1 Running a simple model with no ncp etc
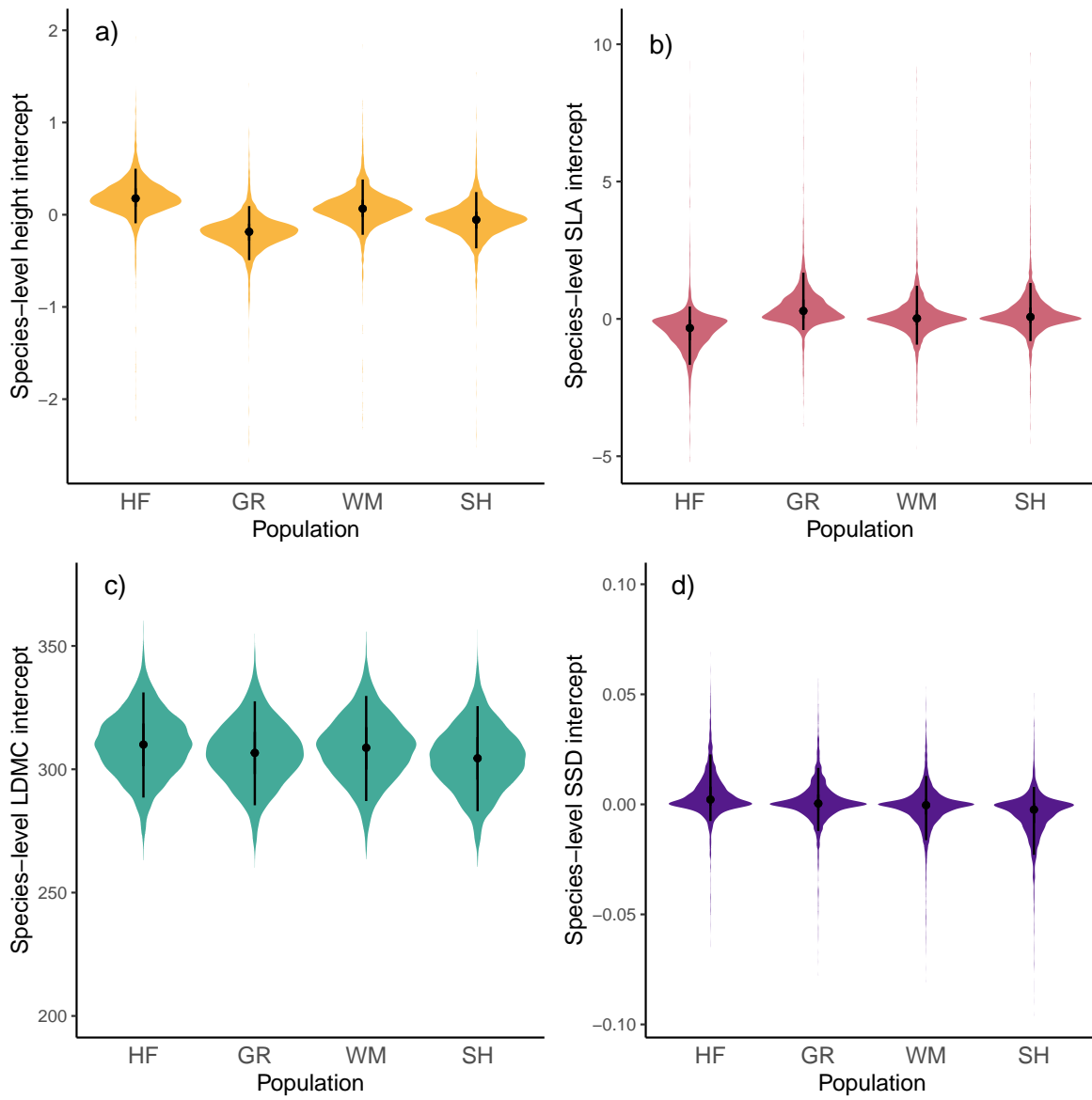

Figure 1: Population-level variation $(\mu_{p}op)$ across traits: (a) height, (b) Specific leaf area, (c) Leaf dry matter content, (d) Specific stem density.

