# On the Structure and Function of the Burrows of the Mediterranean Vole (Pitymys duodecimcostatus)

BUDOWA NOR U *PITYMYS DUODECIMCOSTATUS*

Ramon C. SORIGUER & Juan A. AMAT

Soriguer R. C. & Amat J. A., 1980: On the structure and function of the burrows of the Mediterranean vole *(Pitymys duodecimcostatus)*. Acta theriol., 25, 21: 268—270 [With 1 Fig.]

Three Mediterranean vole, *Pitymys duodecimcostatus* (de Selys-Longchamps, 1839) burrows were dug-up and the galleries structure recorded. The depth of the tunnels, soil and plant bulbs were measured. The analyses of the data suggest that the depth of bulbs and soil determined the vole burrow structure.

[Estación Biológica de Doñana, Sevilla-12, Andalucia, Spain].

In a broader study on the ecology of the Mediterranean Vole, *Pitymys duodecimcostatus* in Andalusia, southern Spain, it was shown that in two localities studied, the geophytes made up over 90% of the diet (Soriguer & Amat, in press). There was also described the microhabitat selection of the vole (measured by the spatial localization of the burrows) in relation to the availability of bulbs of gladioli *(Gladiolus segetum)* and iris *(Iris planifolia)*. The close relationship between the fossorial behaviour and its utilization of subterranean trophic resources such as geophytes was likewise shown. In this note we try to show how the underground structure of the burrows is related to the exploitation of geophytes.

Three complete burrows were dug up. One in Cabra, province of Cordoba [37°27'N, 4°28'W], henceforth called HSC-1 and located in the bottom of a valley with cereal crops. The other two (SC-1 and SC-2) were situated in a typical evergreen oak *(Quercus ilex)* woodland in the Sierra Morena Mountains near Higuera de la Sierra, province of Huelva [37°54'N, 6°23'W]. The digging up method had been described by Alvarez & Hiraldo (1974) and consisted of stuffing the underground galleries with liquid plaster, which on hardening reproduced an exact copy of these tunnels. Next an excavation was carried out, the depth of the tunnels was measured every 30 cm., nest and stores were counted and a series of sequential perpendicular photographs were taken to cover the whole burrow. These photographic series later allowed us to make an accurate map of the tunnels, nest and stores (Fig. 1).

During the excavation it was noted that coming out the main tunnels there were short dead-end passages (see arrows in the figure) heading for the base of the plant (mainly bulbs). It was also seen that almost all material used in the construction of the nest in both plots was the protective coating of bulbs. The contents of stores was likewise made up of iris and gladiolus bulbs.

The average depth of the galleries differed between the plots, confirming that the HSC-1 galleries were significantly deeper than those of SC-1 ($t$=25.93, df=26, $P < 0.001$) and SC-2 ($t$=14.72, df=26, $P < 0.001$). No difference was found between SC-1 and SC-2. These finding also coincide with the fact that the average depth of the profile of the soil (distance between ground surface and underground rock) is also significantly greater in the Cabra plot ($\bar{x}$=1.20 m.) than in the Higuera de la Sierra plot ($\bar{x}$=0.09 m.). Furthermore, the characteristics spatial localization of the SC-1 and SC-2 burrows in a gradient of slope, allowed us to analyze how the depth of the galleries was closely related to the depth of the soil ($r$=0.985, n=14, $P < 0.01$). Likewise the average depth of the iris bulbs in the Cabra plot is significantly greater than in the Higuera de la Sierra plot ($t$=35.59, df=23, $P < 0.001$).

