

AQUATIC HEMIPTERA OF REELFOOT LAKE¹

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INTRODUCTION

This study of aquatic and semi-aquatic Hemiptera of Reelfoot Lake and surrounding waters is based on two months work in the field. Collections were made daily from June 15 to August 10. Identification was made soon after collection of the insects. The three stations in the lake and the one in the bayou established by the Biological Station were studied more carefully. Collections were made in addition at Lake Center, Reelfoot Creek, Samburg, the spillway, near Tiptonville, and at one place on the west side of the lake. The collections were made in the following order: first, the surface zone; next, in the submerged vegetation (*Ceratophyllum demersum* and *Cabomba caroliniana*); third, on the bottom where possible and last in the mud beneath the bottom. The regular methods of collection with a dip net were used. An aquarium was maintained to study the food habits of the species that could be kept in an aquarium.

Many bugs and their eggs are important as food for fish. The members of the family Corixidae are used by some fish. Others are harmful to fish, *Notonecta irrorata* was seen many times killing small fish from one to two inches long. In the aquarium the *Notonecta* would pierce the fish on the ventral surface and suck the juices. Five fish were killed in one day by three back-swimmers.

A total of twenty-nine species were collected; these represent nineteen genera and ten families.

SUBORDER GYMNO CERATA

FAMILY MESOVELIIDAE

Mesovelia mulsanti White

Length, 3.5 to 4 mm.; shape, long, slender, and tapering; color, greenish with a yellowish tinge, hind lobe darkish with a pale yellow median stripe, under surface pale. Structural characteristics: joints one and three of antennae subequal, each about as long as head; 2 shortest, 4 one-third shorter than 3. Stout setae on the under side of front and middle femora.

This species was first found on July 9, above the flood gates of the spillway in quiet water, with *Trepobates pictus*. All were un-winged individuals. Throughout the month of August numerous

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adults were taken along the margin of the lake among clumps of saw grass.

FAMILY HYDROMETRIDAE

Hydrometra martini Kirkaldy (Fig. 1, 1-3)

Length 8 to 11 mm.; shape, elongate with very slender legs; color, medium or dark brown. Structural characteristics: head in front of eyes, 1.3 to 1.5 mm. in length. Last dorsal of male with a distinct spinous projection. Elytra of macropterous form reaching sixth dorsal of the male and fifth dorsal of the female.

This bug was found on the surface of the bayou in front of the Biological Station, walking on the surface that was covered with duckweed. *H. martini* was quite abundant during the month of July.

FAMILY GERRIDAE

Gerris remigis Say (Fig. 1, 5)

Length, 14 to 16 mm.; shape, elongate-oval, rather stout bodied; color, dark brown, in part reddish brown. Structural characteristics: joint 1 of antennae nearly as long as 2, 3, and 4 together, distinctly longer than 2 and 3 together. Disk of front lobe of pronotum conceave at base; hind lobe three times as long, its hind portion regularly rounded without depressed sides. Hind margin of sixth ventral of male with a rounded median concavity, its spines short and stout reaching nearly to tips of first genital.

Only two specimens, both males and fully winged, were found. They were on the surface of Reelfoot Creek after a heavy rain when the water was muddy. Both were parasitized by a red water mite. They were found in company with *G. nebularis*.

Gerris nebularis Drake and Hottes (Fig. 1, 4, 6)

Length, 15.4 to 16 mm.; shape, elongate, more slender than *G. remigis*; color, very dark brown. Structural characteristics: joint 1 of antennae nearly as long as the other three together, distinctly longer than 2 and 3 together. Genital segments of male very broad; the median ridge long and outstanding with a large, strongly depressed area on each side.

Only one specimen was taken—from Reelfoot Creek with *G. remigis*.

Gerris marginatus Say

Length, 9 to 11 mm.; shape, long, slender body; color, dark brown above with yellowish pubescence, margins of abdomen dull yellow, antennae and legs reddish brown, coxae and genital plates yellow. Structural characteristics: short, stout antennae with joint 1 little longer than 4; 2 and 3 shorter and equal. Median carina on disk of hind lobe of pronotum. Elytra usually entire and almost reaching tip of abdomen. Male with median notch of last ventral narrowly rounded, first genital with a median keel.

