STRUCTURAL, ERYTHEMATOUS AND IMMUNOGENIC PROPERTIES OF SALIVARY GLANDS OF THE HUMAN BODY LOUSE, *PEDICULUS HUMANUS* L.

Davy Jones
Graduate Center for Toxicology, Chandler Medical Center, University of Kentucky, Lexington, KY USA 40536-0305, djones@uky.edu

The report here concerns the structure and histology of both the reniform-type and U-shaped salivary glands of these human body lice. The reniform glands were found to have two major types of cellular organization. Those adjacent to the salivary duct possess an unusually thick and flocculent basement-like membrane, whereas the other type of cells (not surrounding the ductwork) are larger with a thin basement membrane. Both types of cell in the reniform glands possess numerous secretory vacuoles apparently containing salivary protein granules. The U-shaped glands were observed to contain the type of cells surrounded by a thick flocculent membrane. A central salivary duct runs the length of each salivary gland. Vasodilatory erythema of human host skin was caused by the saliva of P. humanus. The intensity and persistence of the wheal did not appear to vary significantly between naïve and experienced host individuals. Lice contained a stock of vasodilator, enabling them to rapidly reinitiate new feeding attempts after successively interrupted bites. The vasodilator exerts its action in a rapid, dose-dependent manner, although lice that had not fed for several days took slightly longer to inject the vasodilator than those that had more recently fed. The vasodilator appears not to be a heme-binding protein, and does not exhibit peroxidase or catechol peroxidase activity at gland equivalent concentrations where such activity was detected in other blood-sucking insects. In addition, the vasodilator appears highly specific for human tissue target(s), since it was not detected to exert activity on rat resistance arterioles (by in vivo videomicroscopy), nor in intradermal injection in rats, nor via natural bites on rabbits. Immunoblot analysis of antibodies produced by hosts (rabbit and human) that have been subjected to heavy feeding of lice over several months showed only very weak reactivity against denatured salivary proteins, while a stronger reaction was detected against native proteins. Electrophoretic analysis of the proteins contained in each type of gland revealed that the U-shaped glands have a less complex protein content. The N-terminal sequence of one of the dominant proteins in the U-shaped glands closely matched insect glutathione transferases, not known to be a major salivary gland enzyme in other blood-sucking insects, but which is known to be a terminal enzyme in the vertebrate synthesis of peptidoleukotrienes that induce vasodilation in skin