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Fur growth and replacement in the brushtail
possum, *Trichosurus vulpecula*, Kerr.

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Allan John Nixon

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ABSTRACT

Seasonal hair replacement in the brushtail possum was described using skin histology and fibre measurement. Possums were held in individual cages under conditions of natural light and temperature for an observation period of 26 months, and skin and fibre samples taken from the mid dorso-lateral position at three week intervals. Counts of hair follicles from transverse sections were used to measure hair follicle activity, and changes in compound follicles. Periods of hair growth were poorly synchronized between individuals, and peak levels of follicle activity did not exceed 40 percent. Derived follicles continued to form in mature possums. The number of follicles present in compound follicles increased by an average of 23 percent per annum, amongst six adult animals of various ages. Much of the fibre growth in possum skin was therefore attributable to follicle neogenesis. On average, only 13 percent of fur fibres were replaced per annum. Primary central follicles producing guard hairs undergo normal shedding and replacement cycles. Levels of growth and seasonal variation amongst members of the original wild population were similar to those of captive animals. Using skin pigmentation as an indicator of hair growth (or "moult"), a survey of commercially collected pelts also verified the high individual variation and tendency for spring-summer growth. Also, variation in the proportions of pigmented pelts over time differed between males and females, and pigmentation was greater in juveniles than in adults. A diffuse topographic growth pattern in possums was demonstrated by fur dyeing and skin pigment patterns. However, much fur growth in possums occurred in discrete patches which were attributable to repair of fur lost in intraspecific encounters. Growth of this type was most prevalent about the time of breeding in May, when 89 percent of pelts showed moderate or heavy patchy growth. The median duration of pluck induced follicle activity was 82 days, and growth time of guard hairs was 99 days. These times did not vary with differing ambient temperatures. Peak growth rates were 0.63 mm/day for pluck induced, and 0.58 mm/day for spontaneously growing guard hairs. The force required to extract fibres varied from 0.88 g/fibre under anaesthesia to 0.05 g/fibre shortly after death. Findings were discussed in relation to hair growth in eutherian fur bearers, possible control factors, and commercial management of the species.

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