Pest Control Newsletter

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Mosquito Eating Fish

Poecilia reticulata

Macropodus opercularis

Puntius semifasciolatus

Besides environmental improvement measures and chemical larvicides, biological agents can also be used in mosquito control. Larvivorous fish feed on mosquito larvae have been widely used around the world, such as the U.S., the Philippines, Japan, Spain, Italy and Africa in attempts to control various kinds of mosquito-borne diseases and mosquito nuisance. Suitable species of fish usually have the following characteristics to achieve the mosquito control purpose:

- Prey on mosquito larvae;
- Behavioural and physical adaptation for surface feeding;
- Small size to allow access to shallow water and penetration into areas with aquatic vegetation;
- High reproduction rate;
- Tolerant to pollution, salinity, temperature fluctuations and transportation;
- Originate from the region where control is to be effected whenever possible;
- Low valued as food for human.

There is a considerable number of fish species which prey on the aquatic stages of mosquitoes. The guppy (*Poecilia species*) and tooth carps are among the fish species commonly used for mosquito control in the subtropical and tropical zone. Wild local fish species such as *Macropodus opercularis* and *Puntius semifasciolatus* serve as natural predators of mosquito larvae.

Mosquito eating fish can be released to large artificial water bodies such as abandoned ornamental ponds, disused or "out-of-order" swimming pools, and animal water troughs as a biological control agent against mosquitoes. *Poecilia reticulata*, one of the local species, can tolerate a moderate degree of pollution and can hence be released as a control agent at the rate of one *Poecilia reticulata* per m². However, the public should avoid releasing mosquito fish, particularly those with aggressive behaviour towards other fish species, into natural habitats such as streams and rivers, as it might alter the ecological balance and hence threaten the biodiversity of our natural habitats.

Ms. C. Y. TSANG, Pest Control Officer

Rodenticides

Warning notice should be posted up at each baiting station

Though the benefits of non-chemical methods of rodent control are increasingly recognized, these methods, such as physical exclusion, sanitation measures, public health education, etc, may not achieve acceptable short-term results when used alone. For these reasons, application of rodenticides is an important component of most integrated pest management programs against rodent infestations, particularly in emergency situations or when the infestations are serious.

Rodenticides are chemical substances used for killing rodent pests. Modern rodenticides can be divided in two broad groups: anticoagulants and non-anticoagulants.

Anticoagulant rodenticides

The first anticoagulant rodenticide was introduced in 1940s. Since then, this kind of compounds becomes the first choice of toxicants for commensal rodent control. The various anticoagulant rodenticides have a similar physiological action in that they disrupt the normal coagulation process of the blood in rodents and cause the poisoned rodents to die from internal bleeding. Internal bleeding would induce thirsty to the poisoned animals as water is the main component of blood. The poisoned animal would be in subconscious condition as internal bleeding would also cause insufficient supply of blood to the head of the animal. Because anticoagulant rodenticides are relatively slow-acting (death occurs in about three to seven days following the ingestion of a lethal dose), the target rodent is unable to associate its illness with the bait eaten. Therefore, bait shyness does not normally arise from using this kind of rodenticide. This delayed action also has a safety advantage because it provides time for corrective treatments (administration of antidote vitamin K1) in the case of accidental ingestion of anticoagulants by humans or pets.

With the development of the research on using anticoagulants as rodenticides, anticoagulant rodenticides can be further classified into two groups: first-generation and second-generation anticoagulants.

First-generation anticoagulant rodenticides (e.g., warfarin, chorophacinone, diphacinone and coumatetralyl) are also known as "multiple-dose" anticoagulant rodenticides. They typically require several days of consecutive feedings to kill rodent. To achieve this, the baits have to be replenished continuously until the desired control is achieved.

Second-generation anticoagulant rodenticides (e.g., brodifacoum, bromadiolone, and difethialone) were developed as the result of detection of resistance to the first-generation compounds among commensal rodents in some areas of the world. These compounds are more potent and also referred to as "single-dose" anticoagulant rodenticides. Rodents usually obtain a lethal dose after consuming poisonous bait as part of their food intake on only one day. They are especially suitable for dealing with rodent infestations with plenty of food alternatives or handling infestations by sporadic feeders such as house mice and roof rat/ship rat.

Anticoagulant rodenticides

Non-anticoagulant rodenticides

The characteristics and modes of action of this group (e.g., zinc phosphide, sodium fluoroacetate, cholecalciferol and cellulose) are quite diverse. While cholecalciferol and cellulose are chronic in action, zinc phosphide and sodium fluoroacetate (not registered for use in Hong Kong) are so acute that could bring rodent to succumb in 24 hours or less after the administration of a lethal dose. Most of these acute rodenticides do not have effective antidote. They are of little importance in modern commensal rodent control and have been phasing out by the safer anticoagulant rodenticides.

Rodenticides are hazardous to humans and non-target animals. Always observe the safety precautions as stated on the pesticide labels when handling rodenticides. **Appointment of pest control company for provision of professional and safe rodent control programme is recommended.**

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