

Just the Facts...

Beetles in the genus *Paederus* are insects that belong to the rove beetle family *Staphylinidae*, under the order *Coleoptera*. Adult *Paederus* beetles are predators of other insects and are frequently encountered around light sources on military bases in the Middle East region. *Paederus* beetles do not bite or sting but their blood, called hemolymph, contains a strong chemical called pederin that can cause skin and eye irritations.



What do *Paederus* beetles look like and how long do they live?

Paederus beetles are small, soft bodied and are roughly 1 cm ($\frac{1}{4}$ to $\frac{3}{8}$ inch) in length. They are dark orange in color with their head, front wings (elytra) and the tip of their abdomen colored black. Their short, hardened front wings have a blue/green iridescent sheen to them when viewed under higher magnification. Their delicate hind wings can be extended from underneath their front wings and be used for flight. Adult beetles may live for several months and produce two or more generations per year.

Why should I be concerned about *Paederus* beetles?

Paederus beetles are a concern because they can release a toxin called pederin when they are crushed against the skin. Pederin can cause severe dermatitis and blisters that may result in lost duty time. Symptoms have often been confused with the effects of blister beetle cantharidin, poisonous plant sap, urticating caterpillars and chemical weapons. If not washed, contaminated hands may spread the toxin to other parts of the body. Intense pain and temporary blindness has been reported when pederin is introduced into the eyes.

What should I do if I see *Paederus* beetles on my clothing or equipment?

Gently shake or brush the beetles off with something other than your hands. Avoid the temptation to crush any *Paederus* beetles to prevent releasing the toxin pederin on the skin.



Identification. Adult *Paederus* beetles are small, soft-bodied and are roughly 1 cm ($\frac{1}{4}$ to $\frac{3}{8}$ inch) in length. They are dark orange in color with their head, front wings (elytra) and the tip of their abdomen colored black. Their front wings have an iridescent sheen and only cover half of the abdomen.

What should I do if I accidentally crush a *Paederus* beetle against my skin?

If a *Paederus* beetle is accidentally crushed against the skin, immediately wash the affected area with soap and water. Pederin slowly penetrates the skin. Washing shortly after exposure will remove much of the toxin before it has time to harm the skin. The skin reaction to pederin is delayed and may take between 12 to 36 hours to occur after the initial exposure. Contact with pederin can cause dermatitis followed by inflammation of the area into a reddish rash and eventually blister-like lesions on the skin. The most commonly affected areas are exposed parts of the body including the face, neck, shoulders, arms and the area around the waist.



Effects of Pederin. When *Paederus* beetles are crushed against the skin, they release a toxin called pederin. There may be little to no effects when initially exposed to pederin. Acute dermatitis, inflammation and a reddish rash appears 12-36 hours after exposure. When trapped between layers of skin these beetles can leave rashes similar to a kissing mark (see inset photo). Blister-like lesions develop and become crusted and scaly in a few days. The rashes have been known to heal completely in two to three weeks. The most commonly affected body parts include the face, neck, shoulders, arms and around the waist. Intense pain and temporary blindness has been reported when pederin is introduced into the eye.

How are the effects of pederin treated?

Contact local medical personnel for treatment. Treatment recommendations may include the use of cold, wet compresses, followed by the application of calamine lotions or topical corticosteroids. Antibiotics may be necessary if the blisters become secondarily infected. In a few instances, a permanent change in skin pigmentation has been observed at the affected area. In most cases, the affected area completely heals within two to three weeks without any long-term consequences.



Habitat. Marshy areas along the edges of freshwater lakes, ponds, canals, river flood plains and irrigated fields are ideal habitats for *Paederus* beetles to breed and develop.

these devices may provide some reduction in the biting flies present, particularly at guard posts during nighttime hours, they also attract *Paederus* beetles. A properly worn uniform with the sleeves rolled down, the use of wide-brimmed head gear and gloves will help to protect the skin from contact with the beetles. Use window screens to help to prevent *Paederus* beetles and other insects from traveling toward light sources indoors. Remove any decaying vegetation around buildings and work areas to eliminate potential harborage for the beetles and their larvae. It may also help to conduct surveillance to determine if *Paederus* beetles are indeed present in the area. Sticky traps, glue boards or shallow containers filled with water and a few drops of dishwashing detergent set out at night beneath bright light sources will trap adult beetles. Mosquito light traps have also proven to be useful surveillance tools for capturing adult beetles. Pederin is known to be soluble in alcohol so be careful when handling alcohol that has been used to preserve *Paederus* beetle specimens.

