Pest Control Newsletter

Published by the
Pest Control Advisory Section

Issue No.28 Oct 2012

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Paederus Beetles

Introduction

Paederus (隱翅蟲屬) are small beetles that belong to the rove beetle (盪甲) family Staphylinidae (隱翅甲科), under the order Coleoptera (鞘翅目). *Paederus* beetles are widely distributed around the world.

They are slender and elongate and can usually be recognized by their very short elytra (Fig. 1). The elytra are usually not much longer than their combined width, and a considerable portion of the abdomen is exposed beyond their apices. There are six or seven visible abdominal sterna, which they frequently raise the tip of the abdomen, much as scorpions do. The mandibles are very long, slender, and sharp and usually cross in front of the head. The insects vary considerably in size, but the largest is about 25mm long.

They are much more brightly coloured than other rove beetles, with metallic blue- or geen- coloured elytra and bright orange or red on the pronotum (胸背板) and the basal segments of the abdomen.

Behaviour

Adult *Paederus* beetles prey on other insects. They are active during the day and attracted to bright lights after nightfall. They lay their eggs singly in moist habitats. Larvae go through two instars before pupation. The larvae prey on other insects as well. Adults may live for several months and produce two or more generations during their lives. Because they are breeding in moist soil, large numbers of *Paederus* beetles may live outdoor where they feed on herbivorous insects.

Public health importance

Adult *Paederus* beetles do not bite or sting but their hemolymph, contains a strong chemical called pederin (岬毒素) that can cause skin and eye irritations. Due to toxins in the hemolymph of many species within this genus, it has been given its name to paederus dermatitis, a characteristic skin irritation that occurs if one of the insects is crushed against skin. Once pederin is on the skin from the initial contact, it may also be spread elsewhere on the skin. Initial skin contact with pederin shows no immediate result. Within 12 to 36 hours, however, a reddish rash appears which develops into blisters. Irritation, including crusting and scaling, may last from two to three weeks.

Prevention and control of Paederus beetle

When *Paederus* beetle is resting on a person's skin or clothing, the beetle should be gently shaken or brushed off with something other than by bare hands. People should avoid crushing any *Paederus* beetles to prevent releasing the toxin pederin on the skin.

If a *Paederus* beetle is accidentally crushed against the skin, immediately wash the affected area with soap and water. Pederin will slowly penetrate the skin. Washing shortly after exposure will remove much of the toxin before it has time to harm the skin. Other control and preventive measures include:

1 Keep doors closed and install screens on doors and windows to reduce the entry of *Paederus* beetles into buildings if necessary.

2 Clear excess vegetations from and around the residence, as *Paederus* beetles may rest in these areas.

3 *Paederus* beetles, if present, should be killed by using insecticide (pyrethroid) followed by sweeping up and removal of beetle carcasses. Remember that beetles can cause symptoms, alive or dead and hence avoid handling the beetle directly.

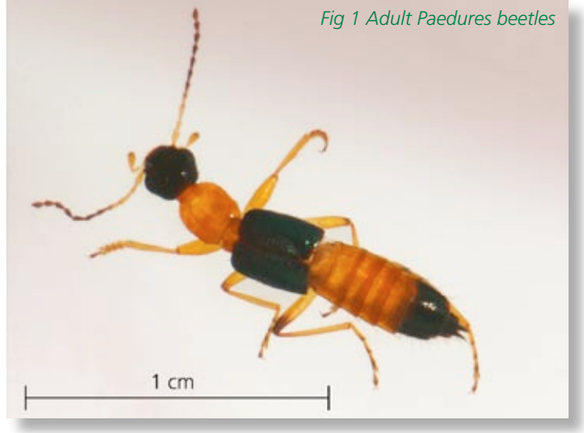

Fig 1 Adult Paedures beetles

CHEUNG Ka-yun, Head of Port Vector Surveillance Unit

More information on pest prevention and control can be obtained from other pages of our website.

Effective use of insect electrocuting device (Part II)

In the "Effective use of insect electrocuting device (Part I)" published in the Pest Control Newsletter Issue No. 27 in July 2012, factors affecting the effectiveness of insect electrocuting devices (IEDs) using ultraviolet light as an attractant were discussed. In this issue, factors affecting the effectiveness of insect trapping devices targeted for biting insects will be discussed.

Design of traps

The design of insect trapping devices varies among target pests. There has been a great public interest in the designs launched in recent years that are targeted for attracting, trapping or killing of biting insects, e.g. mosquitoes and biting midges. All of these devices relied on some sort of olfactory attractants, carbon dioxide, moisture, heat or even coupled with light that lures host seeking female biting insects into their catching or killing component. In some designs, the biting insects are sucked-up by an impellor fan into a catch net/ pan, where they will die of desiccation, while other designs may use an adhesive board to stick the insects when they land. Some designs may also use an electric grid to electrocute the insects drawn into contact.

For trapping blood-sucking insects such as mosquitoes or biting midges, carbon dioxide served as a mid to long range cue to attract them from a distance. When the blood-sucking insect get closer to the trap, presence of other host-specific cues such as octenol, light, heat, moisture or other volatiles may further draw the insect to the trap. Researches also show that some mosquito species have its favorite color light other than ultraviolet light, which may also vary according to their physiological condition. Besides, the intensity of light should be strong enough to attract the insect and the attractant plume of the carbon dioxide or other odor lures should be large enough to outcompete other attractants, e.g. the attractions from hosts.

Placement and location of traps

The location of traps is one of the determinant factors in trapping performance. Since biting insects will be first attracted to the traps before they were being captured, improper placement could make the situation even worse. The traps should be located 9-12 meters (or as indicated in the product instruction) away from entrance, patios or other human congregation areas. If traps are placed too close to these areas, the biting insects will spot the hosts visually or thermally and attack them instead of flying towards the traps. Besides, traps should be placed between the human congregation areas and breeding places of the biting insects, so that the biting insects will reach the traps before they encounter hosts. The traps should also be located in a shady and open area. Scrubby vegetation will affect the dispersal of attractants.

Weather condition

Since some of the traps use odors, carbon dioxide and moisture as attractants, strong wind and heavy rain condition will affect the dispersal of attractants. There should be little wind to disrupt an attractive carbon dioxide cloud. Wind direction will also affect the trap performance. Traps should be placed upwind from the breeding place so that the insects could be attracted by the attractant readily.

Other considerations

Even though an impressively large number of biting insects is trapped in the device, it may only be a small portion of all the biting insects in the area, and this will not collapse a large population of biting insects. There is no scientific evidence indicating that the device is effective for reducing the mosquito density or decreasing the incidence of biting significantly under all situations. Whether the device will produce a noticeable reduction of biting insects is dependent on a number of factors, e.g. personal tolerance level, actual population size of biting insects, the distance to, size and type of breeding places which could provide re-infestation, and species of biting insects that are present, etc. There may also be seasonal and circadian variables that affect the biting insect's response to certain attractants.

Therefore, the devices should only be employed as an additional measure to a pest control program and should not overestimate their potential in pest reduction. A pest control program with reduction or elimination of breeding places should be the ultimate solution of pest problem.

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