Quite abundant on the surface of the bayou and at the edge of the lake. Wings fully developed.

Gerris insperatus Drake and Hottes

Length, 7.5 to 8.5 mm.; shape, elongate; color, dark brown with connexiva, except outer margins, and median portion and posterior margin of last ventral,

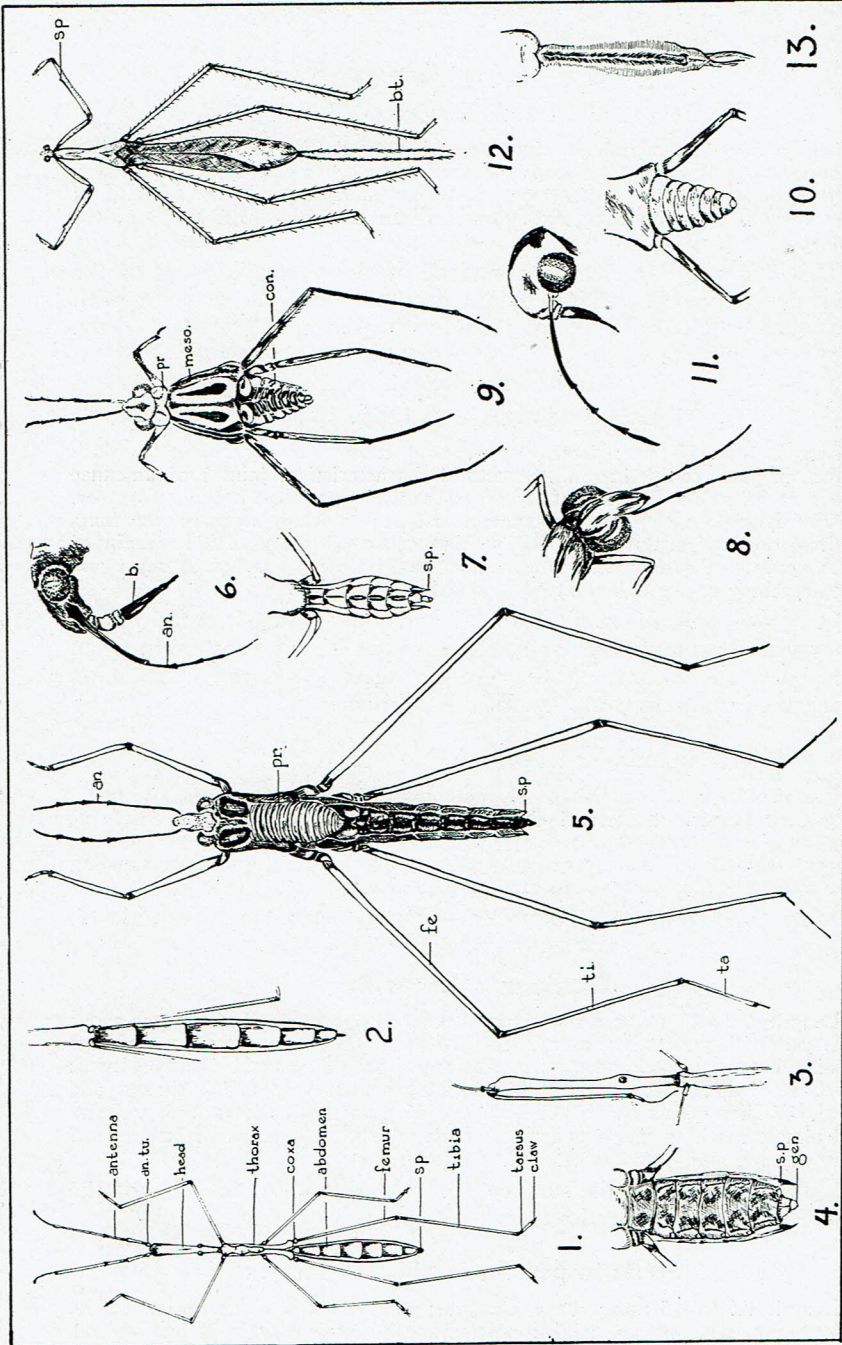


Fig. 1. Reelfoot Lake Hemiptera. 1-3, *Hydrometra martini*: 1, adult; 2, ventral view of abdomen; 3, ventral view of abdomen; 4, abdomen; 5, *Gerris canaliculatus* Say: 7, ventral view of abdomen; 8, head; 9-11, *Trepobates pictus* Herris-b-Schaeffer: 9, adult; 10, ventral view of abdomen; 11, head; 12-13, *Ranatra buenoi* Hungerford: 12, adult; 13, ventral view of abdomen; an., antenna; an. tu., antenniferous tubercule; b., beak; b. t., breathing tube; con., connexival; fe., femur; gen., genal pore; meso., mesonotum; pr., pro-notum; u., tarsus; t., tibia.

golden yellow. Structural characteristics: very similar to *G. marginatus* except for male genitalia. The median notch of last ventral of *G. insperatus* deeply and roundly notched; first genital very convex and without a keel.

Usually found with *G. marginatus* and almost as abundant. The females of the two are hard to separate.

Gerris canaliculatus Say (Fig. 1, 7-8)

Length, 9.5 to 10.5 mm.; shape, slender, elongate, subparallel; color, dark chestnut-brown above, median line of front lobe of pronotum and edge of side margins dull yellow, under surface, beak and legs brownish yellow. Legs very slender. Joints 1 and 4 of antennae subequal in length, 2 and 3 also subequal, each about three-fifths the length of 1. Elytra reaching almost to tips of abdomen. Sixth genital with acute spine.

G. canaliculatus was the most abundant species of the genus, *Gerris*, found. It inhabited quiet pools of the lake, the lake proper, and the bayou.

Limnogonus hesione Kirkaldy

Length, 7 to 8 mm.; shape, stout-bodied, oblong-oval; color, black, clothed with a minute appressed pubescence, pronotum with a small median central spot and the edge of hind margin brownish yellow, antennae and legs dark brown, the bases of front femora paler, coxae yellow, abdomen yellow. Structural characteristics: basal joint of front tarsi much shorter than apical one; pronotum shining, not fused with mesonotum.

