

Brief Communication

Morning blisters: cantharidin-related Meloidae burns

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Abstract

We report several cases of Meloidae-related blisters in French soldiers deployed to Mali. Blister beetles of the Meloidae family produce cantharidin, a blistering agent, for defensive purposes. These virtually cosmopolitan Coleoptera can cause significant nuisance to travellers and deployed soldiers especially during the rainy season in the Sahel region.

Key words: Meloidae, blister beetle, cantharidin, vesicant, Sahel, military

Introduction

Since 2013, French troops have been deployed to Northern Mali (also called Azawad by the traditionally nomadic Tuaregs) in tactical combat operations that were later combined with medical civic action programs. Besides the usual deployment-related health issues (trauma, gastrointestinal and respiratory infections...), soldiers are exposed to a diverse toxin-producing fauna (snakes, scorpions, coleoptera...). We describe several cases of toxic skin injuries.

Cases

From June to October 2014, the French military medical outpost deployed to Gao (16.2640°N, 0.0280°W), Mali, reported an increasing number of wounds and burns detected in the morning. Soldiers had been presenting with single or multiple skin abrasions and/or blisters on the face, scalp, neck, trunk and/or upper limbs (Figure 1). Injuries ranged from punctiform lesions to ~15 cm diameter lesions. All patients described a burning sensation while sleeping before waking up with a wound or a blister in the early morning. Only one patient reported hitting a possible insect during his sleep and waking up with a blister on his arm. This information led to a short

entomological investigation confirming the diagnosis of *Cyaneolytta* sp blister beetles injuries. Due to their life cycle, this corresponded with the growing numbers of attacks as the rainy season approached (from 0 to 1 case/per month during May–July to 1–2 per week in August–October). Treatment was similar to burns care: cleaning the injury, debriding blisters and daily silver sulfadiazine dressings for 10 days, followed by daily sterile paraffin tulle gras dressings with povidone iodine ointment until complete wound recovery. No complications or sequelae were observed.

Discussion

Although the Paederus rove beetle is a common cause of blisters in travellers to tropical areas, it is however not the real ‘blister beetle’. This colloquial name is attributed to the Meloidae family members, which are other toxin-producing Coleoptera. The Coleoptera Meloidae family encompasses 3000 species of blister beetles, of which 800 are found in Africa.¹ They are present on all continents except in Antarctica, New Zealand and most Polynesian islands.² Unlike most coleoptera, their body is relatively soft, due to non-rigid elytra protecting the wings. These beetles have a body length of 7–38 mm (at least three times longer than it is wide), and the majority have long legs. Their

colour differs according to species: black, brown blue, metal green or black with orange spots. All species are winged and capable of flying noiselessly except for the species of the genus *Meloe*. Meloidae have a unique life cycle. Larvae parasitize other insects as Meloidae females lay their eggs on the eggs of others, such as crickets, mantises, wasps, bees or other beetles. Each Meloidae species has a unique host species. They reach the adult stage at the beginning of the rainy season and remain active during this period. Most species are diurnal. The rest are nocturnal and attracted by light, like *Cyaneolytta* sp as in our case (Figure 2A). Meloidae feed on leaves and flowers, and are mainly gregarious insects³ so may travel in large numbers, increasing their threat. All species possess cantharidin toxin (*kantharis* means ‘blister fly’ in Greek), a highly toxic odourless and colourless terpenoid, formerly used as an aphrodisiac, which acts like a vesicant.⁴ Its concentration differs significantly

according to species, sex (only males produce it, before transferring it to females during mating) and age.⁵ This blistering agent is toxic if ingested, even lethal for doses higher than 10 mg. However, unlike what is observed in cattle, the risk of ingesting Meloidae is highly improbable in adult humans.^{6,7} The risk is essentially through skin contact as these beetles exude from their joints orange-coloured, cantharidin-filled haemolymph, a fluid equivalent to blood in insects (Figure 2B). When these insects land on a person, it is advisable not to crush them as large quantity of cantharidin will be released. It is thus recommended to sweep them with the side of the hand, or pick them up and throw them away gently (the tougher skin on the palmar aspect of the hand resists cantharidin well). Handwashing is essential immediately after handling the insect as well as washing clothes that have been in contact with the beetle. Some authors also recommend cleaning the exposed area with acetone, ether, fatty



Figure 1. Blisters located on the arm (A), trunk (B), face (C) and hair (D)

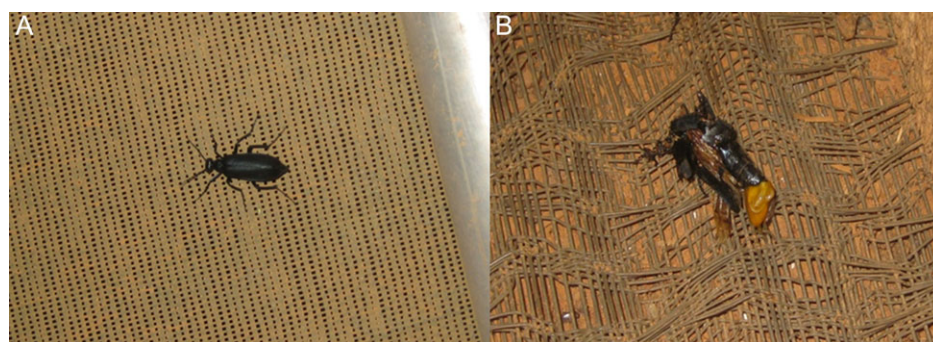


Figure 2. (A) *Cyaneolytta* sp containing high cantharidin concentration and (B) orange-coloured, cantharidin-filled haemolymph from a smashed *Cyaneolytta* sp

soap or alcohol, which helps to dissolve and dilute the cantharidin.⁴ Other preventive measures are similar to those of mosquito bite prevention, including long-sleeved clothing, bednets and screening windows. Low-intensity lights are also useful to decrease exposure to nocturnal species.

As previously mentioned, Meloidae are not the only blister-inducing Coleoptera to which deployed soldiers might be exposed. The Oedemeridae family, also called false blister beetles or pollen feeding beetles, also produce cantharidin, but in reduced quantities, and are not present in Northern Mali. A blister outbreak due to *Thelyphassa lineata* (Fabricius) belonging to the family Oedemeridae was reported previously in New Zealand Army personnel.⁸ Finally, another differential diagnosis to consider is dermatitis linearis due to the genus *Paederus* which carries the endosymbiotic *Pseudomonas* bacteria-synthesized paederin toxin. However, as opposed to cantharidin, paederin causes a 12–48 h delayed post-exposure reaction with more intense itching and pain. In addition, scarring and hyperpigmentation are common in dermatitis linearis which is rarely the case with cantharidin. To conclude, the paederus beetle lives in warm and wet environments which is not the case in the Sahel.⁹ Several dermatitis linearis epidemics were described in Indian, Jordan, Thai and US servicemen.^{10–15}

Conclusion

Meloidae blister beetle injuries are common in the Sahelian environment of northern Mali. To our knowledge, this is the first published outbreak of Meloidae-related burns in deployed soldiers. Service members and travellers should be aware of these Coleoptera when adventuring in the Sahel. There is no known antidote for cantharidin-associated dermatosis. Treatment is similar to burns care. Prevention is based on long-sleeved clothing, bednets and screening windows. Should one find themselves in contact with Meloidae, brushing them away, instead of crushing them, is the safest course of action.

Conflict of interest: None declared.

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