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A preliminary report on locomotory activity in wild and captive *Chrysoxpalax trevelyani* (Mammalia: Chrysochloridae)

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The locomotory activity of a free-ranging, male *Chrysoxpalax trevelyani* was monitored for five days in the Amatola Forest, Ciskei, using radio telemetry. In addition, locomotory activity of a captive juvenile male and adult female *C. trevelyani* was monitored in a special laboratory enclosure for 30 days. Preliminary results indicate that the giant golden mole has a primarily nocturnal regimen possibly associated with its feeding physiology or thermoregulation. It is also suggested that diurnal locomotory activity of *C. trevelyani* on the surface occurs as a result of extreme conditions and is not usual.

Die bewegingsaktiwiteit van 'n vrylopende, manlike *Chrysoxpalax trevelyani* is vyf dae lank in die Amatolawoud, Ciskei, deur middel van radiotelemetrie gemonitor. Daarbenewens is bewegingsaktiwiteit van aangehoue jeugdige manlike en volwasse vroulike *C. trevelyani* 30 dae lank in 'n spesiale laboratoriumruim gemonitor. Voorlopige resultate dui aan dat die reusekruipmol 'n vernameelike nagtelike regimen het wat moontlik met sy voedingsfisiologie of termoregulatie verband hou. Daar word ook aan die hand gedoen dat die bewegingsaktiwiteit van *C. trevelyani* bedags bogronds voorkom as gevolg van uiterste omstandighede en nie gebruiklik is nie.

Chrysoxpalax trevelyani is endemic to eastern parts of southern Africa. Little is known about the giant golden mole owing to its rarity (inclusion in the I.U.C.N. Red Data Book) and secretive habits (Poduschka 1980; 1982). The present study

on the locomotory activity of this animal provides information which may improve the effectiveness of capture techniques and laboratory studies.

The locomotory activity of two giant golden moles (one 420-g female and one 338-g male), caught in the Amatola Forest, Ciskei during October and December 1983 respectively, was measured in an indoor enclosure (Figure 1). Photocells were positioned strategically in the molearium (Figure 1) and movements through each of four light beams were automatically recorded on an Esterline Angus event recorder (Hickman 1980). Days were divided into 5-min periods and moles were considered active for the entire 5-min period regardless of the number of times activity was recorded during that period. Food was placed randomly in the forage area (Figure 1) between 08h00 and 09h00 and again between 17h00 and 18h00. A 12L:12D photoperiod simulated day (06h00 to 18h00) and night conditions while temperature ($21,1 \pm 0,4^{\circ}\text{C}$) and humidity (70%) were kept constant. Data were statistically compared using the Student's *t* test.

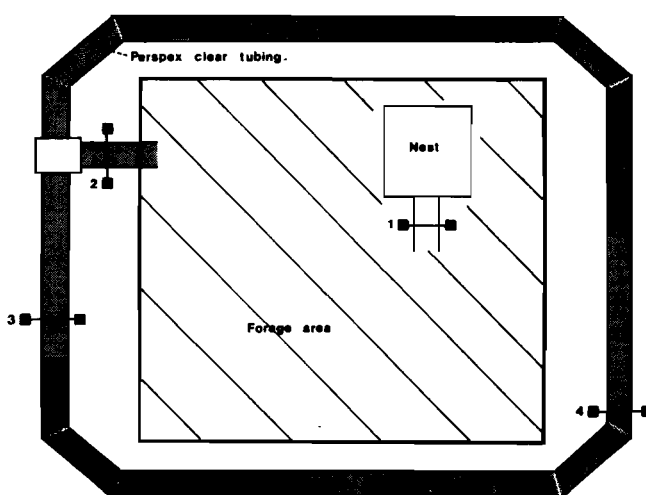


Figure 1 Plan of the artificial burrow system (molearium) indicating position of photocells (1–4), nest, forage area and clear perspex tubing. All measurements in cm. Scale 1 : 20.

Movements of a male giant golden mole (528 g) in the Amatola Forest, Ciskei were monitored in December 1983 using a Mini Mitter CH – 12 receiver and hand-held AF antenna. A 5 g 27,615 MHz 'Tm' transmitter (for maximum penetration of the soil) was glued to the dorsal pelage of the mole. Direct observations supplemented telemetry data.

