Is microbial resilience to drying-rewetting driven by selection for quick colonizers?

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Drying-rewetting (D/RW) can induce two types of bacterial growth response

**Less resilient growth**
- Delay before bacterial growth rate increases

**More resilient growth**
- Immediate increase in growth rate after D/RW
- In soils with history of drought (in field)
- In soils exposed to cycles of D/RW (in lab)

See de Nijs et al. (2019; GCB 25: 1005-1015)

**Q:** Is shift in response driven by selection for microbes quick at colonizing labile C released upon D/RW?

(Illustrations by A. Leizeaga)
**Approach**

**Pre-treatments:**
- Control moist soil
- Glucose addition moist soil (1 mg C g\(^{-1}\) soil)
- Litter addition moist soil (1 mg C g\(^{-1}\) soil)
- D/RW (air-dry to 50% WHC)

Day 0
- Co\(_1\)
- G\(_1\)
- L\(_1\)
- D/RW\(_1\)

Day 7
- Co\(_2\)
- G\(_2\)
- L\(_2\)
- D/RW\(_2\)

Day 14
- Co\(_3\)
- G\(_3\)
- L\(_3\)
- D/RW\(_3\)

**Drying-rewetting:**
- Co\(_{DR}\)
- G\(_{DR}\)
- L\(_{DR}\)
- D/RW\(_{DR}\)

**Measured:**
- Respiration
- Bacterial growth (\(^3\)H-leucine incorporation)
- Fungal growth (\(^{14}\)C-acetate-in-ergosterol)

In response to pre-treatments and in response to final D/RW event
Preliminary results!!

1. Glucose additions reduced – but did not eliminate – the lag before onset of bacterial growth

2. Litter additions only marginally reduced lag in response

Conclusion: selection for quick colonizers partly explains shift from less to more resilient growth response to repeated D/RW

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