L. hesione was the most abundant of all water striders of the lake or adjoining waters. Hundreds could be seen in quiet places on the lake where the duckweed was scarce. All *L. hesione* collected were wingless.

Rheumatobatus rileyi Bergroth

Length, 2.8 to 3 mm.; shape, oblong, tapering posteriorly; color, black above, a transverse median spot on pronotum, a diamond shaped median one on mesonotum, a rounded one above the middle coxae, the front femora and reflexed connexivum yellow, antennae, beak and middle and hind legs brown, the bases of the first antennae and of femora yellow, under surface and mesosternum yellow. Structural characteristics: hind femora of males swollen, strongly curved and fringed within at basal third with long hairs. First joint of male antennae thickened gradually from the base, armed beneath at apical third with one or two short spines; second joint very short with a slender spine near the base; third strongly curved; fourth with apical half curved acute, armed with a strong tooth. Middle tibiae of male fringed with short, hooked hairs on inner side. Female with antennae and tibia unmodified, the antennae with a few stiff bristles.

Abundant on the still waters of the lake margins. Also found along the edge of the bayou in the saw grass. All specimens wingless.

Trepobates pictus Herrich-Schaeffer (Fig. 1, 9-11)

Length, 3.8 to 4.5 mm.; shape, oblong, stout and short body; color, black and yellow above, markings variable, head usually with a median black stripe, enclosed on sides and base by a yellow one, disk of pronotum yellow with two black stripes, mesonotum mostly black with yellow outlining two black club-shaped marks, connexivals each with yellow spot, femora with yellow stripe, remainder of leg black. Structural characteristics: eyes large, fairly prominent. Joint 1 of antennae longest, 2 shortest, 4 slightly longer than 3. Pronotum wider than long, concave at middle. Middle and hind legs very long; front

tarsi 3 jointed, hind ones 1 jointed.

