



## Pathology Biology Section – 2007

### G72 The Postmortem Picnic

Kathryn Haden-Pinneri, MD\*, Mary Lynn Anzalone, MD, and Luis A. Sanchez, MD, Office of the Medical Examiner of Harris County, Joseph A. Jachimczyk Forensic Center, 1885 Old Spanish Trail, Houston, TX 77054

After attending this presentation, attendees will understand a potentially confusing postmortem artifact caused by the Red Imported Fire Ant (RIFA) and stress the importance of good photographic scene documentation.

This presentation will impact the forensic community and/or humanity by educating forensic scientists about alterations in wounds caused by *Solenopsis invicta*, the Red Imported Fire Ant, which may affect wound interpretation.

Postmortem alteration of wounds by insects is a fairly common phenomenon, especially in decomposed bodies where maggots are frequently encountered. The destruction they produce can be significant, even to the point of complete obliteration of the wound and the underlying wound track. Without damage to the skeletal elements, the trauma may not be discernible. Alterations of wounds in the “fresh” state are not as common; however it is being seen with increasing frequency in the Southern United States, where fire ants have invaded.

*Solenopsis invicta* (*S. wagneri*), the Red Imported Fire Ant (RIFA), has infested large parts of the United States, concentrating mainly in the warmer Southern region. States from California to Maryland have documented their presence and the destruction they cause. Lacking predators and parasites, these ants have become a major pest, destroying plants, crops, trees, and even small animals. They are also attracted to electrical currents and subsequently damage electrical boxes, air conditioners and other equipment.

First introduced into the U.S. from its native South America, the RIFA arrived in cargo from Brazil at the port of Mobile, AL in the 1930s. This species has spread rapidly throughout the Southeastern United States and has recently been identified in Australia, the Philippines, Taiwan, and China.

Fire ants are omnivores, feeding on almost any plant or animal. Other insects are their preferred food. Humans become affected by the RIFA when it bites and stings. In response to vibration or movement, RIFAs react quickly and aggressively to disturbances of their colony or mound. A single ant will sting repeatedly, even when out of venom. The RIFA bites with its mandibles to attach itself to the skin, and then it stings with its abdomen, injecting toxic venom. A pustule forms in 24-48 hours, which may get secondarily infected. Some individuals are allergic to the venom, and anaphylaxis may ensue.

For forensic pathologists, RIFAs are creating problems by their rapid appearance on bodies found outdoors. Within minutes, 10-20 ants will arrive at the body, and many more will come after that. Rather than biting and stinging in an aggressive manner, the RIFA just bites, gaining sustenance from the body instead of injecting venom. In contrast to maggots, which prefer open wounds, moist mucous membranes and dark environments, RIFAs will readily eat intact exposed skin. They tend to concentrate at clothing/skin interfaces and prefer the outer surface of the body, rarely entering the body cavities or altering the wound tracks.

Increasingly, RIFAs are being encountered in open wounds, and the changes they leave behind can be troublesome. In general, postmortem artifacts caused by insects are easily distinguished from antemortem trauma. When a wound is involved, however, the changes are not as straightforward. The yellowing, seen with postmortem insect activity is usually lacking or is camouflaged by the actual wound characteristics.

Firearm wounds, in particular, can have a very puzzling appearance when altered by RIFAs. If only a few bites occur around the wound, it may be mistaken for stippling, thereby altering the interpretation of range of fire. On the other hand, if a large number of RIFAs are present and they have been there long enough, determination of entrance versus exit may be completely obscured.

Scene photographs are key in order to verify or deny the presence of RIFA activity. A small number of RIFAs will usually get transported with the body and/or in the body bag. Without scene photographs to review, you may not realize the extent of their involvement in wound alteration. In one case, the edges of a gunshot wound were very irregular, simulating an atypical entrance or possible intermediary target. Scattered areas of postmortem insect activity elsewhere on the body indicated the presence of RIFAs; however, it wasn't until the scene photos were reviewed that it was apparent to what extent they had altered the gunshot wound. In one photo, RIFAs are seen completely filling the wound, something typically associated with maggots, not ants. This large concentration of RIFAs imparted an atypical appearance to the gunshot wound.

In addition to the many other variables that cause alterations of wounds in the postmortem setting,



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changes induced by RIFAs must be considered, particularly in bodies found outdoors. RIFAs pose an additional hazard at the time of autopsy. Care must be taken when manipulating bodies or clothing containing RIFAs because the ants will act aggressively, biting and stinging those that have disturbed them, possibly inciting an allergic reaction in susceptible individuals. As RIFAs continue to invade the United States, more and more forensic investigators will be left to interpret the trauma they leave behind.

**Solenopsis Invicta, Fire Ant, Postmortem Artifact**