2 Specific leaf area - all species

1. Variation due to species (3.81, 50% UI: 3.27, 4.22) is much greater than pop (0.96, 50% UI: 0.33, 1.11)

2. Harvard forest has a negative population effect - most southern (-0.41, 50% UI: -0.78, -0.03)

3. St. Hippolyte (most northern) is positive (0.19, 50% UI: -0.15, 0.41) , but Grant has the largest population effect (0.44, 50% UI: 0.02, 0.71)—sh UI crosses zero

4. Spitom has the largest positive species effect, Vibcas the most negative

5. No clear divide between shrubs and tree species

Table 1: Summary of the intercept only model for SLA across the two years of data (2019 and 2022) (n = 599) with species (n = 18) and population (n = 4).

	Species	Full mdl	Sub. spp mdl	Esti. diff
1	ACEPEN	2.43	2.71	-0.28
2	ACESPI	1.30		
3	ALNINC	-1.70	-1.53	-0.17
4	alpha	21.38	21.17	0.21
5	AMECAN	-4.17	-4.13	-0.04
6	AROMEL	-4.27	-4.11	-0.17
7	BETALL	-0.39	-0.22	-0.17
8	BETPAP	-2.29	-2.16	-0.13
9	BETPOP	-0.57	-0.37	-0.20
10	DIELON	1.40	1.62	-0.22
11	GR	0.44	0.49	-0.04
12	HF	-0.41	-0.45	0.04
13	MYRGAL	1.46	1.64	-0.18
14	QUEALB	2.37		
15	QUERUB	-1.13		
16	SAMRAC	3.07	3.29	-0.22
17	SH	0.19	0.23	-0.04
18	sigma_pop	0.96	1.05	-0.09
19	sigma_sp	3.81	4.36	-0.55
20	sigma_y	7.20	7.33	-0.13
21	SORAME	0.32		
22	SPIALB	7.98	8.22	-0.24
23	SPITOM	3.94	4.16	-0.23
24	VACMYR	-2.08		
25	VIBCAS	-5.03	-4.90	-0.13
26	WM	0.10	0.12	-0.02

10
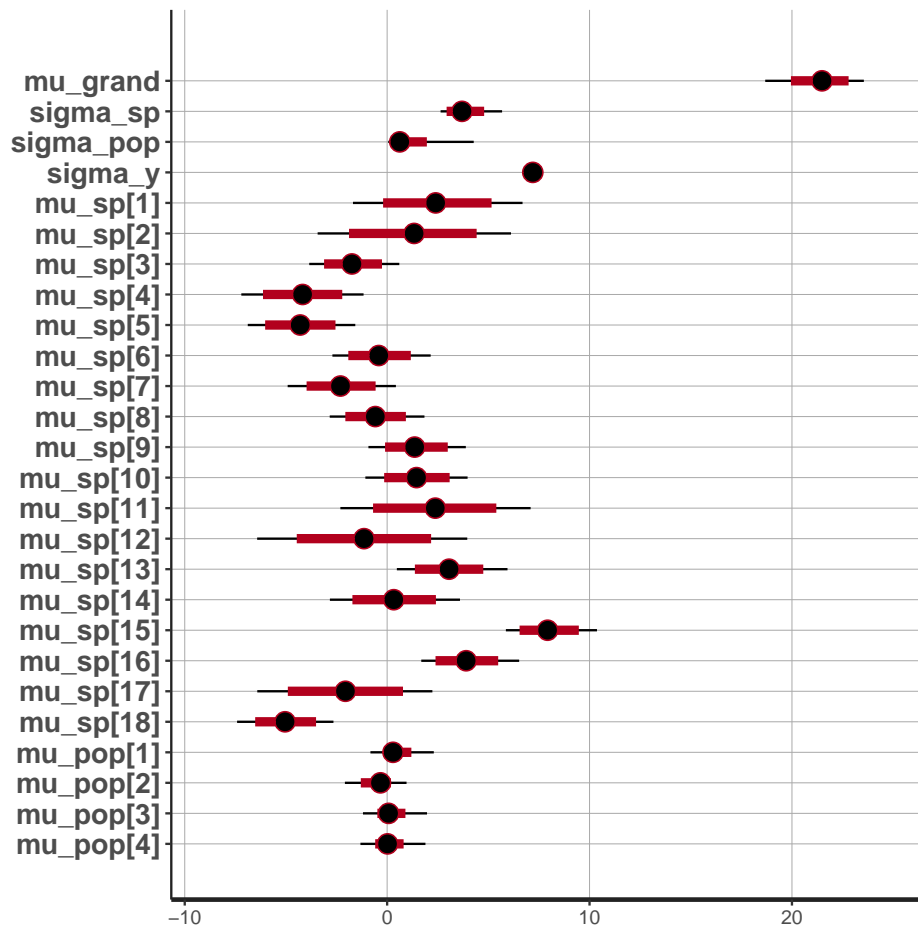
11 Specific leaf area - only species alive by 2022

