

Notes on the early post-natal development of a giant golden mole *Chrysospalax trevelyani* (Günther, 1875) born in captivity (Mammalia: Insectivora; Chrysochloridae)

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Giant golden moles are subterrestrial insectivores which rank among South Africa's most vulnerable and least-known mammals (Smithers 1986, *South African National Scientific Programmes Report* 25:1-216). While several studies have addressed their anatomy (Dobson 1882, *A Monograph of the Insectivora, Systematic and Anatomical*. London: John van Voorst; Parsons 1901, *Journal of Anatomy and Physiology, London* 34:26-34), taxonomy (Meester, Rautenbach, Dippenaar & Baker 1986, *Transvaal Museum Monograph* 5: 1-359) and ecology (Maddock 1986, *Cimbebasia* 8: 87-90), nothing has yet been reported on their breeding biology or post-natal development. Some observations (made during a seven-day period) on the growth and development of a *C. trevelyani* born in captivity are thus presented below.

During October 1987, an adult female *C. trevelyani* was captured at Nqadu Forest (31°26'S; 28°46'E) in Transkei using a specially designed trap (see Duckworth, Maddock & Hickman 1986, *South African Journal of Wildlife Research* 17: 17-19). The mole was transported to the Transvaal Museum for use in a cytosystematic study, where it was maintained on a diet of *Mus musculus*, one-day-old domestic chicks, mealworms and earthworms, whilst housed in a 1m² wooden cage containing leaf litter at an ambient temperature of 20°C - 23°C.

One week after capture, the adult *C. trevelyani* gave birth to a single, live female pup in a roughly-constructed, bowl-shaped

nest made of leaves. Parturition was not observed, so it is possible that there may have been more young which were cannibalised by the mother. No remains of a placenta were found in the cage, suggesting that it was eaten by the parent.

Upon discovery, the pup weighed 28 g, and measured 77 mm in total length. Hind foot length (with claws) was 11 mm. In general appearance it resembled an adult, with a fusiform body, rounded hindquarters, wedge-shaped head and a leathery nose pad. Dorsally, the neonate was covered with short, dense slaty-grey fur of fine texture. The sides of the head and the limbs were also well-haired, although the pelage was a lighter grey than the dorsum. Ventrally, the pup was hairless and pink. Both the fore and hind feet claws were erupted; however, the foreclaws were considerably shorter in relation to body size than those of the adult. The incisors were not erupted, and while the auditory meati were open, there was no noticeable reaction to loud sounds. No perceptible sounds were emitted by the neonate during the short handling and observational period, and the olfactory and tactile senses appeared to be the best developed.

When in the nest, the mother suckled the pup in a curled position lying on one side, whilst also grooming the neonate orally. If disturbed, the mother either adopted a protective, hunched position above the pup, or attempted to burrow under the leaf litter while the pup clung to her nipples with its mouth. When not in contact with the mother, the pup

usually adopted a stationary posture (body hunched with head buried in substrate), and shivered conspicuously, suggesting poor thermoregulatory ability. On a few occasions the neonate also crawled awkwardly using mainly the forelimbs for short distances towards and under the leaf litter, probably in search of warmth. When placed with its back on a flat surface the pup was able to right itself, but only with obvious difficulty. However, it did not complete the cliff-drop aversion or negative geotaxis tests (see Baker & Meester 1978, *Zeitschrift für Säugetierkunde* 42: 295-306) successfully, indicating poor muscle coordination and locomotory proficiency.

During the next five days, the pup grew quite rapidly, but changed little in general appearance. Body mass and total length increased by approximately 1 g and 3 mm daily. Whitish facial patches, located above the sub-dermal, vestigial eyes, and a silver iridescence to the fur developed on the second day, and the pelage became longer and denser, but without any marked change in colour. White vibrissae first emerged on the rostrum on day three and grew to a length of 4 mm by the sixth day after birth. The incisors remained unerupted, but were visible under the gums by day six.

The neonate first vocalised on the second day, when it emitted soft "puffing" sounds and whimpered during handling. By day three, soft chirping was also heard, whereas on the fourth day it made plaintive, high-pitched squeaks when handled, or when the mother left the nest.

Locomotory development of the pup was slow. By day three it was able to crawl quite capably using the forelimbs, but the hind limbs still appeared to be weak and uncoordinated. On the fourth day, the neonate followed its mother for a short distance (ca. 25 cm) out of the nest; however, it is unclear whether this was the first manifestation of exploratory behaviour, or merely a search for warmth and security. The typical chrysochlorid habit of using upthrusts of the head during movement through the substrate was

first shown five days after birth. Negative geotaxis was first exhibited on day four, when the pup unsuccessfully attempted to turn around and face up the slope, while by day six the neonate was able to swivel and crawl up the slope, albeit with apparent difficulty. However, the pup did not successfully complete the cliff-drop aversion test during the study period: while it seemed to detect the fall ahead, it made no overt attempt to retreat or take evasive action.

The neonate died seven days after birth, apparently from dehydration. Mass at death — 28,5 g — is not, therefore, instructive. Evidently, the mother ceased producing milk since none could be squeezed from her teats, probably in response to a dietary deficiency. At death, the pup measured 94mm in total length, while the hindfoot length was 14 mm. Greatest width of the head was 21mm, and the anterior nosepad portion 8 mm. Lengths of the first, second and third fore-claws were 1 mm, 4 mm and 6 mm, respectively. The carcass was preserved in 10% neutralised formalin, and deposited in the Transvaal Museum mammal collection (TM No. 39435).

The data presented here, although scanty, indicate that *C. trevelyani* bears small litters of altricial young whose physical growth is relatively fast averaging ca. 4% daily, in contrast to the development of locomotory skills and muscular coordination which is slow. This is in agreement with data collected for other chrysochlorid species (summarised by Hickman 1990, Pp. 23-48. In: Nevo & Reig (eds.), *Evolution of Subterranean Mammals at the Organismal and Molecular Levels*, New York: Wiley-Liss) which demonstrate that chrysochlorids, like many other subterranean mammals, display K-selected reproductive strategies characterised by small litter sizes, slow post-natal development and extended periods of parental care.

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