BUG BIZ
Pest Management and Insect Identification Series
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The Cactus Lady Beetle: A Voracious Predator of Scale Insects

Scientific name: *Chilocorus cacti* L. (Insecta: Coleoptera: Coccinellidae)

Introduction

The cactus lady beetle, *Chilocorus cacti,* is indigenous to the southern United States, Central America and northern South America (Gordon, 1985). *Chilocorus cacti* was found associated with many scale pests, including crape myrtle bark scale, *Eriococcus lagerstroemiae* Kuwana (Hemiptera: Eriococcidae) (Figure 1), a recently introduced pest on crape myrtle, *Lagerstroemia* spp. L. (Myrtales: Lythraceae). This lady beetle is considered an important biological control agent of soft scales (Gray, 2006).

Other names

Chilocorus cacti is also known as twice-stabbed lady beetle, or twice-stabbed cactus lady beetle.

Distribution

Chilocorus cacti is present in tropical and subtropical areas around the world (Samways et al., 1999). In the United States, *C. cacti* has been reported in Arizona, California, Florida, Hawaii, Louisiana, New Mexico and Texas (BugGuide, 2015).

Description

Eggs: The eggs of *C. cacti* are about 1.1 millimeters (0.04 inches) long, oval and greyish (Figure 2). Field observations suggest that eggs are usually laid near prey or inside white sacs of crape myrtle bark scale (Figure 3).

Larvae: The length of larvae of *C. cacti* ranges from 0.5 millimeters (0.06 inches; 1st instar) to 6.0 millimeters (0.24 inches; 4th instar) long. The color is black with yellow stripes (Figure 4). The larvae have black spines on the dorsal side (Figure 4). The larvae are voracious and highly mobile predators. They usually open the white ovisacs using their strong mouthparts, and feed on the eggs or the newly hatched crawlers of crape myrtle bark scale inside (Figure 5).

Pupae: Pupae of *C. cacti* are approximately 5.0 millimeters (0.20 inches) long, shiny and mottled with black and brown (Figure 6). The pupae do not form a cocoon.

Adults: Adults of *C. cacti* are 4.0 (0.16 inches) to 6.2 mm (0.24 inches) long, circular shape, black and shiny, and have one brown spot on each elytra. In Louisiana, it is easily confused with another lady beetle, *Chilocorus stigma* Say (Coleoptera: Coccinellidae).

Figure 1. The larva of the cactus lady beetle, Chilocorus cacti, feeding on the eggs of crape myrtle bark scale, Eriococcus lagerstroemiae.

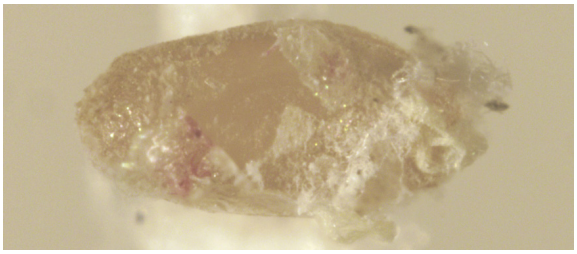

Figure 2. Egg of Chilocorus cacti.

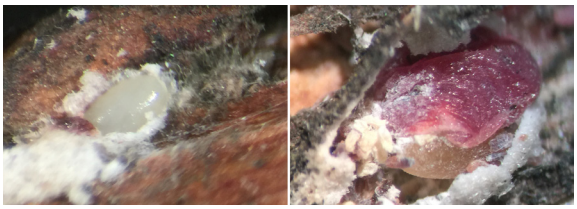

Figure 3. Eggs of Chilocorus cacti buried inside the sac of male crape myrtle bark scale (left) and the ovisac of gravid female (right).

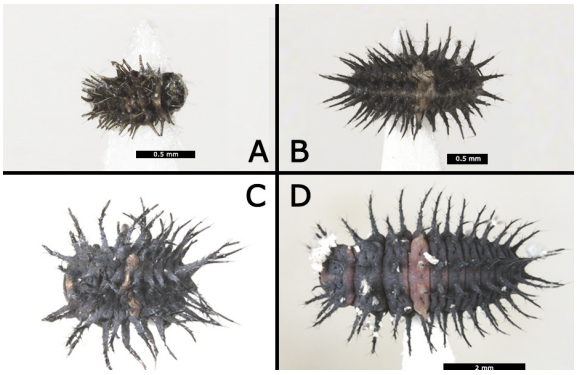

Figure 4. Larvae of Chilocorus cacti. (A) 1st instar; (B) 2nd instar; (C) 3rd instar; and (D) 4th instar.

Both lady beetles can be found on crape myrtle plants infested with the crape myrtle bark scale and crape myrtle aphid, *Tinocallis kahawaluokalani* (Kirkaldy) (Hemiptera: Aphididae). *Chilocorus cacti* usually has larger brown spots on the elytra than *C. stigma* (Figure 7). Another distinction of these two lady beetles is the color of the ventral side of the thorax: dark brown in *C. cacti*, but black in *C. stigma* (Figure 7). Male and female *C. cacti* look alike (Figure 8).

