Terrestrial macrocosms datasheet - CEREEP-Ecotron IleDeFrance

Summary and figures

The terrestrial macrocosms' platform includes a set of 35 outdoor enclosures of ca. 100 m2 each designed to manipulate and monitor populations of individually marked lizards (currently, European common lizards *Zootoca vivipara*) and their associated communities (see Figure 1 below). Each enclosure is separated by plastic fences buried deep in the ground to avoid movements of lizards out and includes a small patch of natural grassland. Movable nets can be used to avoid avian predation. Microhabitats and vegetation can be manipulated, as well as rainfall (automatic sprinklers) and free standing water availability. A fully-equipped weather station records automatically micrometeorological conditions on site. Manipulations can last more than several years without food and water addition.

Figure 1. Photographs of existing facilities at CEREEP. Top, panoramic view of the platform seen from the western side All enclosures are protected with nets. © CNRS UMS 3194. Bottom, inside views of one enclosure with natural vegetation and of one lizard hiding inside a dead trunk. ©CNRS Photothèque, C. Frésillon.

Specification table of Terrestrial macrocosms (CEREEP)

	Terrestrial macrocosms CEREEP
General characteristics	
Design	Independent enclosures with plastic fences installed in rows along a east-west natural soil humidity gradient
Dimensions	Standard enclosures (N=25): 10 × 10 m, 2m high net, 70 cm deep fence Storage enclosures (N=10): 12 × 8 m, 2m high net, 70 cm deep fence
Replicates	35 enclosures
Confinement	Semi-enclosed grasslands with strict confinement of target species (lizards) but movement possibilities for other species. Net stops avian predation. Food and water typically provided naturally.
Weather and habitat control	
Temperature	No temperature control, natural conditions
Humidity and rainfall	Automatic sprinklers (N=12) to increase rainfall. Free standing water availability can be manipulated by adding up to 2 water reservoirs (30 L) in each enclosure.
Vegetation	Manually mowed each 3-4 weeks. Vegetation height can be manipulated, and plants grown in pots can also be added in each enclosure.
Microhabitats	The typical semi-natural set-up includes rock and wood piles used as basking and hiding sites for lizards. The number and features of these microhabitats can be manipulated.
Instrumentation	
Weather conditions	Automatic Campbell weather station equipped with temperature-humidity, rainfall, wind speed-direction, solar irradiance, sunshine duration and soil temperature sensors
Micro-weather conditions	Air temperature and humidity sensors to record weather conditions on ground inside each enclosure
Lizards	Fully equipped laboratory with all needed instrumentation dedicated to morphometry, thermal biology and biomechanical assays of lizards.
Study systems	
Model species	Currently, *Zootoca vivipara* (European common lizard). Up to 30-40 sub-adult and adult lizards can be introduced in each enclosure
Plants	Natural grassland vegetation as high as 40-100 cm above ground
Animals	Natural communities including soil and vegetation arthropods, frogs and toads, small mammals
Communities	Terrestrial communities

References and key publications

Lecomte, J. & Clobert, J. (1996) Dispersal and connectivity in populations of the common lizard Lacerta vivipara: An experimental approach. Acta Oecologica 17, 585-598.

Le Galliard, J.-F., Ferrière, R. and J. Clobert (2003) Mother-offspring interactions affect natal dispersal in a lizard. Proceedings Royal Society London B 270:1163-1169.

Le Galliard, J.-F., Ferrière, R. and J. Clobert (2004) Physical performance and darwinian fitness in lizards. Nature 432:502-505.

Le Galliard, J.-F., Fitze, P. S., Ferrière, R. and J. Clobert (2005) Sex ratio bias, male aggression, and population collapse in lizards. Proceedings of the National Academy of Sciences USA 102(50):18231-18236.

Le Galliard, J.-F., Massot, M., Landys, M., Meylan, S. and J. Clobert (2006) Ontogenic sources of variation in the sexual size dimorphism of a viviparous lizard. Journal of Evolutionary Biology 19(3):690-704.

Cote, J., Clobert, J. and P.S. Fitze (2007) Mother-offspring competition promotes colonisation success. Proceedings of the National Academy of Sciences USA. 104(23):9703-9708.

Fitze, P.S. and J.-F. Le Galliard (2008) Operational Sex Ratio, Sexual Conflict, and the Intensity of Sexual Selection. Ecology Letters 11(5):432-439.

Cote, J. and J. Clobert (2010) Risky dispersal: avoiding kin competition despite uncertainty. Ecology 91(5):1485-1493.

Gonzalez-Suarez, Le Galliard, J-F. and D. Claessen (2011) Population and life-history consequences of within-cohort individual variation. The American Naturalist 178(4):525-537.

Mugabo, M., Perret, S., Legendre, S. and J.-F. Le Galliard (2013) Density-dependent life history and the dynamics of small populations. Journal of Animal Ecology 82(6):1227-1239.