In the laboratory the duration of locomotory activity was greater at night ($74,3 \pm 40,2$ min) compared to day ($34,8 \pm 34,6$ min; $P < 0,001$; Figure 2). Units of locomotory activity at night ranged from 5 to 114 min duration ($35,9 \pm 25,0$ min) with a mean rest period of $142,9 \pm 134,7$ min (range 12–216 min). One longer rest period (264 ± 66 min) also occurred during the night. Between zero and six units of locomotory activity ($3,2 \pm 1,4$ units/night), punctuated by rest periods with a range of 12 to 216 min, occurred nightly and were similar to the number of units recorded during the day (range 0–6; $3,1 \pm 1,7$ units/day).

Diurnal units of activity were significantly shorter than those recorded at night ($20,6 \pm 20,5$ min; $P < 0,001$) and the mean rest periods significantly longer ($176,4 \pm 170,8$ min; $P < 0,05$). During diurnal conditions a total of 32 isolated 5-min locomotory activity periods representing a single movement through one photo-electric beam (suggesting a change in

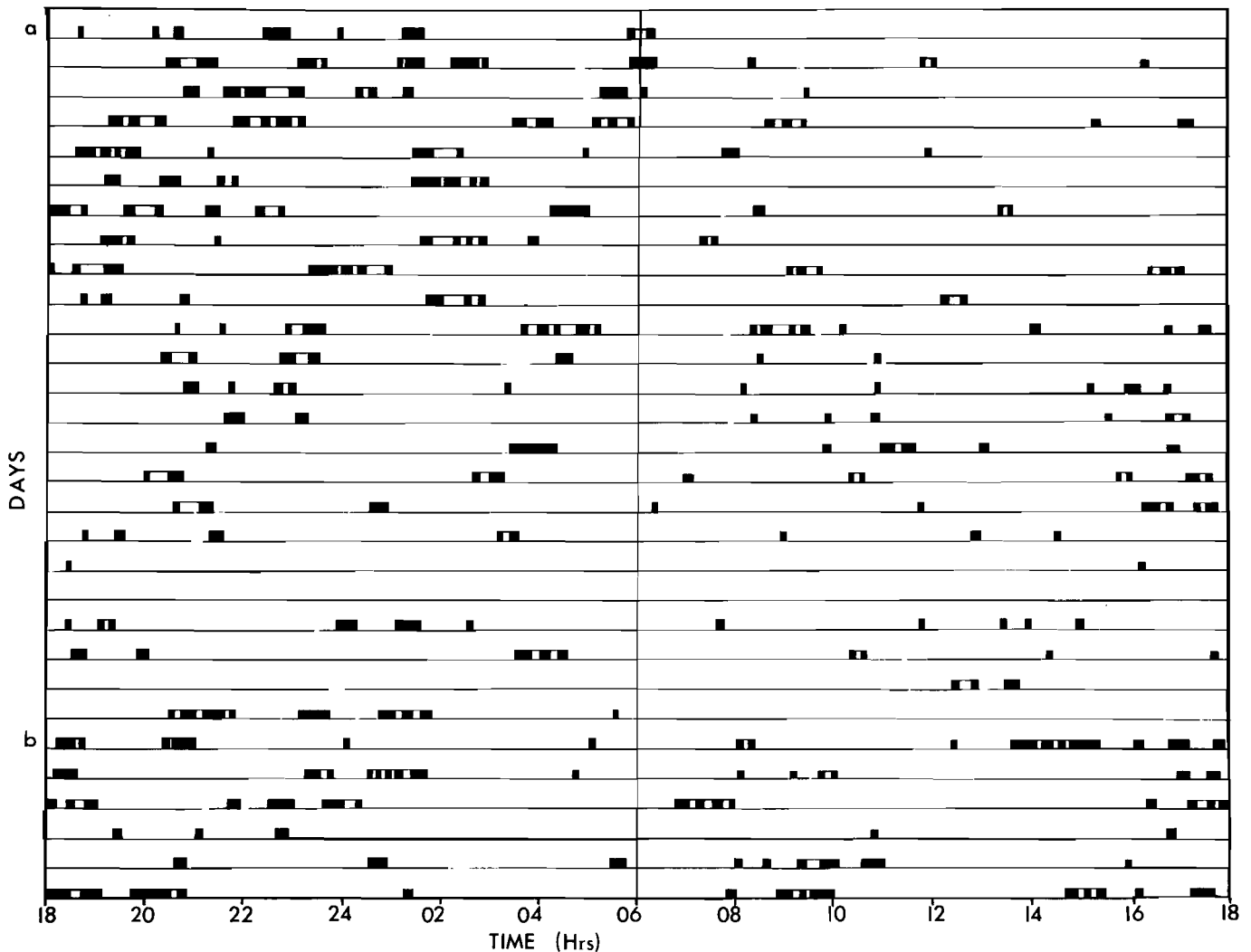


Figure 2 Times of locomotory activity for two *Chrysothalax trevelyani*; (a) 420-g female and (b) 338-g male during separate trials. Darkened area indicates duration of activity. Blocks which are joined include rest periods which were considered parts of major activity blocks.

