quite fuscous on pronotum; genital keel broader (Fig. 3) ..... *nyctalis* D. & H.
4. First genital segment with a tuft of long silvery hairs on each side of keel (Figs. 4-5) . . . . . 5.
- First genital segment without a tuft of long silvery hairs on each side of keel (Figs. 6-8) . . . . . 6.
5. Pronotum with pale stripe laterally; hairs on genital segment in a line (Fig. 4) . . . . . *incongitus* D. & H.
- Pronotum without pale stripe laterally; hairs on genital segment in a tuft or group (Fig. 5) . . . . . *comatus* D & H
6. Pronotum with pale stripe laterally . . . . . 7.
- Pronotum without pale stripe laterally; genitalia as in Fig. 6 . . . . . *incurvatus* D. & H.
7. First genital segment as broad as long (Fig. 7); sternum VII without a median longitudinal groove . . . . . *buenoi* Kirk.
- First genital segment longer than wide (Fig. 8); sternum VII with a median longitudinal groove (Fig. 8) . . . . . *pingreensis* D. & H.

### Female<sup>2</sup>

1. Pronotum laterally with pale stripe . . . . . 2.
- Pronotum laterally without a pale stripe . . . . . 6.
2. Large and rather slender species, length 15.0-20.0 mm.; with very long legs; colour rather rufous; pale stripe on pronotum laterally, usually continuous with the rather pale posterior part of the pronotum . . . . . *notabilis* D. & H.
- Smaller species, less than 16.0 mm. in length; pale lateral stripe to pronotum not continued posteriorly . . . . . 3.
3. Larger and robust species, over 11.0 mm. in length . . . . . *remigis* Say.
- Smaller and less robust species, less than 11.0 mm. in length . . . . . 4.
4. Genital segment rather quadrate (Fig. 16); tergum VIII dorsally with lateral prominences (Fig. 17); small species, 7.0-8.5 mm. in length. . . . . *buenoi* Kirk.
- Genital segments not quadrate (Figs. 12-15) . . . . . 5.
5. Lateral margins of anterior abdominal sterna not broadly pale, but fuscous to margin (Fig. 11); sterna very hirsute . . . . . *pingreensis* D. & H.
- Lateral margins of anterior abdominal sterna broadly pale (Fig. 9); sterna not densely hirsute . . . . . *incongitus* D. & H.
6. Connexival spines on segment VII, when viewed from above, greatly incurved and directed towards centre of tergum (Fig. 13) . . . . . *incurvatus* D & H

—Connexival spines on segment VII, when viewed from above, not greatly incurved, but directed caudad (Fig. 15) . . . *comatus* D & H

<sup>2</sup>*G. nyctalis* not included.

**Coexistence in *Gerris***

Gause's Principle, Gause's Hypothesis or the Competitive Exclusion Principle holds that two species with similar ecology cannot live together in the same place indefinitely (Gilbert *et al.*, 1952; Hardin, 1960). During the course of studies on the aquatic insects of British Columbia, several localities have been found where more than one species of *Gerris* may be observed together and breeding at the same time.

While the biology of these species has yet to be worked out in detail, it seems worthwhile to record the occurrence of this situation. Table I presents the localities where this coexistence has been observed, and the species involved are noted. Work now being undertaken hopefully will clarify the biological significance of this coexistence in *Gerris*.

**Acknowledgments**

I am indebted to Dr. L. A. Kelton for information on the Gerridae in the Canadian National Collection, and Mrs. M. D. Jensen for the illustrations. This paper results from research supported by the National Research Council of Canada.

Area	Water body	Species						
		<i>buenoi</i>	<i>comatus</i>	<i>incognitus</i>	<i>incurvatus</i>	<i>notabilis</i>	<i>pingreenensis</i>	<i>remigis</i>
Fraser Plateau	Boitano L.	x					x	
	Westwick L.	x				x	x	
	McIntyre L.	x				x		
	Brunson L.	x				x		
	Box 17	x					x	
	Moon's L.	x	x				x	
	Boitano PH	x	x			x	x	
	LP3 (nr. Lac du Bois)	x					x	
Lower Fraser Valley	Marion L.	x		x	x	x		x

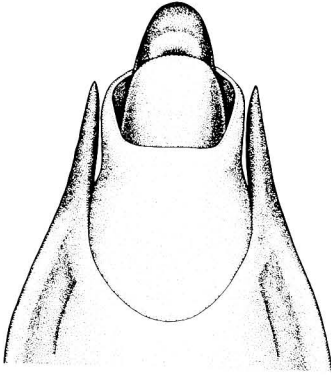
TABLE 1. Records of coexistence of species of *Gerris* in British Columbia. Water bodies arranged in order of decreasing salinity.

