Mast-Trait

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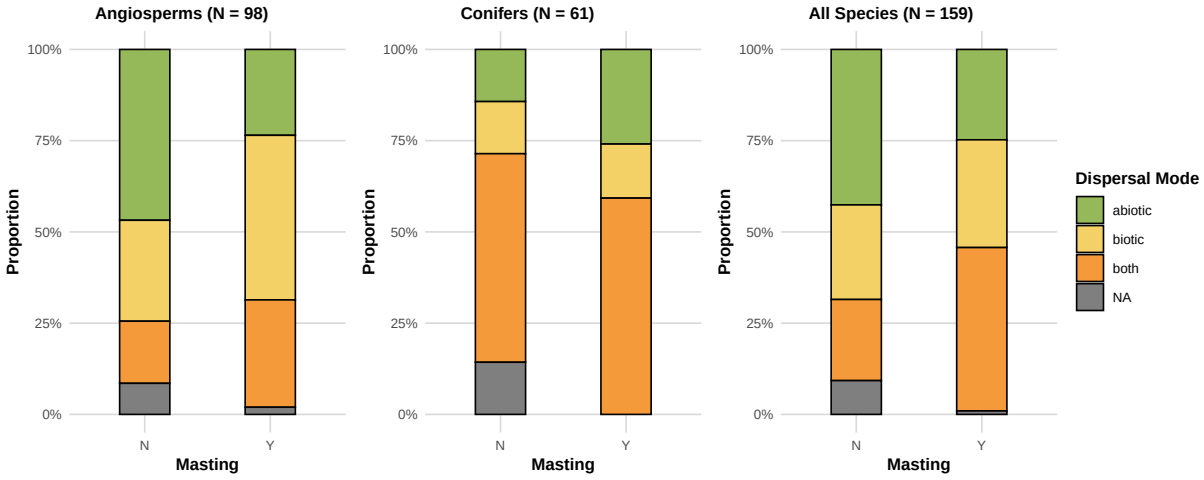
December 19, 2025