12   1. Similar overall trend with samller spp subset, but slightly stronger responses

13   2. Species level estimates are different though


14
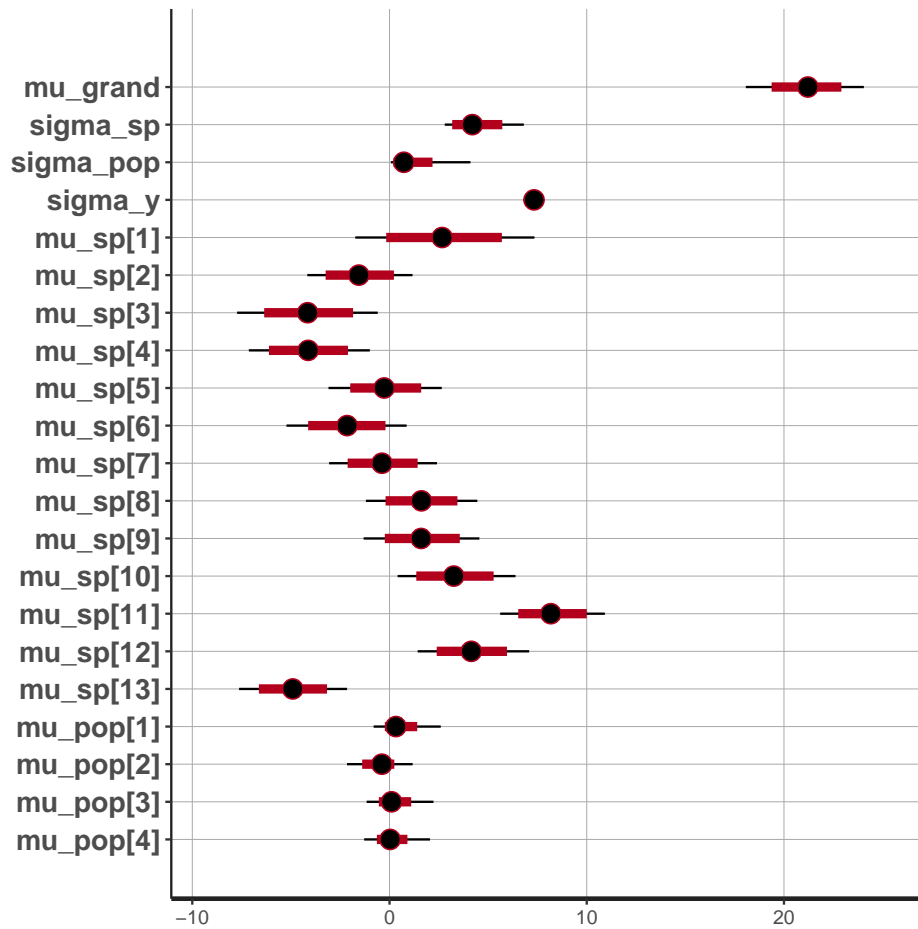
15 Leaf dry matter content - all species

16 1. variation due to population (2.78, 50% UI: 0.97, 3.72) is twice as great as species (42.23, 50%
17 UI: 36.57, 47.24)

18 2. There are no strong differences across populations (Harvard Forest: 0.88, 50% UI: -0.4, 1.93;
19 Grant: -0.23, 50% UI: -1.15, 0.77; White Mountain: 0.5, 50% UI: -0.54, 1.48; St.Hippolyte:
20 -0.74, 50% UI: -1.81, 0.48)—all UI cross zero

21 3. Spitom has the largest positive species effect, Vibcas the most negative

22 4. Quite a lot of species level variaiton, ranging from very negative for Samrac to greater positive
23 values for Querub

Table 2: Summary of the intercept only model for LDMC across the two years of data (2019 and 2022) (n = 599) with species (n = 18) and population (n = 4).

