Blister Beetles Can Appear Suddenly to Devastate Garden Plants

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Blister beetle is the common name for members of the insect family Meloidae. This family contains about 2,500 species in 120 genera worldwide. At least 14 species are native to Arkansas, found in a variety of color patterns and body shapes. They are fairly large insects, ranging between ¾" and 2" long. Meloids have a distinctly narrow "neck" – the pronotum – which is thinner than the head and abdomen, and tapers toward the front. Their elytra are relatively soft and leathery, and may wrap around the sides of the body of some species, but are very short in others. Meloida have a tarsal formula of 5-5-4, with the tarsal claws of blister beetles split lengthwise, giving the distinctive appearance of four claws on each foot. Some ground beetles (family Carabidae) superficially resemble blister beetles, but they have 5-5-5 tarsi, and lack the split tarsal claws. Meloids can be easily confused with members of the family Oedemeridae, known as the False Blister Beetles, which also have 5-5-4 tarsi, but are generally smaller, lack the split claws, and have a pronotum that tapers towards the rear.

Adults blister beetles are phytophagous, with some species feeding solely on flower parts, while others exhibit a preference for consuming foliage. Meloid beetles feed on a wide range of host plants, including many asters and legumes, among others. Some species are particularly fond of solanaceous vegetables (potatoes, tomatoes, peppers, eggplants) as well as beets and chard, and are considered voracious, if only occasional, pests. Blister beetles often disperse and remain in low population densities for most of their lives, but will suddenly aggregate into large mating and feeding swarms when mature, and can cause considerable damage to vegetation. Farmers and gardeners may be surprised to see large numbers of adults appear suddenly, causing significant loss to plants in a very short time.





Key characteristic for identifying beetles in the family Meloidae include the "split claw" and a pronotum that is distinctly narrower than the head, which tapers towards the front. Photos by NCSU Agriculture and Life Sciences.




Blister beetles aggregate suddenly to mate and feed, causing significant plant damage. Photos by J. K. Barnes.

While adult beetles can do serious damage to plants, the larvae of some species feed on grasshopper eggs, and are considered beneficial for controlling those pests. Larvae of the Blackened Blister Beetle, *Epicauta atrata*, will also attack the eggs of the Striped Blister Beetle, *Epicauta vittata*, which can be significant pests. Many meloid species are kleptoparasites, developing on the larvae and provisions they find in the nests of ground-dwelling solitary bees. Some *Epicauta* larvae will climb onto flowers, then hitch a ride on a pollinating bee, only to prey on that bee's offspring and provisions once back inside its the nest. Blister beetle larvae of may also become cannibalistic if their populations are too dense with no other food sources.

Blister beetles earned their common name by producing a substance called cantharidin, which can cause blistering of the skin and mucous membranes, as well as irritation to the digestive and urinary tract if ingested. Young beetles accumulate cantharidin as they feed and grow during their larval stages, and will exude this defensive compound in a milky oral fluid when threatened. Only male beetles continue to produce cantharidin as adults, which they can transfer to adult females in spermatophores during mating. Adult beetles may respond to a disturbance by feigning death and bleeding cantharidin-laden hemolymph from leg joints, or by dropping from plants and quickly hiding from danger.

As a potent source of this toxic terpenoid compound, blister beetles were once used as an ingredient in apothecary preparations. One particular European member of this family, called *Lytta vesicatoria*, was known as "Spanish Fly" and was historically considered an aphrodisiac. The same substance has also been incorporated into traditional North African culinary spices. The supposed benefits of this beetle's defensive compound have led to accidental poisonings. While superficially similar in appearance, members of the unrelated beetle family Cantharidae actually produce no cantharidin.



The infamous "Spanish Fly" was actually a type of European blister beetle, Lytta vesicatoria. Photo by Franco Christophe (CC BY-SA 3.0).

In Arkansas, there are one to two generations of blister beetles per year. Early-emerging adults begin to appear in May–June. These can produce another generation in which adults emerge in August-September. Maximum emergence of adults occurs in July, when large congregations they may be observed on plants, however few of the later-emerging adults contribute to the second generation. Since the generations overlap, many adults may be present in the field from late May to late October. Females deposit eggs in the soil, which quickly disperse to seek food. The later generation will overwinter as larvae, and finish pupating the following spring.

Some blister beetles are highly attracted to alfalfa, and adults sometimes congregate in great numbers in hay fields. If they become crushed by tractor tires or other machinery, large numbers of beetles can end up in baled hay. Cantharidin remains potent, even in dead insects, their body parts or secretions, which irritates both internal and external body tissues of animals. Blister beetle poisoning (cantharidiasis) results when livestock feed on contaminated hay. Symptoms can include tongue and mouth blistering, abdominal pain, colic, rapid pulse and respiration, diarrhea, blood or intestinal lining discharge in stools and problems with urination or bloody urine. Cattle, sheep, alpacas, emus and poultry are all sensitive to cantharidin toxicity, but horses are particularly susceptible, occasionally resulting in death. If blister beetle poisoning is suspected, a veterinarian should be contacted immediately.

For more information on this hazard to livestock, or recommendations for control in pastures, consult the Extension publication FSA-7054, ***Blister Beetle Management in Alfalfa***. For infestations in commercial soybeans or edamame, consult MP-144.

Adult beetles are most active during the morning and late afternoon, seeking shelter from the sun at midday. In particularly hot weather they may remain hidden, limiting their activity to the evening hours. The tendency of beetles to aggregate in large numbers can result in serious defoliation of small areas, with little or no damage nearby. This same behavior but can also aid in their management. Because they are easily disturbed, individuals or small aggregations can be shaken into a bucket of soapy water and drowned. Because cantharidin can cause blistering on human skin, care should be taken to avoid handling adult beetles. Larger aggregations of blister beetles are easily controlled by foliar application of insecticides. Careful visual examination of garden plants is suggested, followed by judicious spot treatment of infested areas only. Some effective products include:

- Acetamiprid 0.5% (Ortho Flower, Fruit & Vegetable Insect Killer)
- Carbaryl (Sevin)
- Cyfluthrin 0.75% (Bayer Advanced)
- Bifenthrin 0.3% + zeta-cypermethrin 0.075% (Ortho Bug-G-Gon Insect Killer)
- Gamma-cyhalothrin 0.08% (Spectracide)

Refer to MP-144 for specific vegetable treatment recommendations. Consumers should read and follow all label instructions when using any pesticide product. ***The label is the law!*** Examples of products and trade names listed here are for the convenience of consumers. Inclusion or omission of any product does not constitute any endorsement or disapproval on the part of the University of Arkansas Division of Agriculture.

Some of the Blister Beetles found in Arkansas



Striped Blister Beetle
Epicauta vittate
Photo by McClarren & Reago
(CC0)



Black Blister Beetle
Epicauta pensylvanica
Photo by Steven Mlodinow
(CC BY-NC-SA)



Short-winged Blister Beetle
Meloe angusticollis
Photo by Angela
(CC BY-NC-ND)



Orange Blister Beetle
Zonitis vittigera
Photo by Jim Elve
(CC BY-NC)



Blackened Blister Beetle
Epicauta atrata
Photo by theo_witsell
(CC-BY-NC)



Margined Blister Beetle
Epicauta funebris
Photo by Mary Keim
(CC BY-NC-SA)



Forest Blister Beetle
Nemognatha nemorensis
Photo by Rick Nirschl
(CC BY-NC-SA)



Squash Blister Beetle
Epicauta conferta
Photo by Laura Gaudette
(CC BY)



Buttercup Oil Beetle
Meloe americanus
Photo by karenlynn
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