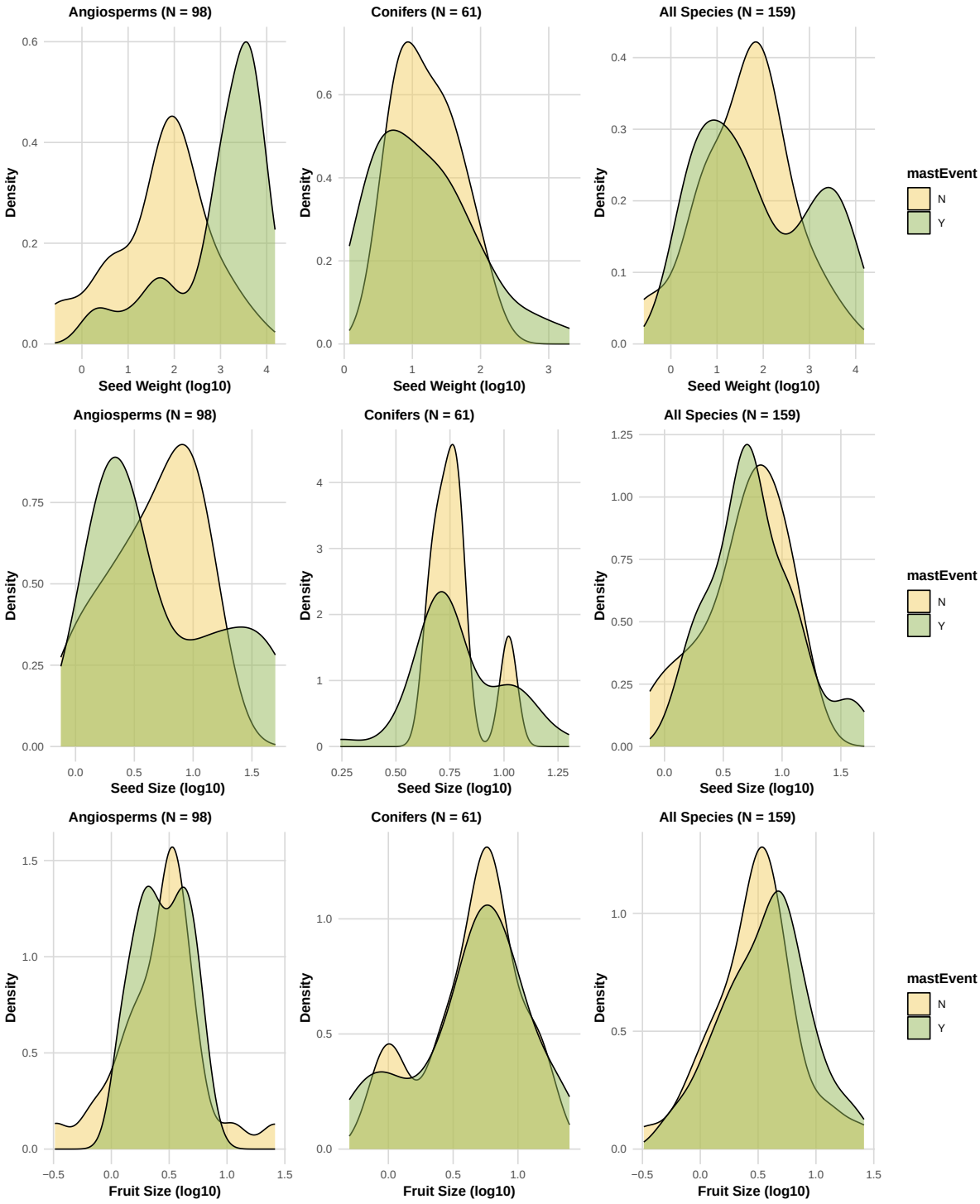
Hypotheses

Predator Satiation

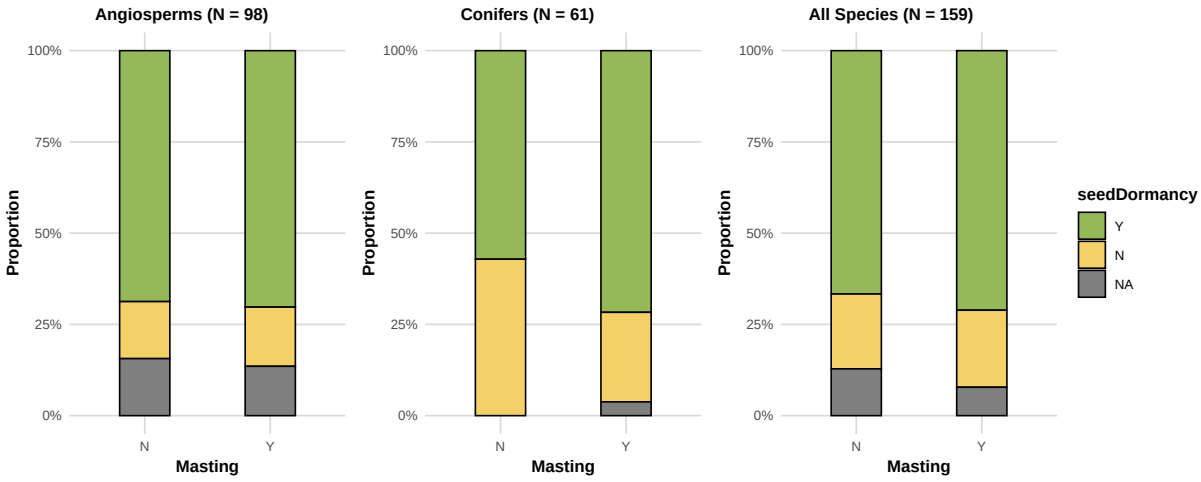
- Dispersal mode: Animal-dispersed species may be more likely to mast, or the mechanisms behind masting could differ depending on dispersal mode.