	Species	Full mdl	Sub. spp mdl	Esti. diff
1	ACEPEN	-35.67	-26.84	-8.83
2	ACESPI	2.79		
3	ALNINC	5.13	14.84	-9.71
4	alpha	338.19	328.35	9.84
5	AMECAN	49.68	58.57	-8.89
6	AROMEL	3.26	12.85	-9.59
7	BETALL	-7.89	1.84	-9.73
8	BETPAP	-11.86	-2.35	-9.51
9	BETPOP	10.87	20.67	-9.80
10	DIELON	-12.63	-3.08	-9.55
11	GR	-0.23	-0.16	-0.06
12	HF	0.88	0.72	0.16
13	MYRGAL	-29.29	-19.35	-9.94
14	QUEALB	19.69		
15	QUERUB	68.43		
16	SAMRAC	-89.55	-79.76	-9.79
17	SH	-0.74	-1.10	0.36
18	sigma_pop	2.78	2.79	-0.01
19	sigma_sp	42.23	39.48	2.75
20	sigma_y	50.19	50.82	-0.63
21	SORAME	-0.02		
22	SPIALB	5.65	15.51	-9.85
23	SPITOM	26.39	36.05	-9.66
24	VACMYR	61.28		
25	VIBCAS	-24.87	-15.04	-9.83
26	WM	0.50	0.39	0.11
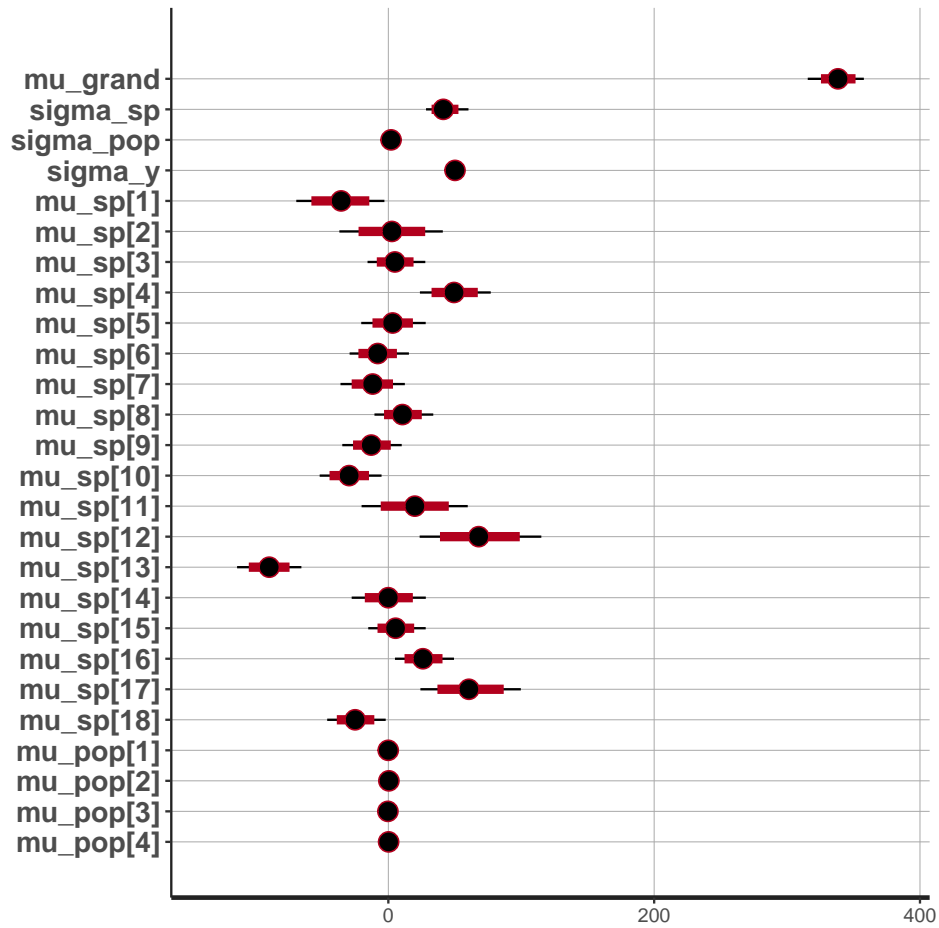
25   Leaf Dry Matter Content - only species alive by 2022

26   1. Variation due to population is about twice that due to species

27   2. Again all populations have similar estimaes

28   3. species level estiamtes are different from the full species model in variable ways across species

