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OBSERVATIONS ON SOME INSECT PESTS OF WOODY ORNAMENTALS: BLACK OLIVE CATERPILLAR, GEIGER TREE TORTOISE BEETLE AND CYCAD AULACASPIS SCALE IN NAPLES, FLORIDA

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Abstract. **Observations over the past 4.5 years fill in some basic gaps on the biology of the black olive caterpillar, *Characoma nilotica* (Rogenhofer) (Lepidoptera: Noctuidae) and the Geiger tree tortoise beetle, *Physonota (Eurypepla) calochroma floridensis* (Blake) (Coleoptera: Chrysomelidae). An update on the new systemic insecticide, Safari™ (dinotefuran from Valent U.S.A. Corp.) for management of the cycad aulacaspis scale, *Aulacaspis yasumatsui* Takagi (Hemiptera: Diaspididae) is included.**

In order for landscape pest management companies and homeowners to determine the appropriate response process (i.e., management strategy), it is helpful to assign a damage category to the species of insects that frequent woody ornamental plants (Lloyd and Miller, 1997). A simple, three rank classification is commonly used:

Category 1 = Annoyance. The major concern is not about plant damage, but rather, the main objection is the unwanted presence of an insect. Often these concerns revolve around unwanted behavior associated with insects such as stinging or by-products produced by the insects: webbing, frass, sooty mold, nests, etc.

Category 2 = Cosmetic. Typically this refers to aesthetic nibbling that produces slight injury, but no long-term stress or serious plant damage occurs. The degree of defoliation or damage that is tolerable may vary year to year, and depends on the innate resilience and vigor of each plant species. A ficus tree may rebound from 50% canopy damage with little stress, however, a hibiscus shrub may spiral into decline if it suffers 25% canopy loss or damage. Other immediate stress factors include weather conditions, poor drainage, nutritional status, diseases, additional insect damage, etc. The other key variable is the level of cosmetic injury that the individual homeowner or the commercial landscape manager will tolerate. Often that threshold is less than the amount of injury that a plant, especially with the long growing season in south Florida, can withstand before it is beyond recovery.

Category 3 = Serious threat. An attack by a pest in this category (examples: palmetto weevil, certain scale insects, mealybugs, mites etc.) will cause rapid death of the plant unless some management action is quickly taken.

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These categories are dynamic as well as subjective. A pest species may fit into all three categories. The category will vary depending on when observations are made in the population's development cycle and the abundance of the pest that particular year and the landscape manager's aesthetic (damage) tolerance level. The following information is based on observations over the past 4.5 years, from January 2001 to July 11, 2005.

Black Olive Caterpillar

The black olive caterpillar, *Characoma nilotica,* is an intermittent pest on a commonly used shade tree, the black olive tree, *Bucida buceras* L. (Combretaceae) and a compact variety, 'Shady Lady'. Because the larva has a habit of dangling on silken threads beneath the canopy of these trees, it has been referred to as the "bungee" caterpillar by some local landscapers. This larva was very abundant in 2002 and fairly common in 2003. During the other years, it was hard to find. It seems odd with our extended growing season, but *Characoma nilotica* only has one generation per year with primary damage occurring between mid-April and early May.

Damage and Biology. In late April 2002, caterpillar complaint phone calls started. Callers were annoyed by the dangling larvae getting in their face and hair. This insect starts as a Category 1 pest and then escalates to a Category 2 as the upper canopies of infested trees turn brown and defoliate. These caterpillars seem to be more into vandalizing the trees rather than consuming them for food. Larger larvae chew some foliage, but it is just a slight skeletonizing of the lower leaf surface. The brown and defoliated leaves are caused by the larvae clipping them to create a feeding niche or a place to hide and spin their little white cocoons on the tree in the leaves or in the old flower parts. With all of the leaf litter, some streets in Naples reminded me of October leaf drop in Ohio. On 1 May, 2002, some trees were 80 to 100% brown or defoliated from this insect (Fig. 1). This alarming amount of damage would typically put this pest into a serious threat category in most northern states. The black olive trees looked doomed at several locations, a sure category 3 event. Up north, borers and bark beetles typically infest trees weakened by such severe defoliation. However, this did not happen and the black olive trees shrugged it off and refoliated within four to six weeks.

