CONTRIBUTION TO THE KNOWLEDGE OF THE BIOLOGY OF THE NAMIB DESERT GOLDEN MOLE *EREMITALPA GRANTI NAMIBENSIS* Bauer & Niethammer 1959

by

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(With 7 figures)

DISTRIBUTION

Eremitalpa is endemic to the Namib Desert and widely distributed in the sand dunes from the Kuiseb River southwards to the Namaqualand coast (Roberts, 1951; cf. map in Coetzee, 1968).

Bauer & Niethammer (1959) described the subspecies *namibensis* from owl pellets collected at Sossusvlei. Coetzee (*pers. com.*) collected topotypical *namibensis* during 1965. Further collections in the northern part of the range of *Eremitalpa* are: Natab (Meester, 1962), Gobabeb (Haacke & Prozeski, 1963; C. Koch, 1964; D. Goode, 1965; Holm & Rautenbach, 1967), Zoutrivier (C. Koch, 1966). All the above mentioned sites are well within the range of vegetation apart from dune grasses, although no conclusions may be drawn from this, since the whole distributional range is as yet unknown.

An ecologically significant new distribution, namely the river-bed of the Kuiseb River itself, which constitutes vastly different micro- and macro-ecological conditions from those mentioned above, was determined during September 1967 (Holm & Rautenbach).

ACTIVITY AND LOCOMOTION

Contrary to earlier assumptions, *E. g. namibensis* have not been found to be active during day-time, as opposed to *E. g. granti* (Roberts, 1951). Activity at noon observed in terrarium (Meester, 1964) was probably due to artificial conditions, (i.e. insufficient sand depth provided). Golden moles would bury to a depth of 50 cm + at noon, depending on prevailing temperature.

Observations based on two specimens kept for a period of 10 and 7 days respectively, show that in captivity golden mole would emerge at dusk or rather later, and would remain active for the whole night, emerging and ranging about the terrarium at intervals. In the field, emergence seemed to be even later since tracks could not be found before 2100 hours, even in localities where golden moles were most active.

The locomotion of *E. g. namibensis* is mainly totally emerged on the surface, implicating a unique adaptation to extraordinary circumstances for a mole in general. Tracks in dune system were measured for up to approximately 3 miles per night per specimen; measured maximum approximately 5,800 meters, as opposed to a maximum of 300 meters in the river-bed locality. This stands in proportion to food supply, which is much higher per surface area in the river-bed environment and parallels the terrarium observation that golden moles would generally submerge for the rest of the night as soon as their appetites had been satisfied.

The technique used to keep track of the activity of golden moles in the field was by inserting coloured lengths of wire on 2 meter intervals upright into the track. Different colours were used on consecutive days to eliminate confusion of old and fresh tracks. The mechanism of locomotion under the surface (Fig. 7), was as other terrarium observations mentioned, made in a 12 x 60 cm. and 90