Found in great numbers on the surface of the bayou. All specimens wingless.

FAMILY VELIIDAE

Microvelia borealis Bueno

Length, 1.6 to 2 mm.; shape, male is elongate, slender, subfusiform, while the female is broader, suborbicular; color, head and pronotum brown, the head with a silvery streak next to the eyes, wings brown. Under surface brown except coxae, femora and middle of abdomen yellow, silvery-gray pubescence on under surface. Structural characteristics: joints 1 and 3 of antennae equal in length, joint 1 stouter, 2 shortest, half the length of 3, 4 slightly longer than 3. Pronotum as long as broad, upper angles swollen. Elytra of male as wide as abdomen. Female with connexivum slightly exposed.

Eight winged specimens were collected on a spring-fed branch in the hills near the bayou.

Microvelia hinei Drake

Length, 1.3 to 1.6 mm.; shape, slender, oblong, tapering behind; color, dark brown, head with a whitish line, pronotum with yellowish line behind the front margin. Structural characteristics: joint 2 of antennae shortest, 1 and 3 subequal, each about two-fifths longer than 2, 4 longest. Head and pronotum with fine whitish hairs.

Found on surface of lake and bayou, wingless specimens only.

Microvelia buenoi Drake

Length, 1.7 to 2.2 mm.; shape, elongate, subfusiform; color, blackish-brown, abdomen with a spot of silvery hairs on each side of the first two and last two dorsals and on each connexival. Structural characteristics: joints 1 and 3 of antennae subequal in length, 4 slightly longer than 2 and 3 together. Pronotum at middle about three times as long as mesonotum.

Taken in the vegetation very near the shore of the bayou and lake. Two were found in cow tracks where the water had been standing after a rain.

Velia stagnalis Burmeister

Length, 4 to 4.2 mm.; shape, long, slender body with straight sides; color, medium brown, legs paler brown or tan mottled with dull yellow, under surface with a broad black stripe extending from prosternum to sixth ventral. Structural characteristics: middle and hind tarsi subequal in length, the former with joints 2 and 3 subequal in length. Antennae with joint 2 one-fourth shorter than 3. Posterior portion of pronotum coarsely punctate.

Found near shore of lake and bayou, also in woodland pools.

SUBORDER CRYPTOCERATA

FAMILY NERTHRIDAEAE

Gelastocoris oculatus (Fabricius)

Length, 7.5 to 9 mm.; width, 5 to 6 mm.; shape, broadly oval; color, dull tan above, with middle of pronotum, scutellum and apical half of elytra dark brown or black, under surface brown, the sides lighter, legs dull yellow annulate with brown. Structural characteristics: front of head below eyes as wide or wider than long; claws of front legs contiguous, shorter than the tarsal joint, the claws

and tarsus together one-half as long as tibia; second joint of hind tarsi about one-third longer than third. Elytra surpassing tip of abdomen.

Taken in the mud and muck along the edge of the bayou.

FAMILY NAUCORIDAE

Pelocoris femoratus Palisot de Beauvois (Fig. 2, 7-9)

Length, 9 to 11.5 mm.; shape, broadly oval, subdepressed; color, dull greenish yellow above, with a median brown stripe on head and pronotum, hind lobe of pronotum dull white with darker marks, legs and beak dull yellow, connexivals each have a brown spot. Structural characteristics: front portion of pronotum, except at middle, with fine, shallow punctures; side margins very feebly flattened; numerous long hairs on keel of mesosternum, tarsi and genital segments. Median lobe of sixth ventral of female not cleft; male with fifth and sixth ventrals of three movable parts.

Numerous specimens were taken in the vegetation at Lake Center and Tiptonville. Their bright red eyes should be a danger signal against incautious handling for the beak can and often does inflict a painful wound.

