MONITORING THE ACTIVITY OF A SOUTHERN HAIRY-NOSED WOMBAT, LASIORHINUS LATIFRONS, USING TEMPERATURE DATALOGGERS

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There is limited information on the activity of the southern hairy-nosed wombat, Lasiorhinus latifrons, due predominantly to the cryptic nature of this species and its burrowing lifestyle. As part of a recent field study of L. latifrons, temperature data loggers were employed to determine the usefulness of this equipment for studying activity patterns in this species including; emergence times, total length of bouts of activity, patterns and variation in activity throughout the year. Data from this pilot study suggest that temperature dataloggers provide an extremely useful and relatively non-invasive means of determining activity patterns in a semi-fossorial mammal.

Among burrowing mammals, the hairy-nosed wombats (Lasiorhinus spp.) are unique when considering their body size, foraging habit, and ranging behaviour. Adapted to a harsh, seasonally changing and unpredictable environment, these large, semi-fossorial marsupials rely heavily on a burrow for survival (Wells 1973). Radio tracking studies have indicated that the activity periods of hairy-nosed wombats show some variation with season (Johnson 1991b) and tend to follow a strong diel (two-phase) pattern (Evans 1999). Use of radio tracking techniques to examine activity patterns in these species however have proved very labour intensive. This pilot study examined the use of temperature dataloggers to provide accurate long-term information on activity patterns in L. latifrons.

The study was conducted near Swan Reach (34° 34’ S; 139° 32’ E), in South Australia’s Murraylands between November 1999 and July 2000. The region has a semi-arid climate, characterised by low rainfall (approximately 300 mm annually) and hot, dry summers. The Murraylands is frequently subjected to periods of drought, with a dramatic difference in vegetation availability between summer and winter months.

The animal used in this study, a 22.5 kg female L. latifrons, was captured using a hand-held net (Taggart et al. 2003) and transferred into a hessian sack for processing. In order to facilitate the collection of morphometric data (including sex, body weight, condition etc.) and the fitting of a radio-collar with temperature datalogger, the animal was anaesthetised with an intramuscular injection of Zoletil (3 mg kg⁻¹). The collar (double thickness nylon webbing) consisted of a double-stage radio-transmitter with a lithium C-cell battery (3-year lifespan) (Titley Electronics, Ballina, NSW), and a ‘TINYTAG’ temperature datalogger, housed in an aluminium cylinder (total dimensions = 20 x 8 cm and 170 g).

The temperature data logger recorded temperature every hour for the duration of the study period. By comparing this data with recordings of ambient temperature, and deep burrow temperature over the same period, also recorded with ‘TINYTAG’ dataloggers, it was possible to determine the activity levels of the animal over the nine-month study period, including emergence times, activity patterns, lengths of bouts of activity and burrow return times. Activity patterns were determined using an activity index, calculated as the


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difference between burrow and collar temperature. When burrow and collar temperatures merged the animal was in the burrow (low activity index) and when burrow and collar temperatures diverged (high activity index) the animal was above ground. The greater the mean difference between burrow and collar temperature, the more likely the animal was to be found above ground at that time.

Approximately 6000 h of data was collected on the study animal. The female *L. latifrons* was considered active when the collar temperature, corrected for a warming effect by the animal using known times of emergence and burrow confinement, corresponded to the ambient temperature recorded concurrently on the above-ground data logger located outside the burrow. When the wombat was confined to its burrow, collar temperature approximated the burrow temperature (Fig. 1).

Strong patterns of nocturnal activity periods were observed throughout the study, with lengths of bouts of activity varying moderately between the warmer and cooler months of the year (Fig. 2). Data indicated that the animal was active for approximately 1551 h or 25.9% of the study period. The mean time spent above ground per night declined significantly from November (7.69 ± 0.44) to a minimum in March (4.54 ± 0.31) before increasing again in July (7.22 ± 2.3) (Fig. 3).

Emergence occurred at a mean time of 1911 in November, was latest in March (mean time = 2311) and became progressively earlier from May (mean time = 2118) until July (mean time = 1815) (Fig. 4). The mean ambient temperature at which the animal emerged in November was 17.7°C. Emergence temperature increased across the summer months to a maximum in February of 20.3°C and declined in the cooler months to a minimum of 10.7°C in June (Fig. 4).

Long-term observations of *L. latifrons* activity at Swan Reach (D. Taggart, pers. comm.) and information from this study suggest that the nocturnal foraging periods of this animal were of short duration (between two and eight hours per night) and that times of foraging varied considerably between the warmer and cooler months. Studies on the common wombat (*Vombatus ursinus*) (McIlroy 1973) indicated that between October and January animals spent approximately 10 h active per night.

Data from the current study indicated that on many occasions the animal would emerge from the burrow and spend a short amount of time above ground before returning for a couple of hours and then re-emerging for a longer bout of activity. This pattern of activity has also been reported in *V. ursinus*, however such bouts of discontinuous activity were infrequent, with wombats remaining above ground more or less continuously between emergence and re-entry into a burrow for diurnal shelter (McIlroy 1973). Such differences may be attributed to different climatic conditions in *V. ursinus* habitat compared with *L. latifrons* and the difference in burrow structures in these associated habitats. Evans (1999) recorded strong diel patterns in *L. latifrons*, similar to those observed in this study (Fig. 2).

![Fig. 1. Hourly activity levels for one female *L. latifrons* for a four-day period in late December. Midnight is shown between each day with a heavy line. Activity levels were determined by comparing the temperature recorded hourly by 'Tinytag' temperature dataloggers attached to the animal’s collar, placed in a burrow and placed outside a burrow to record ambient temperature.](image)
Fig. 2. Hourly activity patterns for the female *L. latifrons* for a 24-hour period. The activity patterns show the hours of increased activity (nocturnal foraging period) and the hours of lower activity, or daytime resting period and the variation throughout the eight months of this study.
on the ground. As a result of this, and probably the lack of available food in these months (Hutchinson 2002), the number of hours spent active by this female declined.

While data in this study were only collected from one animal, the information provides an important insight into the activity patterns of *L. latifrons* and highlights a very effective technique for the study of activity patterns in semi-fossorial animals.

**REFERENCES**