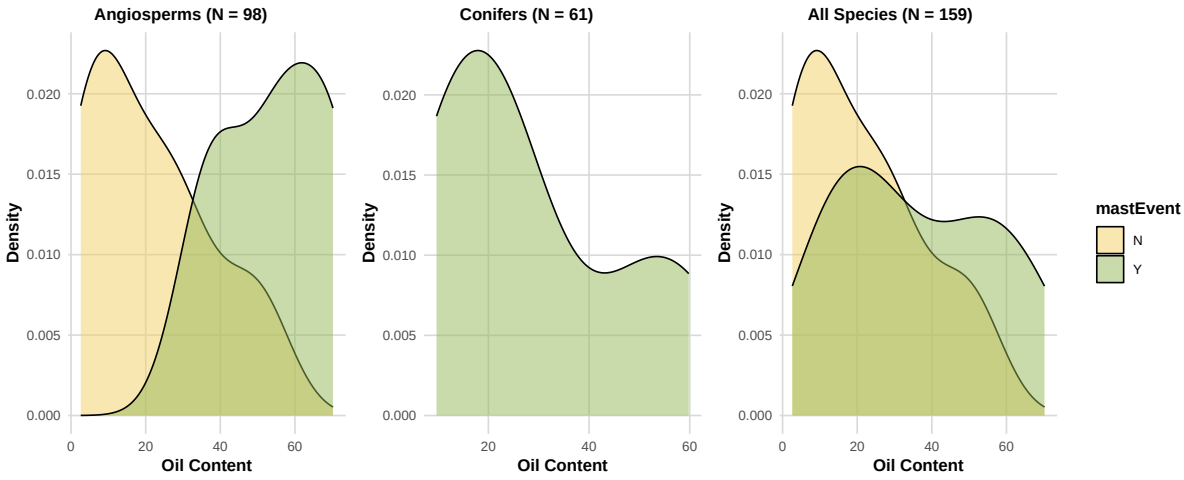
- **Seed size:** Among animal-dispersed species, larger-seeded species might be more prone to masting.



- **Seed dormancy:** Species with dormant seeds are expected to be more likely to mast.

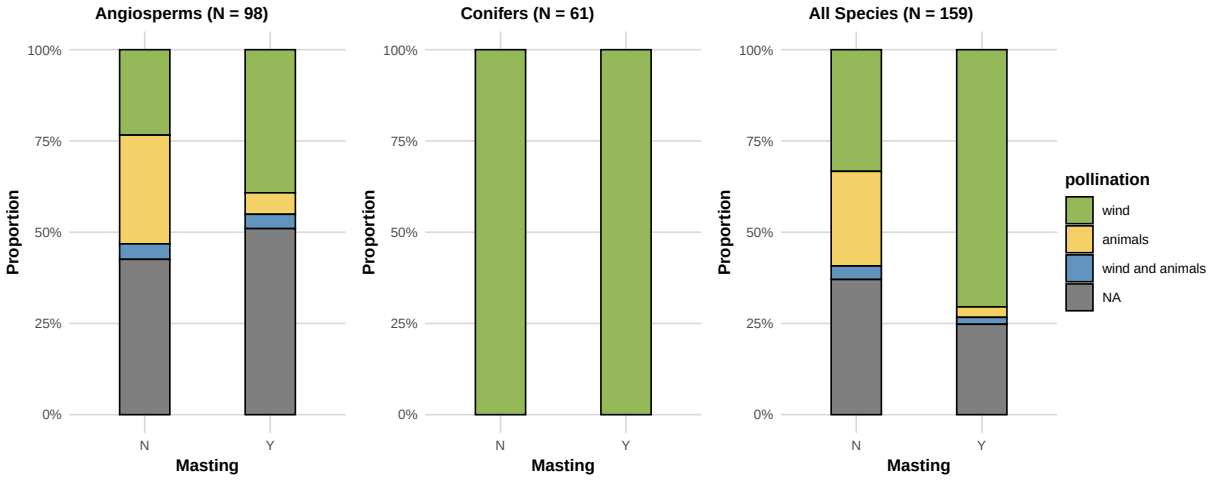


- **Nutrient content:** Species with more nutritious seeds may be more likely to mast.