29
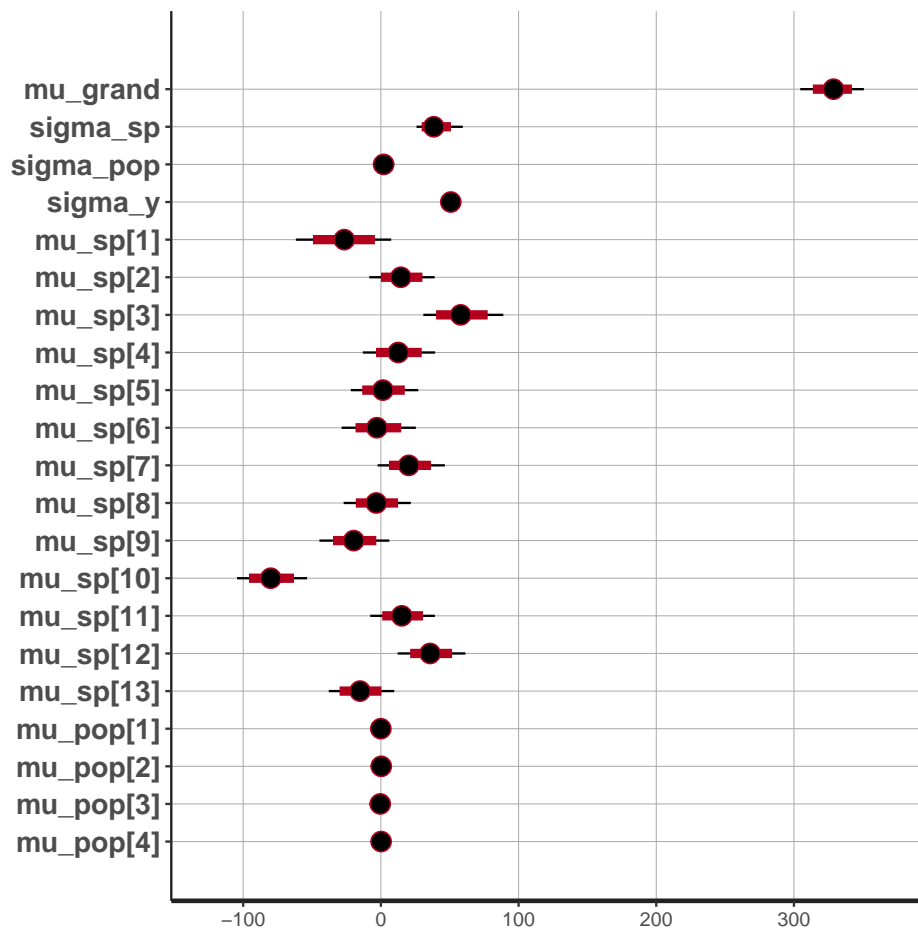
Height - all species

1. variation due to species (1.04, 50% UI: 0.9, 1.15) is much greater than pop (0.35, 50% UI: 0.17, 0.39), about three times

2. Harvard forest (0.18, 50% UI: 0.09, 0.29) and white mountain are positive (0.07, 50% UI: -0.02, 0.16) (the two more southern sites)—wm UI crosses zero

3. but grant (-0.2, 50% UI: -0.28, -0.1) has a much stronger negative effect than St. Hippolyte (-0.06, 50% UI: -0.15, 0.03)—sh UI crosses zero

4. Betpop has the strongest positive response and Vacmyr the strongest negative response

5. No clear divide between shrubs and tree species, but possible weak clade differences (all Acer Betula, Quercus, and Spirea have the same sign at least)

Table 3: Summary of the intercept only model for Height across the two years of data (2019 and 2022) (n = 599) with species (n = 18) and population (n = 4).