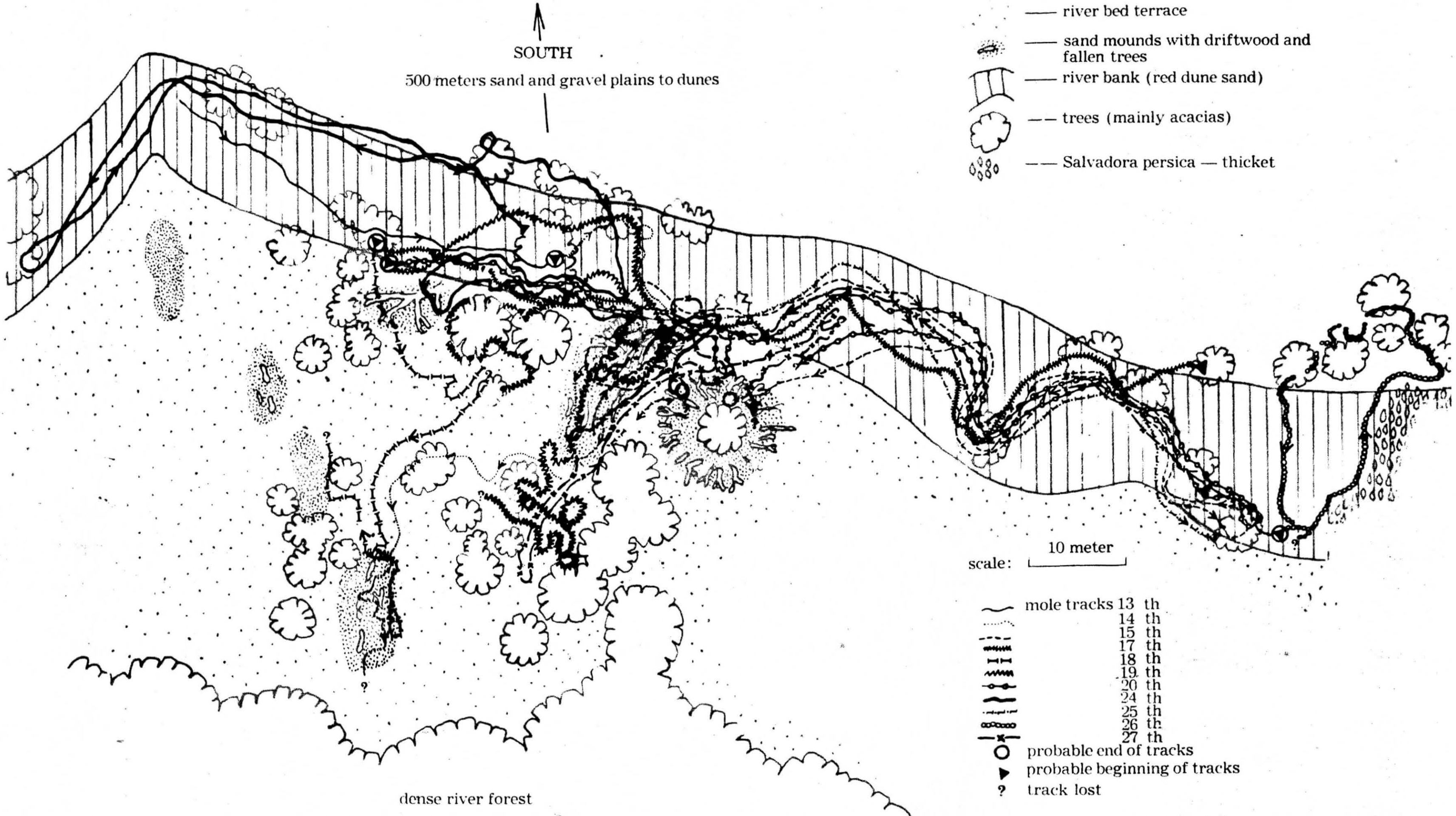

Figure 1: Activity in one river-bed locality. Note well defined 'hunting area', and concentration of activity around vegetation and drift-wood.

cm. deep glass terrarium, filled with dune sand and exposed above, and equipped with a tuft of *Aristida sabulicola* grass in a corner. Light was screened off the sides of sand-portion, except at times of observation.

FEEDING

It is difficult to determine what senses the golden mole relies on in procuring prey, since in the terrarium they would seize all possible prey they literally ran into. Prey is seized in any position and dragged down into the sand, where it is devoured.

Palmatogecko rangei was readily taken, even as many as one per night for 3 consecutive nights, by the same golden mole. Also *Tenebrio molitor* larvae, which are very similar to larvae of the larger dune-living Tenebrionid *Onymacris laeviceps,* and crickets were readily taken by all the captive specimens. The specimens taken from the river-bed area were especially fond of the large adult Dynastidae beetles from the river-bed, of which they would eat the abdomen only, leaving the head, thorax and elytra intact. From tracks observed in the dune area it is also apparent that spiders and legless lizards are taken (K. Schaer, *pers. com.).*

Stomach-content analyses, of 2 ♀♀, 1 unsexed, all from the dune area, produced an average of 0.22 c.c. of sand for 1.8 c.c. of organic material, probably due to the habit of this animal to feed submerged in sand. Some of the typical 'dips' along the tracks of golden moles in the dunes may be due to this feeding habit (Figs. 2 and 5).