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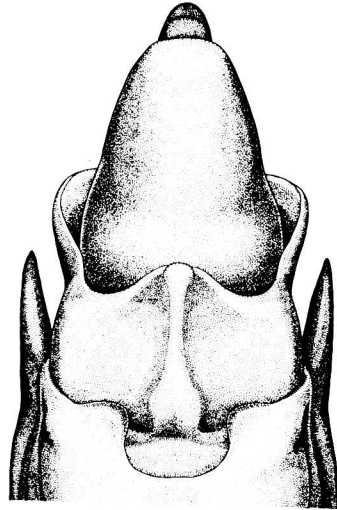
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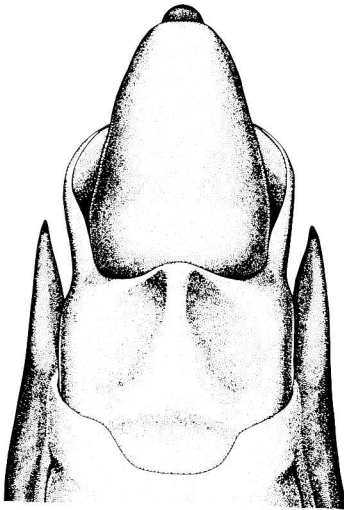
Figs. 1-8. Ventral view of genitalia of male *Gerris*. 1, *G. notabilis*; 2, *G. remigis*; 3, *G. nyctalis*; 4, *G. incognitus*; 5, *G. comatus*; 6, *G. incurvatus*; 7, *G. buenoi*; 8, *G. pingreensis*. Scale line = 1.00 mm.: colour pattern not indicated.



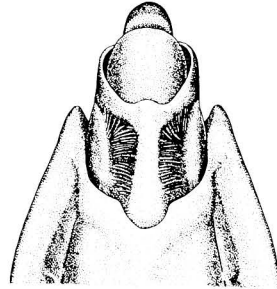
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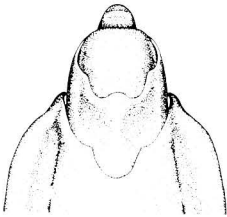
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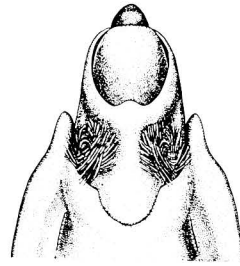
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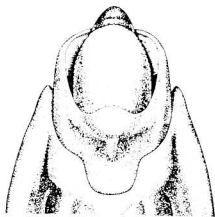
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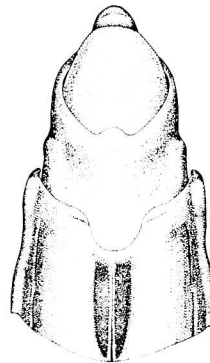
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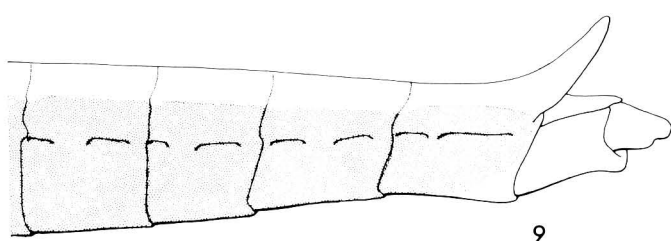


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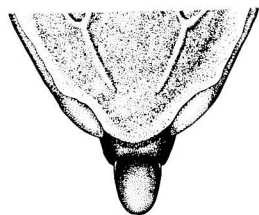


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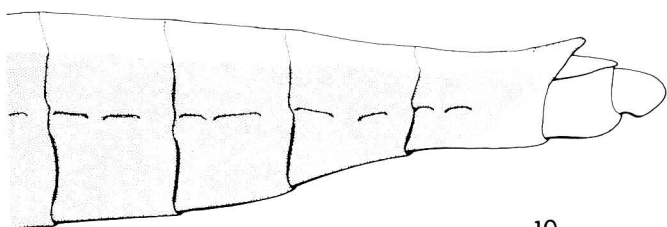




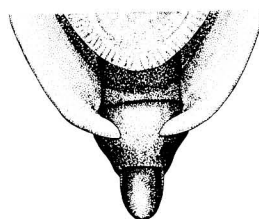
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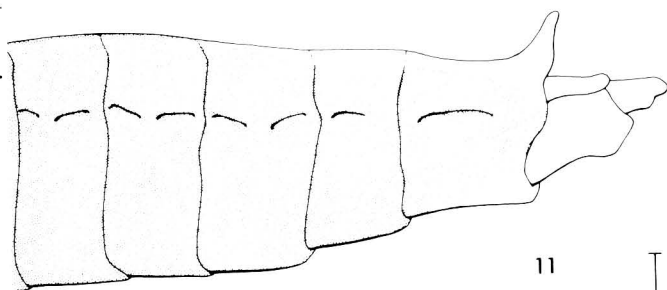
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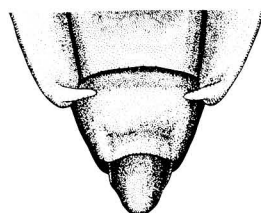
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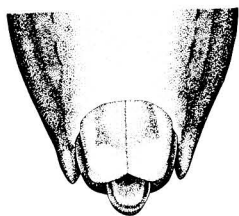
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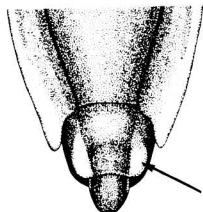
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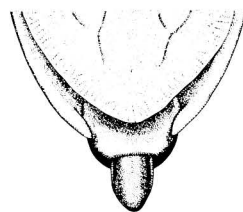
14



16



17



15

Figs. 9-17. 9-11, Side view of abdomen of female *Gerris*: 9, *G. incognitus*; 10, *G. incurvatus*; 11, *G. pingreensis*. 12-15, dorsal view of terminal part of abdomen of female *Gerris*: 12, *G. incognitus*; 13, *G. incurvatus*; 14, *G. pingreensis*; 15, *G. comatus*. 16-17, structure of end of abdomen in female *G. buenoi*: 16, ventral view; 17, dorsal view. Scale line = 1.00 mm.; colour pattern shown only on pregenital segments in Figs. 9-11.