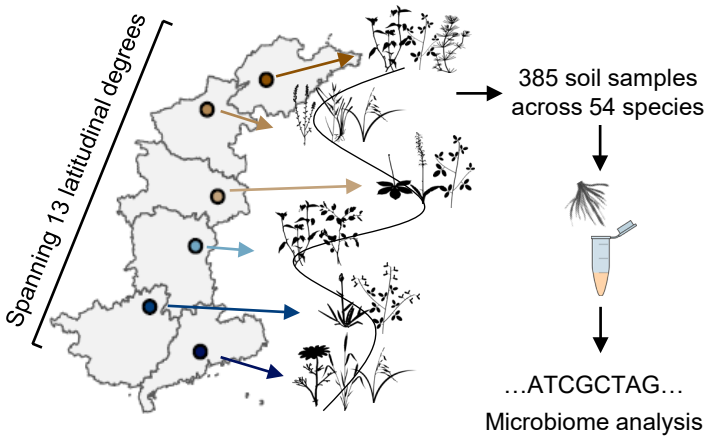
Step 1

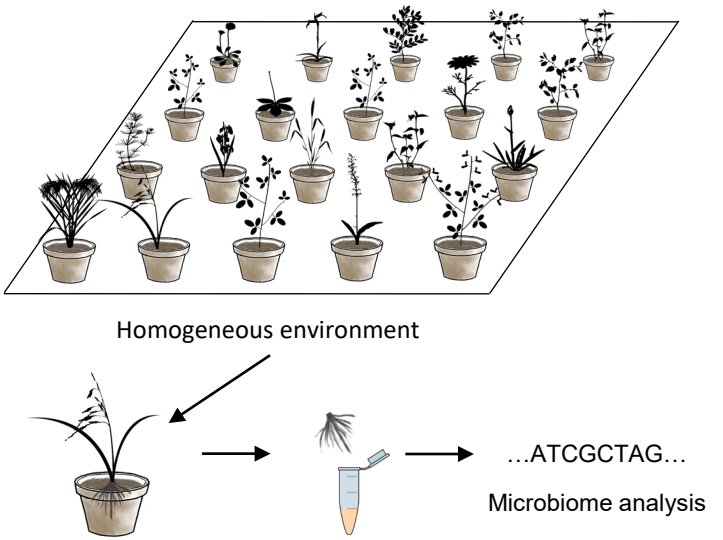
Characterizing natural microbiome in field survey.



Q1 : What are the relative contributions of environmental factors, plant species identity and their interactions in shaping rhizosphere fungal communities in the field?

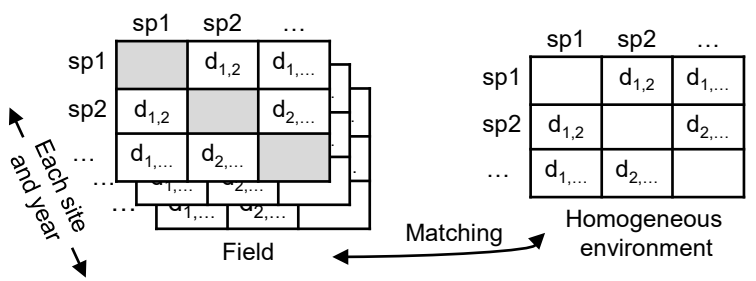
Step 2

Assessing microbiome when plant grown alone.



Step 3

Estimating the fungal compositional distinctiveness of each species compared to co-occurring species in field and homogeneous environment.



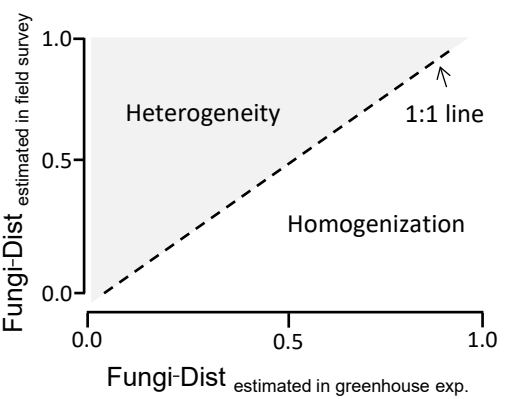
$$\text{Fungi-Dist}_i = \frac{\sum_{j=1, i \neq j}^{N} d_{ij}}{N - 1}$$

Where N is the number of species, d_{ij} is the community composition pair-wise distance between species i and j.

Step 4

Quantifying the environmental effects on the compositional variation in fungal communities among co-occurring species for each site and year.

$$\text{Environmental effects} = \text{Ln}\left(\frac{\text{Fungi-Dist}_{\text{estimated in field survey}}}{\text{Fungi-Dist}_{\text{estimated in greenhouse exp.}}}\right)$$



Q2 : What are the directions and magnitudes of the environmental effects on the compositional variation in rhizosphere fungal communities among cooccurring plant species in the natural field?

Q3 : What are the primary environmental factors and the fungal groups that are sensitive to environmental variation (host special or general taxa)?