The organic material consisted, by dry weight, of approximately 25% termites and ants; 25% *Pseudococcus* sp. found mainly on roots of *A. sabulicola,* this probably accounting for golden mole tracks frequenting these plants at night; and 50% unidentified matter containing Tenebrionid larvae. Specimens from Sossusvlei took the body parts of Lepidoptera (Coetzee, *pers. com.*).

BREEDING

The problem of breeding, as well as the problem of submerged breathing is still largely unsolved, as no tunnels have been found to be made by *E. g. namibensis,* as opposed to typical *Eremitalpa* (Shortridge, Roberts). The air space under the golden mole might act as a breathing 'pocket' while mole is actively burrowing (Fig. 7). Two pregnant ♀♀ were captured on the 3rd and 10th October respectively, both with only one, almost fully developed embryo. Whether this is the rule, or only the case in the beginning of the breeding season, if any, with more numerous litters to follow, could not yet be determined.

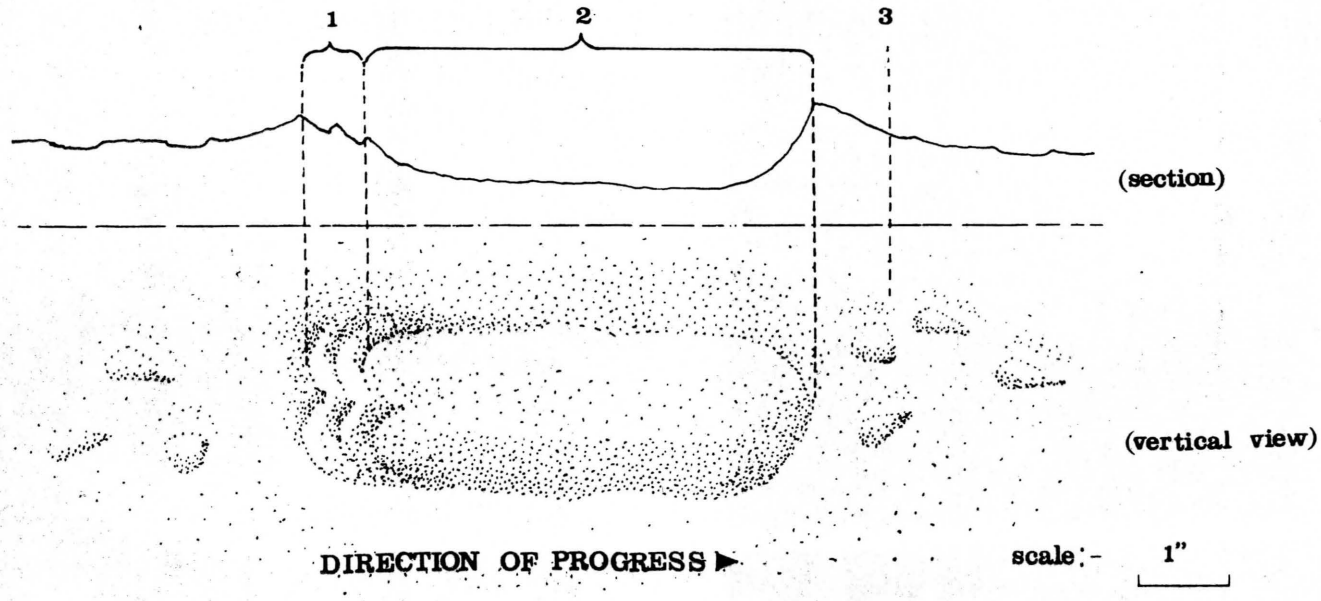

Figure 2: Surface tracks of *E. g. namibensis* in dune sand, depicting typical 'dip' and demonstrating how direction of progress of mole can be ascertained from position of hind-foot impressions.
1 — Hind-foot impressions, superimposed.
2 — Dip or furrow.
3 — Surface tracks.

Figure 3: View of the Kuiseb river-bed, (Southern bank), showing locality where *E. g. namibensis* occurs in river-bed environment.