	Species	Full mdl	Sub. spp mdl	Esti. diff
1	ACEPEN	-0.12	-0.30	0.17
2	ACESPI	-0.49		
3	ALNINC	1.76	1.56	0.19
4	alpha	1.38	1.58	-0.20
5	AMECAN	0.03	-0.17	0.20
6	AROMEL	-0.65	-0.85	0.20
7	BETALL	1.10	0.91	0.19
8	BETPAP	1.01	0.82	0.19
9	BETPOP	2.22	2.03	0.19
10	DIELON	-0.70	-0.90	0.20
11	GR	-0.19	-0.19	0.00
12	HF	0.19	0.18	0.01
13	MYRGAL	-0.69	-0.88	0.19
14	QUEALB	-0.78		
15	QUERUB	-0.20		
16	SAMRAC	0.41	0.22	0.19
17	SH	-0.06	-0.06	0.00
18	sigma_pop	0.35	0.34	0.00
19	sigma_sp	1.03	1.10	-0.07
20	sigma_y	0.94	0.94	-0.00
21	SORAME	-0.72	-0.91	0.19
22	SPIALB	-0.18	-0.38	0.20
23	SPITOM	-0.63	-0.83	0.20
24	VACMYR	-0.90		
25	VIBCAS	-0.39	-0.59	0.20
26	WM	0.07	0.07	0.00
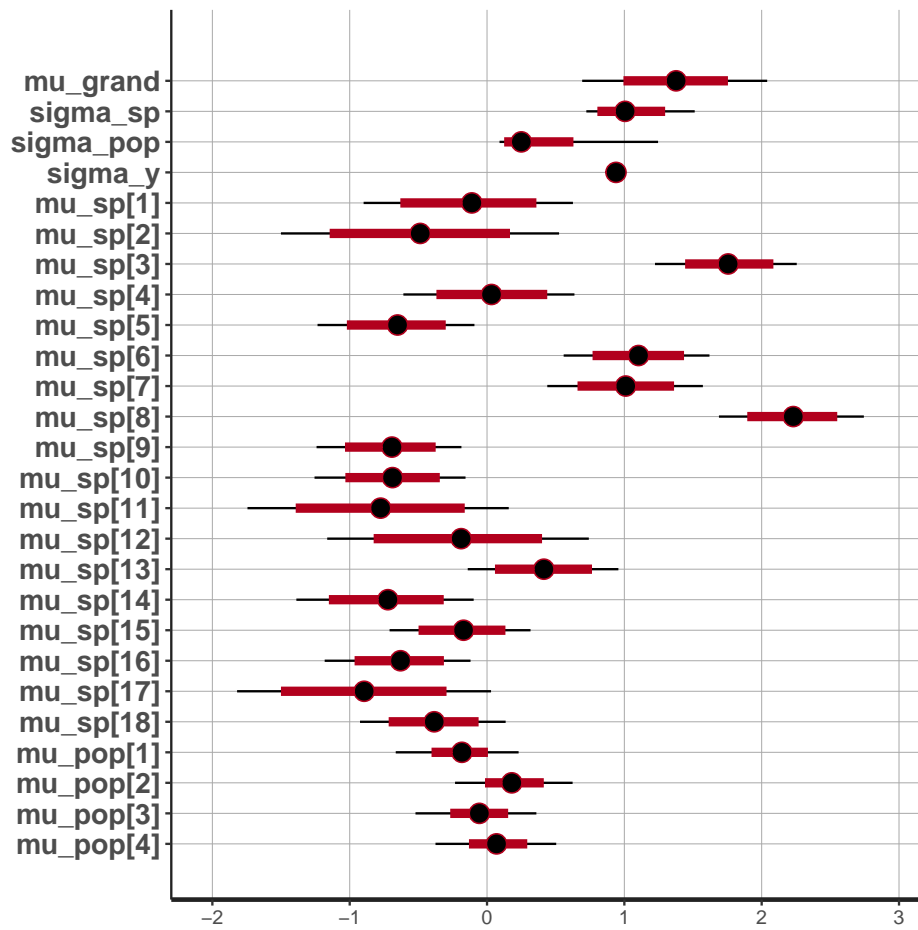
40

