

Red Fire Ants Have Arrived

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Red imported fire ants (*Solenopsis invicta*) were detected in Los Angeles and Orange Counties in November of 1998. It appears that the fire ants had been present since at least 1996. They have also been detected in Riverside and Kern counties. The ants are expected to colonize all irrigated agricultural areas and lawns in California. Fire ants are very belligerent and when a nest is disturbed hundreds swarm out delivering numerous stings. After red fire ants were accidentally imported into Alabama in the 1930s, they marched across the southern United States (figure 1) despite quarantines and various control methods. One factor accounting for the movement of fire ants is the transportation of queens and colonies by movement of infested nursery stock. Another factor is that red imported fire ants have no known, natural enemies. Fire ants are known to attack both humans and pets and to invade homes. They are very aggressive, reddish-brown ants about 1/4 inch long. Ants have

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dark, characteristic bodies (figure 2). The arrival of this pest has been equated to a swarm of locusts. It is likely fire ants are here to stay. Medical practitioners should become aware of what has been referred to as, "...the ants from hell."

Hymenoptera Stings

Wasps, bees and fire ants use their modified ovipositor as an organ of offense and defense. Although hymenoptera stingers are small, the pain they inflict is an immediate burning sensation due to an injection of venom. Honeybee stingers are barbed and usually remain in the victim's skin after a sting. The stinger can be removed using a scraping motion with a credit card or finger nail. A few individuals also have allergic reactions to hymenoptera venom. The imported fire ant possesses a unique method of stinging. It first secures itself with its mandibles, causing pain, then, using its head as a pivot, swings its abdomen in an arc, repeatedly stinging. The characteristic arc-shaped stings are useful in identifying the offending insect. A pustule (not seen in the sting of other species) forms at the sting site in a day or so and may become infected. In Southeastern United States, fire ants are the number one cause of hymenoptera stings.²

In endemic fire ant areas, retrospective studies have reported sting attack rates ranging from 28% to 58%.^{1,5} A prospective study of military personnel at a training facility in Texas reported a 51% attack rate after 3 to 6 weeks exposure to the region. Among individuals reporting fire ant stings, 96% reported a pustule or small local reaction.³ The burning and itching sensation generally resolve in 24 hours while the small pustules usually resolve in a day or two. Although the stings are not usually life threatening, they are easily infected and may leave permanent scars. On rare occasions, life-threatening anaphylaxis can occur.

An experimental study of adult dogs receiving stings from fire ants showed initial gross lesions of swelling and erythema at 15 minutes. Microscopic changes were vascular congestion and superficial dermal edema. After resolution of the initial wheal and flare reaction, the lesions consisted of bright erythematous pruritic papules by six hours.

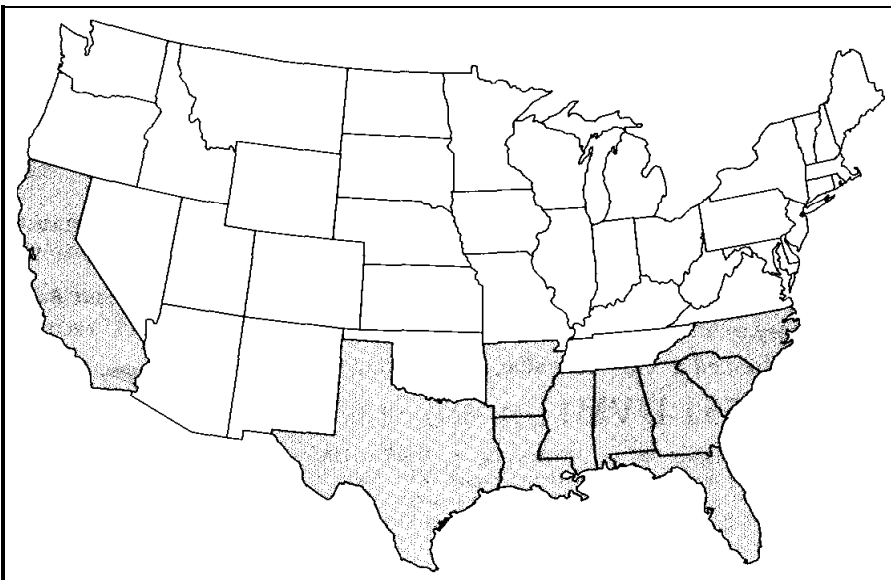


Figure 1 : The red imported fire ant was introduced into Alabama, from South America, about 1930 and now infests more than 275 million acres (shaded) where it is an agricultural pest and a health hazard. Cold weather may halt the ants' northward march.

The sting sites appeared grossly normal by 24 hours. In people, fire ant stings develop a superficial vesicle that evolves into a sterile pustule. The pustule remains for a few days then ruptures. Vesicles and pustules were not prominent in any of the dogs in the study. ⁶

A fire ant survey of members of the American Medical Association in 13 southern states revealed that most of their patients treated for fire ant stings had local reactions, but a few (2%) required treatment for life-threatening anaphylaxis. The study indicated a need for public and health professional education regarding the health hazards posed by the imported fire ant.

The venom of fire ants differs from other hymenopteran venom which are mainly

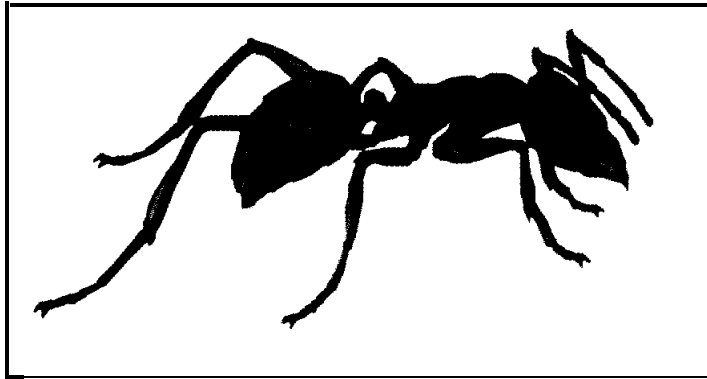


Figure 2 Like other insects, ants have three pairs of legs attached to their thorax. Their jaws are used for carrying objects, chewing and digging. Ants have two, long, joined antennae which are used for taste, smell, and feeling. The female fire ant has a stinger which evolved from her egg-laying organ.

aqueous solutions containing proteins. Fire ant venom is water insoluble and consists of a unique alkaloid. The dermal necrosis at the site of the sting is thought to be directly attributable to the alkaloid. Topical treatment with topical corticosteroids, parenteral corticosteroids, antihistamine or epinephrine does not alter the sting reaction.

Fire Ants Swarms Are Hazardous

Health professionals should be aware that fire ants are hazardous to animals and people. Ground dwelling birds and small mammals can be swarmed on by fire ants and stung repeatedly. Swarms of fire ants have attacked livestock and poultry, killing them. Fatal fire ant attacks may be directly related to massive doses of venom, not an allergic reaction.

In one instance, a 90-year-old woman in a nursing home was found in her bed covered with fire ants. The ants were even inside her mouth. Multiple sting sites were present over her body. The woman died six days later. ⁵ In another instance, a five-day-old infant was sent home following an elective

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cesarean birth. The baby was placed in a playpen about six inches from the floor and found the next morning covered with fire ants. The baby was in shock and hospitalized. Following intensive therapy, the infant eventually recovered. It was the opinion of the attending physicians that the reaction seen in the infant was a direct result of fire ant venom as opposed to an allergic reaction. ⁷

Electrical Damage

Like many other ants, fire ants frequently infest electrical equipment. They chew on insulation and can cause short circuits or interfere with switching mechanisms. Air conditioners, traffic signal boxes, and other devices can be damaged. Fire ants also nest in housings around electrical and utility units. The ants move soil into these structures, which causes shorting and other mechanical problems. Large numbers of ants may be found around contact points, which can cause short circuits.

Feeding Habits

Food is collected by workers. They often leave the mound through tunnels which extend 15-25 m from the mound, 6-12 m underground. When food is found, the forager returns to the nest, leaving a pheromone trail for others to follow to the food source. Their primary food is insects. They invade household kitchens and pantries. They can swarm over newly hatched, ground-nesting, wild birds, stinging them repeatedly. They are attracted to sugar and honeydew and are known to feed on carrion.

Colonies

A colony is usually started by a single queen, but some beginning colonies are known to contain up to five queens. As many as 500,000 ants may live in one colony. The ant colony usually consists of three classes "ants: 1) the queen, 2) workers, and 3) males. Most of the ants in the colony are workers. Workers are sterile females that generally do not mate or lay eggs. Males hatch from unfertilized eggs. There are a few winged ants (reproductives) in the colony. Following the nuptial flight, the male dies while the fertilized queen goes on

to start a new colony. After three years the colony may contain over 50,000 ants.

Mounds

Fire ants build mounds in almost any type of soil, but prefer "pen, sunny areas. Mounds can reach 18 inches in height, depending upon the type of soil. The characteristics of the mound depend on the soil and amount of moisture. In moist clay, mounds may be tall while in dry sand the mounds are flat. Flat mounds are more difficult to detect. Each mound may be teeming with worker ants that measure approximately 1/4 inch in length. Often mounds are located around stumps and trees. Mounds may be found in ground that has been cleared and recently landscaped. Colonies can also be found in or under buildings. The semipermanent nests are large, unsightly mounds of excavated soil with openings for ventilation. **Imported red** fire ant mounds are generally **dome-shaped**, in contrast to those of native fire ant species. In defense of their mounds, fire ants will repeatedly sting an intruder. They may attack with little warning.

Fire Ants Indoors

Fire ants form colonies close to homes and other buildings. They sometimes forage indoors for food and moisture, particularly during the hot, dry, summer months. They also nest under cracked pavement, removing dirt from underneath sidewalks and roadways thereby causing structural damage. Colonies may be difficult to locate. Veterinarians and physicians caring for patients with multiple fire ant stings occurring indoors should investigate the possibility that the patients are cohabiting with fire ant colonies. Entire colonies occasionally nest in wall voids or rafters.

Control

Fire ant mounds near the home should be identified and treated with an ant bait insecticide. To control fire ant mounds, attractant baits are used. These consist of soybean oil, corn grits or chemical agents coated with insecticide. The bait is picked up by the worker ants and taken deep into the mound to the queen. It can take weeks for these insecticides to work. The label

instructions of any pesticides used should always be read and followed.

There are parasitic flies, ants, and other organisms that are currently being evaluated for biological control in fire ant infested areas of the United States. Another solution being evaluated is infesting fire ants with the microorganism *T. solenopsae*. The pathogen, *T. solenopsae*, infects ant colonies and chronically weakens them, but doesn't harm plants or native ant species.

Report Suspected Fire Ants

To help control fire ants, all suspected findings should be reported to the California Department of Food and Agriculture Pest Response Line at 1-800-491-1899 or the Los Angeles County Agricultural Commissioner's Office 626-575-5469.

References

- 1 Freeman TM: Imported fire ants: the ants from hell! *Allergy Proceedings* 1994. 15 (1):11-5. 1994
- 2 Adams CT, Lofgren CS: Incidence of stings or bites of the red imported fire ant and other arthropods among patients at Ft. Stewart, Georgia, U.S.A. *Journal Medical Entomology* 19:366-70. 1982
- 3 Tracy JM, Demain JG, Quinn JM, et. al.: The natural history of exposure to the imported fire ant (*Solenopsis invicta*). *Journal of Allergy Clinical Immunology* 95(4):824-28. 1995
- 4 Staffor CT, Hutto LS, Rhoades RB, Thompson WO, et. al. : Imported Fire Ant as a Health Hazard. *Southern Medical Journal* 82(12): 1515. 19. 1989
- 5 DeShazo RD, Williams DF: Multiple Fire Ant Stings Indoors. *Southern Medical Journal* 88(7):712-15. 1995
- 6 Rakich PM, Latimr KS, Mispagel ME, et al: Clinical and histologic characterization of cutaneous reactions to stings of the imported fire ant (*Solenopsis invicta*) in dogs. *Veterinary Pathology* 11(6):555-9. 1993
- 7 Hardwick WE, Royall JA, Pettit BA, Tilden SJ, et. al. : Near Fatal Fire Ant Envenomation of a Newborn. *Pediatrics* (4):622-4. 1992