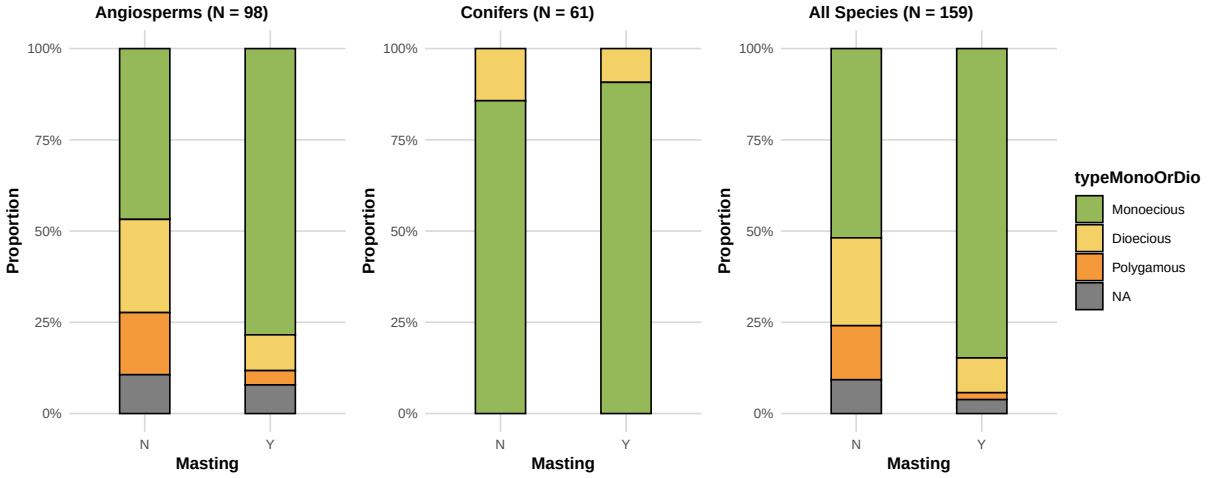


Pollination Coupling

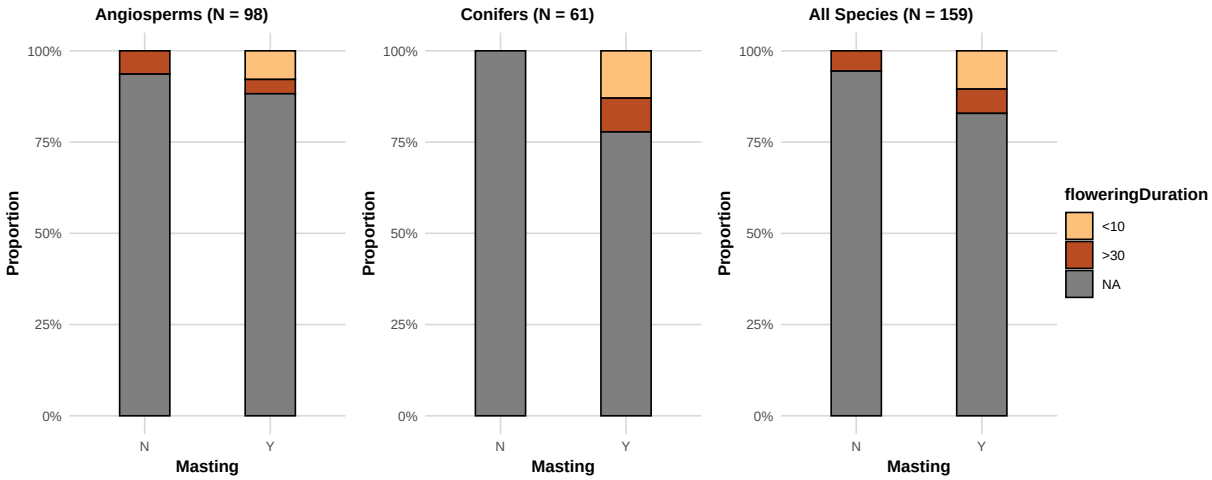
- Wind-pollinated species are expected to mast more frequently.



