SPECIES LIST, DISTRIBUTION AND KEYS TO THE GERROMORPHA (INSECTA: HETEROPTERA) OF ILLINOIS.

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INTRODUCTION

The semiaquatic bugs, or Gerromorpha, are adapted to life on the water surface and in some cases, near shore and shoreline habitats. Many people are familiar with the larger water striders, the Gerridae, but most of the other families are relatively small and cryptic, and thus are often poorly represented in collections.

Gerromorphans are predators and scavengers, feeding on dead and dying aerial plankton, mainly insects, which become trapped in the surface film. Some species also feed on aquatic organisms, such as mosquito larvae, cladocerans, and ostracods, which utilize the underside of the surface film.

Since most species of Illinois Gerromorpha walk upon the surface of the water, they are particularly vulnerable to oil and gas spills, which drastically effect surface tension and other properties of the water surface. Sedimentation of clear rocky streams probably also has an adverse effect on many of the species which appear to be adapted to these habitats.

Page (1989) noted that distributional data on aquatic organisms in Illinois compares favorably to similar data for other states, but that such data is lacking for most aquatic insect groups in Illinois. Because our knowledge of Gerromorpha in Illinois is relatively limited the present study was undertaken. The objectives of the present study were; (1) to make a general survey of the semiaquatic Heteroptera of southern Illinois and attempt to correlate species presence and absence with habitats, (2) to construct keys to the semiaquatic Heteroptera of Illinois, and (3) to compile a faunal list of the semiaquatic Heteroptera of the state with maps of their distributions.

MATERIALS AND METHODS

To survey the semiaquatic bugs of Illinois, museum material from throughout the state was examined and the southern Illinois fauna was more intensively studied by collecting in the southern three tiers of counties. Keys to the species of the state were developed, and distribution maps provided. Seasonal occurrence and habitat preferences are noted where sufficient data is available.

Distributions in North America are taken directly from Henry and Froeschner (1988).

Field collections were made in the bottom three tiers of counties, that is, Alexander, Gallatin, Hardin, Jackson, Johnson, Massac, Pope, Pulaski, Saline, Union, and Williamson counties. Sample sites from these eleven counties were classified into the following general habitat types: A-ponds, B-lakes, C-swamps, D-temporary pools, E-big rivers (Mississippi and Ohio Rivers), F-small rivers, G-permanent muddy streams, H-temporary muddy streams, I-clear rocky permanent streams, J-clear rocky temporary streams, K-roadside ditches, L-springs, and M-flooded river bottomlands. Specimens obtained from field work are housed in the SIU and S. J. Taylor collections.

The gerromorphs in the collections of the following institutions were identified or confirmed and locality data was recorded and later entered into a computer data base: Illinois Natural History Survey, Field Museum of Natural History, Eastern Illinois University, Western Illinois University, Illinois State University, Illinois State Museum, Loyola University and Southern Illinois University.

A more detailed version of this manuscript will be part of a dissertation in the Zoology Department at Southern Illinois University. This research will also be published in appropriate scientific journals.

RESULTS AND DISCUSSION

More than 8200 specimens of Illinois Gerromorpha, and numerous other specimens from surrounding states, were examined in the present study. Nine species (Gerris buenoi, Hydrometra hungerfordi, Mesovelia amoena, Mesovelia cryptophila, Microvelia austrina, Microvelia cerifera, Paravelia stagnalis, Rhagovelia knighti, and Rhagovelia rivale) are reported for the first time from Illinois. The presence of 27 other species of semiaquatic bugs in Illinois was confirmed by examination of specimens, and seven species previously reported from the state were not confirmed. Seven additional species, for which no Illinois specimens were seen, may possibly be found in Illinois. One specimen (a paratype) of Gerris incurvatus with Illinois locality data may be a mislabeled specimen of this western species. A total of 51 species are considered herein. Table 1 lists all of the Gerromorpha species that occur or may occur in the state.

During the present study, field work in the lower eleven counties yielded 30 of the 34 species confirmed or new to the state (not including previously listed but unconfirmed records). Habitat use by these species in southern Illinois is summarized in table 2. That such a large component of Illinois gerromorph fauna occurs in, and in some cases appears to be restricted to, the southern part of the state attests to the great biological importance of this area.

Some general observations can be made about the data which are summarized in table 2. Of the ten species which were only collected in one of the major habitat types, six were restricted to clear rocky permanent streams. In addition to providing habitat for a number of the rarer species with apparently narrow niches, permanent clear rocky streams also yielded the greatest number of semiaquatic species, nearly twice as many as small rivers and muddy streams (Table 2). Clearly these streams represent a valuable natural resource, important not only for a number of semiaquatic bugs with apparently restricted habitat requirements, but for a number of other organisms as well. Tabel 3 lists most of the clear rocky streams visited during the present study.

While rivers were not as well sampled as most other habitats (a boat was not available for this study), collections in rivers yielded two species (Metrobates hesperius and Rhematobates tenuipes) not obtained in other habitats, and one species (Mesovelia amoena) known otherwise in southern Illinois only from permanent clear rocky streams. Thus rivers represent a second major habitat type which is an important resource for semiaquatic bugs with restricted habitat requirements. The remaining two species which were collected only in one habitat type are Gerris alacris, collected in Union county in the swamp at La Rue/Pine Hills (an area for which the biota is already protected by law), and Mesovelia cryptophila, obtained only at one site at the edge of Crab Lake in eastern Gallatin county.

Other species of semiaquatic bugs may be less particular in their habitat requirements. Gerris marginatus, found in seven of the major habitat types and common throughout Illinois and the United States, was even collected from an oil covered roadside ditch. Limnoporus canaliculatus and Mesovelia mulsanti were each collected in nine of the habitat types and Microvelia hinei in eight. The existence of these more ubiquitous species is probably not seriously threatened by current land use practices in southern Illinois.

The most commonly collected species in Illinois (based on examination of museum material) was Gerris remigis. Though it was found to be abundant in all museum collections examined, this species was collected in only three of the major habitat types and is, by far, most abundant in temporary rocky streams.

Because of the rather unique location of Illinois, a number of species are possible for which Illinois would be at or near the limits of the species range. Indeed, the data presented below support this statement: Limnoporus dissortis reaches the southern limits of its range in Illinois, Rheumatobates tenuipes, Hydrometera hungerfordi, Microvelia austrina and Paravelia stagnalis reach the northern limits of their ranges in Illinois, the records of Rhagovelia knighti represents a northeastern range extension, and the single records of Microvelia cerifera and Rhagovelia rivale from southern Illinois represent the eastern-most records for these more western species. Six of the above eight species had not been reported from Illinois prior to this study, attesting to the limited number and extent of past faunal studies on these insects in North America.

A number of keys, and lists for semiaquatic bugs of various parts of the United States exist (Blatchley 1926, Deay and Gould 1936, Froeschner 1949, 1962, Hilsenhoff 1975, 1986, Kirkaldy and Torre-Bueno 1909, Polhemus 1984, Porter 1950, Slater and Baranowski 1978, Smith and Polhemus 1978, Van Duzee 1917 and Wilson 1958), but none treat all of the species possibly occuring in Illinois.

KEY TO THE ADULTS OF THE FAMILIES OF GERROMORPHA OCCURING IN ILLINOIS.

1. Claws of at least protarsi anteapical (Fig. 1A,B).....2

1'. Claws of all tarsi apical (Fig 1C).....3

2. Apex of hind femora extending much beyond tip of abdomen.....GERRIDAE

2'. Metafemora barely extending beyond tip of abdomen if at all.....VELIIDAE

3. Head as long as thorax, eyes at about the middle of the head (Fig. 1D). Extremely slender animals.....HYDROMETRIDAE

3'. Head shorter than thorax, eyes at or near posterior margin of head.....4

4. Tarsi 2 segmented. Groove under head to receive rostrum.....HEBRIDAE

4'. Tarsi 3 segmented. No groove under head.....MESOVELIIDAE

FAMILY GERRIDAE

KEY TO THE ADULTS OF THE GENERA OF GERRIDAE OCCURRING IN ILLINOIS.

1. Inner margin of eyes concave (Fig. 1E).....2

1'. Inner margin of eyes convex (Fig. 1F).....4

2. First tarsal segment of front leg about half the length of the second tarsal segment (Fig. 1A). Pronotum glabrous. Head with a broad transverse basal pale mark.....Neogerris hesione (Kirkaldy)

2'. First tarsal segment of front leg greater than half the length of the second tarsal segment (Fig. 1B). Pronotum dull.....3

3. Antennal segment 1 much shorter than antennal segments 2 + 3.....Limnoporus

3. Antennal segment 1 at most slightly shorter than antennal segments 2 + 3, or as long as or longer than 2 + 3.....Gerris

4. First antennal segment subequal to remaining segments together.....Metrobates hesperius Uhler

4'. First antennal segment much shorter than remaining three segments combined.....5

5. Third antennal segment with stiff bristles longer than diameter of the segment. Fourth antennal segment subequal to or shorter than third. Male with raptorial antennae.....Rheumatobates

5'. Third antennal segment only with short pubesence, at most with stout bristle shorter than width of segment. Fourth antennal segment distinctly longer than third. Male antennae not highly modified.....Trepobates

Genus Gerris Fabricius 1794

The bands of reflective silvery setae and golden flecks on the pronotum in Gerris species in the following key can only be seen on dry, degreased specimens. Alcohol material may be briefly dried enough to see the character and then should be returned to alcohol. The use of the bands of pronotal setae to distinguish species had not been used in keys prior to Biggam and Brusven (1989), the character has proved quite useful in distinguishing the more difficult Illinois Gerris species.

KEY TO THE ADULTS OF THE SPECIES OF GERRIS OCCURRING OR POSSIBLY OCCURRING IN ILLINOIS.

1. Males.....2

1'. Females.....10

2. Sixth abdominal sternite singly emarginate (Fig. 2A), but often with a deep median furrow.....3

2'. Sixth abdominal sternite doubley emarginate (Fig. 2B,C,D).....4

3. Sixth abdominal sternite with a deep median furrow (Fig. 2A). Connexival spines not reaching apex of genital segments. Antennal segment 1 equal to 2 + 3.....Gerris nebularis Drake and Hottes

3'. Sixth abdominal sternite without a median furrow. Connexival spines reaching or surpassing apex of genital segments.....Gerris conformis (Uhler)

4. Body length > 11.0 mm. Seventh abdominal sternite (1st genital segment) with a well developed median longitudinal ridge (Fig. 2B). Anterior labe of pronotum lacking pale lateral longitudinal stripe.....Gerris remigis Say

4'. Body length < 11.0 mm.....5

5. Anterior lobe of pronotum with pale lateral longitudinal stripe (Fig. 2E).....6

5'. Anterior lobe of pronotum lacking lateral longitudinal stripe.....7

6. Notch in sixth abdominal sternite subrectangular, wide, sides nearly parallel (Fig. 2C).....Gerris buenoi Kirkaldy

6'. Notch in sixth abdominal sternite narrow, sides diverging posteriorly (Fig. 2D).....Gerris argenticollis Parshley

7. First genital segment with conspicuous ventrolateral tufts of long, anteriorly directed hairs on either side of a median longitudinal ridge. Pronotum covered with minute golden setae except for two longitudinal bands of silvery reflective setae.....Gerris comatus Drake and Hottes

7'. First genital segment without such well developed hairs on the first genital segment. Pronotum covered with minute golden setae, with or without two longitudinal bands of silvery reflective setae.....8

8. Middle lobe of pronotum covered with minute golden setae except for two longitudinal bands of silvery reflective setae. First genital segment strongly impressed laterally. Omphalium not strongly proturbent.....Gerris marginatus Say

8'. Middle lobe of pronotum uniformly covered with minute golden setae. First genital segment impressed laterally or not. Omphalium strongly protrubent or not.....9

9. Omphalium strongly protrubent (Fig. 2F).....Gerris alacris Hussey

9'. Omphalium not strongly protrubent.....Gerris insperatus Drake and Hottes

10. Body length > 11.0 mm.....11

10'. Body length < 11.0 mm.....13

11. Connexival spines short, reaching tip of first genital segment. Length of spines no more than 2/3 width between spines at base of spines.....Gerris remigis Say

11'. Connexival spines long, reaching or nearly reaching apex of 2nd genital segment. Length of connexival spines at least 3/4 width between spines at base of spines.....12

12. Antennal segment 1 distinctly longer than 2 + 3.....Gerris conformus (Uhler)

12'. Antennal segment 1 subequal to 2 + 3.....Gerris nebularis Drake and Hottes

13. Anterior lobe of pronotum with pale lateral longitudinal stripe (Fig. 2E).....14

13'. Anterior lobe of pronotum without pale lateral longitudinal stripe.....15

14. Ventral margin of first genital segment nearly parallel to ventral margin of preceeding two abdominal sternites in lateral view (Fig 3A). Antennal segment 2 slightly longer than 3, 2 + 3 slightly longer than 1.....Gerris buenoi Kirkaldy

14'. Ventral margin of first genital segment angled upwards posteriorly relative to ventral margin of preceeding two abdominal sternites in lateral view (Fig. 3B). Antennal segment 2 equal to 3, 2 + 3 equal to 1.....Gerris argenticollis Parshley

15. Tips of connexival spines with long (0.1 mm) dark setae at and near tip. Connexival spines not reaching apex of first genital segment. Middle lobe of pronotum with golden flecks interrupted by two longitudinal bands of reflective silvery setae.....Gerris comatus Drake and Hottes

15'. Tips of connexival spines with short (<0.05 mm or slightly more) setae at tip.....16

16. Middle lobe of pronotum with golden flecks interrupted by two longitudinal bands of reflective silvery setae. Connexival spines reaching or surpassing apex of 1st genital segment. Connexival spines only weakly curved.....Gerris marginatus Say

16'. Middle lobe of pronotum uniformly covered with golden flecks. Connexival spines not reaching apex of 1st genital segment.....17

17. Posterior lobe of pronotum (posterior to humeral angles) with lateral bands of reflective silvery setae and median golden flecks. Venter of genital segment often yellowish.....Gerris insperatus Drake and Hottes

17'. Posterior lobe of pronotum uniformly covered with golden flecks (sometimes a few silvery setae at lateral margins). Venter of genital segments often dark.....Gerris alacris Hussey

Gerris nebularis Drake & Hottes, 1925

Distribution: AL, AR, FL, GA, IL, IN, IA, KS, LA, MS, MO, NC, NJ, NY, NB, OH, SC, TN, VA.

