

Black Soldier Fly

Hermetia illucens (Linnaeus),
Stratiomyidae, DIPTERA

DESCRIPTION

Adult - This winged fly is 15 to 20 mm long without working mouth-parts. Mostly black, the female's abdomen is reddish at the apex and has two translucent spots on the second abdominal segment. The male's abdomen is somewhat bronze in colour.

Egg - About 1 mm long, the elongate-oval egg is pale yellow or cream coloured when newly laid but darkens with time. Each egg mass contains about 500 eggs.

Larva - The black soldier fly larva is plump, slightly flattened, with a tiny, yellowish to black head. The skin is tough and leathery. Creamy white and about 1.8 mm long when newly hatched, the larva develops through six stages or 'instars', the last of which is reddish-brown. The mature larva is about 18 mm long and 6 mm wide, although some individuals may be as long as 27 mm.

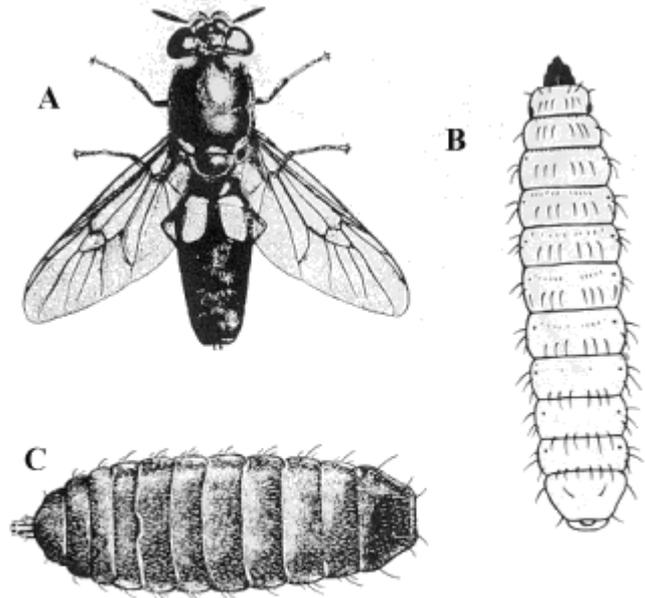
Puparium - The last larval stage which is self-harvesting because of their climbing instinct. The guts are emptied and the mouth-parts change from the kind used for eating to those used for climbing. They can climb slopes $<45^\circ$, more if the walls are damp. Once developed inside the puparium, the adult fly will emerge to breed.

BIOLOGY

Distribution - This fly occurs throughout most of the Western Hemisphere and the Australian region from Samoa to Hawaii. It is likely that you have these in your area or worm farm but haven't noticed them.

Feeding Habits - Soldier fly larvae are attracted to manure, compost, carrion and waste plant products. Adults commonly frequent flowers of the daisy and carrot families although they do not have feeding mouth-parts.

Life History - Newly emerged soldier flies mate in flight. Soon afterwards females begin to deposit hundreds (400-800) of eggs near edges of decaying organic matter. Eggs incubate from 4 days to 3 weeks before hatching. In New Zealand larvae take 31 days to develop from an egg to the final stage.



Black soldier fly. A, Adult female. B, Larva. C, Puparium.

Adapted from http://ipm.ncsu.edu/AG369/notes/black_soldier_fly.html and www.cals.ncsu.edu/waste_mgt/smithfield_projects

Images taken from <http://www.thebiopod.com> and <http://www.beardeddragon.org> 28 Sept 2012

PERMACULTURE

Larvae eat manure proteins and other nutrients found in your compost into valuable animal protein. High in calcium, with ~42% protein, ~35% fat, this food is suitable for chickens, fish, lizards, snakes and other animals. Larvae reduce the nutrient concentration and bulk of manure, potentially reducing pollution potential 50-60% or more. The left over compost is a valuable soil amendment.

COMMERCIAL APPLICATION

As a high value animal feed (\$0.50/kg or more), larvae could be economically hauled significant distances. Larvae can aerate and dry manure, reducing odors. Maggots modify the microflora of manure, potentially reducing harmful bacteria (Erickson, et al., 2004). The high-value insect feedstuff, reduction of the manure mass, moisture content, offensive odor, and pollution potential are the returns for good management of such a system.

DO IT YOURSELF

Several commercial products may be purchased but for those who prefer to do it themselves, there are several plans and instructions on the net including complete instructional videos on YouTube. Yields from one couples unit are approximately one small handful of larvae per day, slowing in the cooler months.

You can design a system yourself, things to consider:

1. Drainage
2. Ramp of approximately 40°
3. Preventing access by regular house flies, in areas where these are problems
4. Allowing adult flies to lay egg masses near the compost (rolled up corrugated cardboard is an option).



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