



DAILY ACTIVITY PROFILES OVER THE LIFESPAN OF MEDFLIES AS BIOMARKERS OF AGING



Rodovitis, Vasilis G.¹, Chen, Han², Müller, Hans-George², Papadopoulos, Nikos T.¹, Carey, James R.³

¹Department of Agriculture, Crop Production and Rural Environment, University of Thessaly, Volos, Greece;

²Department of Statistics, University of California at Davis, Davis, California, USA

³Department of Entomology, University of California at Davis, Davis, California, USA

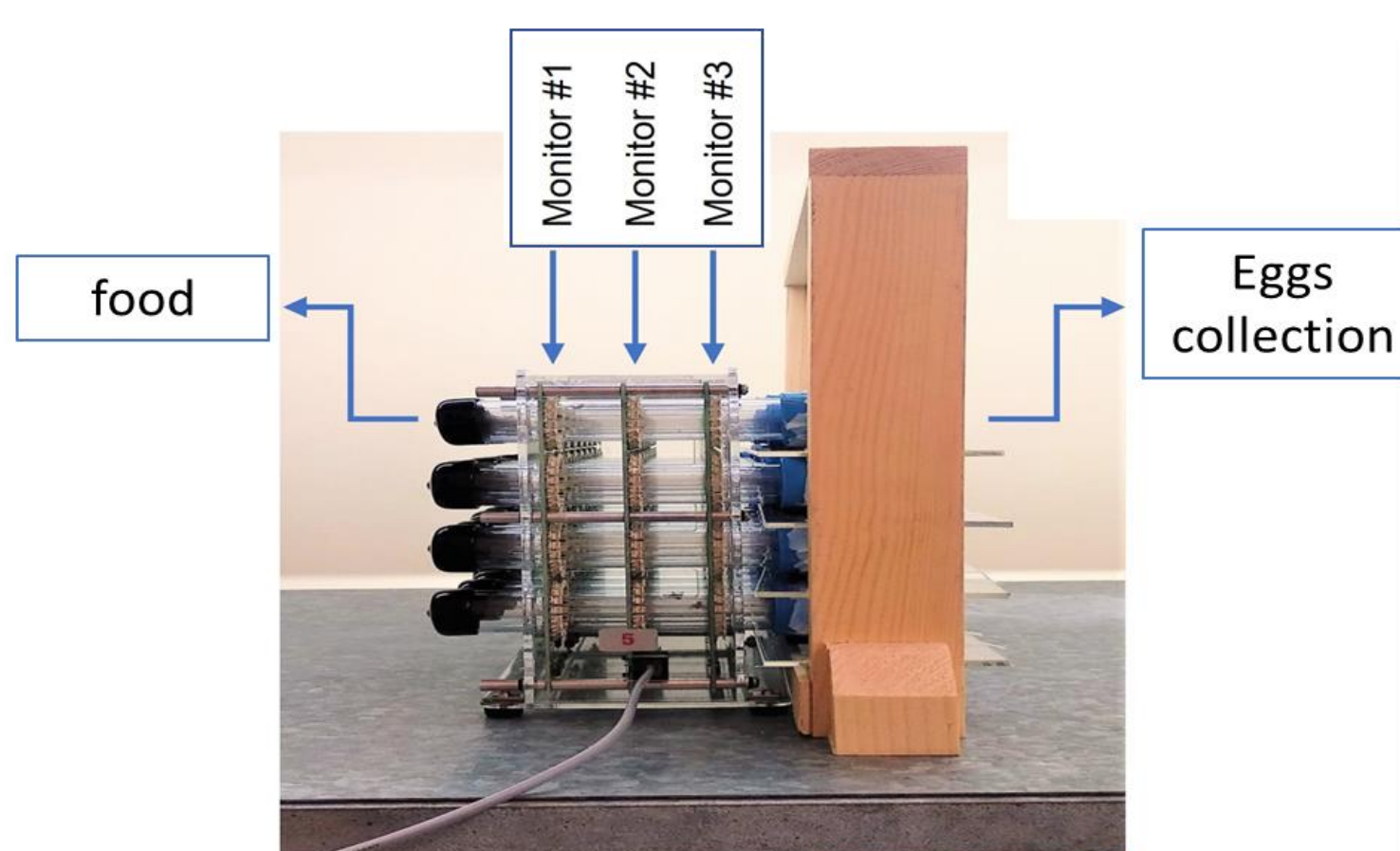
*Corresponding emails: rodoviti@uth.gr, nahchen@ucdavis.edu

