

On Farm Rearing of the soil predator *Dalotia coriaria*.
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Figure 1. Adult *Dalotia coriaria*.
Actual size 3-4 mm.

Dalotia (=Atheta) coriaria is a small (3-4 mm), highly mobile, soil-dwelling polyphagous predatory beetle. Larvae are a pale yellow to cream color (Fig. 2); and the adults are a glossy, dark color (Fig 1.). Their body posture is typically S-shaped with their heads pointed down and their abdomens upturned. Both the larvae and adults are fiercely polyphagous – feeding on the eggs and young larvae of several greenhouse pests including western flower thrips, fungus gnats, and shore flies.

Life Cycle:

Dalotia coriaria is a holometabolous insect with four life stages: egg, larva, pupae, and adult. Adult females lay eggs in the soil and larvae hatch 2 to 3 days later. Larvae develop through three instars in about 7 days. The third instar spins a cocoon of silk strands

and soil particles before pupation. Adults emerge 5 to 8 days later. The development time from egg to adult is about 2.5 to 3 weeks. Adult beetles live for 4 to 12 weeks. Females lay up to 14 eggs a day with an average of 90 eggs during their lifetime.

Rearing:

It is easy to construct rearing-release containers from plastic containers, fill them with a porous media, and feed the beetle poultry feed. Obtain a plastic container with 2 L (0.5 gal) or larger capacity (Fig. 3). Since, the beetles will need ventilation, cut two 1 cm (1/2 inch) diameter holes in the lid. To prevent beetles from leaving, glue bridal veil on the underside of the lid to cover the holes. Fill the container with a 50:50 mixture of coir (ground coconut husk) and vermiculite. Moisten coir, vermiculite mixture with 150 mL (2/3 cup) of water per liter of mixture. Mix in 15 ml (1 Tbsp.) of chicken feed as a food source. The chicken feed must be mixed into the media to prevent it from molding. Add 30-60 *D. coriaria*. Place the rearing containers in a shaded area between 70 – 80° F. Check the containers weekly and mix in 15 ml (1 Tbsp.) of chicken feed. Ground or crumbled feeds work better than pelletized. Add water as needed to



Figure 2. Larva *Dalotia coriaria*.
Actual size 1-3 mm.

maintain moist media. Within about a week, larvae should be present and 2 - 3 weeks later more adults should be present.

Variations:

If more beetles are needed, set-up multiple rearing containers and/or larger containers.

When using larger containers increase the volume of the media, but do not fill it more than half-full. Increase the amount of food added weekly, 15 ml (1 Tbsp.) for every liter (quart) of media. Increase the size or number of ventilation holes. Different medias can be used. Peat moss can be added to the mix or used entirely on its own. Mature composted dairy manure can also be used as media. Rolled oats or commercial trout food could be used as a substitute for the poultry feed.



Figure 3. Rearing container for *Dalotia coriaria*

Applying *D. coriaria* to greenhouses:

To apply *D. coriaria* to cropping systems, simply remove the bridal veil from the ventilation holes, place the rearing container on the ground. To prevent the inside of the rearing-release container from overheating, place it in a shaded area. Beetles will leave and disperse from the container. Rearing-release containers can be easily moved to new locations as needed.

Further Reading:

Bennison J, Chandler D, Maulden K, Smith J (2008a) Mushrooms: potential for biological control of sciarid and phorid flies using the predatory beetle *Atheta coriaria*.

Bennison J, Croft P, Maher H, Maulden K (2009) Protected herbs, ornamentals and celery: development of an on-nursery rearing system for *Atheta coriaria* for reduced cost biological control of sciarid and shore flies.

Bennison J, Maulden K, Maher H, Tomiczek M (2008b) Development of a grower rearing-release system for *Atheta coriaria*, for low cost biological control of ground-dwelling pest life stages. IOBC/wprs Bulletin 32:

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