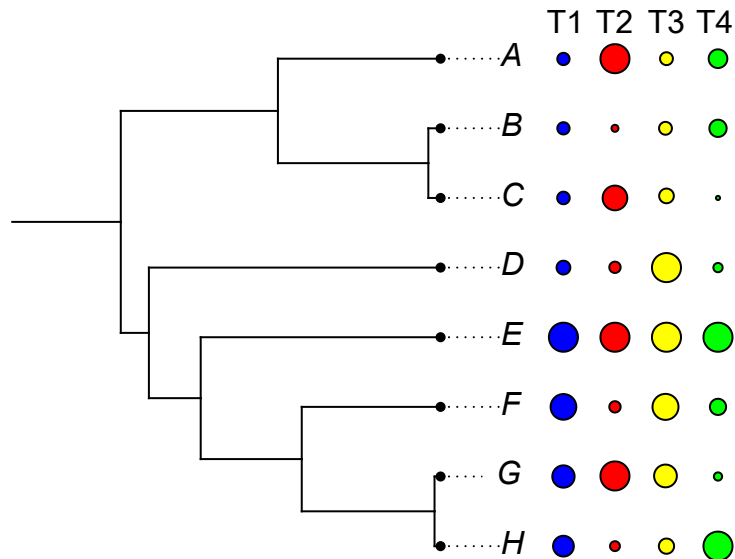


Simulated species, traits and phylogeny under environmental filtering effect in simple habitats



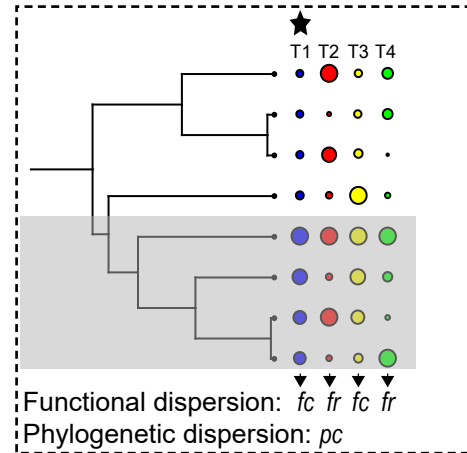
Trait conservatism:

T1/T3: Phylogenetically conserved

T2/T4: Phylogenetically convergent

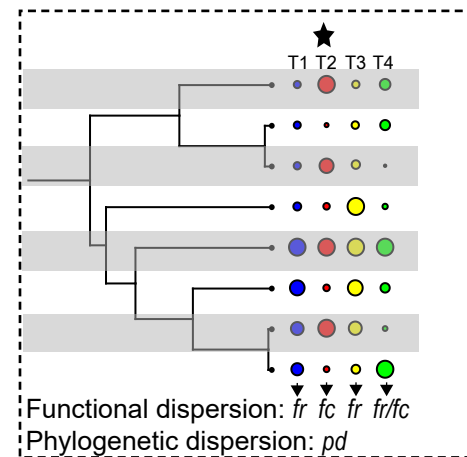
We use a fake phylogeny with 8 species (A~H) containing 4 functional traits (T1~T4) to illustrate our framework of phylogenetic and functional community structure. Functional traits are assumed to be independent with each other, two of which (T1 and T3) are phylogenetically conserved and the others (T2 and T4) are phylogenetically convergent. The size of circles indicate the value of trait attributes. Black stars indicate predominant traits. Species under grey shade is retained under the certain scenario. 'pc', 'pr' and 'pd' indicate phylogenetic clustering, random and dispersing; 'fc', 'fr' and 'fd' mean functional clustering, random and dispersing. 'PreTrs' means predominant traits; 'AssTrs' indicates assistant traits.

Scenario A PreTrs: T1; AssTrs: T2, T3 and T4.



Under scenario A, we assume that species assemblage in simple habitat is organized by environmental filtering effect acting on (phylogenetically conserved) T1, which was assisted by traits T2, T3 and T4. The phylogenetic dispersion of community and the functional dispersion of predominant trait T1 are deserved to be clustered. Due to relative weak filtering effect and the phylogenetic convergence of T2 and T4, functional dispersion of T2 and T4 are expected to be random. Resulting from weak filtering effect, functional dispersion of assistant trait T3 is expected to be weakly clustered.

Scenario B PreTrs: T2; AssTrs: T1, T3 and T4.



Conversely, under scenario B, we assume that species assemblage in simple habitat is organized by environmental filtering effect acting on (phylogenetically convergent) trait T2, assisted by traits T1, T3 and T4. Due to the phylogenetic convergence of T2, phylogenetic dispersion of community is deserved to be dispersed, whereas functional dispersion of predominant trait T2 is expected to be functionally clustered. Due to relative weak filtering effect, functional dispersion of T4 are expected to be random or dispersed, and traits T1 and T3 are expected to be random.