Ecography

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Supplementary material

Table A1: Options for propagating micro-landscapes as study organisms deplete nutrients or occupy the entire landscape.

Replenishment	Description	Example	Benefits	Drawbacks
No replenishment of food or space				
	Entire experiment occurs in same micro-landscape	Baym et al. (2016)	No disturbance Micro-landscape can be fully enclosed	Growth becomes limited by food and space, so larger landscapes generally needed
Food replenished only				
	New food added to existing landscape	De Roissart et al. (2015)	Longer experiments possible	Potential disturbance; avenue for contamination
Food and space replenished				
Treadmill	New patches of landscape added, organisms disperse into new habitat on their own	Fronhofer et al. (2017)	Can simulate a long expansion with minimal space	Dispersal limited to few patches at a time; only suitable for some questions (e.g. range expansions)
Transfer to fresh landscape	Individuals transferred manually to new micro-landscape	Friedenberg (2003a)	Nutrients and space are replenished	Disturbance; must decide whether to maintain population sizes or subsample

Table A2: Examples of stressors used to create variation in environmental quality in micro-landscape experiments. Stressors are of three types: limitation of resources, fitness gradient imposed by researchers, or an actual negative stressor. Plural organism names indicate multiple species were used.

Gradient Organism	Stressor details	Example studies
Resource limitation		
Virus	Ratio of good habitat patches (infectable bacteria) vs. sink habitat (bacteria that virus could bind to but not infect)	Dennehy et al. (2007)
Beetle	Resource quality (ratio of wheat to corn flour)	Hufbauer et al. (2015)
Beetle	Resource availability (amount of flour / patch)	Govindan et al (2015)
Researcher-imposed fitness gradient		
Protist	Mortality (removal of individuals)	Fronhofer et al. (2017b)
Beetle	Patch turnover rate (removal of occupied patches and introduction of new patches)	Govindan et al (2015)
Negative stressor		
E. coli	Antibiotic	Baym et al. (2016)
Yeast	Salt	Bell & Gonzalez (2011)
Soil microbes	Herbicide	Low-Décarie et al. (2015)
Fruit flies	Temperature	Davis et al. (1998)

Table A3. Studies depicted in Figure 2. For each study, we estimated the organism's length in cm from the papers themselves (ideally) or internet sources. We then rounded down to the nearest decimal, e.g. an organism of 30 um = 0.003 cm = 0.01 in the table. This helped deal with organisms with variable body size (most) and studies of multiple organisms. We estimated landscape length as the maximum distance an organism could travel along a landscape during the experiment. For landscapes made of sequentially added patches this was patch length x patch number, for the Baym et al. MEGA plate this was half the MEGA plate length as the antibiotic gradient was mirrored (highest in middle of landscape). We then converted length to the units of measurement (scale). This helped deal with studies where the exact landscape length could not be calculated from the information in the paper.

			Length		
Organism			Organism	Landscape	
Authors	Year	Journal	(cm)	(cm)	scale
Arthropod					
Astrom & Bengtsson	2011	Oecologia	0.1	300	m
Chisholm et al.	2011	Ecography	0.1	50	dm
Dallas et al.	2019	J Anim Ecol	0.1	12	dm
Davis et al.	1998	Nature	0.1	–	m
Drake & Griffen	2013	Ecol & Evol	0.1	31.5	dm
Gilarranz et al.	2017	Science	0.1	50	dm
Gilbert et al.	1998	Proc R Soc B	0.1	34	dm
Gonzalez et al.	1998	Science	0.1	50	dm
Govindan & Swihart	2015	Ecology	0.1	–	dm
Govindan & Swihart	2012	PLOS One	0.1	21	dm
Lomnicki	2006	Evol Ecol Res	0.1	20	dm
Miller & Inouye	2013	Ecol Lett	0.1	410	m
Morel-Journel et al.	2019	Ecol Lett	0.1	650	m
Morel-Journel et al.	2018	Ecography	0.1	455	m
Ochocki & Miller	2017	Nat Comm	0.1	2000	dak
Staddon et al.	2010	Ecol Lett	0.1	–	dm
Starzomski & Srivastava	2007	Oikos	0.1	34	dm
Strevens & Bonsall	2011	J Anim Ecol	0.1	36.5	dm
Szucs et al.	2017	PNAS	0.1	–	m
Tung et al.	2018	Oikos	0.1	–	m
Wagner et al.	2017	J Anim Ecol	0.1	–	m
Weiss-Lehman et al.	2017	Nat Comm	0.1	180	m
Weiss-Lehman et al.	2019	Proc R Soc B	0.1	180	m
Bacteria					
Baym et al.	2016	Science	0.0001	400	m
Bosshard et al.	2017	Genetics	0.0001	9	cm

Goldschmidt et al.	2017	ISME	0.0001	10	dm
Hallatscheck et al.	2007	PNAS	0.0001	10	dm
Hol et al.	2013	PLOS One	0.0001	12.7	dm
Hol et al.	2016	PNAS	0.0001	12.7	dm
Hol et al.	2019	Ecol Lett	0.0001	2.6	cm
Kurkjian	2018	Meth Ecol Evo	0.0001	–	cm
Ozgen et al.	2018	Sci Adv	0.0001	9	cm
Song et al.	2016	Env Micro Bio	0.0001	100	m
Taylor & Buckling	2010	Am Nat	0.0001	10	dm
Taylor & Buckling	2011	Evolution	0.0001	135	m
Nematode					
Friedenberg	2003	Ecol Lett	0.1	10	dm
Friedenberg	2003	Am Nat	0.1	10	dm
Plant					
Lustenhouwer et al.	2019	J Ecol	10	–	m
Williams & Levine	2018	Ecology	10	453	m
Williams et al.	2016	Science	10	840	m
Protist					
Altermatt & Fronhofer	2018	Freshwater Bio	0.001	75	dm
Donahue et al.	2003	Am Nat	0.001	24.4	dm
Fronhofer & Altermatt	2015	Nat Comm	0.001	72	dm
Fronhofer et al.	2017	J Evo Biol	0.001	72	dm
Fronhofer, Nitsche, Altermatt	2017	Glob Ecol Biogeo	0.001	84	dm
Giometto et al.	2014	PNAS	0.001	200	m
Henebry & Cairns	1980	Am Midland Nat	0.001	46.5	dm
Holyoak & Lawler	1996	J Anim Ecol	0.001	62.3	dm
Jacob et al.	2015	J Anim Ecol	0.001	2.5	cm
Jacob et al.	2019	Oikos	0.001	2.5	cm
Protists and Animals / Bacteria					
Altermatt et al.	2011	PLOS One	0.001	12.7	dm
Carrara et al.	2012	PNAS	0.001	–	dm
Seymour & Altermatt	2014	Ecol & Evol	0.001	245	m
Burkey	1997	Am Nat	0.001	15	cm
Yeast					
Gralka et al.	2016	Ecol Lett	0.001	10	dm
Korolev et al.	2012	Phys Biol	0.001	10	cm
Van Dyken et al.	2013	Current Biol	0.001	3.5	cm