



Pathology/Biology Section - 2015

H25 Postmortem Artifacts Caused by the Water Beetle *Rhantus Validus*, Sharp (Coleoptera: Dytiscidae) on a Corpse Found in a Pond in Región de La Araucanía, Chile

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After attending this presentation, attendees will understand the potential capabilities and limitations of forensic entomology practices in order to determine the nature of injuries found on a body when insects are found on a floating corpse.

This presentation will impact the forensic science community by providing information that will be potentially useful in adding a new component to determine the circumstance of death of a corpse found in an aquatic environment.

The estimation of the time since death, determination of the manner of death, identification of the individual, and the pathological evaluation of a body can be impeded by postmortem changes. More accurate diagnosis of these changes are a result of continued research in forensic entomology and case studies; however, at present there is scant literature concerning forensic entomology and decompositional processes in aquatic environments.

In the majority of cases a body placed in water progresses through a series of sinking and floating phases. During the float phases, necrophagous blow flies (Diptera: *Calliphoridae*) and flesh flies (Diptera: *Sarcophagidae*) can colonize a body in the water. Some other aquatic or semi-aquatic insects can use the submerged body as an eventual source of food or as a substrate to attach (e.g., Diptera: *Simuliidae*, *Chironomidae*), but in water there are no specialized carrion insects.

The case study presented involves a decomposed body found in an artificial pond in Región de La Araucanía, Chile, in April 2014. The body was in the early floating stage, six feet from the edge of the pond. The face and majority of the body were immersed in the water, while the ears, the posterior part of the head, and the shoulders were exposed to the surface. Adult water beetles *Rhantus validus* Sharp (Coleoptera: Dytiscidae) were found on the body, associated with injuries on the skin. Water beetles such as *R. validus* are semi-aquatic insects adapted to living in water both as larvae and adults. These species of water beetles carry an air bubble between their abdomens and elytra which provides an air supply and have hind legs adapted for swimming. They are predatory insects with short and sharp mandibles. When they bite, they immediately deliver digestive enzymes.

The water beetles were collected from the body at the crime scene and sent to an entomologist. No other species of arthropods associated the corpse were observed. Four water beetles were found behind the left ear of the body, crawling in an asymmetrical groove of approximately 30x10mm (length x width), while one water beetle was found crawling inside an oval hole (10mm diameter) with regular margins on the upper part of the chest. The entomologist was asked to help clarify the nature of these injuries, in particular, if they could be postmortem artifacts caused by the predatory activity of water beetles on the body.

Postmortem Artifacts, *Rhantus Validus*, Freshwater Environment