- Monoecious species may be more likely to mast.

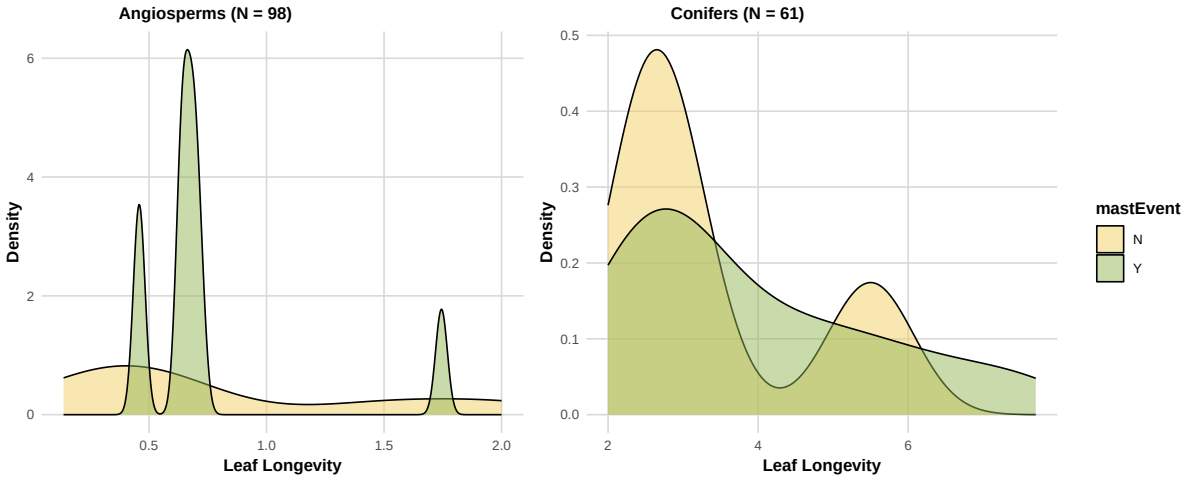


- Species with longer flowering periods may be more likely to mast.

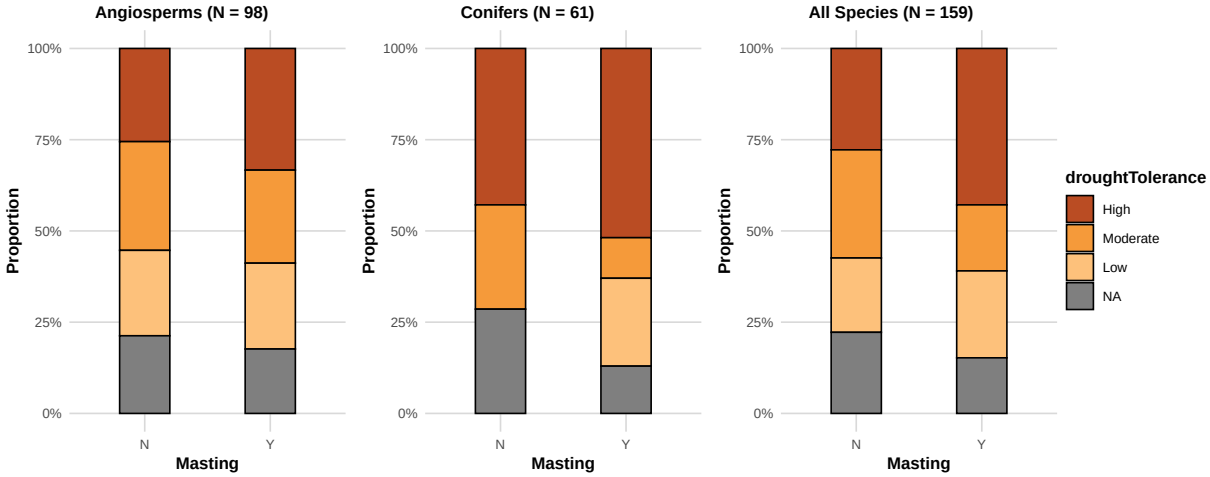

Angiosperms (N = 98)
Conifers (N = 61)
All Species (N = 159)
Proportion
100%
75%
50%
25%
0%
N
Y
Masting
floweringDuration
<10
>30
NA

Resource Matching

- Leaf longevity: Species with long-lived leaves are expected to mast more frequently.

