



Sensory ecology of disease vectors

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Chapter 1: Resource location in a complex sensory landscape

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Abstract:

Blood feeding insects are entwined with the history of mankind and our livestock, with the irritation of arthropod bites bringing a range of vector borne diseases that have devastated human populations. The three documented pandemics of Bubonic plague are more than matched by the constant losses to malaria that have only in recent history been brought under one million per year. Military campaigns throughout history have lost more troops to disease, often vector-borne, than to fighting and malaria and yellow fever devastated the first workers on the Panama Canal and a plethora of other endeavours. Whilst DDT brought some relief, first to the troops of World War II and then to the wider populations, the use of insecticides on a wide scale came at an enormous ecological cost. The more focused use of insecticides in indoor spraying and bed-net campaigns further contributed to the decline of malaria incidence but appear to have begun to reach the limit of what their efficacy can achieve. In these times we need to expand our toolbox, and we need to do so through a better understanding of the ecology and behaviour of vectors of disease. We need to expand our knowledge base of a wider range of vectors because to extrapolate from studies of one species in one situation rarely gives information of sufficient quality for our needs. When it comes to the specific behavior that drives the transmission of disease by a vector then the devil is truly in the detail.