resting place rather than more active behaviour) were monitored compared to 16 isolated 5-min periods during dark conditions. These findings suggest that *C. trevelyani* is primarily nocturnal. This idea is supported by summing the amount of activity for each hour throughout the laboratory study which indicates that there was a gradual increase in locomotory activity from 16h00 to a maximum of 300 min at 20h00. Thereafter locomotory activity decreased until after 'dawn' (06h00; 60 min) with slight rises to 220 min at 23h00 and 240 min at 01h00. Locomotory activity increased slightly in 'midmorning' to reach 160 min at 09h00 but otherwise remained less than 80 min until 16h00 (150 min).

Field studies demonstrated some interesting differences in locomotory activity. Giant golden moles live in short burrows, approximately 10 m long, which are linked by surface runways (manuscript in prep.). The male *C. trevelyani* was released near the capture site (burrow one) at 16h00. After dark the mole travelled 128,4 m along surface runways, past two burrows, and remained in the area of the fourth burrow for 36 h. Thereafter the mole moved 32,8 m to a fifth burrow and remained in that area for 36 h. On the fifth night the transmitter became detached and tracking was no longer possible. However, the male was relocated on the seventh day at burrow three, 98,8 m from where last seen at burrow five. Since no direct runway linked burrows three and five, the mole must have travelled via burrow four, possibly remaining there

for one day. The measured distance travelled by the golden mole during seven nights was 256,0 m (36,6 m/night). However, distances were measured along the most direct inter-connecting surface runways and this distance should be considered minimal.

The mole emerged from its burrow just after dark (19h36 \pm 25 min; $n = 3$) and frequently moved in and out of the burrow, was not disturbed by torch-light and seemed habituated to normal forest sounds such as rain, thunder, and the calls of wood owls (*Ciccata woodfordii*), tree dassies (*Dendrohyrax arboreus*) and other nocturnal animals. However, the giant golden mole fled into the burrow when the observers rustled clothing, leaves, or coughed. Nocturnal activities of the golden mole included moving to other burrows along surface runways, foraging in the leaf litter and digging around the burrow entrance. Throughout the ten day study there was no direct (observation) or indirect (spoor or telemetry) evidence of diurnal surface activity, suggesting that the mole remained in the burrow from before dawn until after dark.

The difficulties in studying a rare and very wary animal are obvious from this report. The limited information presented here prevents definite conclusions of the locomotory activity of *C. trevelyani*, particularly since non-captive golden moles were active on the surface only at night while locomotory activity was recorded throughout the 24-h period in

laboratory moles. However, in reality these differences may be less marked since in the field, (in contrast to the closely monitored locomotory activity of captive moles) no measurements were taken of movements within the burrow thus underestimating total locomotory activity. On the other hand feeding golden moles during the day may have produced an unnaturally long diurnal activity pattern in captive animals.

Other chrysochlorids such as *Eremitalpa granti* (Holm 1969) and *Chrysochloris stuhlmanni* (Jarvis 1974) have a nocturnal mode of life associated with prey availability. However, prey availability may not be a major cause of nocturnal behaviour in *C. trevelyani* since much shallow-burrowing prey (eg. larvae, pill millipedes etc.) is available 24 h each day. Other reasons for the nocturnality of giant golden moles may include predator avoidance and thermoregulation. In summer, forest temperatures are high during the day ($23,1 \pm 2,8^{\circ}\text{C}$) but temperatures in the burrow are constant and similar to nocturnal surface temperatures ($18,1 \pm 0,8^{\circ}\text{C}$). Giant golden moles may remain in the burrow during the daytime heat and emerge at night when surface temperatures decrease.

This preliminary study of giant golden mole locomotory activity shows that *C. trevelyani* is mainly active at night and is adapted to surface activity rather than the more usual fossorial chrysochlorid mode. Laboratory studies simulating

natural conditions characteristic of the forest day and night with natural food supplied during the dark (night) conditions are now being undertaken. By isolating various cues from the environment, laboratory studies may ultimately give some indication of the factors responsible for inhibition and promotion of locomotory activity in the giant golden mole which may well contribute to the survival of this rare and unique animal.

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