

Social interactions compromise thermoregulation in crocodiles *Crocodylus johnstoni* and *Crocodylus porosus*

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Observations of aggressive encounters between crocodiles in the field showed that intraspecific aggression compromised thermoregulation by subordinate animals. Intraspecific aggression may thus trigger a physiological mechanism for dispersal in crocodiles. We measured body temperature (T_b) and environmental variables concurrently with behavioural observations in wild *Crocodylus johnstoni*, and *Crocodylus porosus* free-ranging in captivity. Average daily T_b of crocodiles of both species subordinate in aggressive encounters was significantly lower than when animals were undisturbed. Chased *C. johnstoni* entered the water at significantly lower T_b after basking than when they retreated voluntarily. However, T_b was most severely affected by longer term changes in patterns of behaviour: when chased from their basking site, *C. johnstoni* remained mostly submerged for at least 2 h. In contrast, undisturbed crocodiles re-emerged to bask within 2 h of entering the water after a previous basking episode. This long-term difference in behaviour resulted in chased crocodiles experiencing significantly lower operative temperature compared to undisturbed animals. Mathematical simulations show that average daily T_b of chased crocodiles may be up to 6°C below that of undisturbed animals. Intraspecific aggression may compromise individual crocodiles' physiological performance and even their fitness unless they disperse to less contested areas.

INTRODUCTION

EVER since Cowles and Bogert (1944)

(Schoener 1977; Auffenberg 1981; Heatwole and Taylor 1987). Possible restrictions of