Biology and Ecology

The life cycle of *C. cacti* consists of egg, larva, pupa and adult. Adults can live from two to five weeks. First instars hatch from eggs in about 10 days at 25 C (77 F) and start feeding on nearby prey. Under laboratory conditions at 25 C, the larval stage of *C. cacti*, from 1st to 4th instar, is about 17 days. The pupa lives for another 13 days. Although this lady beetle was used as biological control agent, its biology is still unclear. A laboratory study suggested that *C. cacti* can survive 41 C (106 F) for as long as 50 hours (Hattinghl and Samways, 1994), which means this lady beetle could be adapted to the high summer temperatures present in southern United States.

No natural enemies to this lady beetle are found in the United States, perhaps because of its color and/or bad taste to most predators. The brown and black color can be a warning related to toxicity (Gray, 2006). This lady beetle has a defensive substance in the blood (Shi et al., 1995), which has a repulsive smell that can fend off its predators including small birds and lizards (Gray, 2006).

Use in Biological Control

Chilocorus cacti has been used as a biological control agent for several scale pests in different countries. For example, in 1966, it was introduced into South Africa from Texas to manage the citrus scale, *Aonidiella aurantii* Maskell (Hemiptera: Diaspididae) (DeBach and Rosen, 1976). However, the control was ineffective (Hattinghl and Samways, 1994). *Chilocorus cacti* is also associated with other scales in the family Diaspididae including *Aulacaspis yasumatsui* Takagi (Cave, 2006), *Acutaspis agavis* (Townsend and Cockerell) (Salas-Araiza et al., 2008), *Abgrallaspis aguacatae* Miller, *Hemiberlesia lataniae* Signoret, and *Hemiberlesia rapax* Comstock (Lazaro-Castellanos et al., 2012), and the family Dactylopiidae including *Dactylopius indicus* Green (Badii and Flores, 2001). *Chilocorus cacti* preys on non-scale pests including the Asian citrus psyllid, *Diaphorina citri* Kuwayama (Hemiptera: Psyllidae) (Pluke et al., 2005).

In Louisiana, *C. cacti* have been found feeding on the crape myrtle bark scale (Wang et al., 2015). Larvae and adults of this lady beetle prey on scale eggs and nymphs. In the laboratory, 4th instars can feed about 400 scale eggs in 24 hours. This lady beetle has higher feeding rates than other *Chilocorus* lady beetles under the same temperature (Hattinghl and Samways, 1994).

Several approaches can be used to enhance the presence of *C. cacti* in the landscapes. First, use insecticides with low toxicity to manage the crape myrtle bark scale. Second, insecticides can be applied during the time of year when lady beetles are less abundant such as winter. Additionally, planting flowering plants can provide pollen as an alternative food to attract this lady beetle or prolong its activity in the landscapes.

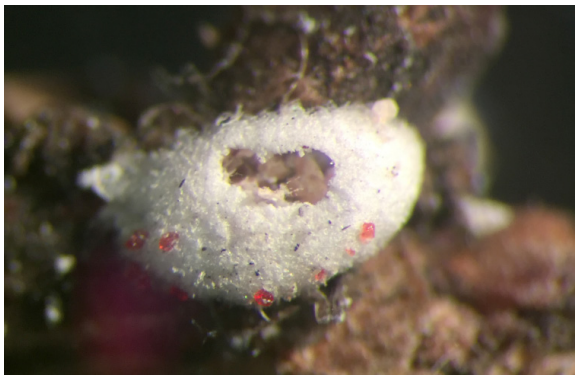

Figure 5. Damage to the ovisac of crape myrtle bark scale caused by Chilocorus cacti larva.

Figure 6. Pupa of Chilocorus cacti.

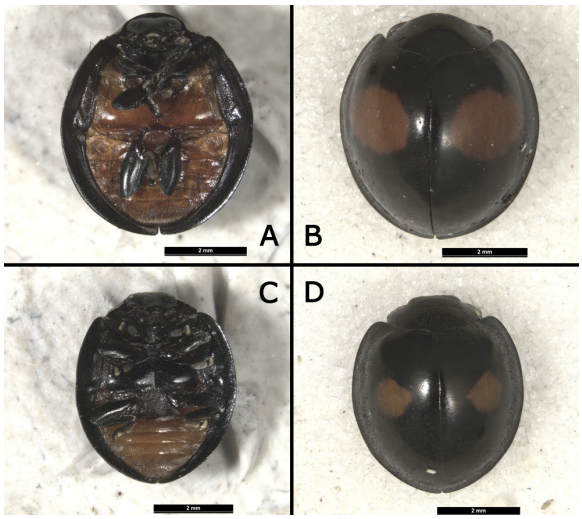

Figure 7. Comparison of adults of Chilocorus cacti and Chilocorus stigma. Pictures (A) and (B) are dorsal side and ventral side of C. cacti; (C) and (D) are dorsal side and ventral side of C. stigma. The color of the ventral side (A and C) and the size of spots on elytra (B and D) are different.

Figure 8. Adults of Chilocorus cacti mating.

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