0.1   Height - only species alive by 2022

41

42   1. variation due to species is still much greater than pop

43   2. population level estimates are similar to the full species model

44   3. Species level estimates are quite different

45
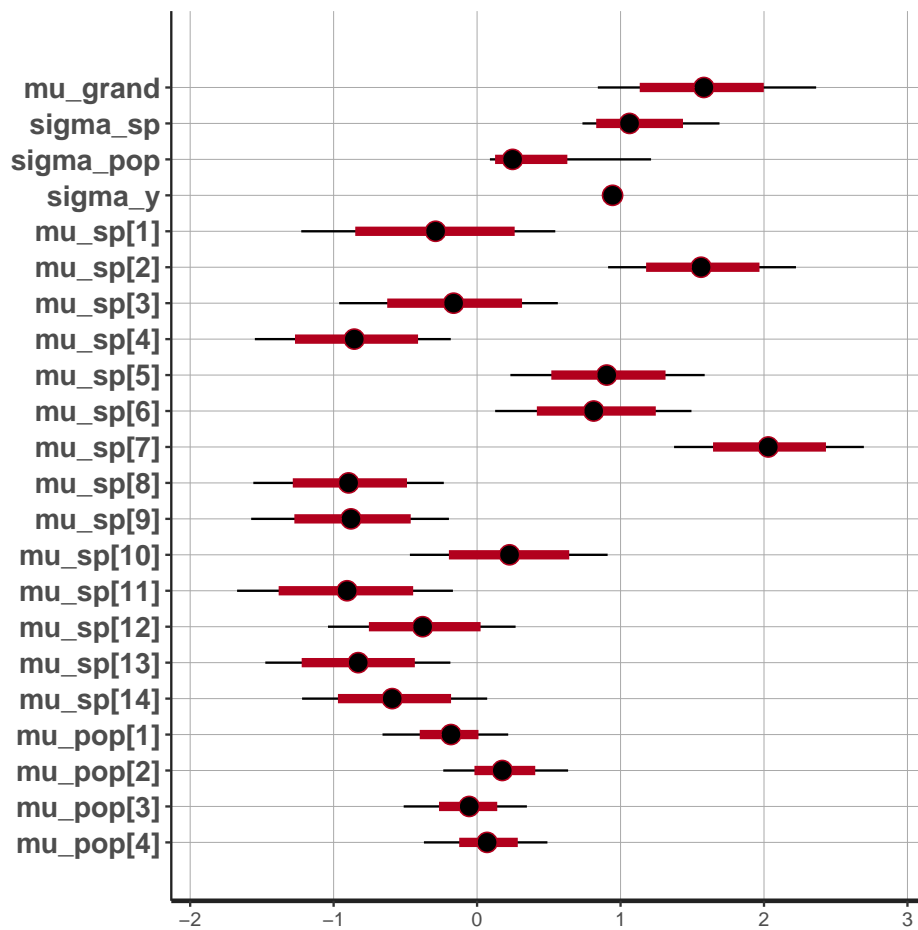
Stem specific density - only species alive by 2022

1. variation due to species (0.09, 50% UI: 0.07, 0.10) is greater than pop (0.01, 50% UI: 0.00, 0.01); but values are very small

2. Population estimates are essentailly 0 (Harvard Forest: 0.00, 50% UI: 0.00, 0.01; Grant: 0.00, 50% UI: 0.00, 0.00; White Mountain: 0.00, 50% UI: 0.00, 0.00; St.Hippolyte: 0.00, 50% UI: -0.01, 0.00)

3. Very weak effects across species relative to other species

4. More of a divide, mostly shrubs are negative, trees are positive, but estimates are small

Table 4: Summary of the intercept only model for plant SSD in 2022 (n = 240) with species (n = 12) and population (n = 4).

|	mean	25%	75%	n_eff	Rhat
alpha	0.44	0.42	0.45	378.00	1.01
ALNINC	-0.02	-0.04	-0.00	425.22	1.01
AMECAN	0.08	0.05	0.10	676.62	1.01
AROMEL	0.07	0.05	0.09	489.93	1.01
BETALL	0.03	0.02	0.05	453.54	1.01
BETPAP	0.04	0.02	0.06	560.61	1.01
BETPOP	0.06	0.04	0.07	459.13	1.01
DIELON	-0.12	-0.14	-0.10	469.54	1.01
MYRGAL	-0.07	-0.08	-0.05	493.18	1.01
SAMRAC	-0.14	-0.16	-0.12	510.04	1.01
SPIALB	-0.00	-0.02	0.02	429.45	1.01
SPITOM	0.02	0.00	0.04	475.36	1.01
VIBCAS	0.06	0.04	0.08	446.64	1.01
GR	0.00	-0.00	0.00	724.72	1.01
HF	0.00	-0.00	0.01	719.06	1.00
SH	-0.00	-0.01	0.00	700.47	1.01
WM	-0.00	-0.00	0.00	738.87	1.01
sigma_a_sp	0.09	0.07	0.10	1071.28	1.00
sigma_a_pop	0.01	0.00	0.01	559.24	1.00
sigma_y	0.06	0.06	0.06	1727.99	1.00

