

Giant Water Bugs, Electric Light Bugs, *Lethocerus*, *Abedus*, *Belostoma* (Insecta: Hemiptera: Belostomatidae)¹

Paul M. Choate²



Figure 1. Dorsal view of an adult giant water bug, *Lethocerus* sp.
Credits: P. M. Choate, University of Florida

Introduction

The heteropteran family Belostomatidae contains the giant water bugs. These large, predatory, aquatic insects have the largest body size among the Heteroptera. Adults of some South American species reach 4 inches in length. Individuals occur in ponds and ditches where they suspend below the surface, respiring through two abdominal appendages which act as siphons. During mating season they fly from pond to pond or pool of water. It is during these flights that these insects fly to lights in large numbers, earning their other common name, “electric light bugs”. Individuals are capable of inflicting a painful bite with their strong beak and may also pinch with their front legs. Individuals prey on aquatic insects, small fish, frogs, tadpoles, small birds,

and other organisms they are able to capture. Powerful enzymes are injected into prey to kill them. Adults of *Lethocerus* are considered a delicacy in Asia, and are eaten both fresh and cooked.



Figure 2. Ventral view of the head of an adult *Lethocerus* sp., a giant water bug, showing the beak.

Credits: P. M. Choate, University of Florida

Life Cycle

Eggs of *Lethocerus* are deposited above water on vegetation and other objects. Eggs of *Abedus* and *Belostoma* are glued

1. This document is EENY-301, one of a series of the Department of Entomology and Nematology, UF/IFAS Extension. Original publication date July 2003. Revised October 2003, March 2013, and May 2016. Visit the EDIS website at <http://edis.ifas.ufl.edu>. This document is also available on the Featured Creatures website at <http://entnemdept.ifas.ufl.edu/creatures/>.

2. Paul M. Choate, Department of Entomology and Nematology; UF/IFAS Extension, Gainesville, FL 32611.

onto males' backs by females. Egg carrying by males is a unique feature in these two genera. Curiously, Kraus (1985) reported that in the absence of sufficient size males, eggs will also be laid on backs of females. Eggs hatch in one to two weeks, with total development time ranging from one to two months. Adults may overwinter in the mud.



Figure 3. Giant water bug eggs, *Lethocerus* spp.
Credits: Lyle J. Buss, University of Florida



Figure 4. Giant water bug nymph, *Lethocerus* spp.
Credits: Lyle J. Buss, University of Florida

Key to Species of Florida Belostomatidae

Seven genera and approximately 60 species occur worldwide, with three genera and approximately 20 species found in North America. The following three genera containing

eight species of Belostomatidae are known to occur in Florida (Henry and Froeschner 1988):

Abedus Stål, 1862

Abedus immaculatus (Say) *Belostoma* Latreille, 1807

Belostoma flumineum Say

Belostoma lutarium (Stål)

Belostoma testaceum (Leidy) *Lethocerus* Mayr, 1853

Lethocerus (*Benacus*) *griseus* (Say)

Lethocerus americanus (Leidy)

Lethocerus annulipes (Mayr) - Palm Beach

Lethocerus uhleri (Montandon) (species key modified from Bobb 1974, Pennak 1953)

1. Metasternum with a strong midventral keel, membrane of front wing reduced *Abedus immaculatus* (Say)

1'. Metasternum without midventral keel, membrane of front wing not reduced 2

2. Basal segment of beak longer than the second, less than 30 mm long (See Figure 5, below) 3

2'. Basal segment of beak shorter than second, 35 mm or longer 5

3. Length 20 mm or greater in length; color dark; head variable; tylus variable 4

3'. Length less than 20 mm; tylus not prominent; color pale brown or testaceous; head only slightly longer than front lobe of pronotum *Belostoma testaceum* (Leidy)

4. Head slightly longer than frontal lobe of pronotum; tylus less convex, not prominent; claval commissure distinctly shorter than scutellum; form narrow, less tapering behind middle of hemelytra *Belostoma flumineum* Say

4'. Head as long as middle of pronotum; tylus more convex, very prominent; claval commissure equal to or longer than scutellum; form broadly oval, strongly tapering behind middle of hemelytra *Belostoma lutarium* (Stål)

5. Anterior femur with deep narrow groove for reception of the tibia 6

5'. Anterior femur not grooved for reception of tibia
Lethocerus (Benacus) griseus (Say)

6. Middle and hind legs not banded, or only faintly so;
interocular space equal to width of an eye; costal margins
feebly but conspicuously curved *Lethocerus america-*
nus (Leidy)

6'. Middle and hind legs distinctly banded (see Figure 6,
below); interocular space not over three-fourths width of
an eye; costal margin almost straight (see Figure 7, below)
and subparallel *Lethocerus uhleri* (Montandon)



Figure 5. Dorsal view of an adult *Abedus lutarium* (Stål).
Credits: P. M. Choate, University of Florida



Figure 7. Ventral view of an adult *Lethocerus uhleri* (Montandon). (Note
banded middle and hind legs).

Credits: P. M. Choate, University of Florida

Distribution

Abedus immaculatus (Say)—Florida, Georgia, and
Mississippi;

Belostoma flumineum Say—Quebec and New England, west
to Manitoba and Colorado, southwest to Florida, Louisiana,
and Arizona;

Belostoma lutarium (Stål)—Massachusetts southwest to
Louisiana and Texas; Kansas;

Belostoma testaceum (Leidy)—New York west to Michigan
and southwest to Florida and Texas;

Lethocerus griseus (Say)—Massachusetts west to Michigan;
south to Florida and Texas; Mexico to Guatemala, West
Indies;

Lethocerus uhleri (Montandon)—Massachusetts, west to
Ontario, south to Texas; Mexico;

Lethocerus annulipes (Herrich-Schaeffer)—Florida, South
America, West Indies; reported from Palm Beach, Florida.

Lethocerus americanus (Leidy)—Newfoundland, Maine
to British Columbia, south to Utah and Nevada, Mexico,
Florida.

Selected References

Blatchley WS. 1926. Heteroptera of Eastern North America
with especial reference to the faunas of Indiana and Florida.
Nature Publishing Company, Indianapolis, Indiana. 1116p.



Figure 6. Dorsal view of an adult *Lethocerus uhleri* (Montandon).
Credits: P. M. Choate, University of Florida

- Bobb ML. 1974. The Insects of Virginia: No. 7. The aquatic and semi-aquatic Hemiptera of Virginia. Research Division Bulletin 87. Virginia Polytechnic Institute and State University, Blacksburg, Virginia. 196p.
- Dubois RB, Rackouski ML. 1992. Seasonal drift of *Lethocerus americanus* (Hemiptera: Belostomatidae) in a Lake Superior tributary. *Great Lakes Entomologist* 25: 85–89.
- Flosi JW, Hart ER. 1987. Endocuticular growth rings as an indicator of age structure in *Belostoma flumineum* Say (Hemiptera: Belostomatidae). *Iowa State Journal of Research* 62: 189–198.
- Henry TJ, Froeschner RC (eds.). 1988. Catalog of the Heteroptera, or True Bugs, of Canada and the Continental United States. E. J. Brill, New York. 958p.
- Hungerford HB. 1920. The Biology and Ecology of Aquatic and Semiaquatic Hemiptera. *Kansas University Science Bulletin* XI: 1–256.
- Hussey RF, Herring JL. 1950a. A remarkable new Belostomatidae (Hemiptera) from Florida and Georgia. *Florida Entomologist* 33: 84–89.
- Hussey RF, Herring JL. 1950b. Rediscovery of a Belostomatidae named by Thomas Say (Hemiptera). *Florida Entomologist* 33: 154–156.
- Ichikawa N. 1988. Male brooding behavior of the giant water bug *Lethocerus deyrollei* Vuillefroy (Hemiptera: Belostomatidae). *Journal of Ethology* 6: 121–128.
- Ichikawa N. 1989. Breeding strategy of the male brooding water bug, *Diplonychus major* Esaki (Heteroptera: Belostomatidae): Is male back space limiting? *Journal of Ethology* 7: 133–140.
- Ichikawa N. 1995. Male counterstrategy against infanticide of the female giant water bug *Lethocerus deyrollei* (Hemiptera: Belostomatidae). *Journal of Insect Behavior* 8: 181–188.
- Keffer SL, McPherson JE. 1988. Descriptions of nymphal instars of *Abedus breviceps* (Hemiptera: Belostomatidae). *Great Lakes Entomologist* 21: 169–174.
- Kehr AI, Schnack JA. 1991. Predator-prey relationship between giant water bugs (*Belostoma oxyurum*) and larval anurans (*Bufo arenarum*). *Alytes* 9: 61–69.
- Kight SL, Sprague J, Kruse KC, Johnson L. 1995. Are egg-bearing male water bugs *Belostoma flumineum* Say (Hemiptera: Belostomatidae), impaired swimmers? *Journal of the Kansas Entomological Society* 68: 468–470.
- Kraus B. 1985. Oviposition on the backs of female Giant water bugs, *Abedus indentatus*: the consequences of a shortage in male back space? (Hemiptera: Belostomatidae). *Pan-Pacific Entomologist* 61: 54–57.
- Kraus WF. 1989. Surface wave communication during courtship in the giant water bug, *Abedus indentatus* (Heteroptera: Belostomatidae). *Journal of the Kansas Entomological Society* 62: 316–328.
- Kraus WF, Gonzales MJ, Vehrencamp SL. 1989. Egg development and an evaluation of some of the costs and benefits for paternal care in the Belostomatidae, *Abedus indentatus* (Heteroptera: Belostomatidae). *Journal of the Kansas Entomological Society* 62: 548–562.
- Kruse KC, Leffler TR. 1984. Females of the giant water bug, *Belostoma flumineum* (Hemiptera: Heteroptera: Belostomatidae), captured carrying eggs. *Annals of the Entomological Society of America* 77: 20.
- Lauck DR, Menke AS. 1961. The higher classification of the Belostomatidae (Hemiptera). *Annals of the Entomological Society of America* 54: 644–657.
- Leidy J. 1847. History and anatomy of the Hemipterous genus *Belostoma*. *Journal of the Academy of Natural Sciences of Philadelphia* (2) I:57–57.
- McPherson JE, Packauskas RJ. 1986. Life history and laboratory rearing of *Belostoma lutarium* (Heteroptera: Belostomatidae) with descriptions of immature stages. *Journal of the New York Entomological Society* 94: 154–162.
- Menke AS. 1960. A taxonomic study of the genus *Abedus* Stal (Hemiptera: Belostomatidae). *Univ. California Publications Entomology* 16: 393–439.
- Needham JG. 1907. The eggs of *Benacus* and their hatching. *Entomological News* 18: 113–116. Pennak, R. W. 1953. *Fresh-water Invertebrates of the United States*. Ronald Press Company, New York. 769p.
- Smith RL, Larsen E. 1993. Egg attendance and brooding by males of the giant water bug *Lethocerus medius* (Guerin) in the field (Heteroptera: Belostomatidae). *Journal of Insect Behavior* 6: 93–106.

Smith RL. 1979. Paternity assurance and altered roles in the mating behavior of a giant water bug, *Abedus herberti* (Heteroptera: Belostomatidae). *Animal Behaviour* 27: 716–725.

Smith RL, Horton C. 1998. Fish predation on giant water bug (Heteroptera: Belostomatidae) eggs in an Arizona stream. *Great Basin Naturalist*. 58: 292–293.

Venkatesan P, D'Sylva T. 1990. Influence of prey size on choice by the water bug, *Diplonychus indicus* Venk. and Rao (Hemiptera: Belostomatidae). *Journal of Entomological Research* 14: 130–138.

Venkatesan P. 1983. Male brooding behavior of *Diplonychus indicus* (Hemiptera: Heteroptera: Belostomatidae). *Journal of the Kansas Entomological Society* 56: 80–87.

Wilcox RS. 1995. Ripple communication in aquatic and semiaquatic insects. *Ecoscience* 2: 109–115.