Pelocoris carolinensis Bueno

Length, 8.2 to 9.6 mm.; shape, similar to *P. femoratus* but generally lighter in color. Structural characteristics: front portion of pronotum, except at middle, with numerous scattered coarse punctures; side margins more broadly flattened than *P. femoratus*; connexiva more widely exposed. Median lobe of sixth ventral of female deeply cleft.

Found with *P. femoratus*.

FAMILY NEPIDAE

Nepa apiculata Uhler

Length, 18 to 20 mm.; shape, elliptical, flattened; color, dull fuscous gray with the base of the abdomen more or less tinged with reddish, tarsal claws yellow. Structural characteristics: surface margins of the head and thorax roughly granulated; head, thorax, scutellum, and corium rough and closely covered with stiff, short pile. Front tibiae and tarsi together nearly as long as femora. Short breathing tubes.

Nymphs were taken from the muck of the bayou about a mile and a half below the station. Three specimens were taken from the mud in the saw grass zone of the bayou in front of the station.

Ranatra buenoi Hungerford (Fig. 1, 12-13)

Length from tip of beak to tip of abdomen, 32 to 38 mm.; length of breathing tube, 22 to 27 mm.; shape, long and slender, eyes large and prominent, legs very slender and very long, broad and deep median groove on under side of prosternum; color, light to dark fuscous, middle and hind legs of lighter color and banded. Structural characteristics: diameter of eyes greater than width of interocular area. Breathing tube longer than abdomen. Submedian tooth of front femora large and placed at apical two-fifths. Hind femora hardly reaching end of abdomen; hind tibiae slightly surpassing end of breathing tube.

Ten specimens were taken in one day among the submerged vegetation of the bayou.

Ranatra fusca Palisot de Beauvois

Length of body, 35 to 42 mm.; length of breathing tube, 21 to 24 mm.; shape, long and slender; color, dark reddish to fuscous brown, legs very faintly or not at all annulated, front femora usually paler than the coxae. Structural characteristics: eyes prominent, as wide as interocular area. Front portion of pronotum distinctly less than twice the length of thickened basal portion; hind femora not reaching middle of fifth ventral. Prosternum with a wide and shallow median groove.

Taken with *R. buenoi* in sticks and submerged vegetation.

FAMILY BELOSTOMATIDAE**Belostoma lutarium (Stal)**

Length, 22 to 26 mm.; width 11.2 to 12 mm.; shape, broadly oval, flat species; color, dull brownish yellow, strongly tinged with fuscous, pronotum sometimes wholly fuscous, clavus and corium often with a vague fuscous stripe, middle and hind legs annulate with fuscous, front femora with brown spots. Structural characteristics: head longer and tylus more convex than in other species. Sides of pronotum sinuate, scutellum broad at base. Elytra sparsely punctuate, strongly tapering behind the middle, their tips narrowly rounded. Silken stripes on sides of abdomen narrow.

Taken from the bottom of the bayou.

FAMILY NOTONECTIDAE**Notonecta irrorata Uhler (Fig. 2, 10-12)**

Length, 12.9 to 15.5 mm.; width of pronotum, 4.5 to 5 mm.; shape elongate, subcylindrical, convex; color, mottled brown and blue-black or black, head, limbs, and connexivum often greenish, scutellum black, hemelytra mottled, with brown predominating on clavus and black on the corium, the membrane is black, the venter is black. Structural characteristics: greatest width of interocular area three times that of narrowest point. Head and pronotum with scattered coarse shallow punctures. The pronotum is twice as wide as long.

Found floating upside down just beneath the surface of the bayou, usually near the roots of the plants in the emergent zone. *N. irrorata* is by far the most abundant species of the genus, *Notonecta* in the Keelfoot Lake region.

Notonecta uhleri Kirkaldy

Length, 10 to 12 mm.; width across pronotum, 3.3 to 4 mm (males usually smaller than females); shape, elongate, males slender; color, orange to brick red and black, scutellum black, hemelytra orange to brick red, corium crossed by a broad, irregular black band extending from near tip of clavus to costal margin, posterior lobe of membrane dark and both lobes crossed by a black band that often covers the lobes to their tips, the venter is dark. Structural characteristics: vertex of head longer than its anterior width and shaped like an inverted wine decanter. Scutellum longer than the pronotum and also longer than the ridge of the hemelytral suture.

