

A Weevil, *Eurhinus magnificus* Gyllenhal (Insecta: Coleoptera: Curculionidae)¹

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The Featured Creatures collection provides in-depth profiles of insects, nematodes, arachnids, and other organisms relevant to Florida. These profiles are intended for the use of interested laypersons with some knowledge of biology as well as academic audiences.

Introduction

Eurhinus magnificus Gyllenhal was first reported in Florida in 2002 when a single specimen was found in an ornamental nursery in Broward County (Feiber 2002). It was collected again in 2003 near Homestead, Miami-Dade County, and was also intercepted in a shipment of bananas from Costa Rica (Fowler 2004). It is likely that this weevil was inadvertently imported into Florida through trade in live plants or plant products. In 2005, all life stages of *E. magnificus* were collected repeatedly in both Broward and Miami-Dade Counties from the host plant *Cissus verticillata* (L.) Nicolson & Jarvis (Vitaceae).

C. verticillata, also known by the common names of possum grape vine, princess vine, and season vine, supports the entire life cycle of *E. magnificus*. Eggs are laid within the stem where larvae hatch and begin to feed. The larvae complete five instars, within a gall formed at the location of oviposition, before pupating. Adults emerge from the host plant gall to feed on *C. verticillata*, mate and oviposit.

It is still to be determined if this new weevil will cause damage in the grape cultivars (*Vitis* spp.) in the grape growing regions of Florida.

Synonymy

Eurhinus magnificus is a member of the Curculionidae-Baridinae. The original spelling of the genus, *Eurhin* Illiger 1807, was suppressed by the plenary power of the International Commission on Zoological Nomenclature (Melville 1985), thereby following the arguments of Zimmerman and Thompson (1983) for resolving a nomenclatural conflict between two homonymously used family-group names.

Distribution

The genus includes 23 species that are widely distributed. *Eurhinus magnificus* occurs in Belize, Costa Rica, Guatemala, Honduras, Mexico, Nicaragua, and Panama (Vaurie 1982, Schall 2002). In 2005, *E. magnificus* was abundant and successfully reproducing in various habitats where the host plant *C. verticillata* was present across Miami-Dade and Broward Counties. After first being reported in Florida in 2002, it appears to be established and flourishing in the southeast region of the state.

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Description

Adult

This insect is a robust weevil similar in body form to other *Eurhinus* weevils (Bondar 1948) and, like many of the other species, *E. magnificus* adults are brilliantly colored. The entire body is a vibrant, metallic blue-green with areas of metallic red-copper on the humeri and apex of the elytra and on the pronotum, rostrum, and legs. The mean dimensions of the adult are 5.66 mm long by 3.71 mm wide (Ulmer et al. 2007).



Figure 1. Adult *Eurhinus magnificus* Gyllenhal, a weevil, (dorsal-lateral view).

Credits: Bryan J. Ulmer, University of Florida

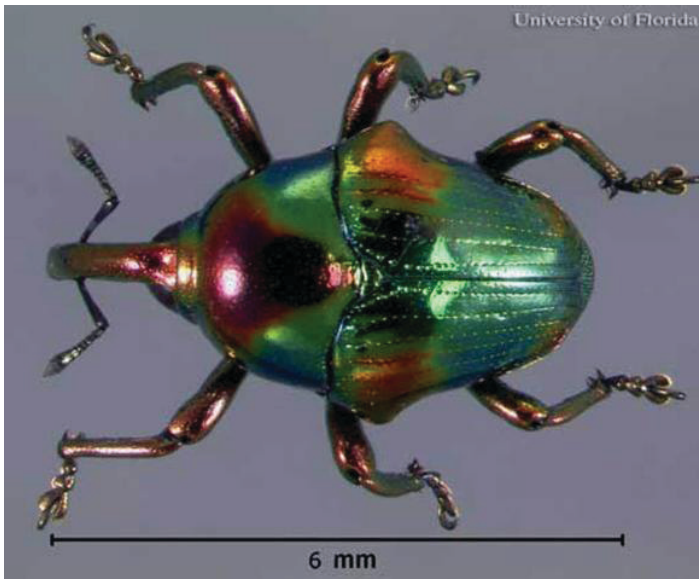


Figure 2. Adult *Eurhinus magnificus* Gyllenhal, a weevil, (dorsal view).
Credits: Huang Ta-I, University of Florida

Egg

The egg is milky beige and a mean of 1.24 mm long by 0.72 mm wide (Ulmer et al. 2007).

