

# Blister Beetles – A Challenge for Arizona’s Growers

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## THE PROBLEM

Blister Beetles are a highly diverse group of agriculturally, ecologically, and medically important insects, with nearly 150 species occurring in Arizona feeding on a variety of plants, including economically important crops. Blister beetles can potentially contaminate agricultural crops. **Blister Beetles are of concern due to the presence of the toxic defensive chemical cantharidin within their bodies, which can cause illness and potentially death if ingested by humans and livestock. Accurate identification of these beetles is critical to verify their occurrence in crop and non-crop habitats.**

## WHAT WE ARE DOING

Based on two USDA-funded projects, the [University of Arizona Insect Collection \(UAIC\)](#) and the [UA's Arizona Pest Management Center's \(APMC\) Insect Diagnostics Clinic](#) is updating species records, distributional and life-history data, host plant records, and digitizing the UAIC's extensive blister beetle collection. Analytical techniques are also being developed to determine cantharidin levels in select species and to evaluate their potential impact if ingested by humans.

## WHAT WE ARE PRODUCING

Expected outputs and outcomes include [developing educational resources for crop producers and pest manager](#) and [providing diagnostic support enabling accurate identification of blister beetles](#). These materials and resources will be promoted through a [cooperative effort between the APMC, UAIC, and Cooperative Extension](#).

## BLISTER BEETLE BASICS

Blister beetles are at times confused with other similar looking beetles that do not produce cantharidin. Blister beetles are found in many different sizes and colors (Fig 1). However, they all share the characteristic feature of a broad head that is wider than the thorax (“neck”). This, combined with broader elytra (wing covers), creates a distinct “neck-like” appearance. They also have just 4 segments in their hind tarsi (Fig 2). **A pest manager must be familiar with the general characteristics of various species to properly identify the potential threat to crops and livestock (Fig 3).**

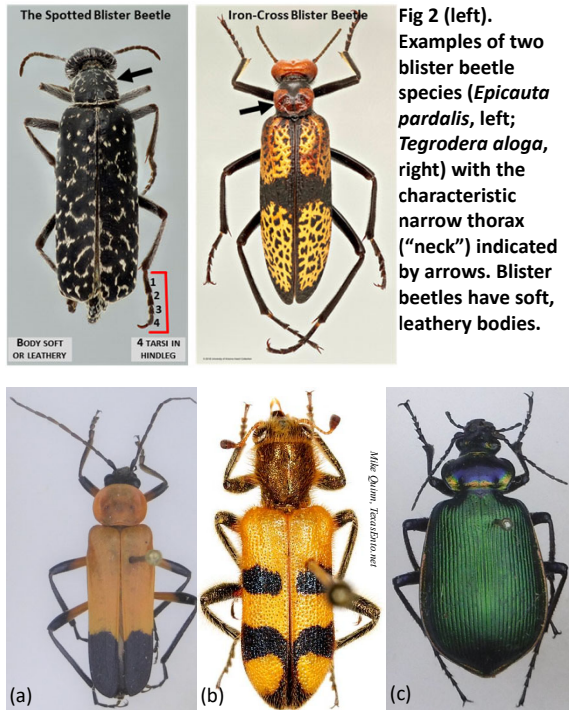
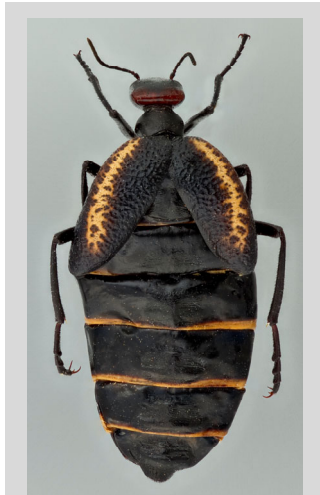


Fig. 3 Blister beetles may be confused with soldier beetles (a), checkered beetles (b), ground beetles (c), and others.



## BLISTER BEETLE DIGITIZATION

The University of Arizona Insect Collection houses the largest blister beetle collection in the southwestern United States. More than 10,000 specimens will be digitized, with images of each specimen and their associated data available online worldwide (Fig 4).



Fig. 4. Example digitization of a blister beetle species from the UA Insect Collection.

*These efforts will advance our knowledge of blister beetles in Arizona and adjacent regions, providing stakeholders with information to minimize health risks and potential economic losses.*



## CANTHARIDIN

Contact with cantharidin on the skin or mucous membranes can cause severe blistering or irritation. When ingested, the chemical irritates the gastrointestinal and urinary tracts, potentially leading to illness or death, depending on the amount of cantharidin consumed. **Not all species of blister beetles produce the same levels of the toxin, and little information is available on the levels of cantharidin in individual beetles. No antidote exists for cantharidin poisoning.**

## BLISTER BEETLES IN FOOD!?

**Noting beetle presence in fields and preventing them from getting into harvested product is key.** Blister beetles emerge in spring, but can be found during the summer months and early fall. They feed on many plants, often preferring those in flower. The Spotted Blister Beetle (*Epicauta pardalis*) has been found in baled alfalfa. *Lytta magister* was unusually abundant in 2019 and strayed from its favorite adult host, the brittlebush (*Encelia* spp.), to local iceberg lettuce in isolated cases (Fig 5a). The Iron Cross Blister Beetle (*Tegrodera aloga*) has been found infrequently in large numbers in leafy green produce in Arizona (Fig 5b).



Fig. 5 *Lytta magister* on iceberg lettuce (a). The iron cross beetle, *Tegrodera aloga*, found in a spinach field (b).



Fig 1. Diversity of blister beetle species.



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