1. Introduction

Age-specific and diurnal patterns of locomotory activity, can be considered as biomarkers of ageing. The relationship between the early-age locomotory activity of *Ceratitis capitata* (Diptera: Tephritidae) adults and their lifespan remains unexplored. We studied the relationship between activity patterns and diet with mortality patterns, longevity and remaining lifespan in *C. capitata* adults.

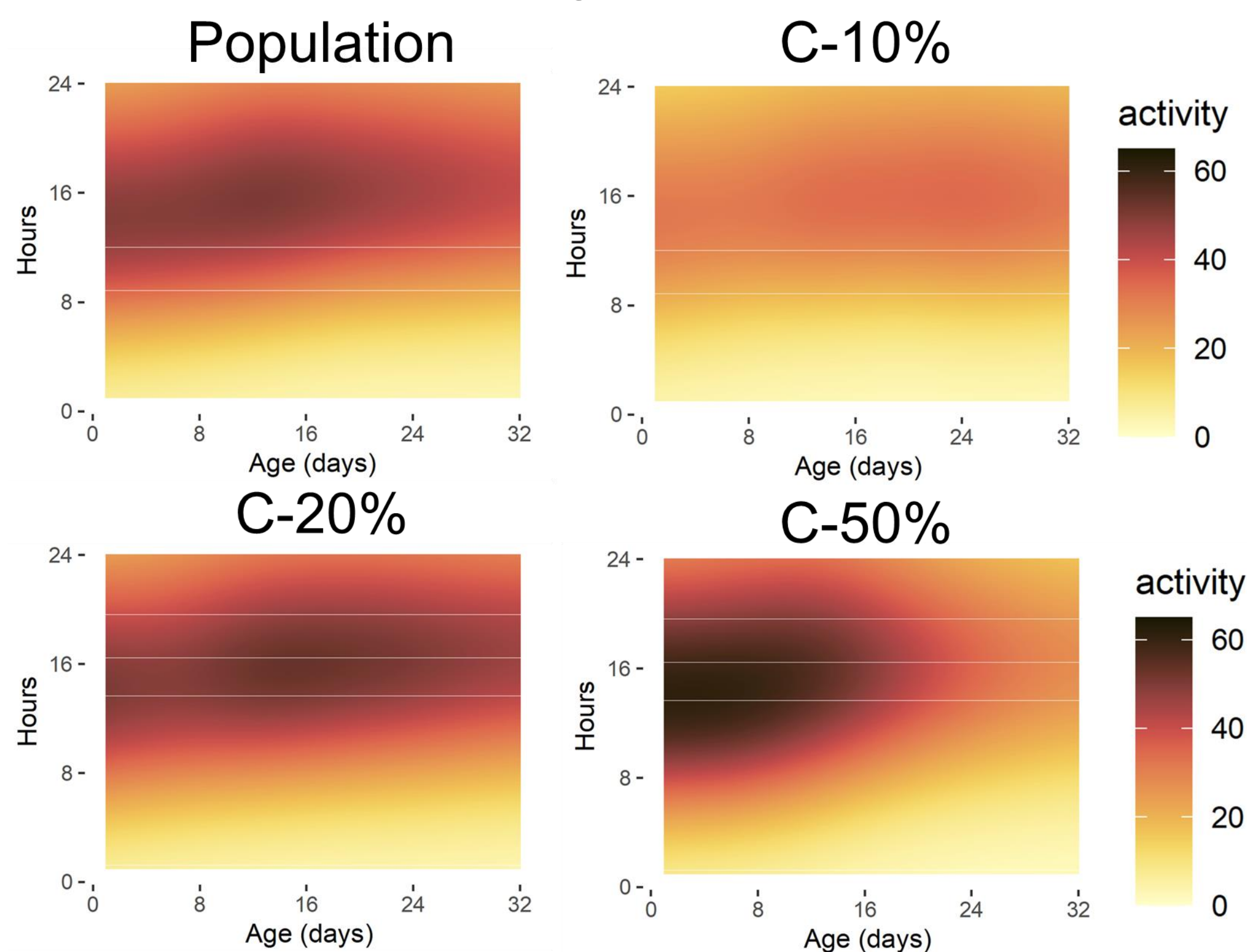
2. Methods

- Locomotor Activity Monitor- LAM25system
- Different diets (treatments) were considered with varying percentages of nutrition in the normal diet: C-50%, C-20%, C-10%.
- Recordings of activity for every minute for the whole lifespan
- Functional Data Analysis (FDA)