What can I do if I am faced with a heavy infestation of *Paederus* beetles?

Move away from areas of high rove beetle prevalence and avoid standing directly underneath or next to bright light sources. Mosquito light traps and sticky traps may capture some of the beetles, but are not effective in removing large numbers from the area, especially when located close to competing light sources. The application of deltamethrin dust to vegetation may help to reduce beetle numbers in small areas. Pesticide application to breeding sites outside the military compound are usually impractical due to the number of marshy areas within the flight range (several miles) of the adult beetles. The use of light covers or shields in combination with reducing the intensity and number of light sources present may help to ultimately reduce the numbers of beetles attracted.

References:

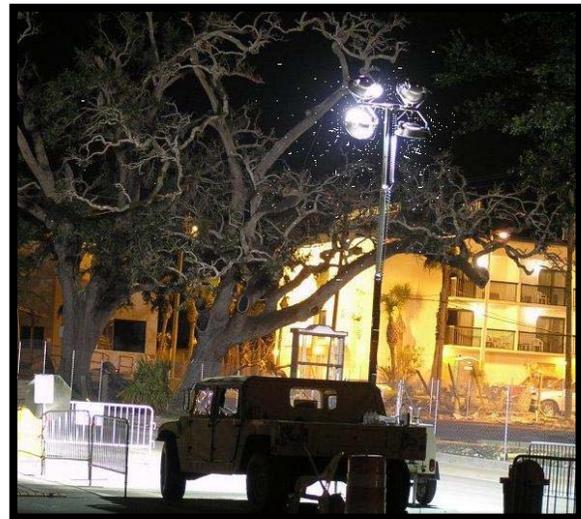
- Al-Dhalimi, M.A. 2008. *Paederus* Dermatitis in Najaf Province of Iraq. Saudi Med. J., Vol. 29(10), pgs. 1490-1493.
- Chambers, J.A. 2003. Staphylinid Beetle Dermatitis in Operation Enduring Freedom. J. Spec. Ops. Med., Vol. 3(4). pgs. 43-46.
- Defense Pest Management Information Analysis Center. 1999. Regional Disease Vector Ecology Profile. The Middle East. [Accessed November 2008]. Available from: http://www.afpmb.org/pubs/dveps/mid_east.pdf.
- Dursteler, B.D., R.A. Nyquist. 2004. Outbreak of Rove Beetle (Staphylinid) Pustular Contact Dermatitis in Pakistan among deployed U.S. Personnel. Milit. Med., Vol. 169(1), pgs. 57-60.
- Frank, J.H., K. Kanamitsu. 1987. *Paederus*, *Sensu Lato* (Coleoptera: Staphylinidae): Natural History and Medical Importance. J. Med. Ent., Vol. 24(2), pgs. 155-191.

Where do *Paederus* beetles breed?

The immature stages of *Paederus* beetles develop in moist areas such as marshes, irrigated croplands and wetland areas surrounding freshwater. The larvae usually feed on the algae, small insects and decaying plant and animal material found in these habitats. The adults are predators of other insects and are often found during the daytime searching for prey or resting on vegetation and structures around their breeding site. At night, light towers and other bright light sources can attract the adult beetles from habitats that are miles away. *Paederus* beetles have been known to fly in large numbers on warm nights, particularly after heavy rains or floods.

What can I do to prevent contact with *Paederus* beetles?

Avoid working or resting under bright lights during the months when the adult beetles are most active. In Iraq, *Paederus* beetles are commonly encountered at night beneath strong light sources close to their breeding habitat during the months of May through July. Avoid hanging around insect electrocution devices (Bug Zappers®) which use ultraviolet (UV) light as an attractant. While



Light Sources. Adult *Paederus* beetles are highly attracted to bright light sources such as generator-powered light towers near guardshacks and security checkpoints. Avoid sitting or standing directly underneath these light sources to avoid coming in contact with these beetles.