

The Kiss of Death: A Rare Case of Anaphylaxis to the Bite of the “Red Margined Kissing Bug”

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Abstract

Triatoma (kissing bugs), a predatory genus of blood-sucking insects which belongs to the family Reduviidae, subfamily Triatominae, is a well-known vector in the transmission of *Trypanosoma cruzi*, the causative agent in Chagas disease. However, it is less well appreciated that bites from these insects can cause a range of symptoms varying from localized cutaneous symptoms to a generalized anaphylactic reaction. While anaphylactic reactions following bites have been reported with five of the eleven species endemic to the United States, the majority are associated with *Triatoma protracta*, and *Triatoma rubida*. There have been very few reported cases of anaphylactic reaction to the bite *Triatoma rubrofasciata*, which is endemic to Florida and Hawai'i. We report a case of a 50 year old previously healthy female from a rural area in Honolulu County who suffered three separate bites from *Triatoma rubrofasciata* and experienced a generalized anaphylactic reaction on each occasion. There is currently no commercially available skin test to determine allergy to *Triatoma* bites, and there is likewise no immunotherapy. Avoidance is the best strategy and allergic patients should always have an epinephrine auto injector readily available.

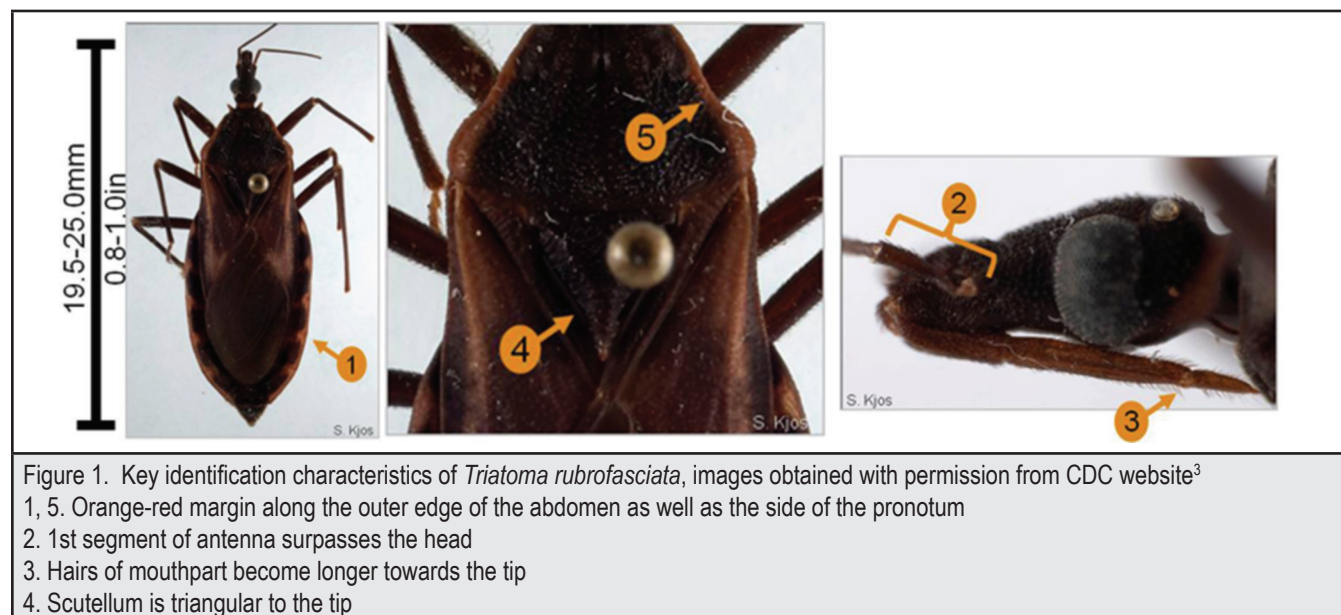
Introduction

Triatoma “kissing bugs” are a predatory genus of blood-sucking insects that belong to the family Reduviidae, subfamily Triatominae. There are 141 species worldwide, of which 11 species are found in the United States.^{1,2} *Triatoma rubrofasciata* is the only triatomine species found in the state of Hawai'i and is characterized by a triangular scutellum and an orange-red margin along the outer edge of the abdomen and the sides of

the pronotum, as shown in Figure 1.^{1,5} These insects are usually found in rural areas and feed on warm blooded mammals to include chickens, rodents, dogs, and humans. They are able to consume two to four times their body weight in blood a day, and typically feed at night. The term “kissing bug” is a consequence of the insect's predilection of biting the victim's face because it is often the most accessible body part.²

Triatoma bites are associated with a variety of other adverse reactions, which can range from mild localized inflammation to a severe, systemic, anaphylactic reaction. Allergic reactions following bites from five different *Triatoma* species have been reported. The majority of allergic reactions have been attributed to *Triatoma protracta*, which is found in California; and *Triatoma rubida*, which is found predominately in Arizona. The other three species associated with reported adverse reactions are *Triatoma gerstaeckeri*, *Triatoma sanguisuga*, and *Triatoma rubrofasciata*.^{2,4} One death following an anaphylactic reaction secondary to a *Triatoma* bite was reported in Arizona in 2004, though that case report did not delineate the species.⁵

While most *Triatoma* bites leave a barely noticeable punctum without surrounding swelling or erythema, other reported bite manifestations include bullae, vesicles, papules, and cellulitis. Lymphedema following a bite has also been reported. Reports of anaphylactic reactions frequently involve patients awoken from sleep with generalized cutaneous symptoms including urticaria,



flushing, pruritus, and angioedema. Gastrointestinal symptoms of nausea, vomiting, abdominal cramps, and diarrhea have also been reported. Respiratory symptoms may include dyspnea, wheezing, and laryngeal edema. Cardiovascular involvement is generally manifested by hypotension and syncope.²

Unlike other triatomine species such as *T. protracta*, and *T. rubida*, there are few cases of reactions to *T. rubrofasciata* reported in the literature. Two cases were reported from the Kaimuki district of O'ahu in 1944. In the first case one patient suffered localized swelling around the bite followed by lymphangitis and axillary adenitis while the second patient suffered localized pain and swelling.⁶ A case of an anaphylactic reaction to *T. rubrofasciata* was reported in Singapore in 1973. This case involved a 19 year old Chinese male who suffered a bite to the back of his chest while sleeping. On arrival to the Emergency Department, he was in a state of shock with an unrecordable blood pressure. The patient was treated with hydrocortisone, adrenaline, and promethazine for anaphylaxis. He became anuric and was kept on mannitol for 24 hours. He was discharged in stable condition 48 hours after admission.⁷

This paper presents a rare case of an anaphylactic reaction to the bite of *T. rubrofasciata* which occurred on the island of O'ahu. The purpose of this paper is to further review available epidemiological data on the insect specific to the Hawaiian Islands, as well as to discuss the diagnosis and management of patients with hypersensitivity to its bite. The importance of avoidance strategies and potential avenues for further research are also discussed.

Case Presentation

We present a case of a healthy 50-year-old woman with no previous history of allergies or known hypersensitivity from Waianae, a rural farming area on the west side of the Hawaiian Island of O'ahu. Over the course of two years she suffered two shock events with a third shock event following a witnessed insect bite. The insect was subsequently captured and identified as *Triatoma rubrofasciata*. On her first reported event, she felt a sudden onset of dizziness, systemic pruritus, and a feeling of "tightness" in her throat. This progressed to whole body urticaria, dyspnea and lightheadedness. The patient was taken promptly to the Emergency Department (ED). On arrival she was hemodynamically stable. She was given IV diphenhydramine, methylprednisolone, and ranitidine with gradual amelioration of her symptoms. Two days after this event she noted a large, erythematous, warm welt on her left medial upper arm. She hypothesized that she had suffered an insect bite, though at that time she was unsure of the culprit organism. Approximately one year later while lying in her bed, she felt pain on her right lateral forearm and visualized two raised welts in the area of discomfort. She then developed dyspnea, urticaria, and lightheadedness. She suffered a witnessed loss of consciousness from which she recovered and was not taken for medical care. A search of the bed revealed an insect with characteristics suggestive of *Triatoma rubrofasciata*, though it was not captured for identification at this time.

The third reaction occurred approximately nine months after the second event. On this occasion she experienced urticaria, shortness of breath, and lightheadedness without loss of consciousness following an insect bite. An immediate search of the bed revealed the culprit insect which was captured by the patient's husband and later identified as *T. rubrofasciata* by a medical entomologist (Figure 2). The patient's husband had also experienced bites from a similar insect in the past, though he had not suffered a systemic allergic reaction. The patient was provided with avoidance measures and prevention education, and was instructed to obtain an epinephrine auto-injector from her primary care physician.



Figure 2. *Triatoma rubrofasciata* insect captured and identified by entomologist.

Discussion

Overall, *Triatoma rubrofasciata* bites are rare, and systemic, anaphylactic reactions are even rarer. The insect has been found on the Hawaiian Islands of Kaua'i and O'ahu.⁸ There is no recent epidemiological data detailing the occurrence and distribution of the insect in Hawai'i, though older literature describes finding them in great numbers in the Kaimuki district of Honolulu.⁹ The two previously reported bites also occurred in Kaimuki.⁶ Review of the Hawai'i Entomology Society Proceedings has shown that the insect has been noted near the Ewa Plantation mill on O'ahu and at the Honolulu Zoo.^{10,11} On Kaua'i, *T. rubrofasciata* has been found near Barking Sands Beach.¹² Another closely related Reduviidae insect, *Oncocephalus pacificus* (Pacific kissing bug), has been found in Wahiawa and at the Kaimana Beach Hotel in Waikiki, as well as a documented human bite at Radford Terrace, O'ahu in 1970.^{13,14}

The diagnosis of *T. rubrofasciata* hypersensitivity is based on clinical presentation and identification of the insect. Currently, serum specific IgE testing for *T. rubrofasciata* is not performed by any commercial labs and serum extracts are likewise unavailable, thus precluding skin testing. As specific serum is not available for *Triatoma*, desensitization using immunotherapy is not performed outside of a research setting. Although there have been no reports of using immunotherapy on *T. Rubrofasciata* bites, there have been two successful studies using *T. protracta* extracts. The first reported use of immunotherapy to

prevent an anaphylactic reaction in a known allergic patient was by Marshall and Street in 1982. In this instance, a patient who had previously experienced a generalized reaction to *T. protracta* bite was given progressively increasing doses of a salivary gland extract. Observed bite challenges elicited mild cutaneous reactions without evidence of anaphylaxis.¹⁵ In a 1984 study by Rohr et al, five patients who had life-threatening anaphylactic reactions from the bite of *T. protracta* were treated with immunotherapy using extract-antigen preparations from the insect's salivary glands. The anti-Triatoma IgG and IgE responses were found to rise after four weeks of treatment, plateau by 12 weeks, and remain steady after 30 weeks of treatment. The patients were subsequently challenged by *T. protracta* bites. One patient exhibited a local wheal with scattered urticarial lesions while four other patients developed limited wheals at the site of bites.¹⁶ Although the antigenic cross reactivity between *T. rubrofasciata* and *T. protracta* is unknown, *T. rubrofasciata* desensitization is theoretically possible. However, because of the complexity of obtaining the serum from Triatoma glands, it is not a viable treatment option outside of a research setting.

In susceptible individuals known to have an anaphylactic reaction to *T. Rubrofasciata*, avoidance of exposure is the only effective preventive measure. The greatest risk factor is living in a rural area in close proximity to animals which can serve as vectors, as did the patient in the above case who lived on land adjoining both a pig and chicken farm. According to the 1982 Hawai'i Vector Control Manual, a number of avoidance and insect proofing strategies can be instituted. All wild animal harborages within 100 yards of a home, to include mongoose and rodent shelters, should be destroyed. The fur of domesticated animals should be regularly checked for the presence of these insects and pet entryways should be bug-proofed. The flooring, moldings and foundations of the home should be checked for cracks, and discovered imperfections should be filled with caulking. Also, beds should be moved at least a foot away walls and adhesive tape should be applied to the legs of beds with the sticky side out.¹³

As the kissing bug is a nocturnal insect capable of flight, outside lights should be turned off or away from the home so as not to attract them to the area. Other avoidance strategies include use of approved indoor pesticides as well as use of bed nets. The floor of the bedroom should be kept free of clutter and bed linens should not touch the floor. In high incidence areas, examination of bed sheets prior to getting into bed may be helpful. As the insect rarely bites covered skin, wearing pajamas with long sleeves and long pants is reasonable, as is spraying insect repellent on uncovered skin prior to bed.²

Epinephrine is the only effective treatment for anaphylaxis. Sensitized patients should always have an epinephrine auto injector readily available. The patient and close contacts should be taught how and when to use this medication.² Altogether, true hypersensitivity to this insect is a rare occurrence, but when it does occur, avoidance is the best strategy and clinicians should be aware of this sequela to the *T. rubrofasciata* bite. There is no current skin testing or immunotherapy, though this presents a potential area for future research.

Conflict of Interest

None of the authors identify any conflicts of interest.

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