Cocoons that were collected in early May, produced dull gray-brown moths in by 15 May.

The following year, on 22 April, 2003, I found young larvae feeding on the delicate flower clusters (Fig. 2). In the future, with more observations to confirm, flowering could be used as a phenological trigger to monitor for larval activity and, if needed, a window-of-control to time pesticide applications early enough to minimize damage or nuisance behavior. Previously, due to the short life cycle, by the time the pest was noticed, it was too late to remedy. No information could be found on what happens after the moths emerge. The eggs

Fig. 1. Some trees were 80 to 100% brown or defoliated by the black olive caterpillar, *Characoma nilotica* in Naples (taken, May 2002)

may be deposited on twigs in the upper canopy and hatch next spring. Or perhaps the adults aestivate until next spring and deposit their eggs when the trees are in flower. Heppner (2003) reported moths captured from Feb. through Nov. which may support the idea that the adults survive the winter and deposit eggs the following spring.

Description. The final caterpillar instar is about 5/16 inch long (Fig. 3) with a beige body speckled with darker brown and a darker brown lateral longitudinal stripe on each side; the head capsule is a dark brown to black. The color of younger larvae may be lighter green or pale green if they have been feeding on the flowers. The moth has about a ½ inch wing spread and is a gray-brown with at least one distinct set of adjacent black and white fine, irregular lines that tranverse the midwing area (Fig. 4). There are some other irregular brown and dark brown blotches. No description of the eggs has been reported.

Hosts. Besides black olive, Heppner (2003) reports buttonwood (*Conocarpus erectus* L.: Combretaceae) and a few odd hosts, *Rhododendron* sp. (Ericaceae) and *Salix* sp. (Salicaceae).

Fig. 2. The four Characoma nilotica caterpillars feeding on the black olive flower petals (note notching on petals) are indicated by read spots (22 April 2003)

Fig. 3. The final black olive caterpillar instar is about 5/16 inch long with a beige body speckled with darker brown and a darker brown lateral longitudinal stripe on each side; the head capsule is a dark brown to black. Note the skeletonizing damage on the lower (abaxial) leaf surface.

Geiger Tree Tortoise Beetle

The Geiger tree tortoise beetle, *Physonota (Eurypepla) calochroma floridensis* feeds on the orange flowering Geiger tree. It has overlapping generations and can probably be found almost anytime.

Damage and Biology. Young larvae "team" feed or feed in a group and skeletonize the upperside of the leaves. They also feed on the flowers (Chaboo, 2004). The adults feed on the margins of the leaves and contribute to the damage. The fruit often looks pock-marked, probably from larvae or adults chewing on them when they are small. The leaf beetles were common each year, but not abundant enough to cause much more than 20 to 30% consumption of the canopy. I remember seeing a 30 to 35 ft Geiger tree on Sanibel Island in April 1991 that had been 90% defoliated. I would categorize this beetle as a Category 2, no big deal nibbler, but as with most insect populations, their numbers can swell and they may cause considerable damage. This beetle has overlapping gen-

Fig. 4. The "black olive caterpillar" moth has about a ½ inch wing spread and is a gray-brown with at least one distinct set of adjacent black and white fine, irregular lines that tranverse the midwing area. The moth is parched on a millimeter ruler.

Fig. 5. The Geiger tree tortoise beetle *Physonota (Eurypepla) calochroma floridensis* adults are ⅜ inch long and at first, after they have freshly emerged from the pupal stage (callow adults), they are a dull tan and black. Note the typical adult chewing as a slight marginal notching on the edge of the leaf.

erations. There appears to be at least 3 peak periods when larvae are busy chewing away (mid-April, July and September) in the Naples, Fla. area. It seems that one can always find a few individuals of one stage or another all season long. Chaboo (2004) reported finding adults, larvae and pupae on 20 Nov. in Ft. Lauderdale in 2002.