Illinois records: ALEXANDER, COLES, GALLATIN, HARDIN, JACKSON, JEFFERSON, JOHNSON, MCDONOUGH, POPE, PULASKI, SALINE, SHELBY, UNION, WASHINGTON, WAYNE and WILLIAMSON counties.

Map # 8.

Collection dates range from 15 April to 21 October. Common in still waters of medium to large streams and small rivers in the southern part of the state. Extending as far north as McDonough county.

Gerris remigis Say, 1832

Distribution: ALL 48 STATES, B.C., MAN., N.S., NFLD., ONT., QUE., MEX., GUAT.

Illinois records: ALEXANDER, BROWN, CARROLL, CHAMPAIGN, CLARK, COLES, COOK, DOUGLAS, DU PAGE, EDGAR, EFFINGHAM, FRANKLIN, HANCOCK, HARDIN, JACKSON, JO DAVIESS, JOHNSON, KANKAKEE, LA SALLE, MARION, MASSAC, MCDONOUGH, MCLEAN, MOULTRIE, OGLE, PEORIA, PERRY, PIATT, PIKE, POPE, PULASKI, SANGAMON, SHELBY, UNION, VERMILION, WILL and WILLIAMSON counties.

Map # 9.

Collected every month of the year, this common species is found throughout the state in pools of small clear rocky streams, especially temporary streams. This is the most commonly collected gerromorphan in the state.

Gerris conformus (Uhler), 1878

Distribution: CT, DC, DE, GA, LA, MA, MD, ME, MI, MS, NC, NH, NJ, N.S., NY, OH, PA, SC, TN, VA, WI, MEX.

No Illinois specimens of this eastern species were found in collections, but it could turn up in Illinois.

Gerris alacris Hussey, 1921

Distribution: CT, DC, IL, IN, KS, ME, MI, MO, NC, NJ, OH, SC, VA.

Illinois records: JACKSON, POPE and UNION counties.

Map # 1.

An uncommon southeastern species, collected in Illinois only in the southern part of the state (but also known from Michigan). Most collections are from La Rue swamp in Pine Hills (Union county). Collection dates: 15 March to 13 July.

Gerris argenticollis Parshley, 1916

Distribution: AR, FL, GA, IL, IN, LA, MA, MI, MS, MO, NC, NJ, NY, SC, VA.

Illinois records: ADAMS, CHAMPAIGN, CLARK, COLES, COOK, EFFINGHAM, HANCOCK, JACKSON, JOHNSON, MCDONOUGH, PEORIA, POPE, PULASKI, SALINE, UNION, VERMILION and WILLIAMSON counties.

Map # 2.

Collected from 28 February to 27 July throughout the southern two thirds of the state (with one 1906 specimen bearing a Chicago label). Mainly in ponds and streams.

Gerris buenoi Kirkaldy, 1911

Distribution: AK, ALTA., B.C., CO, CT, ID, MAN., MA, ME, MI, MN, MO, MT, NH, NJ, NY, NFLD., ONT., QUE., RI, SC, SD, SASK., VA, WI, WY.

Illinois records: CHAMPAIGN, COOK, LAKE, MCHENRY and PULASKI counties.

Map # 3.

This northern species extends south into northern Illinois, with two speciemens from central Illinois (Champaign county) and
a singe specimen from Pulaski county in southern Illinois. The species closely resembles Gerris argenticollis. Collections range from 23 March to 9 November.

Gerris comatus Drake and Hottes, 1925

Distribution: ALTA., AZ, BC, CO, CT, FL, IA, IL, IN, KS, MAN., MD, MI, MN, MO, MT, NH, NJ, NM, NY, NB, OH, OK, ONT., PA, QUE., SC, SD, SASK., VA, WI, WY.

Illinois records: COOK, JO DAVIESS, LAKE, MASON, MCDONOUGH, MCHENRY, STEPHENSON, VERMILION and WILL counties.

Map # 4.

Collected from 10 March to 2 November in the northern half of the state.

Gerris incurvatus Drake and Hottes, 1925

Distribution: B.C., CA, ID, IL, MT, NV, OR, TX, WA, WY.

Illinois record: PUTNAM county.

Map # 5.

This single specimen of an exclusively western species may be mislabeled. The species is not to be expected in Illinois and is therefore not included in the key.

PUTNAM Co.: Hennepin, Illinois R., H280, 13 September 1912 (INHS, PARATYPE).

Gerris insperatus Drake and Hottes, 1925

Distribution: AZ, CO, FL, GA, IL, IN, MN, MS, NC, NJ, NY, OH, ONT., PA, QUE, SD, TX, VA, WV, MEX.

Illinois records: ALEXANDER, CASS, CHAMPAIGN, CLARK, COLES, GALLATIN, HANCOCK, JACKSON, MCDONOUGH, POPE, SALINE, UNION, WAYNE and WILLIAMSON counties.

Map # 6.

Found throughout the southern two thirds of the state from 20 March to 30 July (one specimen dated 4 November).

Gerris marginatus Say, 1832

Distribution: ALL 48 STATES, EXCEPT CA, MAN., N.S., ONT., QUE., MEX.

Illinois records: ADAMS, CARROLL, CASS, CHAMPAIGN, CLARK COLES, COOK, DU PAGE, FRANKLIN, GALLATIN, HANCOCK, HARDIN, IROQUOIS, JACKSON, JO DAVIESS, JOHNSON, LA SALLE, LAKE, MACOUPIN, MADISON, MARSHALL, MASON, MCDONOUGH, MCHENRY, MCLEAN, OGLE, PERRY, POPE, PULASKI, SAINT CLAIR, SALINE, SANGAMON, STEPHENSON, TAZEWELL, UNION, VERMILION, WAYNE and WILLIAMSON counties.

Map # 7.

Perhaps the most common, Gerris in Illinois. Collected from 2 January to 2 November in a variety of habitats, especially streams and ponds.

Genus Limnoporus Stal, 1868

KEY TO THE ADULTS OF THE SPECIES OF LIMNOPORUS OCCURING OR POSSIBLY OCCURING IN ILLINOIS.

1. First genital segment (7th sternite) of male with a ventral median keel at base. Body length <= 11.0 mm.....Limnoporus canaliculatus (Say)

1'. First genital segment of male lacking ventral median keel at base. Body length > 11.0 mm.....2

2. Connexival spines of male longer than narrowest distance (ventral view) between them. Posterior margin of 1st genital segment of male straight. Length >= 15.0 mm.....Limnoporus notabilis (Drake and Hottes)

2'. Connexival spines of male shorter than or equal to narrowest distance (ventral view) between them. Posterior margin of 1st genital segment of male slightly convex. Length < 15.0 mm.....Limnoporus dissortus (Drake and Harris)

Limnoporus canaliculatus (Say), 1832

Distribution: AL, AR, CT, FL, GA, IA, IL, LA, MA, MI, MS, MO, NC, NJ, NY, OH, RI, SC, TN, TX, VA.

Illinois records: ALEXANDER, COLES, GALLATIN, JACKSON, JOHNSON, MCDONOUGH, POPE, PULASKI, SALINE, UNION and WILLIAMSON counties.

Map # 10.

Limnoporus canaliculatus is common in a wide variety of habitats in southern Illinois, where it has been collected from 13 March through 8 November. The species has been collected in Illinois as far north as McDonough county.

Limnoporus dissortis (Drake and Harris), 1930

Distribution: ALTA., CT, DE, IA, IN, IL, KS, KY, MA, MD, ME, MI, MN, MO, NJ, NY, NB, NFLD., OH, ONT., PA, RI, WV, WI.

Illinois records: CARROLL, COOK, LAKE and STEPHENSON counties.

Map # 11.

This species has a more northern distribution than L. canaliculatus and has been collected in northern Illinois from 22 April to 4 August.

Limnoporus notabilis (Drake and Hottes), 1925

Distribution: ALTA., AZ, BC, CA, CO, IA, ID, MT, NM, OR, SD, UT, WA, WY.

Limnoporus notabilis is a western species, extending as far east as Iowa. Possible occur in the western part of Illinois.

Genus Neogerris Matsumura, 1913

Neogerris hesione (Kirkaldy), 1902

Distribution: AL, AK, AR, FL, GA, IA, IL, IN, KS, KY, LA, MI, MS, MO, NC, NY, NB, OH, OK, PA, SC, TN, TX, VA, WV, CUBA, PANAMA.

Illinois records: ALEXANDER, COLES, EFFINGHAM, FRANKLIN, HARDIN, JACKSON, JOHNSON, MASON, MASSAC, MCDONOUGH, PERRY, SHELBY, UNION, PULASKI, SALINE, VERMILION and WILLIAMSON counties.

Map # 13.

Common in duckweed covered ponds and lakes in southern Illinois, and probably abundant in appropriate habitat throughout the southern two thirds of the state. Collection dates range from 21 March to 27 November.

Genus Rheumatobates Bergroth, 1892

No characters are yet known which allow us to distinguish the females of Illinois Rheumatobates.

KEY TO THE ADULTS OF THE MALES OF THE SPECIES OF RHEUMATOBATES OCCURING OR POSSIBLY OCCURING IN ILLINOIS.

1. Hind femora straight.....Rheumatobates tennuipes Meinert

1'. Hind femora distinctly bowed.....2

2. Basal 1/2 of hind femora with obvious tufts oflong hairs, at least some greater than width of femur....3

2'. Basal 1/2 of hind femora with at most fine pubesence.....4

3. Fourth antennal segment with distinct tooth at middle or slightly beyond...Rheumatobates rileyi Bergroth

3'. Fourth antennal segment with distinct tooth proximal to middle of segment.....Rheumatobates palosi Blatchley

4. Hind femora with apical tufts of long hairs. Hind tibiae with thick row of hairs on distal 1/3. Hind tibiae nearly straight.....Rheumatobates trulliger Bergroth

4'. Hind femora lacking apical tufts of hairs. Hind tibiae lacking thick row of hairs on distal 1/3. Hind tibiae with strong (30-40 degrees) bend in proximal 1/3.....Rheumatobates hungerfordi Wiley

Rheumatobates hungerfordi Wiley, 1923

Distribution: AZ, AR, GA, LA, MO, NM, OK, SC, TX, UT, BELIZE, MEX.

A southern and western species which extends into Missouri, possible in Illinois.

Rheumatobates palosi Blatchley, 1926

Distribution: AR, FL, GA, IL, IN, KS, LA, MI, MN, MS, MO, NY, OH, OK, SASK., TN, TX, VA.

Illinois records: CHAMPAIGN, COLES, COOK, GALLATIN, HARDIN, JACKSON, JOHNSON, MASON, PIATT, POPE, SALINE, UNION and WILLIAMSON counties.

Map # 14.

The most common Illinois Rheumatobates species, collected from 27 June through 26 Novmber. Found throughout the state in large streams, rivers, ponds, and especially lakes. Because of its smaller size (relative to Gerris) and tendency to frequent the shade of overhanging willows and bushes, this species is probably underrepresnted in general collections.

Rheumatobates rileyi Bergroth, 1892

Distribution: DC, FL, GA, IA, IL, IN, KS, LA, MAN., MA, MD, MI, MS, NC, NJ, NY, OH, QUE., SC, SASK., TN, VA, VT.

Reported from Illinois but not confirmed. Early records of R. palosi may be found under this name.

Rheumatobates tenuipes Meinert, 1895

Distribution: AR, DC, FL, GA, IL, KY, LA, MD, MS, MO, NC, NJ, NY, OK, SC, TN, TX, VA, BELIZE.

Illinois records: GALLATIN, SALINE and WILLIAMSON counties.

Map # 15.

This species has been collected from beneath overhanging vegetation in small rivers in southern Illinois from 9 July to 17 October. This species is probably more common than the data indicate since appropriate habitat is difficult to reach without a boat.

Rheumatobates trulliger Bergroth, 1915

Distribution: AR, FL, GA, KS, MS, MO, OK, TN, TX.

A southeastern species which may turn up in the southern parts of the state.

Genus Metrobates Uhler, 1871

Metrobates hesperius Uhler, 1871

Distribution: AL, AR, CT, DE, FL, GA, IA, IL, IN, KS, LA, MAN., MA, MD, ME, MI, MN, MS, MO, NC, NJ, NY, OH, ONT., PA, QUE., RI, SC, TN, VA, HAITI.

Illinois records: CHAMPAIGN, CLARK, COLES, EFFINGHAM, MCLEAN, PEORIA, PULASKI, WILL and WILLIAMSON counties.

Map # 12.

Largely restricted to smooth swift water on rivers, this species has been collected through much of the state. Dates range from 12 July to 12 October. Collections probably undrepresent the species, since it would best be collected from a boat. This species may also occur in the Mississippi and Ohio Rivers.

Genus Trepobates Uhler, 1883

KEY TO THE ADULTS OF THE APTEROUS TREPOBATES OCCURING IN ILLINOIS.

1. Light colored lateral mesonotal stripe behind dark lateral pronotal stripe absent (Fig. 3C).....Trepobates subnitidus Esaki

1'. Light colored lateral mesonotal stripe behind dark lateral pronotal stripe present, either very short or extending the length of the mesonotum (Fig 3D,E).....2

2. Lateral mesonotal sripe extending entire length of mesonotum (Fig. 3D).....Trepobates pictus (Herrich-Schaeffer)

2'. Lateral mesonotal stripe very short (Fig. 3E).....3

3. Female never with connexival spines. Pubesence on abdominal segment 8 of male pale in color.....Trepobates inermis Esaki

3'. Female usually with connexival spines. Pubesence on abdominal segment 8 of male darker in color.....Trepobates knightii Drake and Harris

Trepobates inermis Esaki, 1926

Distribution: CT, FL, GA, IA, IL, IN, KS, KY, LA, MA, MD, MI, MS, NJ, NY, OH, ONT., PA, TN, TX, VA, WV, WEST INDIES.

Illinois record: COLES county.

Map # 16.

This species is rare in Illinois, but apparently is established in Coles county, with three specimens collected over a 17 year period. Collected only in late September.

Trepobates knighti Drake and Harris, 1928

Distribution: AR, IA, IL, IN, KS, LA, MI, MN, ND, MO, OK, SD, TX.

Illinois records: CHAMPAIGN, COOK, HARDIN, JACKSON, KANKAKEE, PIATT, POPE, UNION and WILL counties.

Map # 17.

This species is probably found throughout the state. In southern Illnois the species inhabits clear rocky streams. Dates range from 10 June to 24 October.

Trepobates pictus (Herrich-Schaeffer), 1847

Distribution: AL, AZ, AR, CT, DC, DE, FL, GA, IL, IN, KS, KY, LA, MA, MD, ME, MI, MN, MS, MO, NC, NH, NJ, NY, OH, ONT., PA, RI, SC, TN, TX, VA, WV, S. AMER., WEST INDIES.

Illinois records: COLES, HARDIN, JACKSON, JOHNSON, MASSAC, POPE and UNION counties.

Map # 18.

Mainly in clear rocky streams in southern Illinois extending north to Coles county. Collection

dates range from 23 June to 31 October.

Trepobates subnitidus Esaki, 1926

Distribution: AL, AR, CT, DC, FL, GA, IA, IL, IN, KS, KY, LA, MA, ME, MD, MI, MN, MS, MO, NC, NH, NJ, NM, NY, NB, OH, OK, ONT., PA, RI, SC, TN, TX, VA, WV.

Illinois records: ALEXANDER, CHAMPAIGN, COLES, EFFINGHAM, FRANKLIN, FULTON, GALLATIN, HARDIN, IROQUOIS, JACKSON, JOHNSON, KANKAKEE, MASON, MASSAC, MCDONOUGH, PIATT, POPE, PULASKI, SALINE, UNION and WILLIAMSON counties.

Map # 19.

By far the most common species of Trepobates in Illinois, this species should be found throughout the state (though it apparently has not been reported from northern Illinois). Found in streams, lakes, ponds, rivers. Collected 19 February through 3 November, though there are few records earlier than June.

FAMILY HEBRIDAE

KEY TO THE ADULTS OF THE GENERA OF HEBRIDAE OCCURING IN ILLINOIS.

1. Antennae 5 segmented.....Hebrus

1'. Antennae 4 segmented.....Merragata

Genus Hebrus Curtis, 1833

The genus Hebrus has been particularly problematic, as no keys are available which cover all the species occuring or possibly occuring in Illinois, and original descriptions of species are often outdated and inadequet for distinguishing the species. John Polhemus, of the University of Colorodo Museum, has recently loaned me specimens of most of the material in question, and a key is currently being worked out.

Hebrus beameri Porter, 1952

Distribution: GA, IN, KS, OH.

Possible in Illinois.

Hebrus buenoi Drake and Harris, 1943

Distribution: CA, CO, DC, FL, IA, ID, IL, KS, LA, MA, MI, MO, MS, NY, NB, OH, OR, PA, VA, WI.

Reported from Illinois.

Hebrus burmeisteri Lethierry and Severin, 1896

Distribution: DC, FL, GA, IA, IL, KS, KY, MA, MD, MI, MO, NH, NJ, N.S., NY, ONT., PA, QUE., SC, SASK., VA, WI, MEX.

The most common Hebrus in our area, reported from Illinois.

Hebrus concinnus Uhler, 1894

Distribution: AL, CO, CT, FL, IL, LA, MD, MI, NC, NJ, NM, NY, OK, ONT., PA, QUE., SC, TX, MEX., S. AMER., WEST INDIES.

Reported from Illinois.

Hebrus sobrinus Uhler, 1877

Distribution: AZ, CA, CO, GA, KS, MO, NJ, NM, NV, TX, VA, VT.

A southern and western species, possible in Illinois.

Hebrus tuckahoanus Drake and Chapman, 1954

Distribution: IL, NJ.

Illinois record: LAKE county.

Map # 20.

This extremely rare bug is only known from two localities, one in New Jersey and the other at Illinois Beach State Park. The Illinois specimen is housed in the Polhemus Collection (University of Colorodo Museum). Dr. Polhemus has provided the label data: LAKE Co.: IL Beach St. Pk., bridge over Dead River, 25 June 1972.

Genus Merragata White, 1877

KEY TO THE ADULTS OF THE SPECIES OF MERRAGATA (MACROPTEROUS INDIVIDUALS) OCCURING IN ILLINOIS.

1. Macropterous individuals with wing membrane white. Apex of scutellum (macropterous form) rounded.....Merragata brunnea Drake

1'. Macropterous individuals with four clearlyvisible light spots on darker wing membrane. Apex of scutellum (macropterous form) truncate or slightly concave.....Merragata hebroides White

Merragata brunnea Drake, 1917

Distribution: "S. CANADA", FL, IL, KS, MI, MN, NJ, NB, OH, TX.

Illinois records: ALEXANDER, JACKSON, JOHNSON, MASSAC and UNION counties.

Map # 21.

Probably more abundant than the available data suggest. In the present study, this species was usually found in association with duckweed near the shoreline of ponds and lakes. Collection dates range from 18 May to 17 October. Illinois collections are only from the southern tip of the state, though the species has been collected in Michigan and Minnesota.

Merragata hebroides White, 1877

Distribution: AL, ALTA., AZ, B.C., CA, CO, CT, FL, IA, IL, IN, KS, KY, LA, MAN., MA, MI, MN, MO, MS, NJ, NM, NY, NB, OH, ONT., PA, SASK., TX, VA, WV, HA, MEX. TO ARGENTINA, WEST INDIES.

Illinois records: COLES, COOK, HANCOCK, IROQUOIS, JACKSON, MCDONOUGH, POPE, UNION, VERMILION and WILLIAMSON counties.

Map # 22.

Collected throughout most of Illinois from 6 April to 19 October. This species is less common than M. brunnea in southern Illinois.

FAMILY HYDROMETRIDAE

Genus Hydrometra Latreille, 1796

KEY TO THE ADULTS OF THE SPECIES OF HYDROMETRA OCCURING IN ILLINOIS.

1. 2 pits on each side above meoscoxae (Fig 4A). Male with a pair of linear, transverse processes on 6th abdominal sternite (Fig. 4B). Color brown.....Hydrometra martini Kirkaldy

1.' 4 pits on each side above mesocoxae (Fig. 1D). Male with a pair of spine-like tubercle on 6th abdominal sternite (Fig. 4C).

Color blue-black.....Hydrometra hungerfordi Torre-Bueno

Hydrometra hungerfordi Torre-Bueno, 1926

Distribution: AR, DC, FL, GA, KS, LA, ME, MS, MO, NJ, NY, SC, VA, CENT. AMER.

Illinois records: ALEXANDER, HARDIN, JACKSON, JOHNSON, POPE, PULASKI and UNION counties.

Map # 23.

This southeastern species is undoubtedly more common than the collection data indicates, as it is best obtained by vigorously scooping a net up under overhanging banks of clear rocky streams where the roots hang down into the water. Occasionally collected on swamps, lakes and ponds. Collection dates range from 28 February to 10 October. In Illinois this species has only been collected in the southern part of the state.

Hydrometra martini Kirkaldy, 1900

Distribution: AR, AZ, B.C., CT, DC, FL, GA, IA, ID, IL, IN, KS, LA, MD, ME, MAN., MA, MI, MN, MS, MO, NC, NJ, NY, OH, ONT., OR, PA, QUE, SC, SD, TN, TX, VA.

Illinois records: ALEXANDER, CHAMPAIGN, COLES, COOK, EFFINGHAM, FRANKLIN, HARDIN, JACKSON, JOHNSON, MASON, MASSAC, POPE, UNION, VERMILION, WASHINGTON and WILLIAMSON counties.

Map # 24.

This is the more commonly collected hydrometrid, found throughout the state from 15 March to 16 November, especially among emergent vegetation in ponds, lakes and sometimes streams.

FAMILY MESOVELIIDAE

Genus Mesovelia Mulsant and Rey, 1852

KEY TO THE ADULTS OF THE SPECIES OF MESOVELIA OCCURRING IN ILLINOIS.

1. Pro and mesofemora with a row of black spines on ventral margin.....Mesovelia mulsanti White

1'. Pro and mesofemora lacking row of spines.....2

2. Two broad, longitudinal bands on head, with a slender line between them. Length of first antennal segment no more than 3/4 width of head through eyes.....Mesovelia amoena Uhler

2'. Two slender longitudinal bands on head. Length of first antennal segment 9/10 width of head through eyes.....Mesovelia cryptophila Hungerford

Mesovelia amoena Uhler, 1894

Distribution: CA, FL, GA, KS, LA, MI, MS, NJ, NV, TX.

Illinois records: HARDIN, POPE and SALINE counties.

Map # 25.

A southern species, uncommonly collected in southern Illinois along shorelines of clear rocky streams and in overhanging grasses along the Saline river. Collection dates: 27 June to 17 October.

Mesovelia cryptophila Hungerford, 1924

Distribution: FL, GA, IA, MI, MS, NJ, OK.

Illinois records: GALLATIN county.

Map # 26.

The rarest of our Mesovelia, collected at a single locality in southern Illinois in a small, shaded, duckweed covered pool off Crab Lake (= Hulda Lake) in Gallatin County (R10E T8S SE1/4 NE1/4 s33, 9 July 1991 [10 males, 17 females]).

Mesovelia mulsanti White, 1879

Distribution: B.C., CA, CT, FL, GA, IA, IL, IN, KS, LA, MAN., MA, MD, MI, MS, MO, NC, NJ, NY, OH, SC, TX, VA, MEX. TO ARGENTINA.

Illinois records: ALEXANDER, CARROLL, CHAMPAIGN, COLES, COOK, CUMBERLAND, EDWARDS, FRANKLIN, FULTON, GALLATIN, HARDIN, JACKSON, JOHNSON, KANKAKEE, LAKE, MASON, MASSAC, MCDONOUGH, MCLEAN, PEORIA, POPE, PULASKI, PUTNAM, SALINE, UNION, VERMILION and WILLIAMSON counties.

Map # 27.

Common throughout Illinois from 24 March to 11 November. In southern Illinois it is most often collected in association with duckweed or emergent vegetation.

FAMILY VELIIDAE

KEY TO THE ADULTS OF THE GENERA OF VELIIDAE OCCURING IN ILLINOIS.

1. Tarsus of middle leg with third segment deeply cleft, with large plumose setae. Front tarsi two segmented .....Rhagovelia

1'. Tarsus of middle leg with last segment not deeply cleft, no large plumose setae. Front tarsi one or three segmented. 2

2. Antennal segment 4 longest. Front tarsi one segmented.....Microvelia

2'. Antennal segment 1 longest. Front tarsi three segmented.....Paravelia stagnalis (Burmeister)

Genus Microvelia Westwood, 1834

KEY TO THE ADULTS OF THE APTEROUS MICROVELIA OCCURING OR POSSIBLY OCCURING IN ILLINOIS.

1. Dorsum of thorax appearing 1 segmented (Fig. 4D).....2

1'. Dorsum of thorax appearing 2 or 3 segmented (Fig. 4E,F).....4

2. Color uniformly sooty black, no blue to gray pruniose patches (may be orange transverse band across anterior lobe of pronotum).....Microvelia austrina Torre-Bueno

2'. Color generally oarange brown to dark reddish brown. Blue to gray pruniose patches present on abdominal terga 2 and 3, and often also on 6 and 7.....3

3. Dorsum covered entirely with long, erect pubesence, majority of hairs equal in length to width of hind femur. Male without pair of short, laterally projecting caudal spines on second genital segment.....Microvelia cerifera McKinstry

3'. Dorsum with only short pubesence, closely apressed to body. Male with pair of short, laterally projecting caudal spines on second genital segment.....Microvelia fontinalis Torre-Bueno

4. Dorsum of thorax appearing 2 segmented (Fig. 4E).....5

4'. Dorsum of thorax appearing 3 segmented (Fig. 4F).....7

5. Length of antennal segment IV equal to 90% width of head across eyes. Second abdominal tergum darkened in middle 1/3. Male with large acute tubercle on second abdominal sternite.....Microvelia albonotata Champion

5'. Length of antennal segment IV less than or equal to 75% of width of head across eyes. Second abdominal tergum not darkened in middle 1/3. Male without tubercle on second abdominal sternite.....6

6. Last three abdominal terga with broad shining areas (which may be covered with hairs) covering at least 25% to 90% of 1 segment.....Microvelia buenoi Drake

6'. Last three abdominal terga with at most a thin (10% of maximum width) shiny medial line present on last two abdominal terga.....Microvelia hinei Drake

7. Hind tibiae of male curved. Female with wide groove between fron coxae for reception of rostrum, inner edges of the longitudinal groove sloped gradually, and groove divergent posteriorly. Front coxae of female widely separated, distance between coxae 1 1/2 to 2 times width of one coxa.....Microvelia puchella Westwood

7'. Hind tibiae of male straight or nearly so. Female with groove between front coxae not prominant, and not divergent posteriorly. Front coxae of female separated by less than 1 1/2 coxal widths.....8

8. Distal margin of male first genital segment with caudal median glabrous area surrounded by very short pubesence. Apterous form predominantly black in color, covered with patches of silvery pubescence.....Microvelia paludicola Champion

8'. Distal margin of male first genital segment lacking well developed caudal median glabrous area, distal margin of genital segment with row of long hairs (sometimes short tufts). Apterous form predominantly light brown dorsally. Large (over 2 mm).....Microvelia americana (Uhler)

Microvelia americana (Uhler), 1884

Distribution: AR, CT, DC, FL, GA, IA, IL, IN, KS, KY, MA, MD, ME, MI, MN, MS, MO, NC, NH, NJ, N.S., NY, NB, OH, OK, ONT., PA, QUE., RI, SC, SD, TN, TX, VA, VT, WV, WI.

Illinois records: ALEXANDER, CARROLL, CLARK, COLES, COOK, EFFINGHAM, FRANKLIN, HARDIN, JACKSON, JO DAVIESS, JOHNSON, MASSAC, PERRY, POPE, PULASKI, SALINE, TAZEWELL, UNION, VERMILION and WILLIAMSON counties.

Map # 28.

Common and widespread, this species is found throughout Illinos in clear rocky streams, especially those which are reduced to isolated pools in the summer months. Collected from 20 February to 2 November.

Microvelia paludicola Champion, 1898

Distribution: AL, AZ, CA, CO, FL, GA, KS, KY, LA, MS, MO, NM, OK, TN, TX, GRTR. ANTILLES, MEX. TO CENT. AMER.

A southern species related to Microvelia americana. Reported from Kentucky and Missouri, and possible in Illinois.

Microvelia albonotata Champion, 1898

Distribution: CT, FL, GA, IA, IL, IN, MA, MD, MI, MN, MS, NC, NJ, NY, PA, RI, SC, TX, MEX. TO S. AMER., WEST INDIES.

Previously reported from Illinois, but no specimens were seen.

Microvelia austrina Torre-Bueno, 1916

Distribution: AL, DC, GA, IN, MD, MS, NC, SC, TN, VA, MEX.

Illinois records: ALEXANDER and HARDIN counties.

Map # 29.

This distinctive looking species is probably more common than indicated here, since it is best collected in the same place and same manner as Hydrometra hungerfordi. Known in Illinois only from the southern end of the state.

Microvelia buenoi Drake, 1920

Distribution: AK, ALTA., B.C., CA, FL, IA, IL, IN, MAN., MA, ME, MI, MN, MS, MT, NJ, NT, NV, ONT., OR, QUE., SC, SASK., UT, WA, WI.

Illinois records: COOK and MASON counties.

Map # 30.

In Illinois this species has been collected only from two counties in the northern half of the state. Collection dates range from 9 April to 14 September.

Microvelia cerifera McKinstry, 1937

Distribution: AZ, CA, CO, IA, KS, NM, NB, NV, UT, WY.

Illinois records: HARDIN county.

Map # 31.

A single male of this western species has been collected at one locality in southern Illinois-a clear rocky stream (HARDIN Co.: Hogtheif Creek-R8E T12S NW1/4 SW1/4 s2, 27 June 1991). It has been suggested that Microvelia cerifera and Microvelia fontinalis are conspecific (Smith 1980).

Microvelia fontinalis Torre-Bueno, 1916

Distribution: CT, DC, GA, IA, IL, IN, MA, MD, MI, MN, MS, NJ, NY, OH, PA, RI, TN, VA, WV, WI.

Previously reported from Illinois, but no material from Illinois was seen.

Microvelia hinei Drake, 1920

Distribution: AL, AZ, AR, CA, CO, CT, DC, FL, GA, IA, IL, KS, KY, LA, MA, MD, MI, MN, MS, MO, NJ, NM, NY, NV, OH, OR, PA, TN, TX, VA, WY.

Illinois records: ALEXANDER, FRANKLIN, HARDIN, IROQUOIS, JACKSON, JOHNSON, MASSAC, SALINE, UNION and WILLIAMSON counties.

Map # 32.

This small species is fairly common in southern Illinois in lakes and ponds from 20 March to 19 October. The single specimen from Iroquois county suggests that the species may be found throughout the state. Because of its small size, Microvelia hinei is not often collected and its distribution in Illinois is likely to be more extensive than indicated here. The species is found on ponds and lakes where duckweed and emergent vegetation are abundant.

Microvelia pulchella Westwood, 1834

Distribution: AL, AK, AZ, AR, B.C., CA, CT, DC, FL, GA, IA, IL, IN, KS, LA, MAN., MA, MD, MI, MN, MS, MO, NC, NJ, NY, OH, ONT., OR, PA, QUE., RI, SC, TX, WV, WI, WY, VA, MEX. TO S. AMER., WEST INDIES.

Illinois records: ALEXANDER, CHAMPAIGN, COLES, COOK, FRANKLIN, GALLATIN, HARDIN, JACKSON, JOHNSON, MASON, MASSAC, PULASKI, SALINE, UNION and VERMILION counties.

Map # 33.

Collected from 16 May to 19 October throughout much of Illinois. Habitat is similar to that of Microvelia hinei. There is considerable variation in the size of individuals of this species.

Genus Rhagovelia Mayr, 1865

KEY TO THE ADULTS OF THE APTEROUS RHAGOVELIA OCCURRING OR POSSIBLY OCCURRING IN ILLINOIS.

1. Male pronotum triangular, apex extending over metanotum, mesonotum visible

only at sides. Female pronotum extended posteriorly as a long elevated process (Fig. 4G).....Rhagovelia oriander Parshley

1'. Male pronotum not extending over metanotum. Female pronotum not produced at apex.....2

2. Abdominal terga of male with only traces of median shining areas on a few segments in addition to segment 7. Female mesonotum swollen.....Rhagovelia rivale Torre-Bueno

2'. Abdominal terga of male and dorsum of metanotum with broad median shining areas. Female mesonotum tumid only on sides or not swollen.....3

3. Connexival margins of female with first two segments curved; exposed portion of mesonotum longer than exposed portion of metanotum.....Rhagovelia obesa Uhler

3'. Connexival margins of female with first two segments straight; exposed portion of mesonotum shorter than exposed portion of metanotum.....Rhagovelia knighti Drake and Harris

Rhagovelia knighti Drake and Harris, 1927

Distribution: AR, MO, OK.

Illinois records: HARDIN, POPE and UNION counties.

Map # 35.

Southern Illinois is probably the northern limit of the range of this species. Rhagovelia knighti has been collected from 10 June through 30 October in riffles of clear rocky streams.

Rhagovelia obesa Uhler, 1871

Distribution: AL, DC, GA, IL, IN, ME, MAN., MD, MA, MI, MN, MS, NC, NH, NJ, NY, OH, ONT., PA, SC, TN, VA, VT.

Previously reported from Illinois, two apterous female specimens with rather questionable locality data (no counties, no dates) reside in the Illinois Natural History Survey collection.

Rhagovelia oriander Parshley, 1922

Distribution: IA, IL, IN, KS, MI, MN, MO, OH, SD.

Illinois records: CHAMPAIGN, COLES, MERCER, OGLE, PEORIA, PIATT, POPE, VERMILION, and WILL counties.

Map # 36.

The pronotal process on females of this species makes identification easy. The species has been collected throughout Illinois, but mainly in the northern half of the state. In riffles of streams. Collection dates range from 10 June to 28 October.

Rhagovelia rivale Torre-Bueno, 1924

Distribution: CO, IA, KS, MO, NB, OK, SD, TX.

Illinois records: WILLIAMSON county.

Map # 37.

The one locality in southern Illinois (WILLIAMSON Co.: Rock Crk x Hwy 13-R4E T9S NE1/4 NW1/4 s24, 9 July 1991 [9 males, 4 females, 16 nymphs]) represents an eastern range extension for the species. In riffle of clear rocky stream.

Genus Paravelia Breddin, 1898

Paravelia stagnalis (Burmeister), 1835

Distribution: AL, DC, FL, GA, KS, LA, MD, MS, MO, NC, NJ, OH, PA, TX, VA, CUBA.

Illinois records: JACKSON, MASSAC and UNION counties.

Map # 34.

Southern Illnois probably represents the northern limits of this species' range. Specimens have been collected from 8 April to 1 December. Habitat consists of shorelines of ponds, lakes and swamps with dense grasses or emergent vegetation. The species may be nocternal (Polhemus, pers. comm.).

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LITERATURE CITED

Biggam, R. C. and M. A. Brusven. 1989. Gerridae (Water Striders) of Idaho (Heteroptera). Great Basin Naturalist 49(2):259-274.

Blatchley, W. S. 1926. Heteroptera or true bugs of eastern North America. Nature Publishing Company, Indianapolis. 1116pp.

Deay, H. O. and G. E. Gould. 1936. The Hemiptera of Indiana, I. Family Gerridae. The American Midland Naturalist 17:753-769.

Froeschner, R. C. 1949. Contributions to a synopsis of the Hemiptera of Missouri, Pt. IV. Hebridae, Mesoveliidae, Cimicidae, Anthocoridae, Cryptostemmatidae, Isometopidae, Meridae (sic). Amer. Midl. Nat. 42:123-188.

Froeschner, R. C. 1962. Contributions to a synopsis of the Hemiptera of Missouri, Part V. Hydrometridae, Gerridae, Veliidae, Saldidae, Ochteridae, Gelastocoridae, Naucoridae, Belostomatidae, Nepidae, Notonectidae, Pleidae, Corixidae. The American Midland Naturalist, 67:208-240.

Henry, T. J. and R. C. Froeschner (eds.). 1988. Catalog of the Heteroptera, or True Bugs, of Canada and the Continental United States. E. J. Brill, NY. 958 pp.

Hilsenhoff, W. L. 1975. Aquatic insects of Wisconson with generic keys and notes on biology, ecology, and distribution. Wisconson Department of Natural Resources Technical Bulletin 89:1-53.

Hilsenhoff, W. L. 1986. Semiaquatic Hemiptera of Wisconson. The Great Lakes Entomologist 19(1):7-19.

Kirkaldy, G. W. and J. R. de la Torre-Bueno. 1909. A catalogue of American aquatic and semiaquatic Hemiptera. Proc. Entomol. Soc. Wash. 10:173-215.

Page, L. M. 1989. Inventories of aquatic organisms: an introduction. Pg. 15 In Phillippi, M. A. and B. D. Anderson (eds.). Proceedings of the Illinois Nature Preserves Commission 25th Anniversary Symposium on Preserving the Aquatic Biodiversity of Illinois: Inventory, Research, Regulation, and Protection. Southern Illinois University at Carbondale, April 21, 1989. Illinois Nature Preserve Commission, Springfield, IL.

Polhemus, J. T. 1984. Aquatic and semiaquatic Hemiptera. Pp. 231-260 In R. W. Merritt and K. W. Cummins (eds.). An introduction to the aquatic insects of North America (2nd edition). Kendall/Hunt Pub. Co., Dubuque, Iowa.

Porter, T. W. 1950. Taxonomy of the American Hebridae and the natural history of selected species. Ph. D. diss., University of Kansas, Lawerance. 185 pp.

Slater, J. A. and R. M. Baranowski. 1978. How to know the true-bugs (Hemiptera-Heteroptera). Wm. C. Brown,

Dubuque. 256 pp.

Smith, C. L. 1980. A taxonomic revision of the genus Microvelia Westwood (Heteroptera: Veliidae) of North America including Mexico. Ph.D. diss., University of Georgia, Athens. 372 pp.

Smith, C. L. and J. T. Polhemus . 1978. The Veliidae (Heteroptera) of America north of Mexico-keys and check list. Proc. Entomol. Soc. Wash. 80:56-68.

Van Duzee, E. P. 1917. Catalogue of the Hemiptera of America North of Mexico. Univ. Calif. Publ. Ent. 2:1-902.

Wilson, C. A. 1958. Aquatic and semiaquatic Hemiptera of Mississippi. Tulane Studies in Zoology 6(3):116-170.

Table 1. List of species of Gerromorpha (Insecta:Heteroptera) occuring or possibly occuring in Illinois.

c-confirmed literature record
l-literature record, not confirmed
n-new state record
p-possible in Illinois
q-questionable record

Family Gerridae Leach, 1815
- Subfamily Gerrinae Leach, 1815
  - Tribe Gerrini Leach, 1815
    - Genus Gerris Fabricius 1794
      - Subgenus Aquarius Schellenberg, 1800
        - c 1. Gerris nebularis Drake & Hottes, 1925
        - c 2. Gerris remigis Say, 1832
        - p 3. Gerris conformus (Uhler), 1878
      - Subgenus Gerris Fabricius, 1794
        - c 4. Gerris alacris Hussey, 1921
        - c 5. Gerris argenticollis Parshley, 1916
        - n 6. Gerris buenoi Kirkaldy, 1911
        - c 7. Gerris comatus Drake and Hottes, 1925
        - q 8. Gerris incurvatus Drake and Hottes, 1925
        - c 9. Gerris insperatus Drake and Hottes, 1925
        - c 10. Gerris marginatus Say, 1832
    - Genus Limnoporus Stal, 1868
      - c 11. Limnoporus canaliculatus (Say), 1832
      - c 12. Limnoporus dissortis (Drake and Harris), 1930
      - p 13. Limnoporus notabilis (Drake and Hottes), 1925
    - Genus Neogerris Matsumura, 1913
      - c 14. Neogerris hesione (Kirkaldy), 1902
- Subfamily Rhagodotarsinae Lundblad, 1933
  - Genus Rheumatobates Bergroth, 1892
    - p 15. Rheumatobates hungerfordi Wiley, 1923
    - c 16. Rheumatobates palosi Blatchley, 1926
    - l 17. Rheumatobates rileyi Bergroth, 1892
    - c 18. Rheumatobates tenuipes Meinert, 1895
    - p 19. Rheumatobates trulliger Bergroth, 1915
- Subfamily Trepobatinae Matsuda, 1960
  - Genus Metrobates Uhler, 1871
    - c 20. Metrobates hesperius Uhler, 1871
  - Genus Trepobates Uhler, 1883
    - c 21. Trepobates inermis Esaki, 1926
    - c 22. Trepobates knighti Drake and Harris, 1928
    - c 23. Trepobates pictus (Herrich-Schaeffer), 1847
    - c 24. Trepobates subnitidus Esaki, 1926

Family Hebridae Amyot and Serville, 1843
- Subfamily Hebrinae, Amyot and Serville, 1843
  - Genus Hebrus Curtis, 1833
    - p 25. Hebrus beameri Porter, 1952
    - l 26. Hebrus buenoi Drake and Harris, 1943
    - l 27. Hebrus burmeisteri Lethierry and Severin, 1896
    - l 28. Hebrus concinnus Uhler, 1894
    - p 29. Hebrus sobrinus Uhler, 1877
    - c 30. Hebrus tuckahoanus Drake and Chapman, 1954
  - Genus Merragata White, 1877
    - c 31. Merragata brunnea Drake, 1917
    - c 32. Merragata hebroides White, 1877

Family Hydrometridae Billberg, 1820
- Subfamily Hydrometrinae Billberg, 1820
  - Genus Hydrometra Latreille, 1796
    - n 33. Hydrometra hungerfordi Torre-Bueno, 1926
    - c 34. Hydrometra martini Kirkaldy, 1900

Family Mesoveliidae Douglas and Scott, 1867
- Subfamily Mesoveliinae Douglas and Scott, 1867
  - Genus Mesovelia Mulsant and Rey, 1852
    - n 35. Mesovelia amoena Uhler, 1894
    - n 36. Mesovelia cryptophila Hungerford, 1924

c 37. Mesovelia mulsanti White, 1879

Family Veliidae Amyot and Serville, 1843

Subfamily Microveliinae China and Usinger, 1949

Tribe Microveliini China and Usinger, 1949

Genus Microvelia Westwood, 1834

Subgenus Kirkaldya Torre-Bueno, 1910

c 38. Microvelia americana (Uhler), 1884

p 39. Microvelia paludicola Champion, 1898

Subgenus Microvelia Westwood, 1834

l 40. Microvelia albonotata Champion, 1898

n 41. Microvelia austrina Torre-Bueno, 1916

c 42. Microvelia buenoi Drake, 1920

n 43. Microvelia cerifera McKinstry, 1937

l 44. Microvelia fontinalis Torre-Bueno, 1916

c 45. Microvelia hinei Drake, 1920

c 46. Microvelia puchella Westwood, 1834

Subfamily Rhagoveliinae China and Usinger, 1949

Genus Rhagovelia Mayt, 1865

Subgenus Rhagovelia Mayr, 1865

n 47. Rhagovelia knighti Drake and Harris, 1927

l 48. Rhagovelia obesa Uhler, 1871

c 49. Rhagovelia oriander Parshley, 1922

n 50. Rhagovelia rivale Torre-Bueno, 1924

Subfamily Veliinae Amyot and Serville, 1843

Genus Paravelia Breddin, 1898

n 51. Paravelia stagnalis (Burmeister), 1835

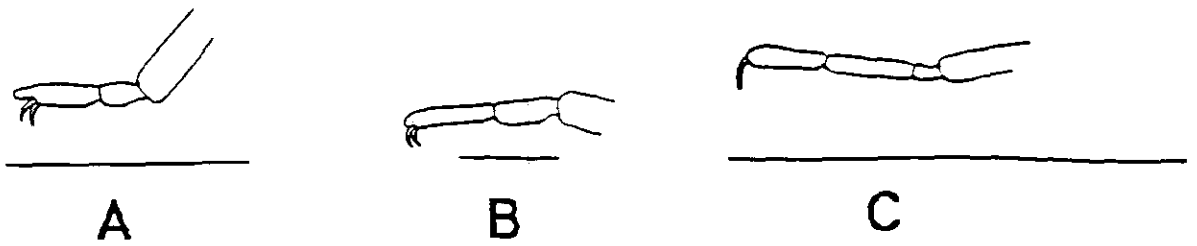
Table 2. List of gerromorphan species collected in southern Illinois and the habitats in which they were found.

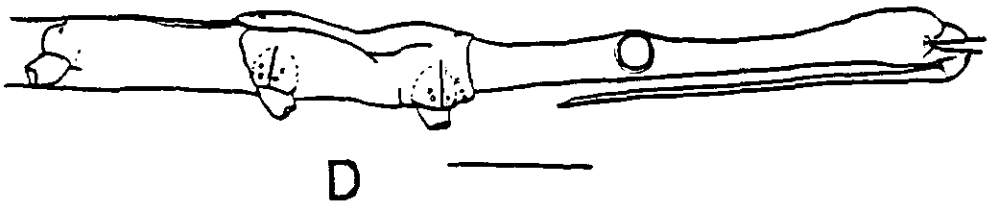
Species	General Habitat Type(*).												Total # habitats occupied.
	A	B	C	D	E	F	G	H	I	J	K	L	M	
GERRIDAE														
Gerris alacris			X											1
Gerris argenticollis			X	X		X			X					4
Gerris insperatus									X	X		X		3
Gerris marginatus	X		X	X		X			X		X	X		7
Gerris nebularis						X	X		X					3
Gerris remigis							X		X	X				3
Limnoporus canaliculatus	X	X	X	X		X	X		X			X	X	9
Metrobates hesperius						X								1
Neogerris hesione	X	X												2
Rheumatobates palosi		X				X	X		X					4
Rheumatobates tenuipes						X								1
Trepoabtes knighti									X					1
Trepobates pictus							X		X	X				3
Trepobates subnitidus	X	X			X	X	X		X				X	7
HEBRIDAE														
Merragata brunnea	X	X	X									X		4
Merragata hebroides	X	X					X		X					4
HYDROMETRIDAE														
Hydrometra hungerfordi							X		X					2
Hydrometra martini	X	X					X		X		X		X	6
MESOVELIIDAE														
Mesovelia amoena						X			X					2
Mesovelia cryptophila		X												1
Mesovelia mulsanti	X	X	X			X	X		X		X	X	X	9
VELIIDAE														
Microvelia americana							X		X	X		X		4
Microvelia austrina									X					1
Microvelia cerifera									X					1
Microvelia hinei	X	X	X			X	X		X		X		X	8
Microvelia puchella	X	X				X	X						X	5
Paravelia stagnalis	X	X												2
Rhagovelia knighti									X					1
Rhagovelia oriander									X					1
Rhagovelia rivale									X					1
	A	B	C	D	E	F	G	H	I	J	K	L	M	
Number of species/habitat	11	12	7	3	1	12	13	0	22	4	4	6	6	

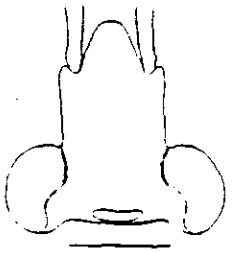
(*) Letters designate habitats as follows: A-ponds, B-lakes, C-swamps, D-temporary pools, E-big rivers (Mississippi and Ohio Rivers), F-small rivers, G-permanent muddy streams, H-temporary muddy streams (no sites were found), I-clear rocky permanent streams, J-clear rocky temporary streams, K-roadside ditches, L-springs, and M-flooded river bottomlands.

Table 3. Locations of clear rocky permanent streams examined during the present study.

Alexander County	
	Cooper Creek (R1W T14S NW1/4 NW1/4 s6)
Gallatin County	
	Eagle Creek (R8E T10S NW1/4 NW1/4 s18)
Hardin County	
	Three Mile Creek (R8E T12S NE1/4 SW1/4 s30)
	Hogtheif Creek (R8E T12S NW1/4 SW1/4 s2)
Jackson County	
	Spring Creek (R4W T8S NW1/4 s2)
	Indian Creek (R1W T10S NE1/4 NW1/4 s25)
	Clear Springs Picnic Area Creek (R3W T10S s27)
Johnson County	
	Wagon Creek (R3E T11S NE1/4 NE1/4 s14)
	Dutchman Creek (R3E T12S NE1/4 SE1/4 s7)
Pope County	
	Lusk Creek (R6E T12S N1/2 SE1/4 s16)
	Big Grand Pierre (R7E T12S NW1/4 SW1/4 s22)
Saline County	
	Horseshoe Creek (R7E T9S NE1/4 NE1/4 s36)
Union County	
	Clear Creek (R2W T11S NW1/4 NE1/4 s34)
	Hutchins Creek (R2W T11S SW1/4 SW1/4 s31)
Williamson County	
	Rock Creek (R4E T9S NE1/4 NW1/4 s24)







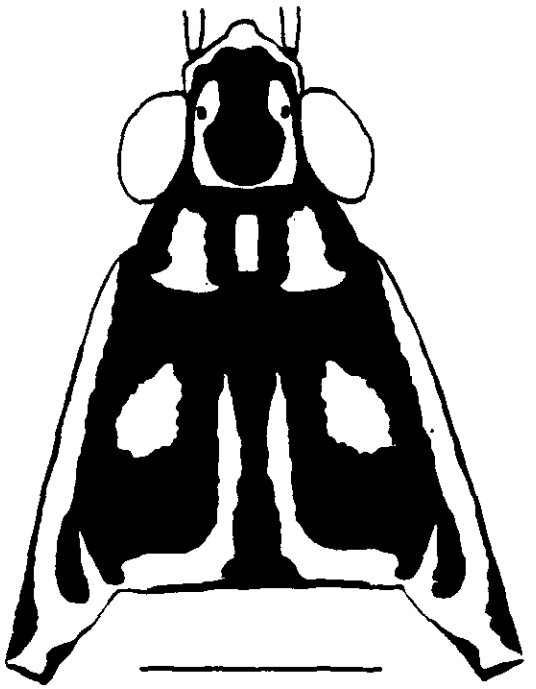


Figure 1. A, Protarsus of Neogerris hesione; B, protarsus of Gerris remigis; C, mesotarsus of Mesovelia mulsanti; D, lateral view of head and thorax of Hydrometra hungerfordi (apterous male); E, head of Gerris remigis; F, head and thorax of female apterous Trepobates subnitidus. Horizonal bars = 1.0 mm.

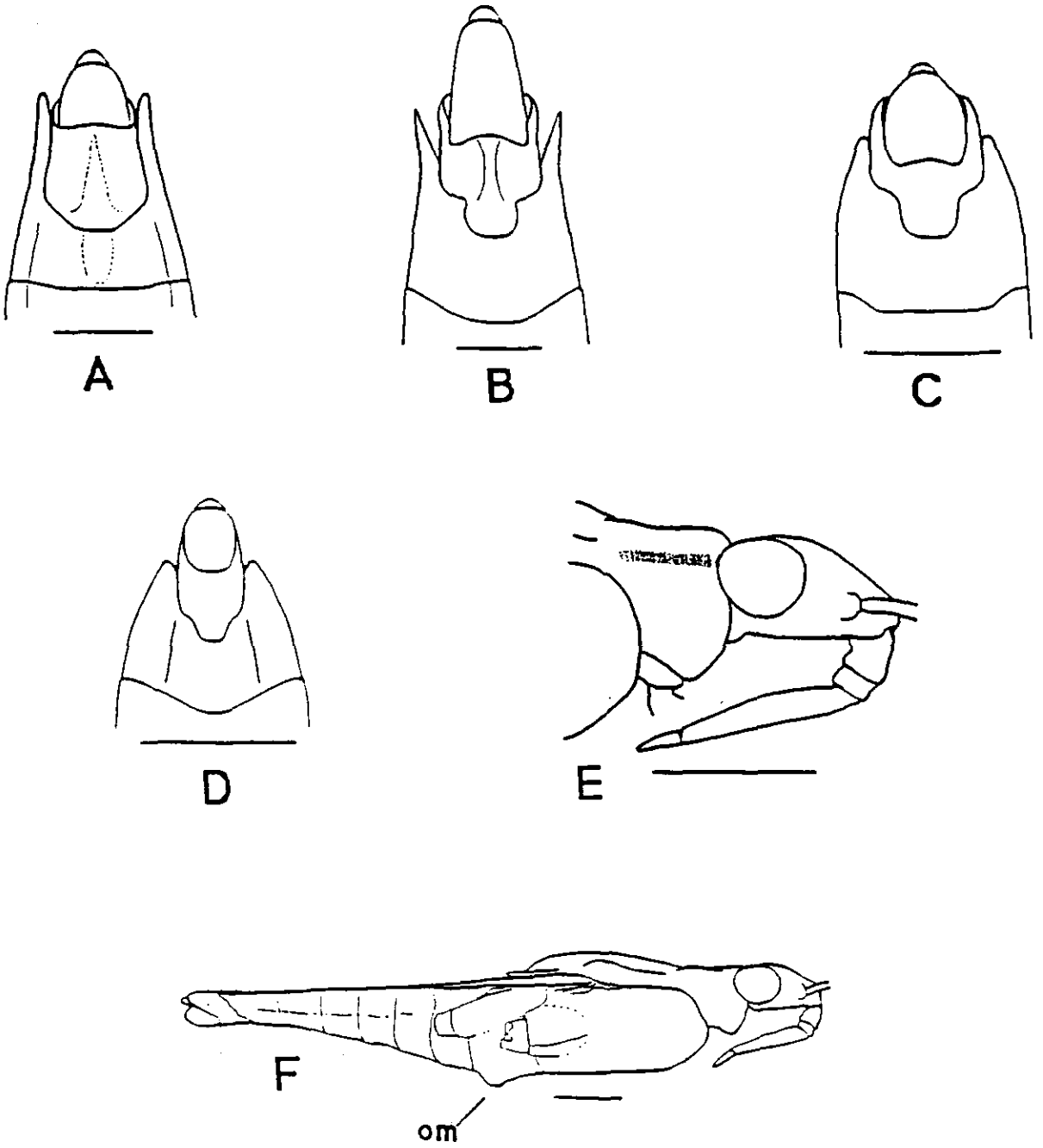


Figure 2. Male genital segments, ventral view: A, Gerris nebularis; B, Gerris remigis; C, Gerris buenoi; D, Gerris argenticollis; E. lateral view of head and thorax of Gerris argenticollis; F. lateral view of male Gerris alacris, om = omphalium. Horizonal bars = 1.0 mm.

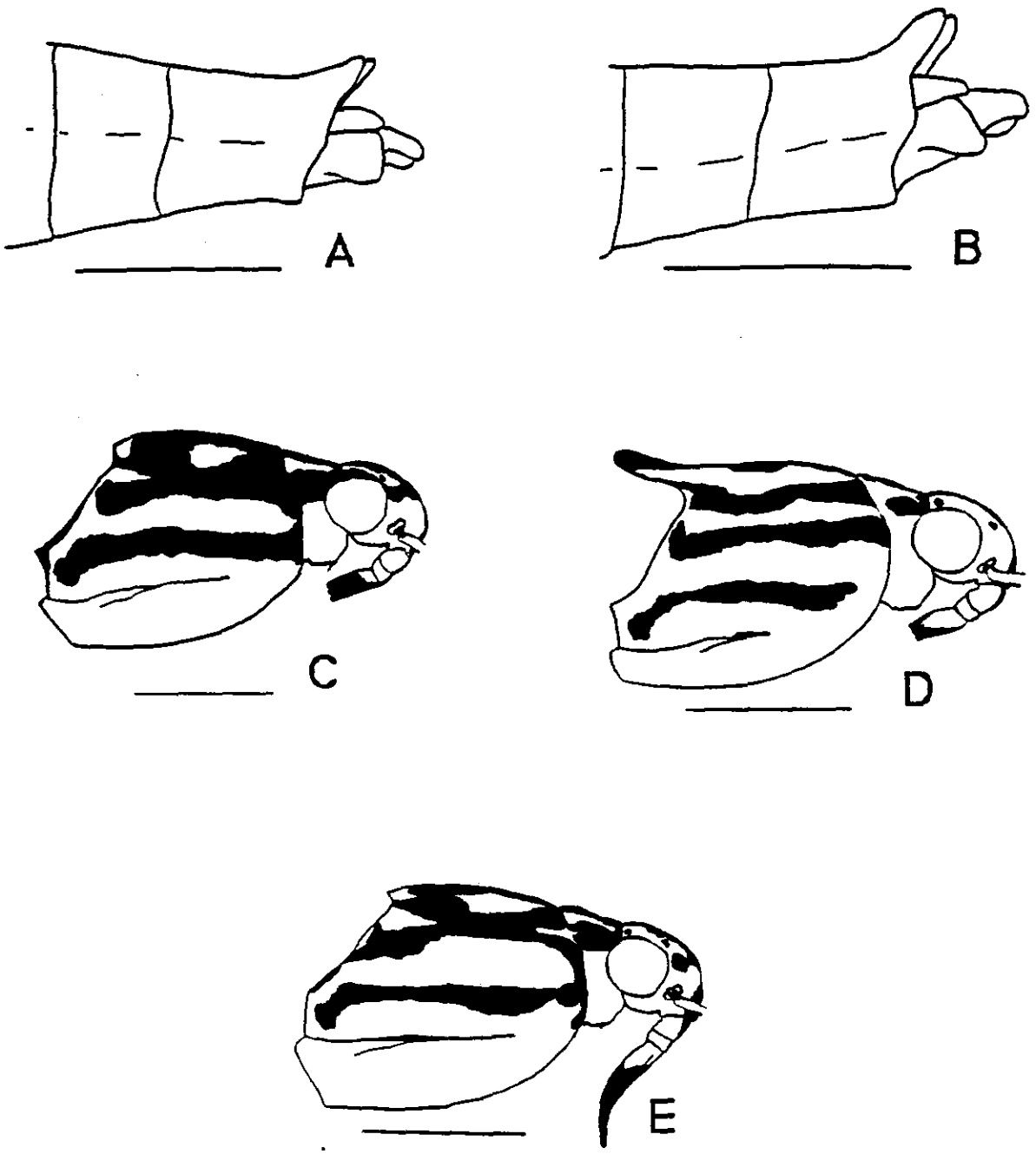


Figure 3. A, lateral view of genital segments of female Gerris buenoi; B, lateral view of genital segments of female Gerris argenticollis; lateral views of head and thorax of Trepobates species: C, T. subnitidus; D, T. pictus; E, T. knighti. Horizontal bars = 1.0 mm.

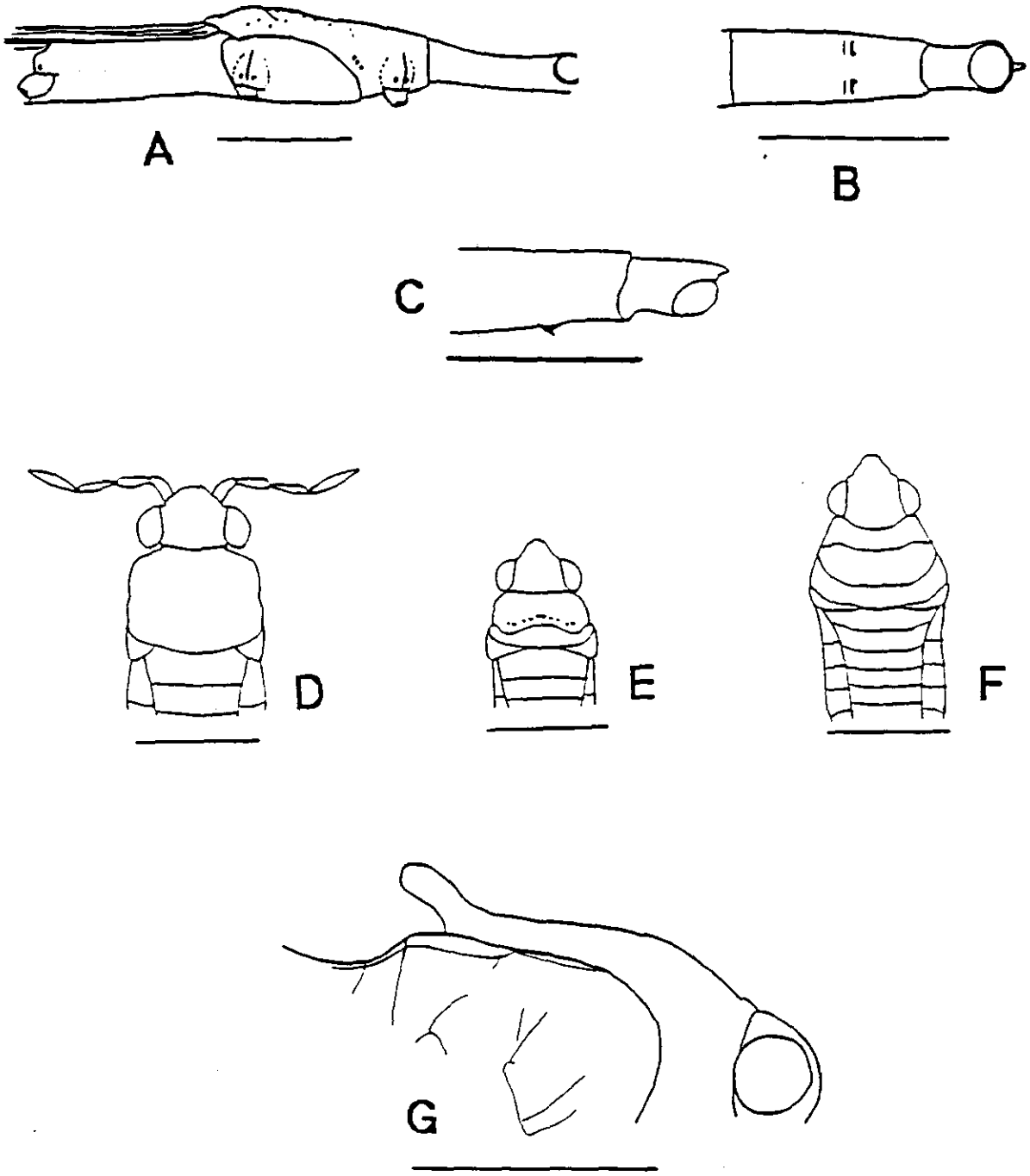
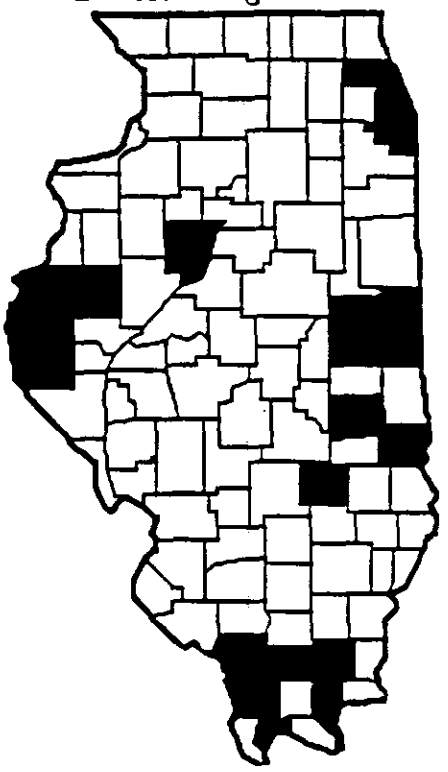


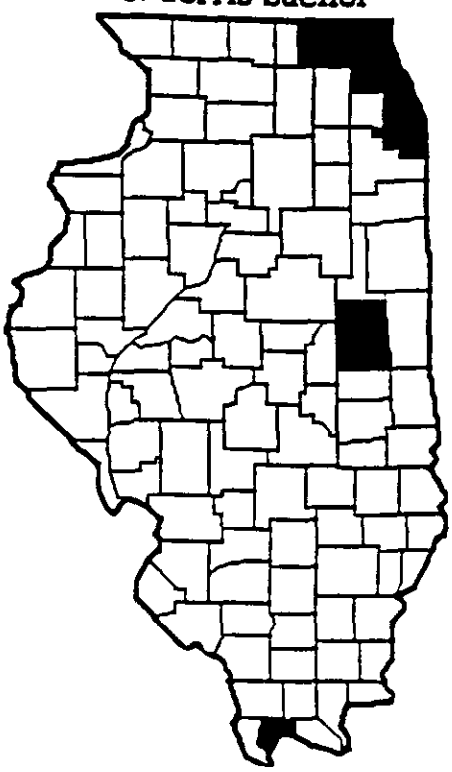
Figure 4. A, Lateral view of thorax of Hydrometra martini (macropterous femal); B, male genitalia of Hydrometra martini (ventral view); C, male genitalia of Hydrometra hungerfordi (lateral view); head and thorax of Microvelia species (apterous males): D, M. austrina; E. M. hinei; F, M. pucheila; G, dorsal part of head and thorax of female Rhagovelia oriander (lateral view). Horizontal bars A, B, C, G = 1.0 mm; D, E, F = 0.5 mm.

1. Gerris alacris

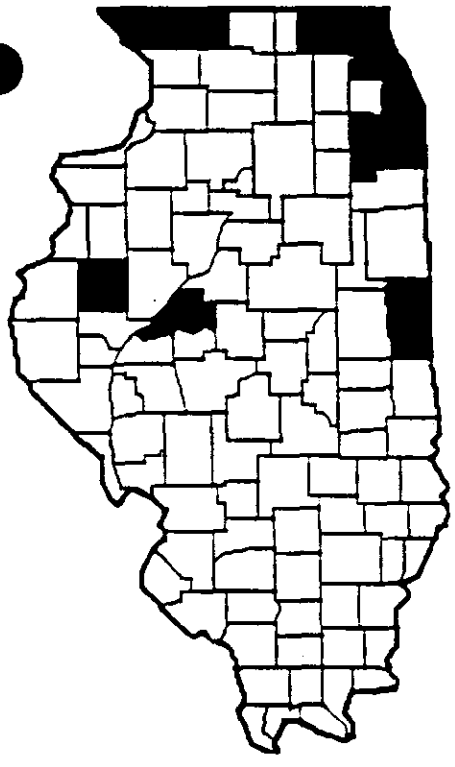
2. Gerris argenticollis



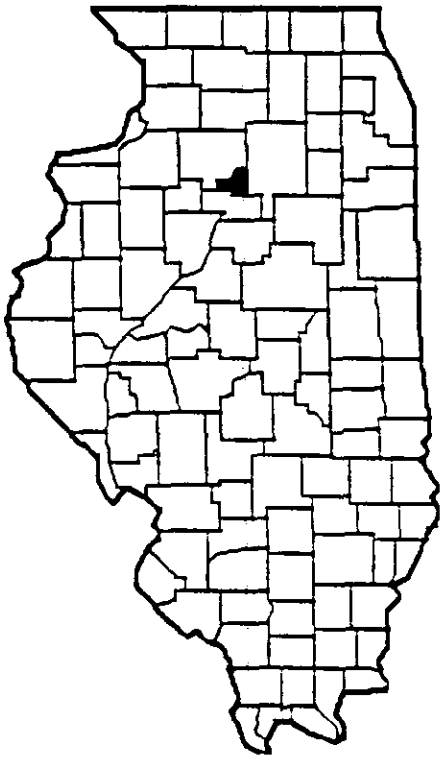
3. Gerris buenoi



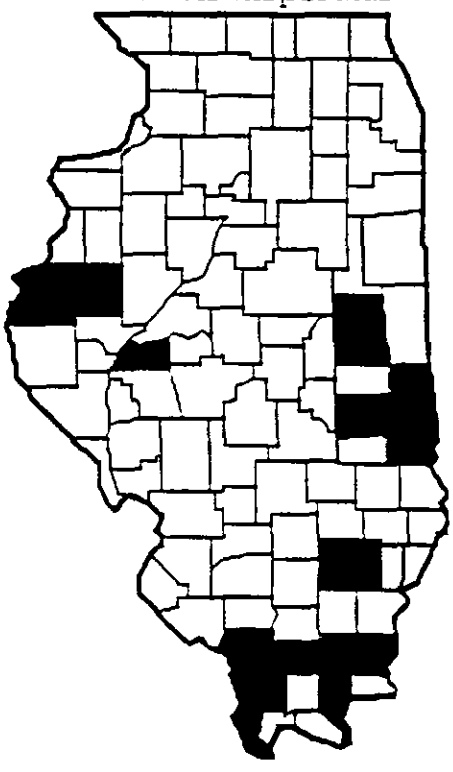
4. Gerris comatus



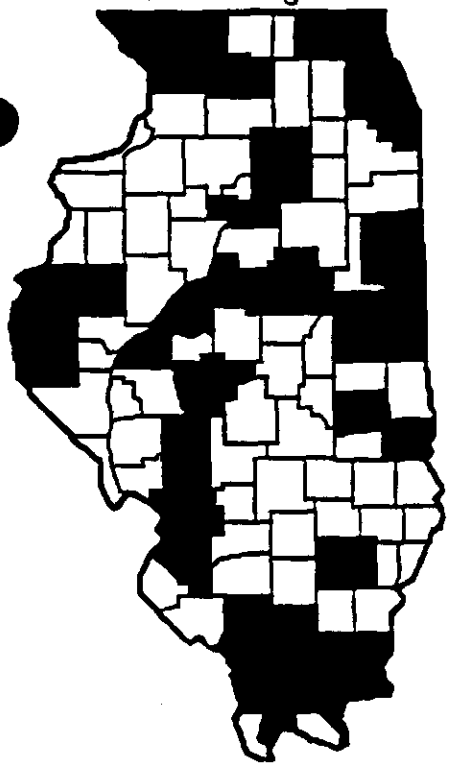
5. Gerris incurvatus



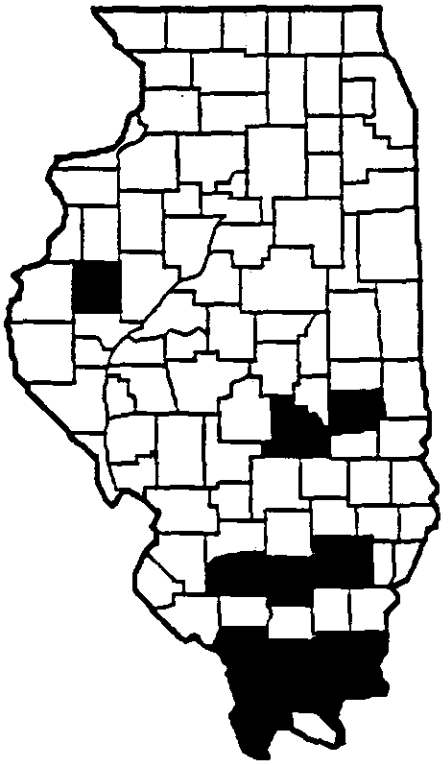
6. Gerris insperatus



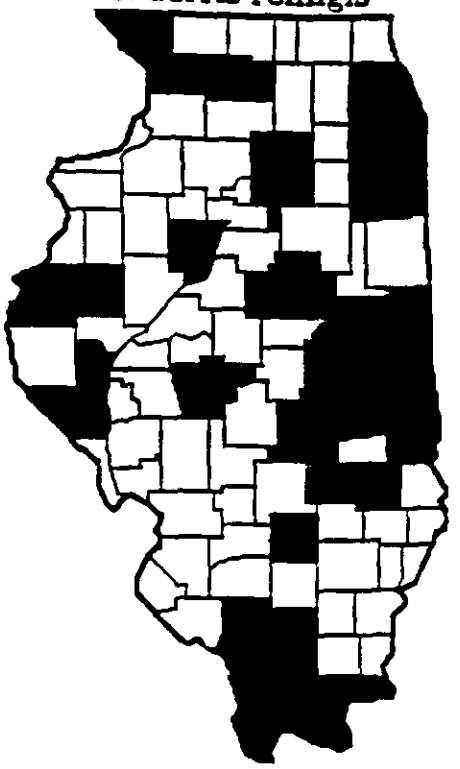
7. Gerris marginatus



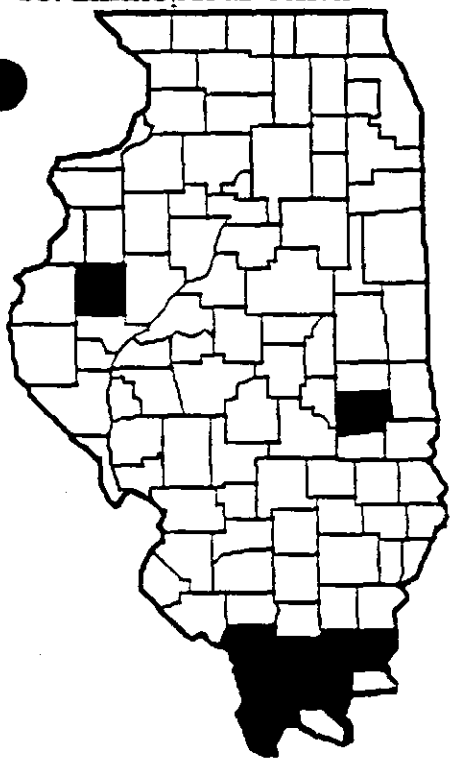
8. Gerris nebularis



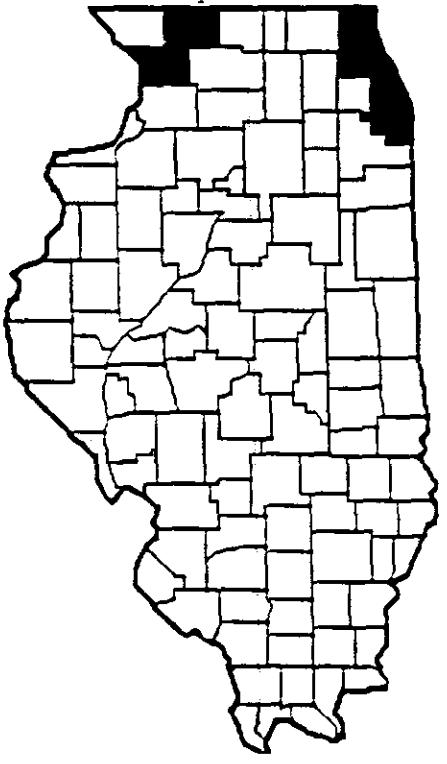
9. Gerris remigis



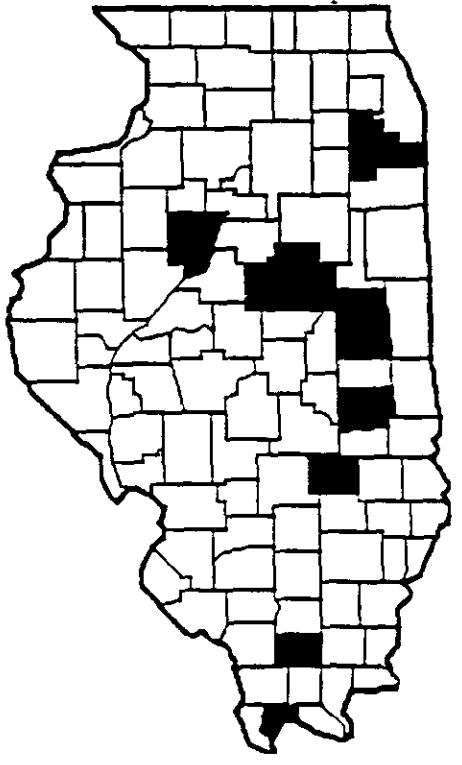
10. Limnoporus canaliculatus



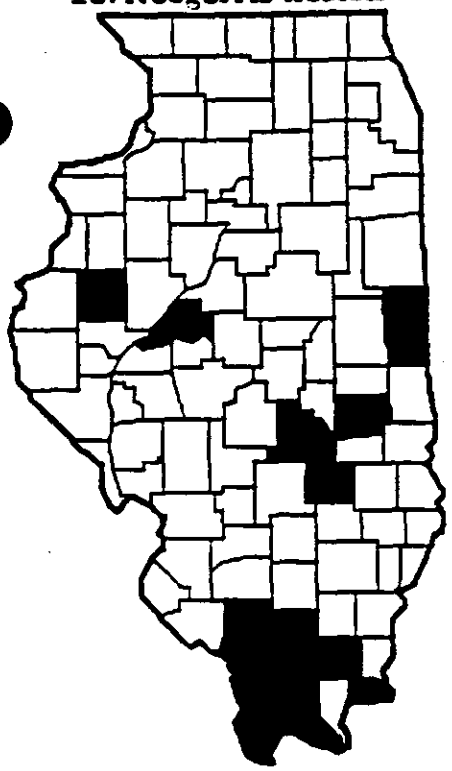
11. Limnoporus dissoris



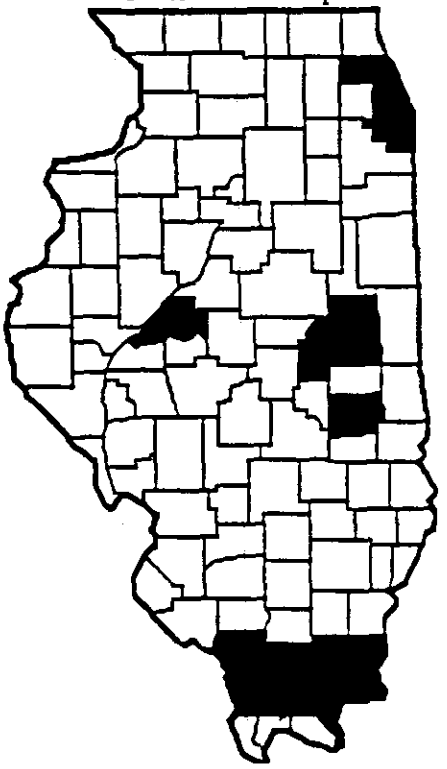
12. Metrobates hesperius



13. Neogerris hesione

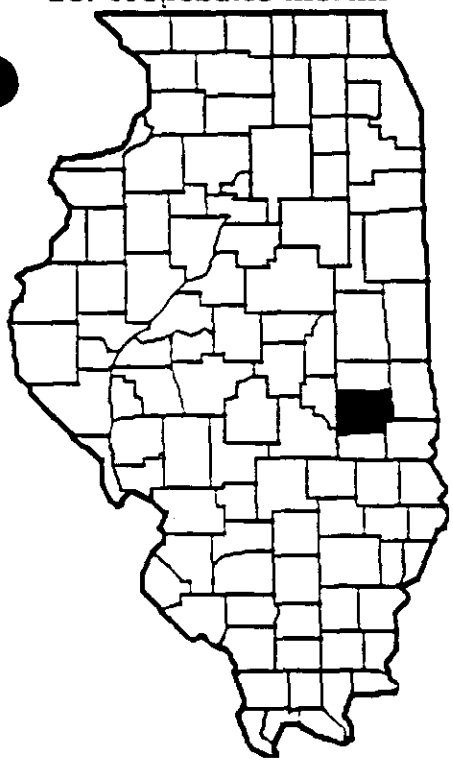


14. Rheumatobates palosi

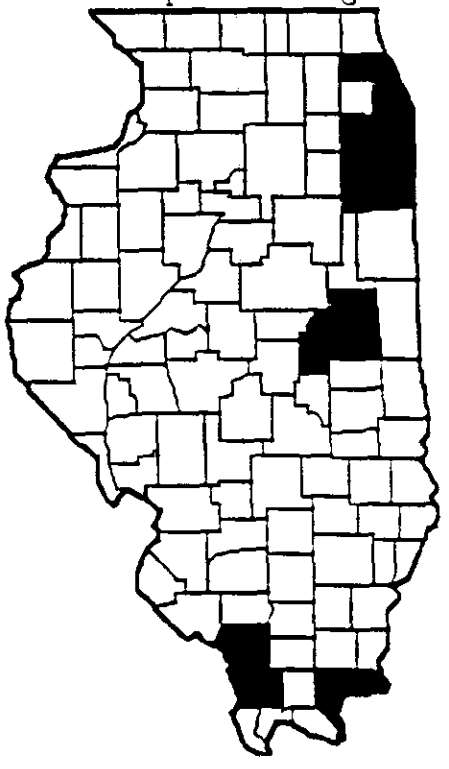


15. Rheumatobates tenuipes

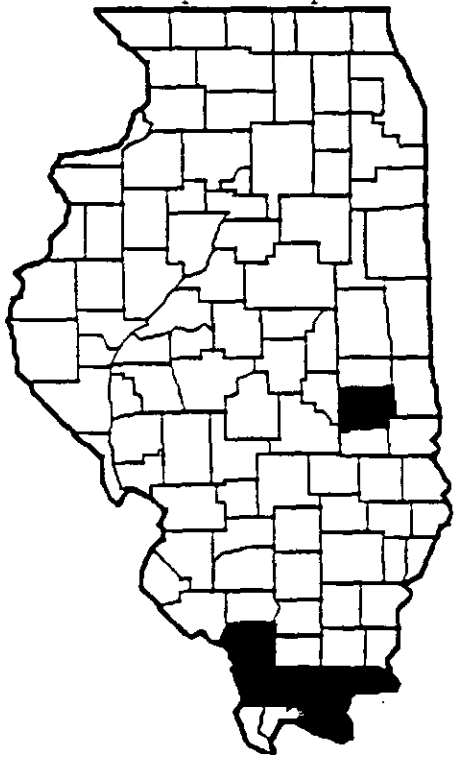
16. Trepobates inermis



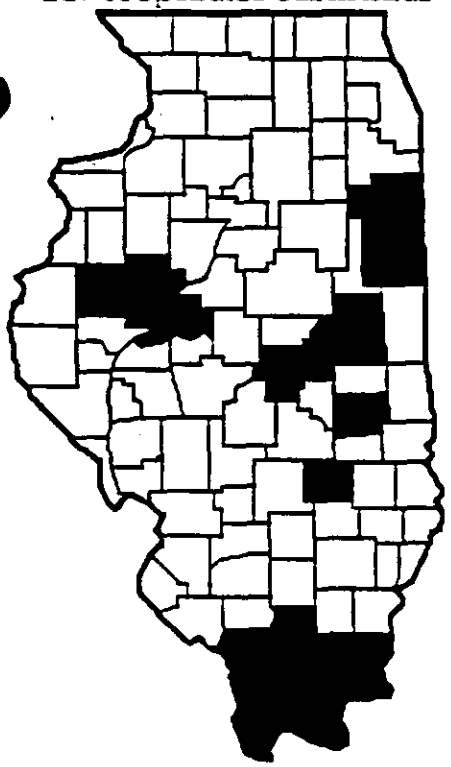
17. Trepobates knighti



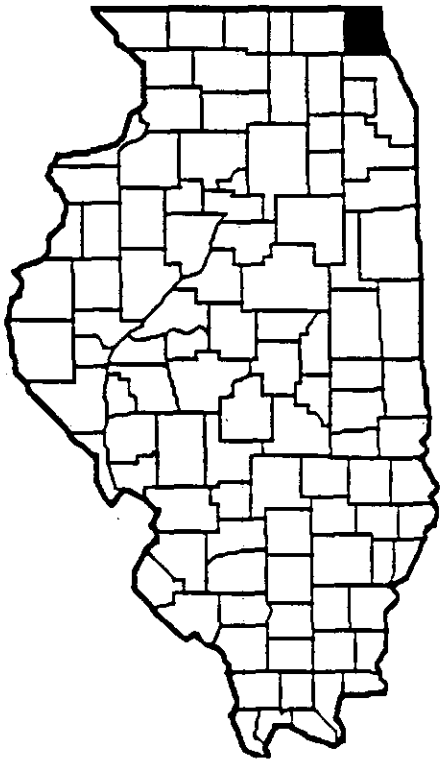
18. Trepobates pictus



19. Trepobates subnitidus

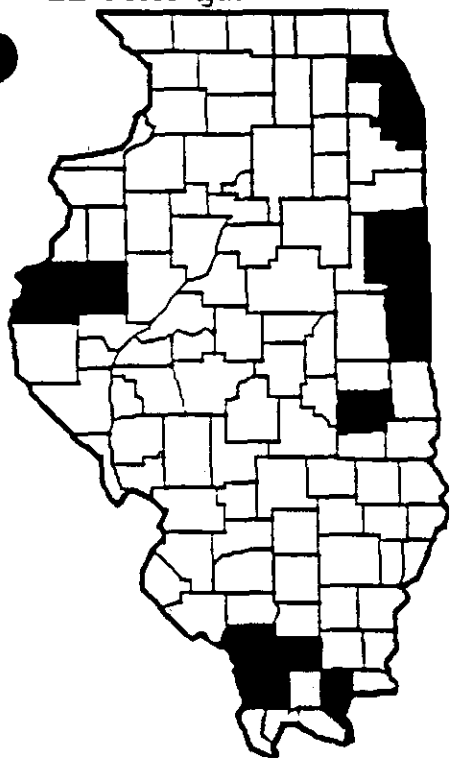


20. Hebrus tuckahoanus

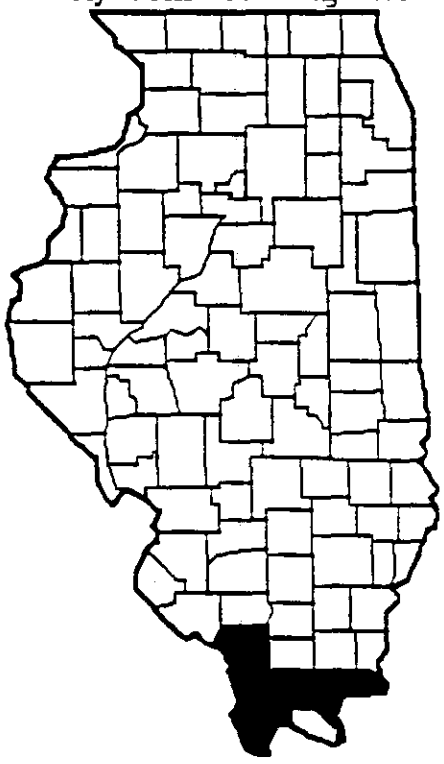


21. Merragata brunnea

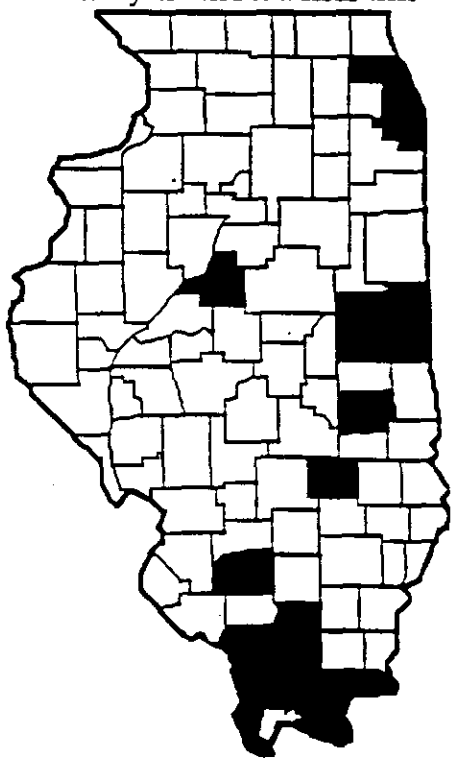
22. Merragata hebroides



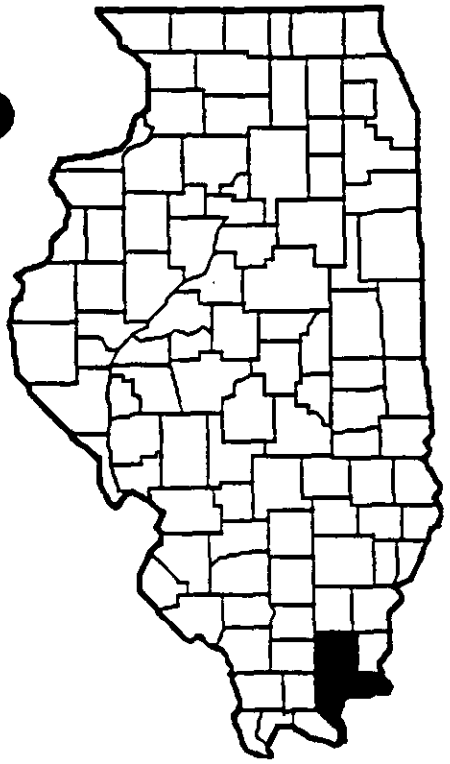
23. Hydrometra hungerfordi



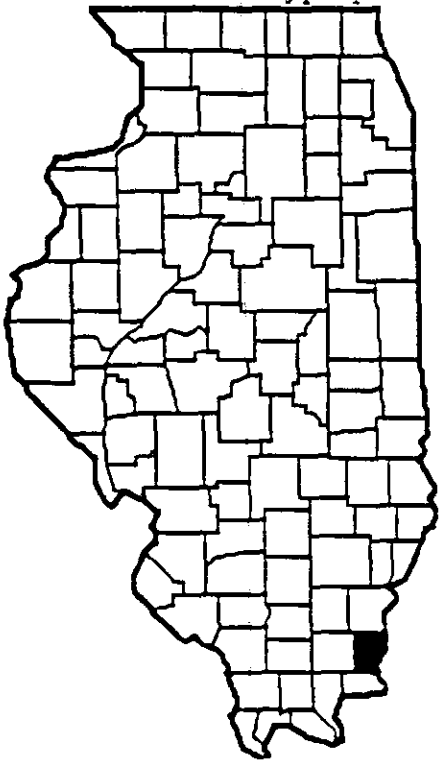
24. Hydrometra martini



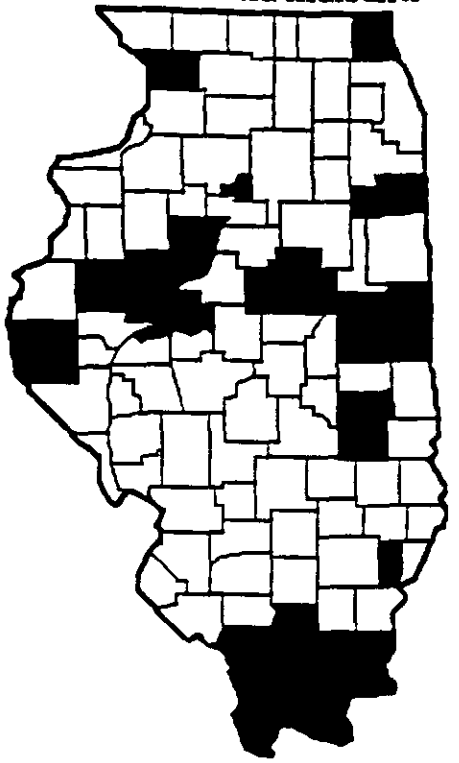
25. Mesovelia amoena



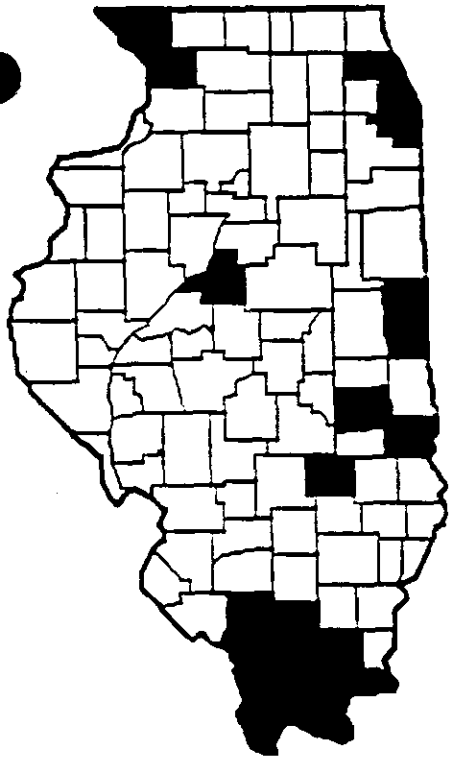
26. Mesovelia cryptophila



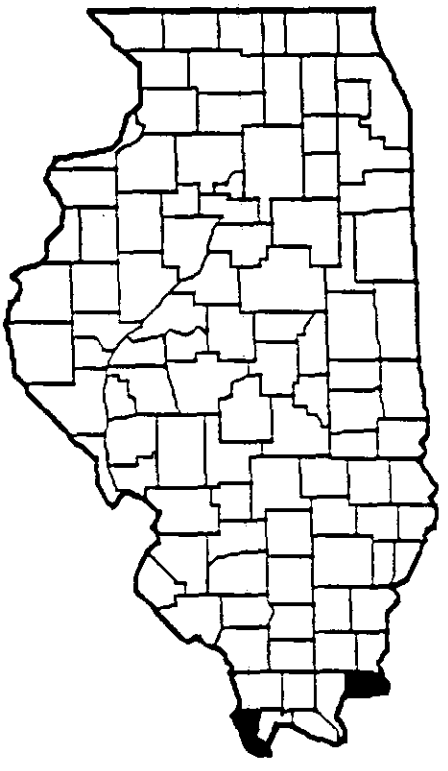
27. Mesovelia mulsanti



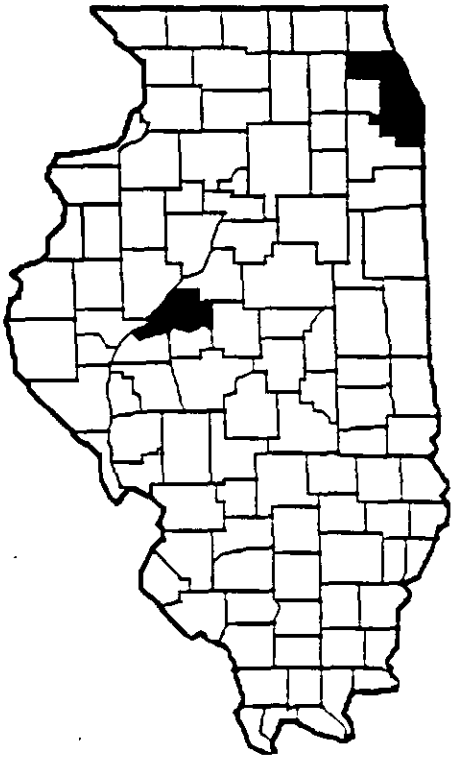
28. Microvelia americana



29. Microvelia austrina

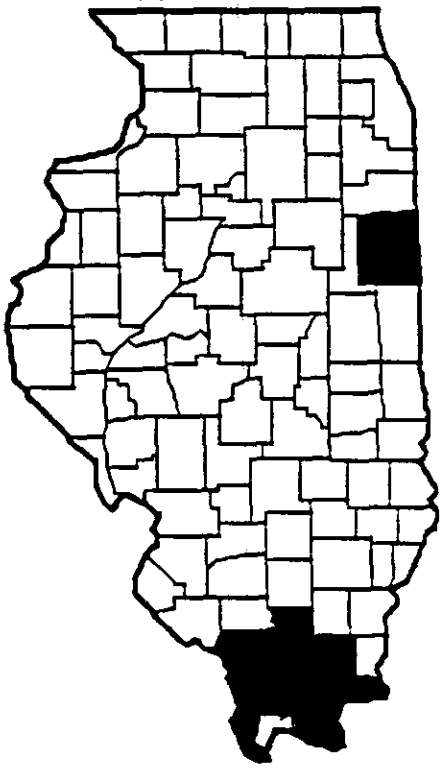


30. Microvelia buenoi

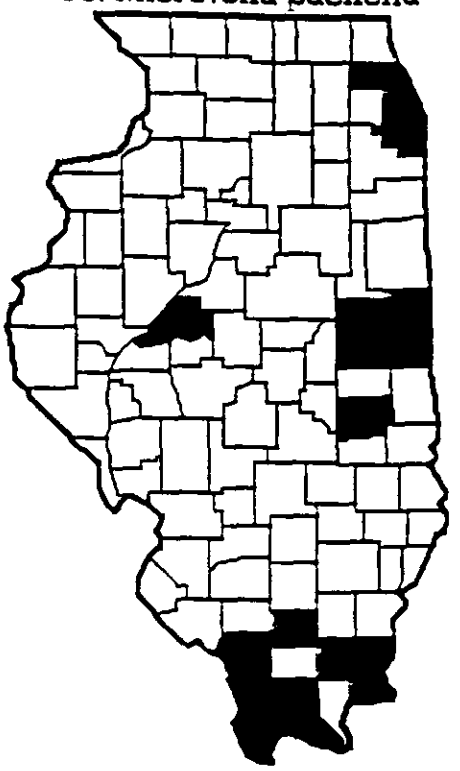


31. Microvelia cerifera

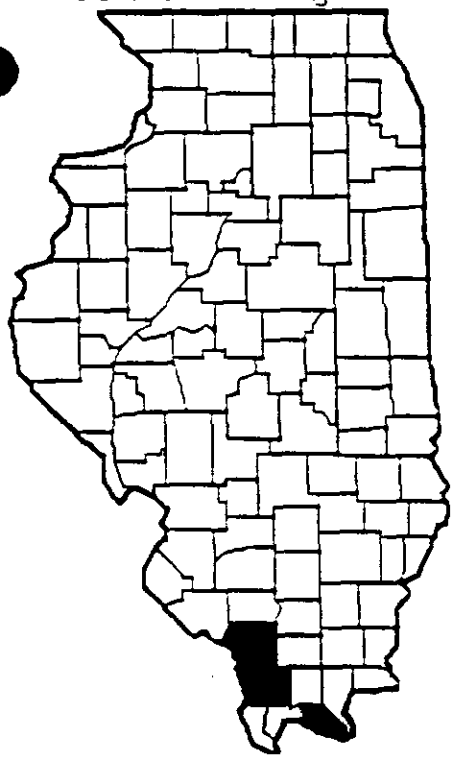
32. Microvelia hinei



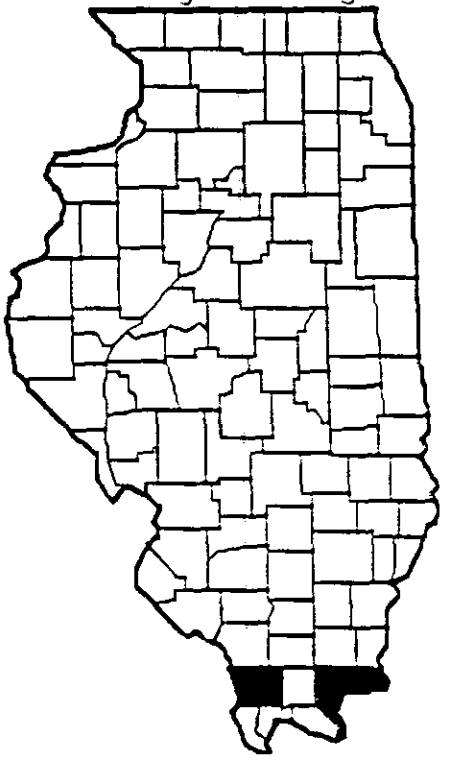
33. Microvelia puchella



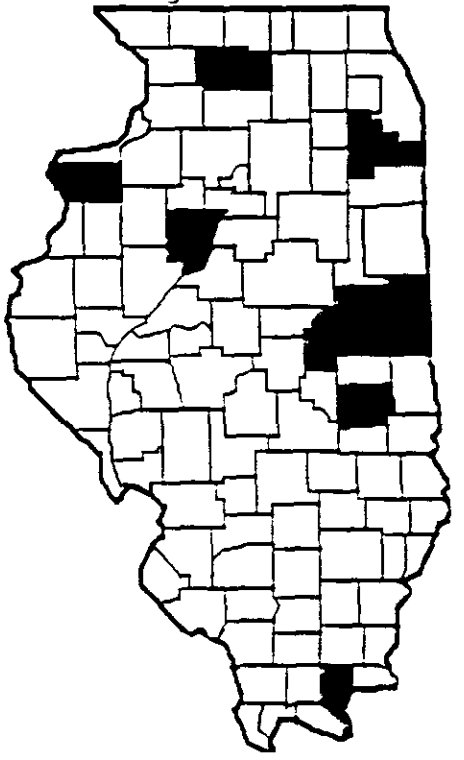
34. Paravelia stagnalis



35. Rhagovelia knighti



36. Rhagovelia oriander



37. Rhagovelia rivale