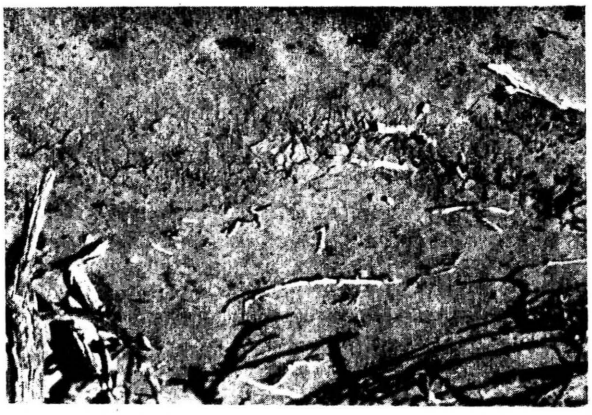

Figure 4: Surface 'tunnel' of *E. g. namibensis* under layer of silt in river-bed locality.

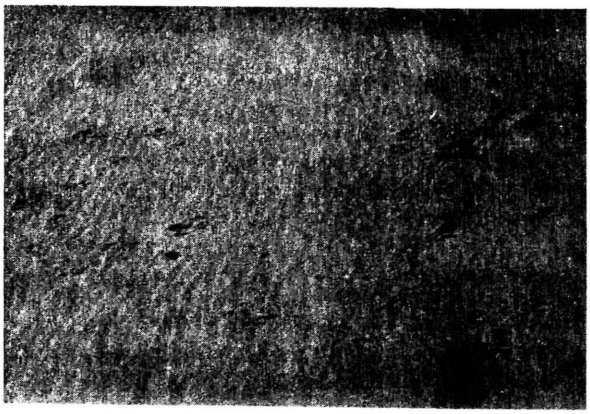

Figure 5: Surface tracks in dune area. Note typical 'dips'.

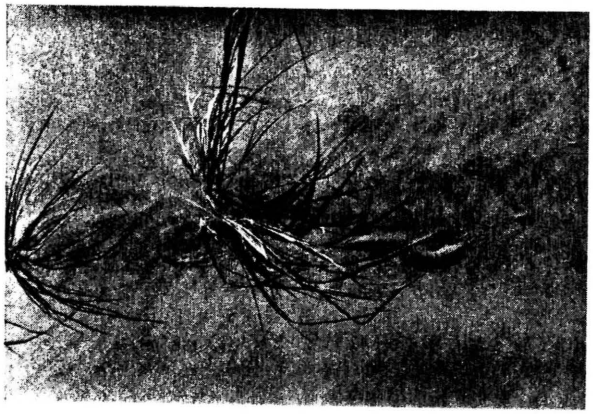

Figure 6: Tuft of *Aristida sabulicola* grass in dune area, with end of track where specimen of *E. g. namibensis* was collected.

