

SALT AND WATER BALANCE

*It was during the dry season of 1973 that I first became intrigued about how crocs manage their body water and electrolytes. This was after seeing very small estuarine crocodiles, *Crocodylus porosus*, in the lower reaches of the Liverpool River, in water as salty as the Arafura Sea into which it flows. There they were, looking sassy, splashing in the shallows against the muddy exposed bank at low tide and snapping at prawns. There was no fresh water nearby and it was hard to imagine these small crocs swimming far enough to find any. Their common name in Australia is 'salties', and everything I was seeing suggested a physiological capacity for living full time in salt water, not just visiting. But the research to that time reported that crocodiles lacked salt glands: the few species that could be found in salt water were assumed to need fresh water nearby if they were to survive in the sea. A very big crocodile (or alligator) could presumably go for a long time and, perhaps, long distances between drinks, but not a 200 g hatchling. That chance observation of baby crocs swimming around in salt water diverted me for a few years from what I initially wanted to study – their thermal relations – and a fascinating story of discovery, suspenseful at times, gradually unfolded (see Grigg 1993, <http://espace.library.uq.edu.au/view/UQ:9724>).*

SALT AND WATER BALANCE IN *CROCODYLUS POROSUS*: AN INTRODUCTION TO CROCODYLIAN OSMOREGULATION

Estuarine or saltwater crocodiles, 'salties' in the Australian vernacular, *Crocodylus porosus*, thrive across a very wide range of salinities, from fresh to hypersaline waters. A description of the patterns and mechanisms of their osmoregulation provides a convenient way to introduce salt and water balance (osmoregulation) in crocodylians in general and discuss some of the procedures by which it can be explored. With that as background, we will then look at three species which live mostly in fresh water but are sometimes found in salt or brackish water: *C. johnstoni*, *Alligator mississippiensis* and *Caiman latirostris* (the latter two being alligatorids). Other species will be mentioned briefly. Relevant terminology is explained in Box 11.1. The most recent review of crocodylian osmoregulation is that by Leslie and Taplin (2001).

Events leading to the discovery of salt glands provide classic examples of the value of studying

*An estuarine or saltwater crocodile, *Crocodylus porosus*, proudly displaying its lingual salt glands. (Photo DSK)*