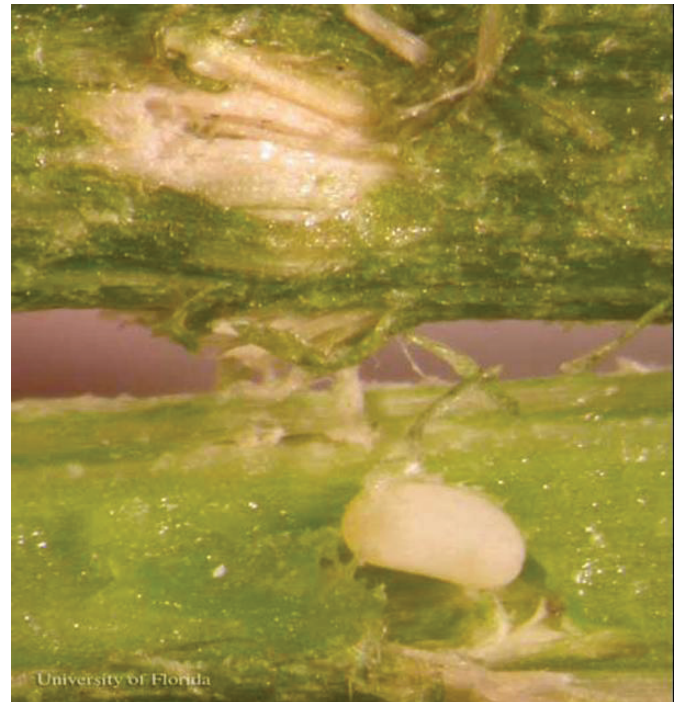


Figure 3. *Cissus* stem opened to reveal *E. magnificus* Gyllenhal egg.

Credits: Bryan J. Ulmer, University of Florida



Figure 4. Close up of an egg of *Eurhinus magnificus* Gyllenhal, a weevil.
Credits: Bryan J. Ulmer, University of Florida

Larva

Body stout, curved, greatest width near middle, tapered at both ends. The mean head capsule width of a fifth instar larva is 1.6 mm. A full description of the larva and pupa can be found in Ulmer et al. 2007.



Figure 5. *Cissus* stem opened to show an early instar larva of *E. magnificus* Gyllenhal, a weevil.

Credits: Rita E. Duncan, University of Florida



Figure 7. Head capsule and mandibles of the larva of *Eurhinus magnificus* Gyllenhal, a weevil.

Credits: Rita E. Duncan, University of Florida



Figure 6. Fifth instar larva of *Eurhinus magnificus* Gyllenhal, a weevil, in a gall.

Credits: Rita E. Duncan, University of Florida

Pupa

Stout in appearance, with a mean length of 5.66 mm by 3.71mm wide.



Figure 8. Ventral view of a pupa of *Eurhinus magnificus* Gyllenhal, a weevil.

Credits: Bryan J. Ulmer, University of Florida



Figure 9. Lateral view of a pupa of *Eurhinus magnificus* Gyllenhal, a weevil.

Credits: Rita E. Duncan, University of Florida

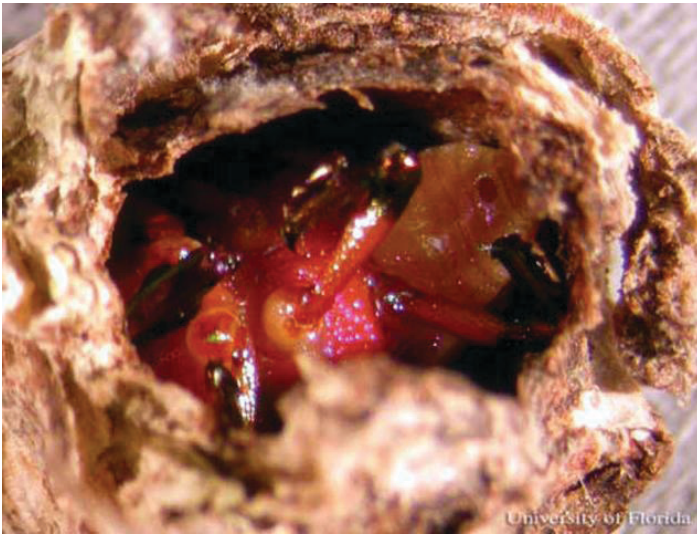


Figure 10. Gall with ventral view of newly formed adult *Eurhinus magnificus* Gyllenhal, a weevil.

Credits: Bryan J. Ulmer, University of Florida



Figure 12. Adult *Eurhinus magnificus* Gyllenhal weevils and feeding damage.

Credits: Rita E. Duncan, University of Florida



Figure 11. Sclerotized adult *Eurhinus magnificus* Gyllenhal, a weevil, emerging from *Cissus* gall.

Credits: Rita E. Duncan, University of Florida

Biology

Adults feed on the outer layers of host plant stems and also within cavities created in the stems and the leaf petioles. Some feeding also occurs on leaf blades at the portion of the leaf directly around the attachment point of the petiole. Females oviposit in young parts of the stem (mean diameter = 2.3 mm) by creating a cavity with their rostrum and depositing a single egg. One or two eggs are laid within a single host plant internode. Gall formation becomes detectable by the first to third instar larva. The largest diameter of the gall is at the pupal stage, at this stage the mean stem size is 4.2 mm and the mean gall size was 9.2 mm.