Taken in the vegetation of the bayou and lake. A very brightly colored species.

Notonecta raleighi Bueno

Length, 8 to 8.9 mm.; width of pronotum, 2.5 to 2.9 mm.; shape, oblong, robust, subcuneiform; color, pale species, usually greenish-yellow above, thickly pubescent with appressed yellow hairs, eyes dark reddish-brown, basal half of pronotum, scutellum and clavus often blackish by transmission of the hues of

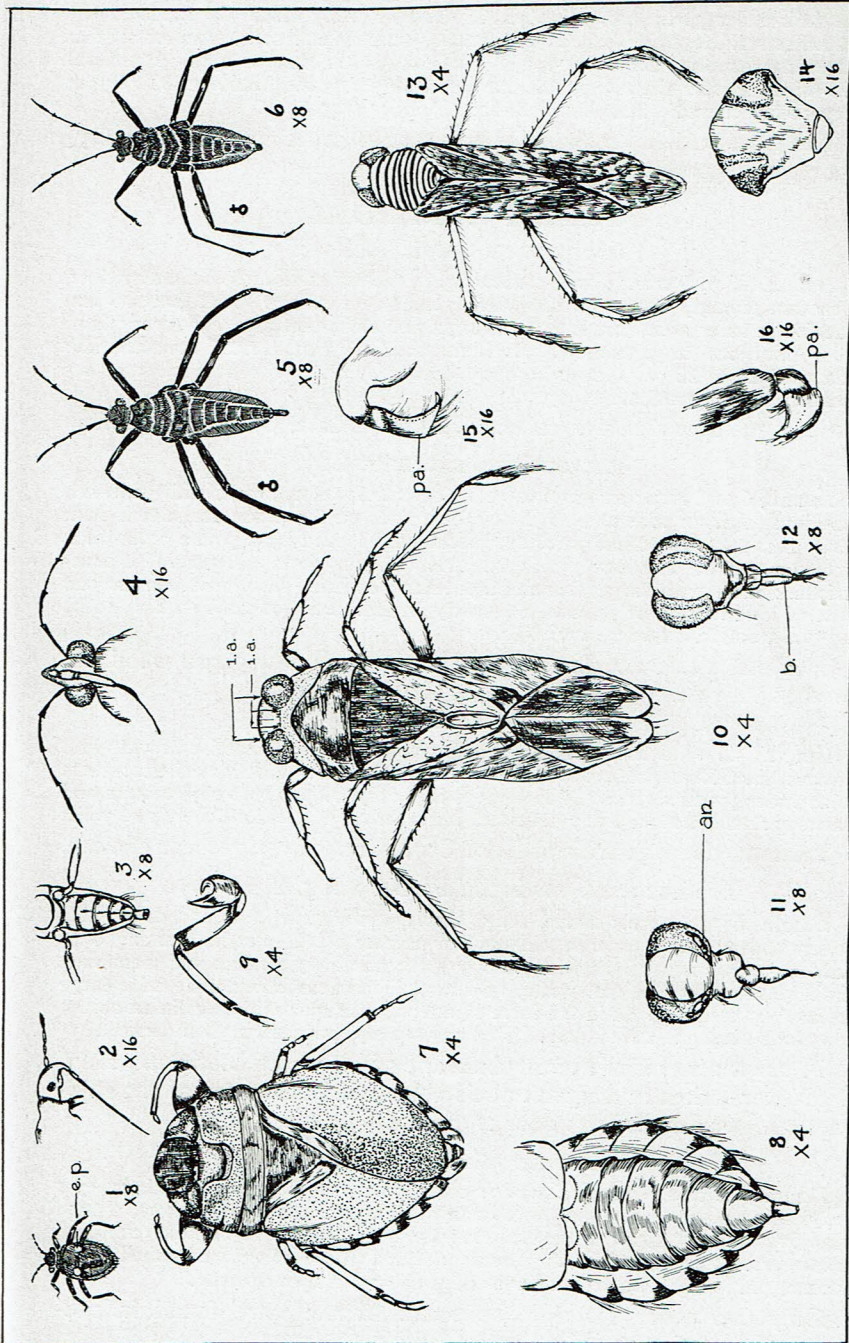


Fig. 2. Reelfoot Lake Hemiptera. 1-6, various species of *Micronetia* not so far found at this lake; 7-9, *Pelocoris femoratus* Palisot de Beauvois; 7, adult; 8, ventral view of abdomen; 9, hind leg; 10-12, *Natantia innotata* Say; 10, adult; 11, ventral view of head; 12, dorsal view of head; 13-15, *Trichocorixa ventralis* Fieber; 13, adult; 14, head; 15, pala showing pegs; 16, *Cortixa reticulata* (Guerin) pala. an., antenna; b., beak; e. p., elytra pad; i. a., interocular area at front and apex; pa., pala.

the dark under parts, external edges of clavus broadly black, the humerus has a black streak, legs dull yellow. Structural characteristics: interocular area at vertex narrow, only about one-fourth the width at the base of eyes. Pronotum two-thirds broader than long, side margins feebly concave, hind one broadly but very feebly curved. Scutellum one-fourth wider than long.

The most variable coloring of any species collected. Of the sixty-five specimens very few are alike.

FAMILY CORIXIDAE

Arctocorixa lucida Abbott

Length, 8.7 to 9 mm.; shape, slender, wider behind middle; color, dull yellow. pronotum strongly rastrate with seven or eight very narrow black lines, corium blackish at inner apical angle, outer margin and embolium pale, eight very faint cross lineations on pronotum, embolium whitish. Structural characteristics: pala with 20 to 22 pegs in an abruptly bent row, male with ovate frontal depression, reaching middle of eyes.

Only one specimen was collected, taken at Lake Center July 23.

Arctocorixa alternata Say