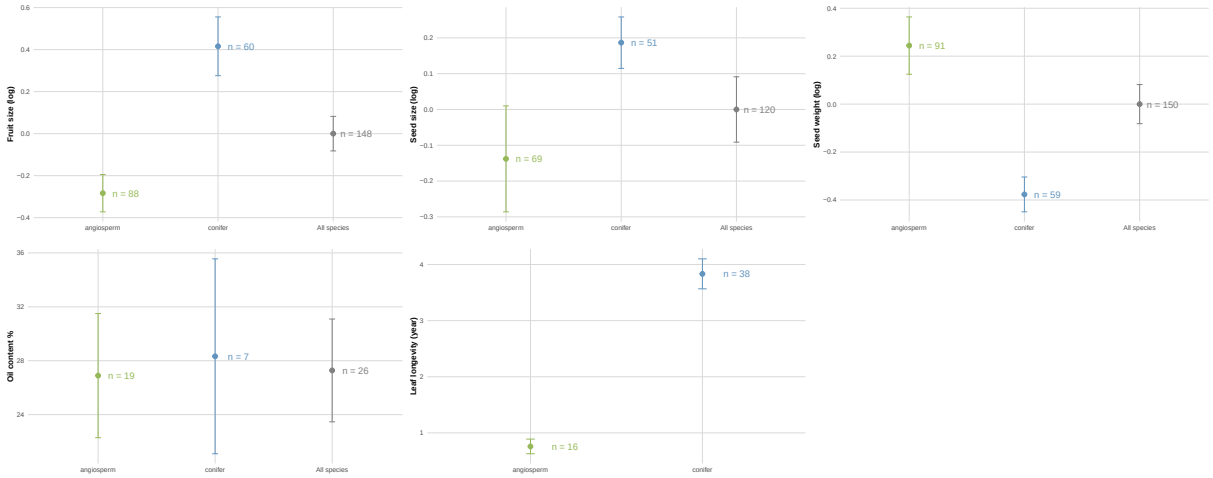


- Drought tolerance: May go either way — tolerant species can accumulate resources; intolerant species respond to resource fluctuations.

