CHAPTER 8

Ecology and management of mosquitoes

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Introduction

Saltmarshes form at the dynamic interface between land and sea. This interface experiences fluxes in the biological, physical and chemical processes which determine the density and abundance of species. As a result, saltmarshes provide important ecosystem services but also support the key habitat features necessary for breeding of some species of pestiferous and vector mosquitoes.

In Australia, the most common species of mosquitoes that breed in saltmarsh habitats are *Aedes vigilax* (Skuse) in the warmer tropics and subtropics and *Aedes camptorhynchus* (Thomson) in the cooler areas. *Aedes alternans* (Westwood) occurs in both regions, but less commonly. All saltmarsh mosquitoes breed in the free water that pools in shallow depressions following tidal influence or as a result of freshwater inputs.

Mosquito breeding strategies

The biology of the mosquitoes inhabiting saltmarsh was described by Russell (1993) for south-east Australia and by Liehne (1991) for Western Australia. The adaptive strategies of different species are reflected in their ability to exploit the dynamic nature of saltmarsh. For example, the larvae of some species develop near saltmarshes during normal tidal cycles and then in them following rainfall, when the salinity of ground pools is lower. These brackish species include *Culex sitiens* (Wiedemann), *Verrallina funerea* (Theobold), *Aedes procax* (Skuse), *Culex annulirostris* (Skuse) and *Aedes notoscriptus* (Skuse).

Many mosquitoes require water for egglaying. For example *Culex sitiens* and related *Culex* species lay a raft of eggs on the water. The Anopheline (genus *Anopheles*) mosquitoes also lay eggs on water, hence water is needed for both the egg and larval stages. In contrast, aedine mosquitoes (those in the genus *Aedes*) lay eggs on the ground surface. For the saltmarsh mosquito (*Aedes vigilax*) the lifecycle requires the varying conditions that occur on the saltmarsh. The eggs are laid, singly, on damp ground or plant stems, and are conditioned by drying out. Then flooding occurs and hatching is stimulated by a decline in dissolved oxygen. Following tidal events, hatching of Aedine species can occur almost immediately and simultaneously. This can result in very high densities of larvae developing under ideal conditions.