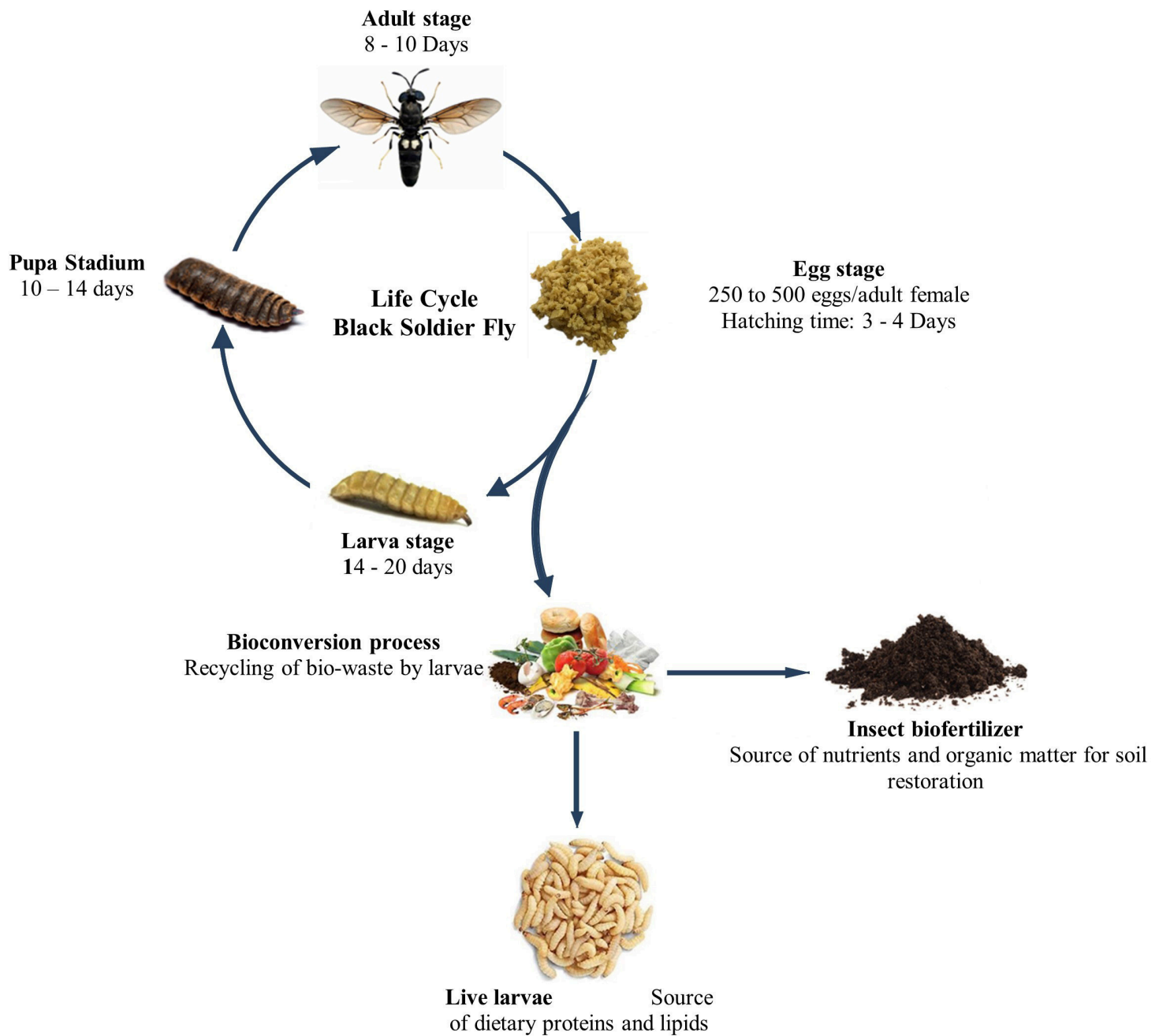


BLACK SOLDIER FLY LIFE CYCLE



Background

The black soldier fly (*Hermetia illucens*) is a common and widespread fly. Its larvae are used in the bioconversion of waste into organic fertilizer for vegetable production and as an alternative source of protein for aquaculture, poultry and pig farming.

the fly goes through a cycle made of four stages namely the egg stage, the larval stage, the pupal stage to become an adult fly.

1. The egg stage

The female of the Black soldier fly lays eggs in packs of 250 to 500 units on decaying organic matter such as animal manure, vegetable, and fruit wastes or compost pile. The eggs are oval and creamy white. At room temperature, the eggs take 3 to 4 days to hatch into larvae after spawning.



2. The larval stage

The larvae are worm-like creatures with no legs and with a creamy or whitish colour. They measure about 1.8 mm in length when hatched; with a black spot at the anterior end called the head. The head has a mouth part which allows them to feed on a wide range of organic matter ranging from Kitchen waste, fruit waste, pig malt, and chicken manure. The mature larva measures up to 27mm long and 60 mm wide. The larvae go through six intermediate stages and need 16 days approximately to complete their development. During this period, the larvae grow speedily by shedding their exoskeleton several times to accommodate their increasing size. They stop eating and enter the pre-pupal stage.



3. The pupal stage

The larvae mature and enter the pupa stage. The pupa of the black soldier fly is distinguished from the pre-pupa by its total immobility and the hardening of its cuticles inside which the adult fly is formed. The larvae stop eating and seek out a dry and sheltered area to pupate. It also has a dark coloration, and its last abdominal segment is usually folded in a ventral position and the cuticle becomes progressively opaque and sclerotized. This process is called apolysis and proceeds in a torso-ventral direction, from the extremity posterior to the abdomen toward the head. Once the larvae find a suitable place, they form oval-shaped reddish-brown pupae. It takes an average of 12 days for the fly to undergo a transformation process where the body organizes and turns into adult flies.



4. The adult fly

The adult black soldier fly emerges from the pupae. It has a black body divided into three parts: head, thorax, and abdomen. It measures on average 18mm long and carries a head without mouthparts. The head bears two compound eyes and a pair of antennae twice as long as itself. The thorax bears a pair of dark wings and three pairs of black legs with whitish or pale-yellow tarsi. The abdomen is filiform and bears in its first segment two translucent bands. Its end posterior is sometimes reddish and carries the genital organ. One of the remarkable characteristics of the black soldier fly in the adult stage is that it does not sting, or feed and does not transmit pathogenic. This stage lasts about 10 days, during which the insect lives on reserve nutrients accumulated during the larval stage.



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