

69. SEASONAL CHANGES IN PROSTATIC MESOTOCIN IN THE BRUSHTAIL POSSUM (*TRICHOSURUS VULPECULA*)

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In eutherian mammals, oxytocin is locally synthesized in the prostate, and has been implicated in prostate growth. This study investigates the presence of an oxytocin-like hormone, mesotocin, in the prostate of the brushtail possum in relation to seasonal changes in prostate size. Male possums were sacrificed throughout the year during the breeding and nonbreeding periods, and blood samples and prostate tissue collected. Prostates were divided into cranial and caudal areas and either fixed in 10% neutral buffered formalin for immunocytochemistry of mesotocin and its carrier protein, neurophysin, or frozen in preparation for measurement of mesotocin by radioimmunoassay. Significant changes ($P<0.05$) in prostate weight occurred throughout the year, with the largest prostate weights occurring in the main breeding season months of March (26.52 ± 8.25 g), April (19.61 ± 6.42 g) and May (23.03 ± 6.62 g), and lowest in the nonbreeding month of January (7.54 ± 1.48 g). Mesotocin and neurophysin-like immunoreactivity were identified in the cranial and caudal prostate. The peptides were immunolocalised to all the epithelial cells of the glandular acini. The concentration of mesotocin in the cranial prostate changed throughout the year in relation to changes in prostate weight, and was significantly higher ($P<0.05$) in March (156 ± 9 pg/g) than at other times of the year. The concentration of mesotocin in the caudal prostate also changed throughout the year, displaying the same pattern as the cranial prostate, with the highest concentration present in March (219 ± 16 pg/g). The levels of plasma mesotocin were lower than those present in the prostate and did not change throughout the year. The seasonal increases in prostate weight in the months of March, April and May correspond to part of the main period in which mating occurs. The concentration of prostatic mesotocin closely mimics changes in prostate weight, supporting an involvement for the hormone in prostate growth in the marsupial in addition to the eutherian. The higher levels of mesotocin present in the prostate than the peripheral circulation and the localisation of a neurophysin-like peptide in the prostate also support the local synthesis of mesotocin in the possum prostate.