

# Post-trapping behavioral sequence analysis of the Eastern broad-toothed field mouse in field conditions

## Stylianos P. Zannetos\*, Yiannis G. Zevgolis, Triantaphyllos Akriotis

ABS 2021 Virtual Meeting August 3-6, 2021

\*Biodiversity Conservation Laboratory, Department of Environment, University of the Aegean, Greece, zannetos@env.aegean.gr



The behavioral response of murids to various handling techniques used by the researchers has been studied extensively, both on laboratory mice and wild mice that had been acclimated first in laboratory conditions. Nevertheless, the behaviour, after trapping and handling, of a wild mouse such as Apodemus mystacinus, has not been studied yet in its natural habitat.

### **MATERIALS & METHODS**

#### **Behavioral sampling**

In order to fathom the behavioral aspects of A. mystacinus regarding the aforementioned procedures, a delimited release field was selected in an undisturbed forest area for a trapping session. Every trapped mouse was ear-tagged, and its biometric characteristics were noted following the standard rodent sampling procedure. Subsequently, each individual was transferred into a dark wooden box for five minutes, to reduce its handling stress before the release. After five minutes the four doors of the wooden box were opened by the researchers from distance with the use of ropes. For each A. mystacinus individual, the freeing process was recorded for five minutes by two cameras that were set at the edge of the field.

#### Ethogram creation and behavioral sequence analysis

An ethogram was created using BORIS software (Friard & Gamba 2016) and a set of different behaviors was extracted. Additionally, the proportion of time of each behavior was calculated. Finally, the behavioral sequences of distinct groups based on capture occasions were exported, while the Beahatrix software (Drerup et al., 2020) was used to generate kinematic diagrams. The significance of each transition probability was determined by Behatrix' random permutation test.

Table 1. Ethogram with the basic behaviors of A. mystacinus

Behavior Code	Description
INBOX	The individual is in the box
DOOR	The individual is in the box and is visiting one of the four doors
MOVING IN	The individual is moving in the box from the field
MOVING OUT	The individual is moving out of the box to the field
STAY INBOX	The individual remained inbox after the five minutes
STAY IN FIELD	The individual remained in the field after the five minutes
EXIT	The mouse exits the delimited field before the end of time
STANDING ON TWO LEGS	The individual is standing on its hind feet and sniffing/ looking around to check the area
CHANGE DIRECTION	Changing its direction
STATIONARY	The individual is stationary at a certain point
MOVING SLOWLY	The individual is moving slowly in the field
RUN	The individual is running away

### **RESULTS & DISCUSSION**

In total 116 videos corresponding to 19 A. mystacinus were analyzed with BORIS. The 38 videos were belonging to first captured occasions and the 78 to recaptured occasions. Our results show that the majority of the first captured individuals (74%) choose to remain in the box despite the escape opportunity presented to them. At their recapture, most of the mice (74.3%) took the opportunity and escaped, not only form the wooden box, but from the delimited field too. The kinematic diagram of the recaptured individuals (Figure 2.) demonstrated a higher complexity, with more behaviors, and transitions between behaviors, than the first captured individuals, as it can be seen in Figure 1.



We observed also that when the doors were opened at the first capture occasion, most of the individuals moved at one of the four exits, and stayed there for some seconds or even minutes. This behaviour confirmed

EXIT

This research is carried out / funded in the context of the project "Study of acute and chronic physiological and behavioral response of small mammals to stressful stimuli, using non-invasive methods in field sampling conditions" (MIS 5048921) under the call for proposals "Supporting researchers with an emphasis on new researchers" (EDULLL 103). The project is co-financed by Greece and the European Union (European Social Fund- ESF) by the Operational Programme Human Resources Development, Education and Lifelong Learning 2014-2020.



Figure 2. Kinematic diagram displaying significant and non-significant transitions of the A. mystacinus after the freeing process at the recapture occasions. All the transition probabilities are presented in %. The significant transitions (p < 0.05) are presented with the thick arrows

that the mice were highly stressed without having any sense of that the . The most common behavior observed for all the capture occasions was the slow locomotion (Moving Slowly - Behavior code) of the captured animals after exiting the box, with 68 occurrences and 5.1 seconds mean time. This study was the first approach to investigate the behavioral sequence of A. mystacinus after trapping and handling in field conditions and provides valuable information for future field research on the Muridae family.

### REFERENCES

Friard, O., & Gamba, M. (2016). BORIS: a free, versatile open-source event-logging software for video/audio coding and live observations. Methods in ecology and evolution, 7(11), 1325-1330.

Drerup, C., Sykes, A. V., & Cooke, G. M. (2020). Behavioural aspects of the spotty bobtail souid Euprymna parva (Cephalopoda: Sepiolidae). Journal of Experimental Marine Biology and Ecology, 530, 151442.