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## The Chironomid – Bloodworms

Chironomids are well-known by their larval form as bloodworms. By contrast, their adult form is commonly mistaken as mosquitoes because of their resemblances in size and general appearances. Truly, both dipteran species share similar features as members of Order Diptera. Chironomids, however, are classified under a unique group as Family Chironomidae. Adult chironomids (figure 1), unlike other bloodsucking arthropod vectors, have no piercing and sucking mouthparts known as non-biting midges.

Chironomids can be found in a great variety of aquatic habitats with only a few species associating with terrestrial environments. They inhabit both lotic (running) and lentic (static) environments, from fresh to saline water, and large to small water bodies. Chironomids go through complete metamorphosis from eggs, larvae, pupae to free living adults. Most of the chironomids lay eggs in mass enveloped in a gelatinous sheath typically arranged in a linear or helical shape (figure 2). Larval chironomids live in aquatic or semi-aquatic environments, such as running streams, rotting vegetation, tree holes and artificial water bodies, usually with relatively high organic content. The larvae are protected in a fixed

Figure 1. Adult chironomid



Figure 2. Egg masses of chironomids

tube at the benthic environments; and feed by filtration within the tube and / or browsing around for food sources. The presence of haemoglobin in the larvae gives them the distinct blood red appearance (figure 3); and allows them to survive in oxygen low environments. With this characteristic, the larvae have been commonly used as a biological indicator to monitor natural water qualities. Adult chironomids are short-lived after emergence and survive only for reproduction.

Although chironomids have least medical importance, the massive swarming behaviour of the species sometimes creates nuisance problem to humans. Since adults are attracted to light, populated areas close to their breeding places are very subject to their nuisance. In addition, some people may develop allergic reactions when contact with chironomids.

The principal control measure of chironomids has always been elimination of breeding places. Otherwise, physical barriers could be used to prevent them from getting indoors. If their population becomes a nuisance, pesticides such as pyrethroids could be applied to their resting area. In general, chironomids pose least threat to human lives, but they are an important group of insects in our ecology system.



Figure 3. Chironomid larva

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## Stored Product Pests Commonly Found

There are many stored product pests which infest food and non-food products of plant and animal origin. They can be found in mills, warehouses, processing plants, retail stores and homes. In this article, the pests of stored products in homes which infest our foodstuffs are discussed.

In homes, stored product pests are mainly beetles or moths. They infest dried fruits, flour, dried vegetables, dried flowers, pet foods, Chinese herbal medicines, rice and cereals etc. They contaminate and damage our foods. They can be found mostly in kitchens and cupboards where foods are stored.

The life cycle of stored product beetle and moth pests includes an egg stage, several larval stages, a pupal stage and finally an adult stage. For some species of stored product pests, only the larval stages consume foods and the only purpose of the adult insect is to mate, discover a food resource and deposit their eggs. The damage of these species to foods is caused by their larvae. For example, larvae of Indianmeal moths infest food items such as flour and cereals. The adults are short-lived and do not feed. The common stored product pests in homes include rice weevil (*Sitophilus oryzae*), red flour beetle (*Tribolium castaneum*), Indianmeal moth (*Plodia interpunctella*) and cigarette beetle (*Lasioderma serricorne*).

Among the stored product pests, the rice weevil is one of the most destructive pests of stored grain and is found worldwide. Rice weevils can sometimes be found in our rice jars or packaged rice in homes. The adults are about 3 to 4 mm long with four light reddish or yellowish spots on elytra (Figure 1). Both male and female have a long snout. An adult female makes a small hole on the grain and deposits a single egg in this hole. The hole is then sealed with a gelatinous fluid. When the larva hatches from the egg, it feeds inside the grain. The larval and pupal stages of the rice weevil are spent inside the grain. The damage is not easily seen except when the adult emerges from the grain. Both the larvae and adults feed on the grains. The grains are sometimes completely damaged beyond human consumption.

Figure 1: Adult rice weevil  
(*Sitophilus oryzae*)

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Insecticides can be used to reduce visible population of adult stored product pests in homes. However, the infestation will likely persist unless infested material is found and removed if the source is in home. **It is important that no insecticide of any type should come in contact with food products.** The following suggestions will help premises occupiers to prevent current and future infestations in homes.

- Store dried foods in containers with tight-fitting lids. This will prevent entry or escape of insects.
- Keep food storage areas clean. Spilled foods will attract insects.
- When purchasing packaged foods, be sure that the containers are not broken or unsealed. Packages with clear plastic coverings should be checked for the presence of insects. Sometimes foods are infested before being brought into homes.
- Avoid keeping too many dried foods at home.

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