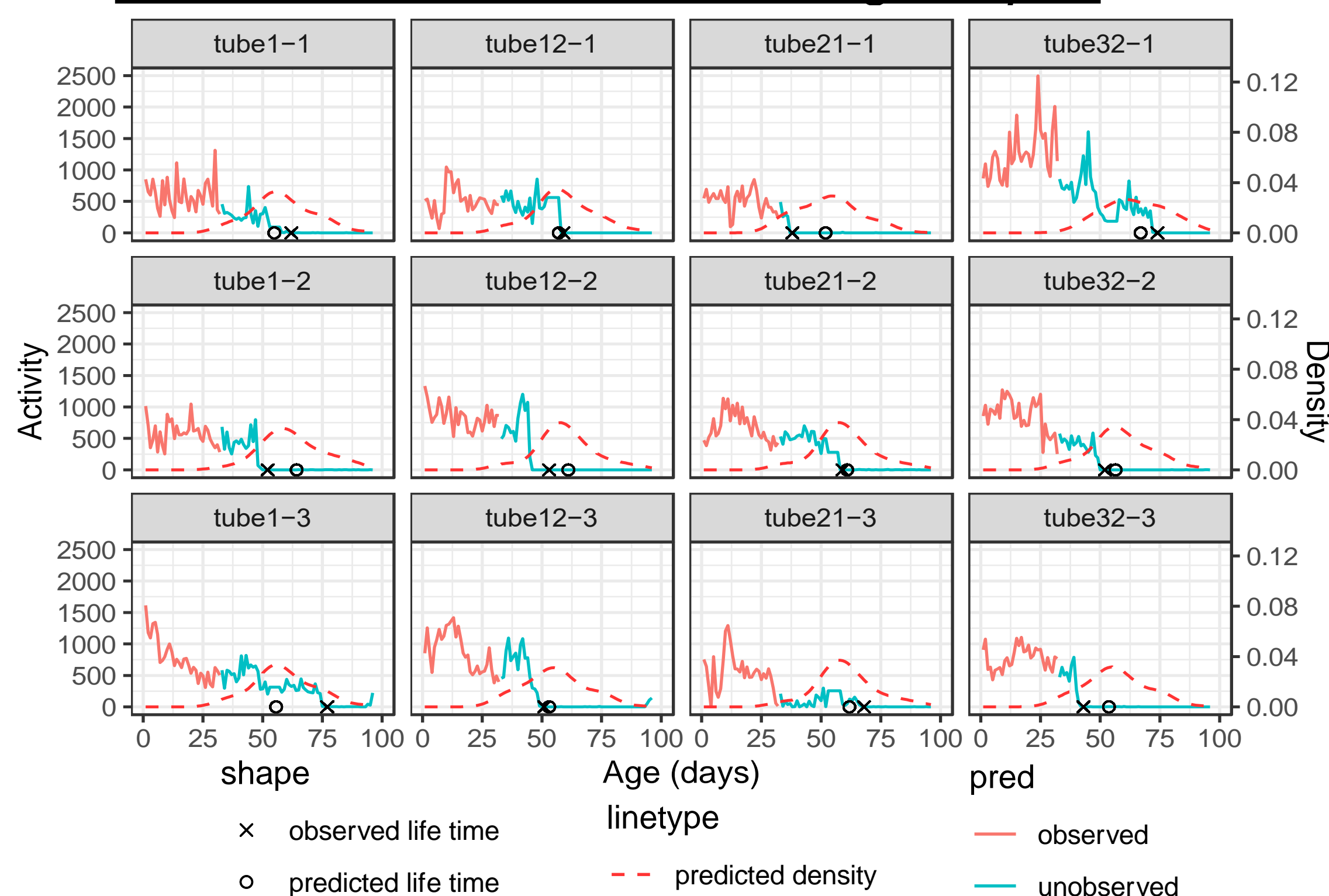
3. Results

3.1. Estimated early-age activity



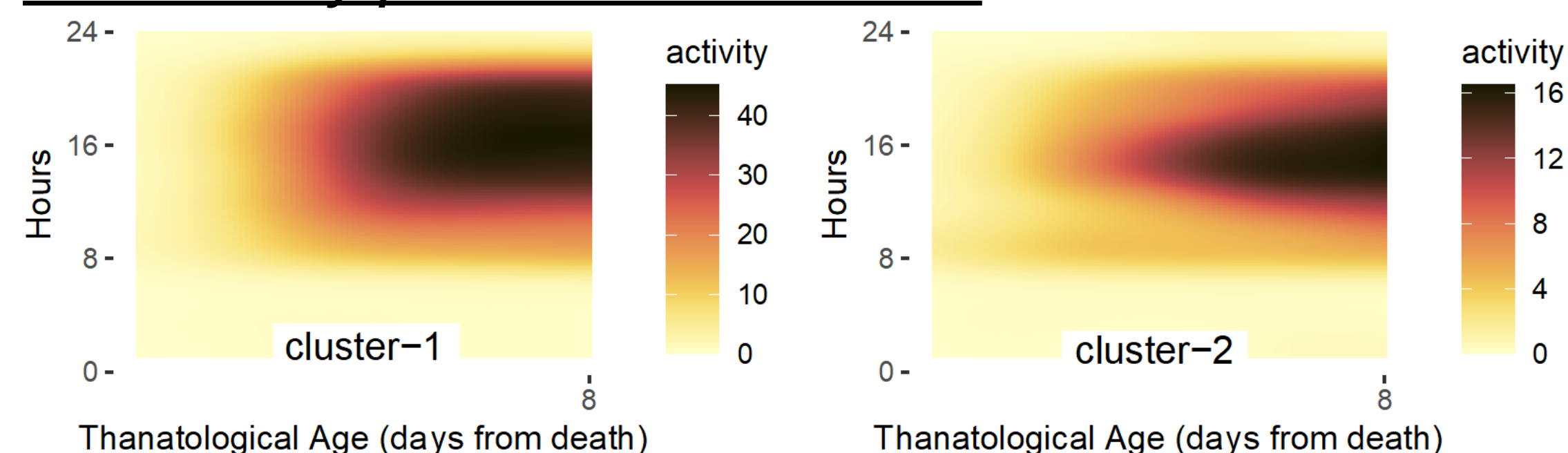
- ✓ Three distinct patterns of activity in early-age activity profiles
- ✓ Low-caloric diet → delayed activity peak (C-20%)
- ✓ High-caloric diet → earlier activity peak (C-50%)

3.3. Prediction of the remaining lifespan



- ✓ Age-at-death was connected to activity profiles in early life
- ✓ Increased activity in early age → Increased risk of mortality
- ✓ Medium-caloric diet → longer lifespan

3.2. Activity profiles before death



- ✓ Before-death activity profile patterns:
 - 1) sudden decline followed by death (cluster-1)
 - 2) slow decline daily activity (cluster-2)

4. Conclusions

Strong connection between daily activity in early age and subsequent mortality, demonstrating that locomotor activity profiles can be served as biomarkers of functional senescence.

Acknowledgements

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