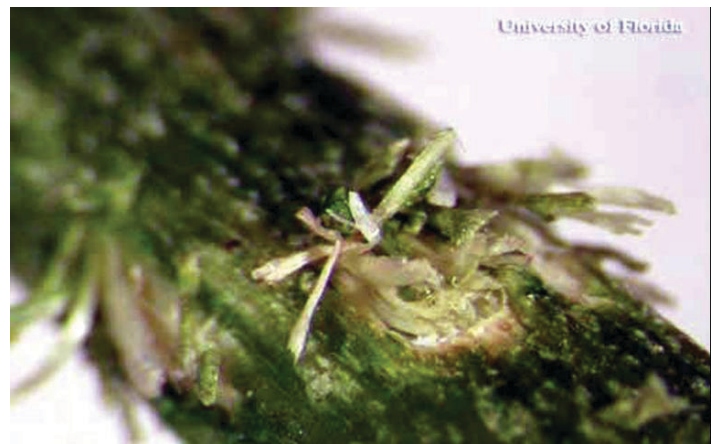


Figure 13. Oviposition cavity of *Eurhinus magnificus* Gyllenhal, a weevil.

Credits: Bryan J. Ulmer, University of Florida



Figure 14. Gall caused by larval growth of *Eurhinus magnificus* Gyllenhal, a weevil.

Credits: Rita E. Duncan, University of Florida

A single specimen of *E. magnificus*, reared in a greenhouse in Homestead, Florida, required approximately 83 days to develop from egg to adult during the coldest part of the year. It is likely that the development time of *E. magnificus* would be greatly reduced during the summer months. The presence of adults in the field and larval development observed during winter indicate that *E. magnificus* is capable of reproducing throughout the year in south Florida. Adults emerging from field collected galls survived nine to 47 days (mean 32 days) from the time of emergence under laboratory conditions (Ulmer et al. 2007).

Host Plants and Damage

Like other members of the genus, *E. magnificus* larvae induce galls on the stems of *Cissus* spp. (Vitaceae) (Bondar 1948). *Vernonia*, *Andira* and *Mikania* spp. have also been suggested as host plants (Silva et al. 1968, Vaurie 1982). However, the only verified host plant of *E. magnificus* in Florida is *C. verticillata*.

Florida contains native species of all four genera which are also represented by species occurring over a wide range in the United States (Fowler 2004, USDA 2006). *C. verticillata* is widely distributed in the Caribbean, Central and South America, and Mexico (Lombardi 2000). It also is considered native to Florida in the United States (USDA 2005). Though *C. verticillata* is sometimes planted as an ornamental, it is a prolific perennial vine that is generally considered a weedy species when occurring with various ornamental and fruit crops in south Florida (Futch and Hall 2003).

In Trinidad and Tobago, *C. verticillata* is used for medicinal purposes against urinary problems (Lans 2006). A single adult was also found on pigmy palm, *Phoenix robelinii* O'Brien (Arecaceae), and one was collected from avocado, *Persea americana* Mill. (Lauraceae), foliage. However, no evidence of feeding or oviposition was observed on these two plants and it is likely that the collections were incidental and they are not true host plants.

In general, *C. verticillata* appear healthy and actively growing beyond the point of gall formation. However, the development of *E. magnificus* within the stem causes a significant malformation and often has an obvious negative impact on the host plant. Occasionally the gall and resulting damage coupled with environmental conditions results in severing the stem.

Eurhinus magnificus is not known to be a pest of commercial grapes and is not considered a threat to attack *Vitis* spp. (Fowler 2004). However, in a preliminary study Ulmer et al

(2007) showed three of four cultivars tested were attacked by adult weevils in a no-choice situation resulting in feeding damage and galls. No larval development was apparent on any of the grape species tested. It is conceivable that this weevil could develop on other grape cultivars under different conditions. Additional studies to investigate a wide range of grape cultivars varying in physical and chemical characteristics should be undertaken before eliminating *Vitis* spp. as suitable host plants.

The impact of the weevil on *C. verticillata* and on other potential hosts, such as *Vernonia* spp. and *Vitis* spp., is not discernible at this early stage of colonization but necessitates future research. Further work is also required to better understand the population biology of *E. magnificus* and to establish its potential for range expansion in the United States.



Figure 15. *Cissus verticillata* Nicolson & C.E. Jarvis vine with flowers and fruit.

Credits: Rita E. Duncan, University of Florida



Figure 16. Damage to *Cissus* vine caused by gall formed by *Eurhinus magnificus* Gyllenhal, a weevil.

Credits: Rita E. Duncan, University of Florida

Management

Successful development of *E. magnificus* in the field appears to be significantly reduced by predation and fungal agents. However, an examination of approximately 200 specimens of *E. magnificus* revealed no evidence of parasitism for any life stage. There are no records of parasitism for *E. magnificus* in its native range. *Capitonus tricolorvalvus* Ent (Hymenoptera: Braconidae) was reared from stem galls of *C. verticillata* in Costa Rica, the host was not identified but presumed to be a beetle (Ent and Shaw 1999). Further sampling is needed to establish the parasitoid fauna, or lack of, associated with this weevil in Florida and its native range.

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