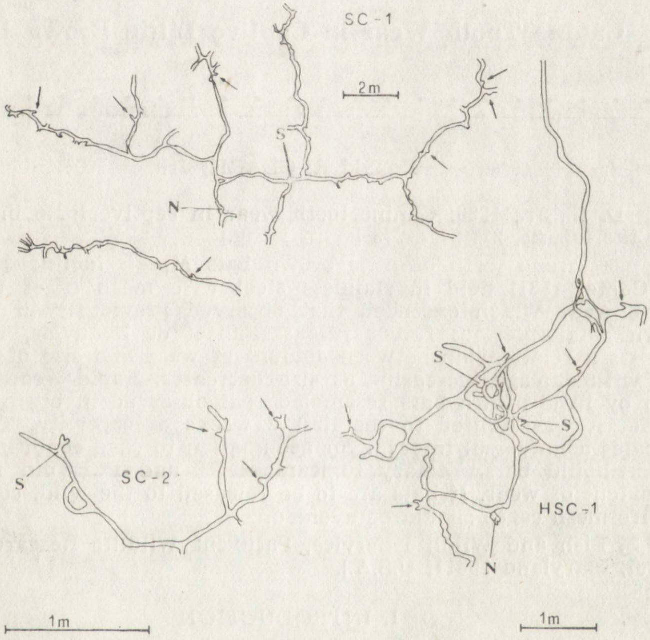


Fig. 1. Structure of the galleries of the three Mediterranean Vole burrows HSC-1, SC-1 and SC-2. N: nest; S: stores: arrows: dead-end passages heading to bulbs (only the more conspicuous are shown).

All this shows that the type of soil can limit the depth at which the bulbs and galleries are distributed. The dead-end passages in the tunnel walls (heading towards the bulbs) and the contents of the nest and stores shown us the close relationship between the galleries and trophic resources. The latter, together with the type of soil (as a factor controlling the depth of the bulbs and galleries) would be the direct cause of the underground structure of the vole burrows.

**Acknowledgements:** We thank J. L. Soriguer and C. Melgarejo for making our field work easier. C. M. Herrera critized a draft of this manuscript. During the writing of this note the authors were assisted by a grant from the Fundación March (to J. A. A.) and a grant from Plan Formación Personal Investigador (to R. C. S.).

REFERENCES

Alvarez F. & Hiraldo F., 1974: Estructura de las galerias de nidificación del Abejaruco *(Merops apiaster)* en Doñana. Doñana Acta Vert., *1:* 61—67.
Soriguer R. C. & Amat J. A., in press: Ecological and evolutionary relationships between the Mediterranean Vole *(Pitymys duodecimcostatus)* and geophytes in the western Mediterranean Basin. J. Mammal. (submitted).

*Accepted, February 15, 1980.*

## Canine Tooth Wear in Captive Little Brown Bats

STARCIA KŁOW U NOCKOW *MYOTIS L. LUCIFUGUS* W NIEWOLI

Donald R. CLARK, Jr.

Clark D. R., Jr., 1980: Canine tooth wear in captive little brown bats. Acta theriol., 25, 21: 270—273 [With 1 Fig.]

Upper canine teeth of little brown bats *Myotis lucifugus lucifugus* (Le Conte, 1831) held in stainless steel wire mesh cages underwent severe wear which exceeded that observed previously in caged big brown bats *Eptesicus fuscus fuscus* (Palisot de Beauvois, 1796). This suggests a relationship between amount of wear and size of the caged bats with damage increasing as size decreases. Rapid wear of canine teeth by little brown bats resembled that observed in big brown bats in that it was limited to the first 2 weeks of captivity. This result indicates a universal interval for acclimation to cage conditions among vespertilionid bats. Dietary toxicants DDE and PCB did not affect the extent of wear. If bats are to be released to the wild, confinement in wire mesh cages should be avoided.

[U.S. Fish and Wildlife Service, Patuxent Wildlife Research Center, Laurel, Maryland 20811, U.S.A.].

### 1. INTRODUCTION

Upper canine teeth of caged big brown bats *Eptesicus fuscus fuscus* (Palisot de Beauvois, 1796) underwent severe wear during captivity (Clark, 1976). The purpose of the present study is to quantify wear that occurred among captive little brown bats *Myotis lucifugus lucifugus* (Le Conte, 1831) and compare it to that observed in big brown bats.

### 2. MATERIALS AND METHODS

On 6 July 1976, 51 adult female little brown bats were captured in the attic of North East Methodist Church in North East, Cecil County, Maryland, U.S.A. The bats were collected for a toxicological experiment. Five bats, two that were injured during capture and three others chosen at random, were frozen without being caged. The other 46 bats were individually caged in stainless steel wire