

How Quorum Sensing Interactions Affect Microbial Population Structures

02-712 Final Project

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Abstract

example abstract

*[OTU]: Operational Taxonomic Unit

Background

Methods

Results

Comparing QS interaction matrices

How Sparsity affects model dynamics

Examining well-known adjacency matrices

Simulations with OTU data

The data we use is an OTU table O_I , an $m \times n$ matrix representing the abundance of m OTUs across n samples. For each sample we use the abundance vector as our initial state and run the simulation with a given set of parameters. So after all simulations we get

an OTU table O_T representing the terminal state of the model (abundance vector) for each initial state. Given the tables O_I, O_T for each sample we can calculate

- difference in α -diversity (richness and Shannon Index)
- β -diversity (Bray-Curtis distance)
- difference in skewness (Fisher's Coefficient of skewness)
- total population growth rate

and we examine how these statistics vary when using different K_a matrices and the same O_I .

Simulation with an empirically derived QS interaction matrix

Discussion

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