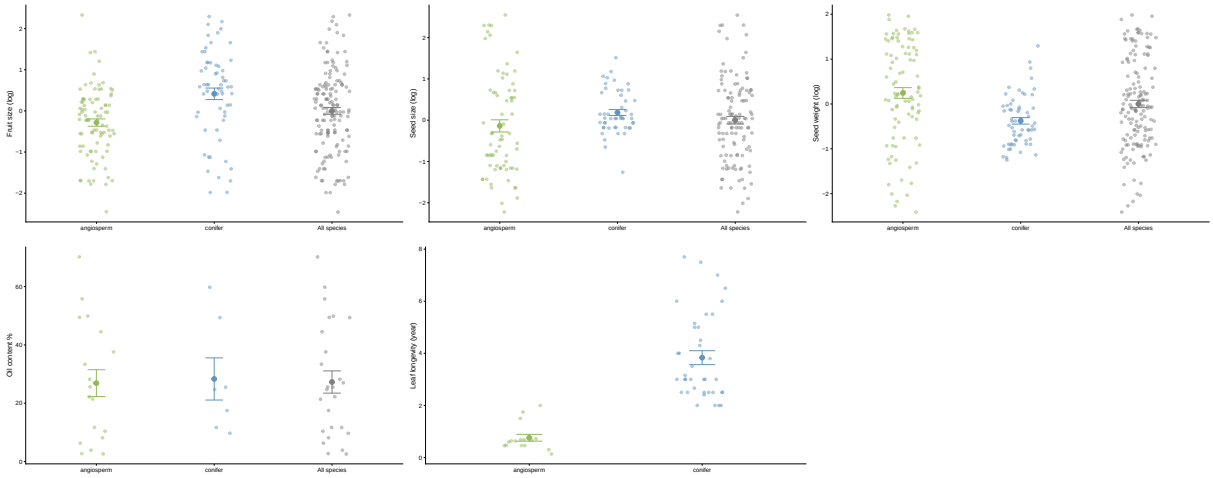


Data visualization

I calculated the mean and standard errors for the continuous traits in the raw dataset, with number of the data.