Length, 6 to 8 mm.; shape, elongate, subparallel; color, brown with yellowish markings, eight or nine narrow dark-brown lines on the pronotum, clavus with dark cross bars, broad and parallel, corium with forked zigzag pale cross-lines, embolium yellow with dusky margin, under surface dark. Structural characteristics: male with large frontal impression; female with front convex and apex of hind margin of pronotum obtusely angled. Pala of male with 38 to 40 pegs in a single, slightly curving row.

Two males and one female were taken from a stagnant woodland pond in August.

Palmacorixa sp.

Length, 4.5 to 6 mm.; shape, oblong; color, above yellowish-brown with fuscous lineations, pale yellow underneath. Structural characteristics: male palae wider than long with 24 to 33 pegs in a very irregular row, pronotum and clavus rastrate, corium finely punctate, front femur of female oblong and wide.

Taken in the vegetation at Lake Center, only two specimens found.

Trichocorixa verticalis Fieber (Fig. 2, 13-15)

Length, 5 to 6 mm.; shape, long, slender with straight sides; color, pale yellow above, pronotum with nine or ten narrow black lines, alternating with similar yellow ones, clavus with narrow black markings, corium and membrane similar, under surface dull white. Structural characteristics: male with large frontal depression. Pala in the form of a triangular spur with pegs in an abrupt row following outline of pala. Vertex obtusely carinate in both sexes.

T. verticalis was the most abundant of all water boatmen. Hundreds were taken in stagnant pools below the flood gates of the spillway. A very unpleasant odor is given off by these insects.

Corixa minima Abbott

Length, 3.3 mm.; shape, elongate; color, yellow with brown markings, eyes gray, female paler than male. Structural characteristics: pala short, twelve pegs in a straight row. Pronotum rastrate with five or six blackish confused cross bars. Pale lineations of clavus confused, those of corium united along the margin. Male with frontal impression oblong, vertex carinate.

Only two specimens were collected. These were found in submerged vegetation at Lake Center, July 29.