Description. Adults are ⅜ inch long and at first, after they have freshly emerged from the pupal stage (callow adults), they are a dull tan and black (Fig. 5). After the exoskeleton hardens, it becomes a shimmering golden-green, attractive, scintillating, sequin-like tortoise beetle (Fig. 6). On the other hand, the larvae are disgusting looking. They resemble miniature nodosaurid dinosaurs with lateral spines. Their bodies are covered with slime and feces (Fig. 7). Chaboo (2004) observed that, unlike other species in this Cassidinae subfamily, the larva holds its abdomen vertically and "a constant stream of wet feces dripped unto (sic) the head, thorax and abdomen." The larva is black-grey with a whitish stripe down the middle of its dorsum ("back"). The lateral projections along the pronotum and abdomen resemble small claws. The beige eggs are deposited in clusters of about 25 to 40. Long white filaments lightly cover the cluster (Fig. 8). Each egg is about 1 mm long and 0.5 mm wide.

Fig. 6. After the exoskeleton hardens, it becomes a shimmering golden-green, attractive, scintillating, sequin-like tortoise beetle.

Fig. 7. The Geiger tree tortoise beetle larvae resemble miniature nodosaurid dinosaurs with lateral spines. Their bodies are covered with slime and feces.

Host. The Geiger tree (*Cordia sebestena* L.: Boraginaceae) is the principal host. Other *Cordia* species, which are occasionally found in the landscape, are not suitable for this beetle. These include the white flowering, wild-olive (*Cordia boissieri* Lam.), a yellow flowering shrub (*Cordia lutea* A. DC.) and bloodberry (*Cordia globosa* (Jacq.) H.B.K.).

Cycad Aulacaspis Scale

A new systemic insecticide, Safari™ (a.i. is dinotefuran) became available in 2005 from Valent U.S.A. Corp., for use in the management of the white armored scale**,** cycad aulacaspis scale, *Aulacaspis yasumatsui.* This scale is a Category 3, serious

Fig. 8. The beige color Geiger tree tortoise beetle are deposited in clusters of about 25 to 40. Long white filaments lightly cover the cluster. Each egg is about 1 mm long and 0.5 mm wide.

threat, on our two common sagos (cycads), the queen sago, *Cycas rumphii* Miquel and the king sago, *Cycas revoluta* Thunberg. Safari proved highly effective as a root drench in a test I conducted in Oct. 2003 on 3-gal container-grown king sagos (3 plants per treatment). The Safari rate tested was 1.2 g of 20 SG in 10 oz of water/ sago plant. Results were based on the mortality of 60 settled crawlers and 60 adult female scales per treatment. Mortality for settled crawlers was 88% at 7 DAT (days after treatment), which indicates fairly fast uptake. Mortality was 100% at 14, 22, and 43 DAT for crawlers. Mortality of crawlers on the untreated plants ranged from 23% (7 DAT); 8% (14 DAT); 25% (DAT) and 51% (43 DAT). The adult stage was tougher to manage as is typical with scale insects, as mortality was a little slower with the adult female, going from 32% at 7 DAT to 48% at 14 DAT to 70% at 22 DAT and 87% at 43 DAT. Mortality on the untreated plants for the adult female stage was: 3% (7DAT); 3% (14DAT); 10% (22 DAT); and 25% (43 DAT). If results with Safari prove consistent, only 2 root drench applications per year (early May and mid-September) may be needed rather than the repeated series of foliar applications which do not address the populations on the roots and hidden under the petiole stubs and bracts on the trunk. The product only comes in a 3 pound container for landscape professionals and costs about $270. However, the treatment rate cost is very reasonable, at the high-end rate (24 oz/100 gal), the cost is about 34 cents per vertical ft (measure ground to crown). The current label doses are geared at container nursery use, even though outdoor landscape use is on the label, which leaves the dose rate open to interpretation. This will be clarified in a forthcoming label amendment according to Valent representatives. Smaller packaging should also be available soon.

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