Here's the version of raw data scattering on the plot



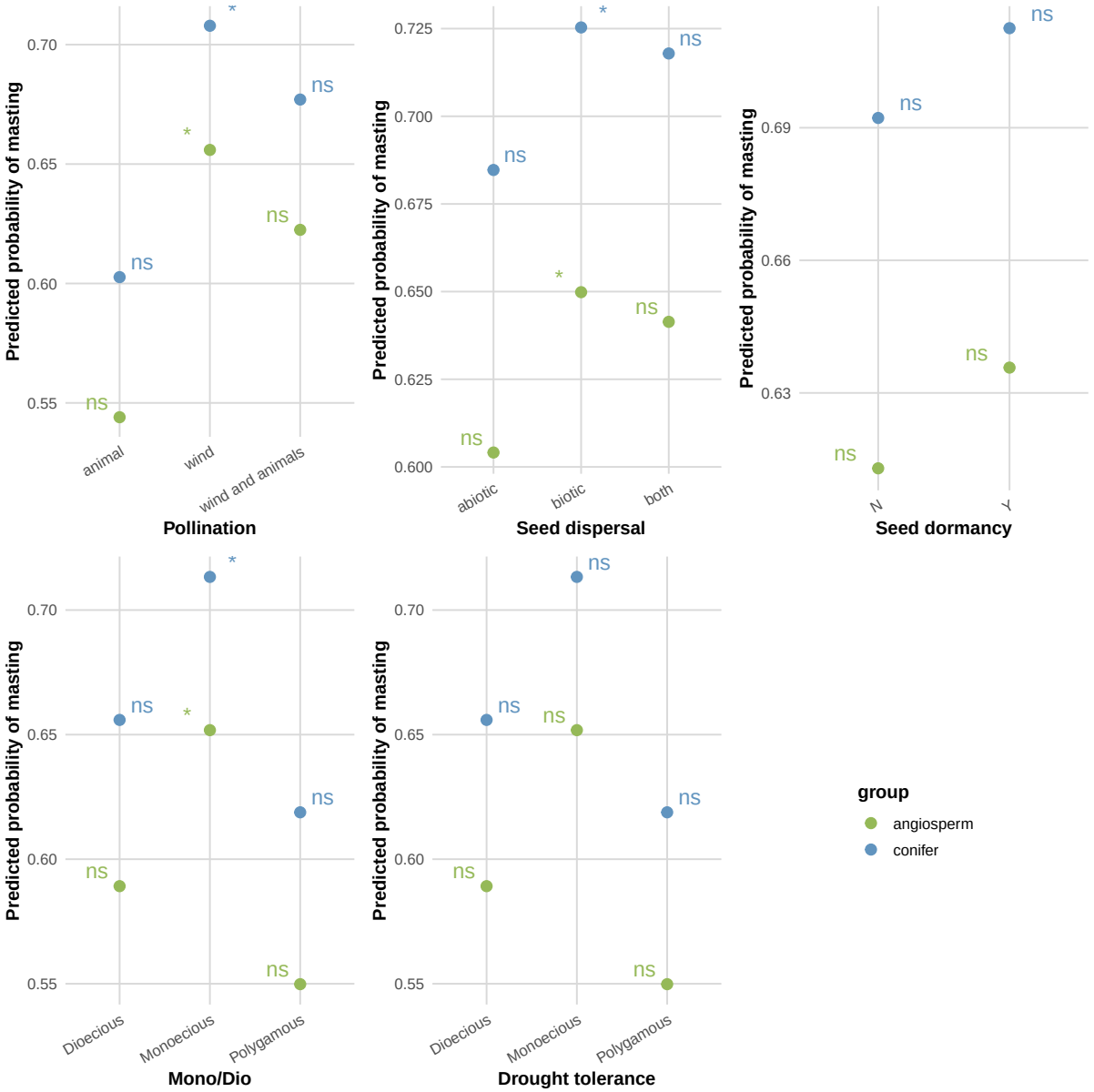
Results

I ran the phyloglm, including the phylogeny variation.Here I reproted the direct model results in a table:

Trait (group)	Predictor	Estimate	SE	Z	P	Sig.	Phylo a
Seed dispersal (conifer)	Biotic dispersed (compared to Abiotic)	−0.830	0.807	−1.03	0.3040		0.015
Seed dispersal (conifer)	Abiotic and Biotic dispersed (compared to Abiotic)	−1.106	0.666	−1.66	0.0968	.	0.015
Seed dispersal (angio)	Biotic dispersed (compared to Abiotic)	0.549	0.533	1.03	0.3030		0.059
Seed dispersal (angio)	Abiotic and Biotic dispersed (compared to Abiotic)	0.552	0.567	0.97	0.3300		0.059
Pollination (angio)	Wind pollinated (compared to Animal pollinated)	1.719	0.723	2.38	0.0174	*	0.346
Pollination (angio)	Wind pollinated (compared to Animal pollinated) and animals	1.225	1.148	1.07	0.2860		0.346
Seed dormancy (conifer)	Dormant	0.706	0.703	1.00	0.3150		0.411
Seed dormancy (angio)	Dormant	0.034	0.497	0.07	0.9460		0.096
Mono/Dio (conifer)	Monoecious (compared to Dioecious)	−1.135	1.017	−1.12	0.2640		0.007
Mono/Dio (angio)	Monoecious (compared to Dioecious)	0.904	0.680	1.33	0.1840		0.110
Mono/Dio (angio)	Polygamous (compared to Dioecious)	−0.129	0.956	−0.14	0.8920		0.110
Seed weight (conifer)	Seed weight (log, std)	−0.047	0.403	−0.12	0.9080		0.427
Seed weight (angio)	Seed weight (log, std)	0.707	0.306	2.31	0.0210	*	0.063
Fruit size (conifer)	Fruit size (log, std)	0.021	0.345	0.06	0.9520		0.428
Fruit size (angio)	Fruit size (log, std)	0.058	0.232	0.25	0.8020		0.171
Seed size (conifer)	Seed size (log, std)	−0.108	0.418	−0.26	0.7960		0.413
Seed size (angio)	Seed size (log, std)	0.269	0.330	0.82	0.4150		0.081
Oil content (angio)	Oil content	0.036	0.028	1.29	0.1980		0.141
Leaf longevity (conifer)	Leaf longevity	0.147	0.345	0.43	0.6700		0.430
Leaf longevity (angio)	Leaf longevity	0.262	0.948	0.28	0.7820		0.007
Drought tol (conifer)	Low drought tolerated (compared to High drought tolerated)	0.908	1.645	0.55	0.5810		0.429
Drought tol (conifer)	Moderate drought tolerated (compared to High drought tolerated)	−1.565	1.065	−1.47	0.1420		0.429
Drought tol (angio)	Low drought tolerated (compared to High drought tolerated)	0.045	0.476	0.09	0.9250		0.110
Drought tol (angio)	Moderate drought tolerated (compared to High drought tolerated)	−0.126	0.465	−0.27	0.7870		0.110

I also ran the common glm, using conifer and angiosperm as a fixed effect in the model, and I modified the results for better visualization:

For the categorical traits, I calculated the probability (of being a strong masting species) for each level:



For the continuous traits, I just presented the effect sizes, with the star indicating a p-value smaller than 0.05: