



## Beneficial insects: true bugs

Erin W. Hodgson  
Extension Entomology Specialist

Ron Patterson  
Carbon County Extension

### What You Should Know

- True bugs are fluid feeding insects that suck out juices from plants and animals.
- Nymphs and adults feed on the same prey, especially soft-bodied insects like aphids and caterpillars.
- Predatory true bugs are usually not host-specific, meaning they do not have a preference for feeding on certain prey.

**T** rue bugs have piercing-sucking mouthparts (Fig. 1) and belong to the order Hemiptera and suborder Heteroptera. There are more than 38,000 species of true bugs, and are most closely related to aphids, cicadas, and leaf hoppers. Although some true bugs are considered pests, about one-third are predaceous. True bugs have forewings, or hemelytra, that cross over the back at rest, but sometimes the wings are reduced (Figs. 1-3). Hemelytra are hardened at the base and membranous near the end. A triangular patch between the forewings is usually noticeable. True bugs have 5-segmented antennae and scent glands. Sometimes the first pair of legs are modified for grasping prey, as with the praying mantids. Common predatory bugs include: ambush bugs, assassin bugs, big-eyed bugs, damsel bugs, minute pirate bugs, and stink bugs.

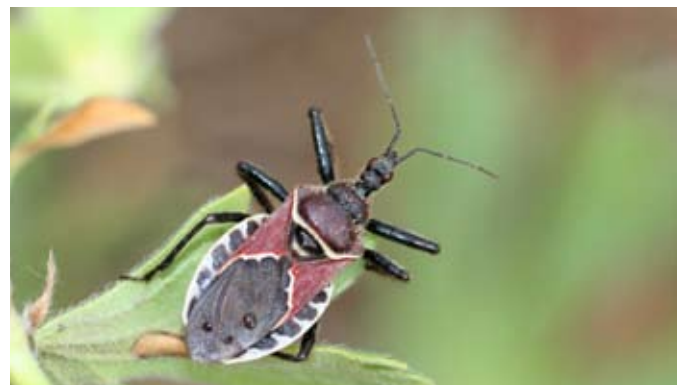


Fig. 2. Bee assassin bug adult.<sup>2</sup>

### True Bug Life Cycle

True bugs, and all Hemipterans, go through simple or incomplete metamorphosis. Males and females will mate end-to-end (Fig. 3), or facing away from each other. Mated females lay eggs singly or in small masses near potential food sources. Nymphs hatch from the eggs and begin to search for small prey items. Nymphs look similar to the adults except they are smaller in size and lack functional wings; nymphs will develop wing pads as they mature. They pass through five instars before finally molting into an adult. Total development time is dependant on the weather, but generally there are several generations per year.



Fig. 1. Spined assassin bug adult.<sup>1</sup>



Fig. 3. True bugs mate end-to-end.<sup>2</sup>

## Reduviidae - Assassin Bugs

Reduviidae is a large family of assassin bugs with more than 7,000 species in the world. Adults range from 4-40 mm in length and are brown, black, red or orange in color. Most assassin bugs have an elongated head accentuated by a narrow neck, long legs and an obvious curved piercing stylet or beak (Figs. 1, 4-5). Another distinctive trait is the tip of the beak fits into a groove of the thorax and rasps against ridges to produce sound. Assassin bugs eat a variety of prey, including grasshoppers, beetles, flies, bees, and other plant-eating true bugs.



Fig. 4. Assassin bug adult feeding on a fly.<sup>3</sup>



Fig. 5. Assassin bug nymph feeding on a leafminer fly.<sup>2</sup>

## Geocoridae - Bigeyed Bugs

Geocoridae is a small family of predatory insects, with only 275 bigeyed bug species in the world. Adults are brown or black in color, and range from 3-5 mm in length. Adults have a triangular head with large, prominent eyes that occasionally extend over the back (Figs. 6-7). These predators are commonly found on weeds, sparse grass, in woods and near streams. Prey items include eggs, caterpillars, leafhoppers, mites, thrips, whiteflies, and aphids. Sometimes bigeyed bugs are mistaken for chinch bugs or other pests.



Fig. 6. Bigeyed bug nymph.<sup>4</sup>



Fig. 7. Bigeyed bug adult.<sup>4</sup>

## Anthocoridae - Minute Pirate Bugs

Anthocoridae are small predatory bugs, with about 600 species in the world. Adults range from 0.5-6 mm in length and have dark bodies with black and white forewings (Figs. 8-7). Minute pirate bugs have oval bodies that are somewhat flattened. Adults have large, prominent eyes. These predators are found in ground litter and grass, and attack insect eggs, aphids, scales, and spider mites. Minute pirate bugs are also released into greenhouses for biological control.



Fig. 8. Minute pirate bug nymph feeding on an aphid.<sup>4</sup>



Fig. 9. Minute pirate bug adult feeding on an insect egg.<sup>5</sup>



## Pentatomidae - Stink Bugs

Pentatomidae is a large family of stink bugs, with over 4,500 species in the world. In general, stink bugs are larger (8-20 mm in length) and wider compared to other true bugs (Figs. 3, 10). All stink bugs are usually green or brown camouflaged to blend in the background (Fig. 11). Adults resemble a shield and have a stubby beak. If disturbed, stink bugs will emit a rancid liquid derived from cyanide compounds. Stink bugs can be found in fields, meadows, and on herbaceous plants. These predators will feed on eggs and caterpillars.



Fig. 10. Spined soldier bug nymph eating a caterpillar.<sup>6</sup>



Fig. 11. Stink bug eggs.<sup>2</sup>

## Nabidae - Damsel Bugs

Nabidae is a family of predatory damsel bugs, with about 400 species in the world. Adults range from 8-12 mm in length, and are considered thin and soft-bodied compared to other true bugs (Figs. 12-13). Most damsel bugs are brown in color and grasping forelegs. These predators are found in low vegetated areas and prey on many crop pests, including caterpillars, aphids, and plant-feeding bugs.



Fig. 12. Damsel bug nymph.<sup>4</sup>



Fig. 13. Damsel bug adult.<sup>2</sup>

<sup>1</sup> Image courtesy of Susan Ellis ([www.ipmimages.org](http://www.ipmimages.org)).

<sup>2</sup> Image courtesy of Whitney Cranshaw, Colorado State University Extension ([www.ipmimages.org](http://www.ipmimages.org)).

<sup>3</sup> Image courtesy of Sturgis McKeever, Georgia Southern University ([www.ipmimages.org](http://www.ipmimages.org)).

<sup>4</sup> Images courtesy of Bradley Higbee, Paramount Farming ([www.ipmimages.org](http://www.ipmimages.org)).

<sup>5</sup> Image courtesy of John Ruberson, University of Georgia ([www.ipmimages.org](http://www.ipmimages.org)).

<sup>6</sup> Image courtesy of Russ Otters, University of Georgia ([www.ipmimages.org](http://www.ipmimages.org)).

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