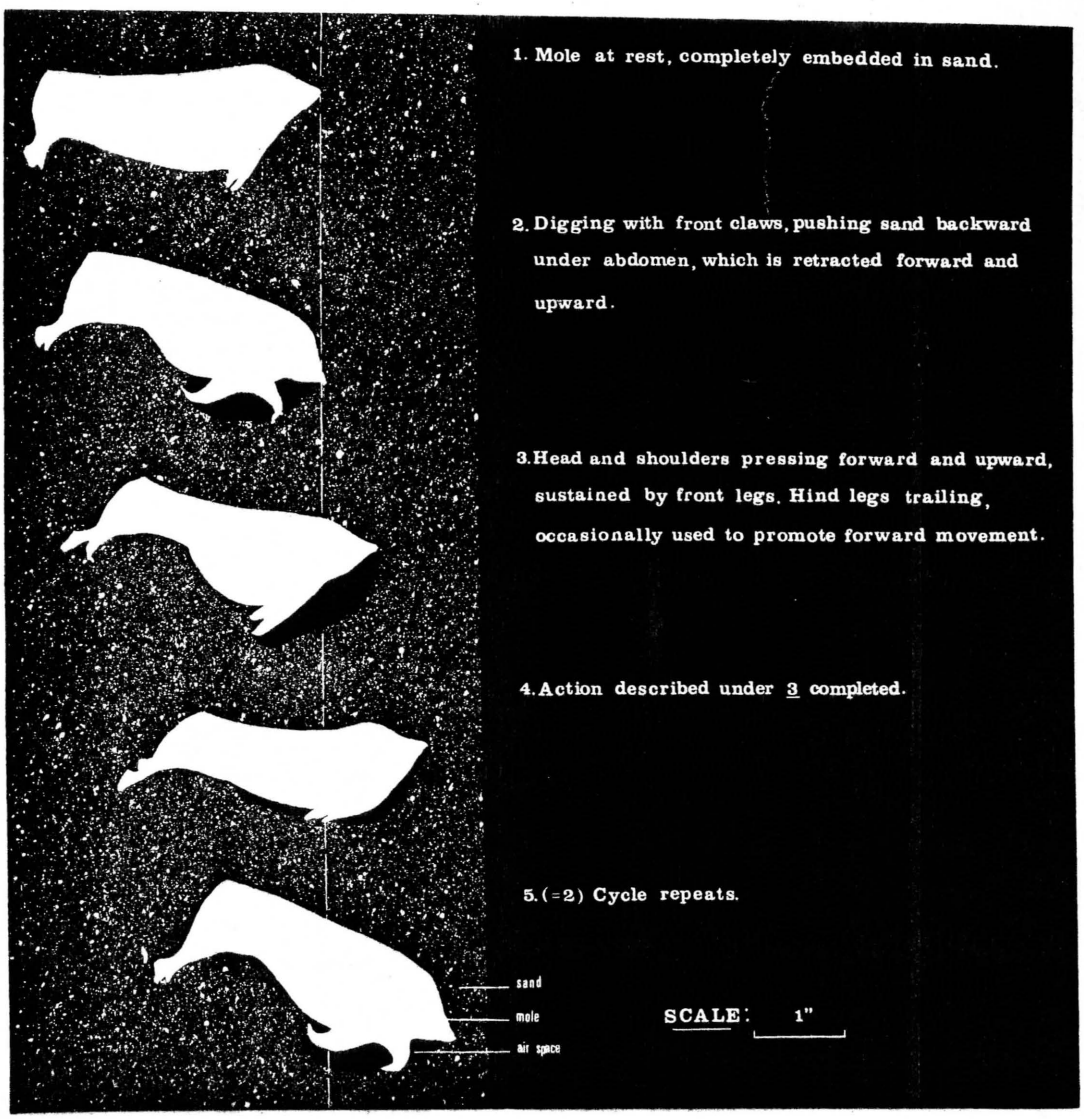

Figure 7: Locomotion of *E. g. namibensis* under surface

ADAPTATION TO HIGH DIURNAL TEMPERATURES

In day-time golden moles in terrarium would burrow to a depth where sand was in the vicinity of 25°C. Golden moles frequented sand in the shade as was provided by the tuft of a *A. sabulicola* in the terrarium, probably to minimize required depth. This observation was paralleled in the field, where on two occasions specimens were retrieved from under *A. sabulicola* tufts, where their tracks ended, in the early morning (Figure 6).

With surface temperatures ranging from 25.3°C to 43.5°C in the terrarium, temperature measured at resting site of mole read from 23.0°C to 26.5°C, at varying depths from 3 to 57 cm. The golden mole would come to rest at a suitable depth, only to shift position when temperature rose considerably above 25°C, and would settle again as soon as a suitable temperature was reached.

SENSES

Before emerging, golden moles expose their nose only and sniff the air. They do not remain particularly sensitive to the smell of human beings after one or two days under observation, but stay remarkably sensitive to vibration, although not to touch. Though sight is vestigial, they seem to be to some extent aware of lighting conditions. *E. g. namibensis* emits a high shriek when agitated, and two terrarium specimens (unsexed) fought vigorously when they were introduced to the same terrarium (Koch, *pers. com.*).

ENEMIES

The only confirmed predator is *Tyto alba,* the barn owl (Meester, 1964). Tracks of *Genetta genetta* in river-bed, and *Canis mesomelas,* the saddle-backed jackal, in the dunes, have been found following the trails of golden moles and occasionally digging for them, which suggests that these animals might also prey upon *E. g. namibensis.* A more intensive study would be needed, however, to ascertain the relative importance of predators in food-chains of the dune system.

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