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# Entomology for Master Gardeners

## Entomology Basics

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**Order Homoptera:** Cicadas, planthoppers, leafhoppers, whiteflies, mealybugs, aphids, and scales

Homoptera means 'similar wing.' It is a large, diverse group composed entirely of plant feeding insects. Like the Hemiptera, they have piercing-sucking mouthparts and gradual metamorphosis (as seen here with the cicada nymph and adult). The Homoptera hold their wings at an angle at rest, similar to the pitch on a gabled roof. However, many of the Homoptera are wingless as adults (such as the mealybugs). Some groups of Homopterans, such as the aphids and scales, have winged and wingless adult forms.



As can be seen with the cicada nymph and adult above, the body shapes are similar,

however, the nymph has legs modified for digging while the adult does not. The wing pads are visible on the nymph's back. Note how the adult is holding its wings.



Some of the Homopterans produce honeydew, as with the mealybug above. Using their piercing-sucking mouthparts, they remove large amounts of plant sap. Often there is more sugar and water than what they need, so they expell the excess. Dark sooty mold can grow on the honeydew, and the sooty mold can be an indication of an insect infestation.

#### **Kentucky Examples in the Order Homoptera**



This is a periodical cicada. In some areas of the state these are referred to as locusts, but they are cicadas. There are many broods of periodical cicadas that emerge on either a 13 or 17 year cycle. Upon emerging, they cluster on trees in wooded areas by the tens of thousands causing a nuisance with their constant noise. The periodical cicada in Kentucky can be recognized by its red and black coloration. Note how the wings are held like the sides of a gabled roof and the piercing-sucking mouthparts can be seen below the head.





This is the candystriped fleahopper feeding on a grape leaf. You can see the mouthparts inserted into the leaf. Many of the leafhoppers are vectors of plant diseases. As they move from plant to plant probing and feeding, they can move viruses that cause plant diseases.



This is a colony of corn leaf aphids, nymphs and adults. All of the aphids in this picture are females that produce other females through asexual reproduction. Asexual reproduction enables aphid colonies to increase in number very rapidly. Many aphids have complex annual cycles switching between plant hosts during the seasons as well as sexual and asexual reproduction. Note the glistening honeydew produced by the aphids that is covering the leaf. Honeydew can draw ants to these colonies and promote sooty mold growth. There are also a few shed exoskeletons on the right. Aphids are also important vectors of plant viruses.



This is an example of an armored scale, the calico scale. For most of their life, scale insects are sedentary, they stay in one spot feeding on the plant underneath a protective cap. The cap protects them from many predators, the harsh environment, and contact pesticides. The female calico scale may lay up to 4500 eggs inside of her shell. When the eggs hatch, the active 'crawler' stage emerges and moves about on the plant before settling down. It is this crawler stage that is most easily controlled with contact insecticides. Once it settles down and begins to feed, it begins to produce the protective cap. Knowing when the crawler stage occurs in the spring is key to control of scale insects.



These are mealybugs (not true bugs hence a one word name), a common pest of greenhouse plants. Mealybugs are covered with a waxy coating making it difficult for some sprays to contact the body. As with aphids, honeydew is often associated with mealybug infestations.





This is a treehopper adult and nymphs. Note how with gradual metamorphosis the wings buds are visible on the outside of the body. With complete metamorphosis, wing development occurs internally in the larval stage.



Planthoppers are small, at least the ones outside of the tropics. Many of the species are unusual in appearance. This species feeds on woody fungi.



Whiteflies, such as the greenhouse whitefly pictured above, can be very difficult to manage. Similar to scale insects, the whitefly nymphs settle in one spot to feed, later emerging as an adult.

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*Photo credits: R. Bessin, Department of Entomology, University of Kentucky; montage created by P. Dillon, Department of Entomology, University of Kentucky*

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