54
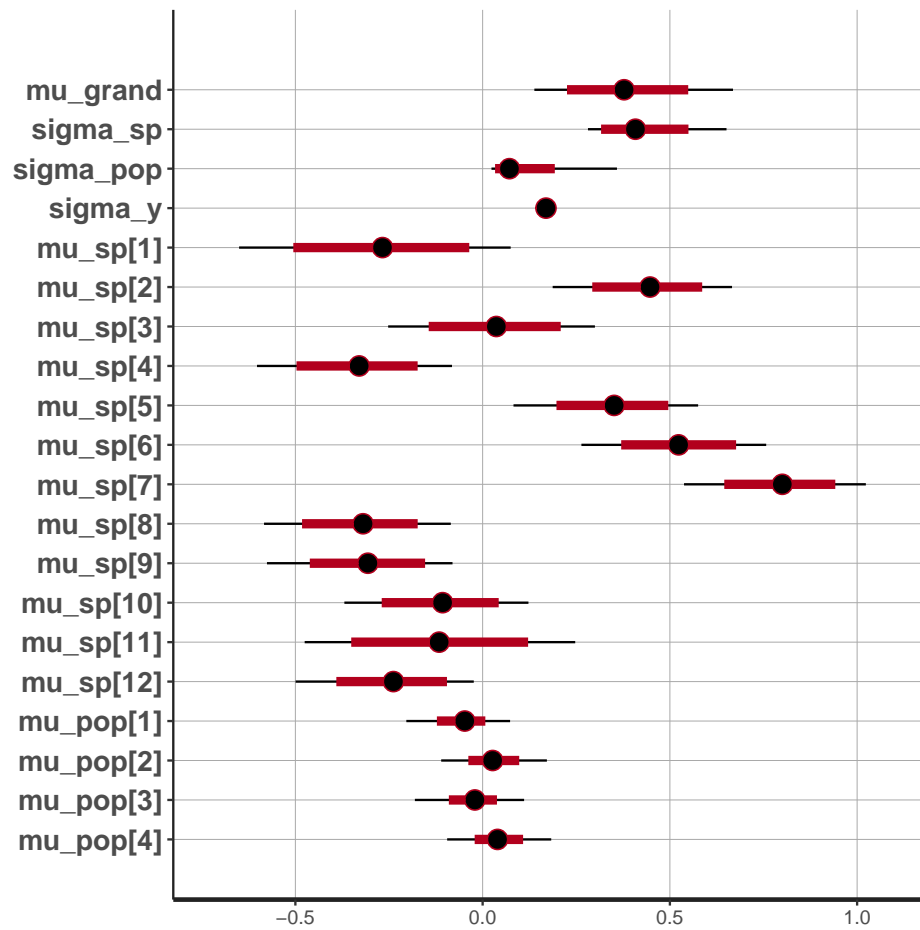
55 Relative Growth Rate - only species alive by 2022

56   1. Variation due to species is much greater than pop, about four times

57   2. The two southern sites are positive, but two more northern sites are negative

58   3. Again Grant has a more negative effect that St. Hippolyte, but effect sizes are small across
59   populations

60   4. There might be some divide, with shrubs having negative estimates, but there are not many trees
61   in this dataset (which excludes any indiviudal that had negative growth over the years)

Table 5: Summary of the intercept only model for plant relative growth rate averaged over 3 years (n = 222) with species (n = 12) and population (n = 4). For this analysis I excluded any individual that had negative growth rates.

|	mean	25%	75%	n_eff	Rhat
alpha	0.38	0.30	0.47	565.01	1.01
ACEPEN	-0.27	-0.39	-0.14	1245.20	1.00
ALNINC	0.44	0.37	0.52	637.41	1.01
AMECAN	0.03	-0.06	0.12	840.24	1.01
AROMEL	-0.33	-0.41	-0.25	715.29	1.01
BETALL	0.35	0.27	0.43	648.92	1.01
BETPAP	0.52	0.44	0.60	692.55	1.01
BETPOP	0.80	0.72	0.88	644.22	1.01
DIELON	-0.32	-0.40	-0.24	677.06	1.01
MYRGAL	-0.31	-0.39	-0.22	673.49	1.01
SAMRAC	-0.11	-0.19	-0.03	697.58	1.01
SORAME	-0.11	-0.24	0.02	1326.93	1.00
SPIALB	-0.24	-0.31	-0.16	622.07	1.01
SPITOM	-0.29	-0.37	-0.21	656.81	1.01
VIBCAS	-0.24	-0.31	-0.16	645.10	1.01
GR	-0.05	-0.08	-0.02	542.18	1.01
HF	0.03	-0.00	0.06	552.77	1.00
SH	-0.02	-0.05	0.01	547.36	1.01
WM	0.04	0.01	0.07	531.84	1.01
sigma_a_sp	0.42	0.36	0.47	2254.62	1.00
sigma_a_pop	0.10	0.05	0.11	681.82	1.00
sigma_y	0.17	0.16	0.18	2568.16	1.00
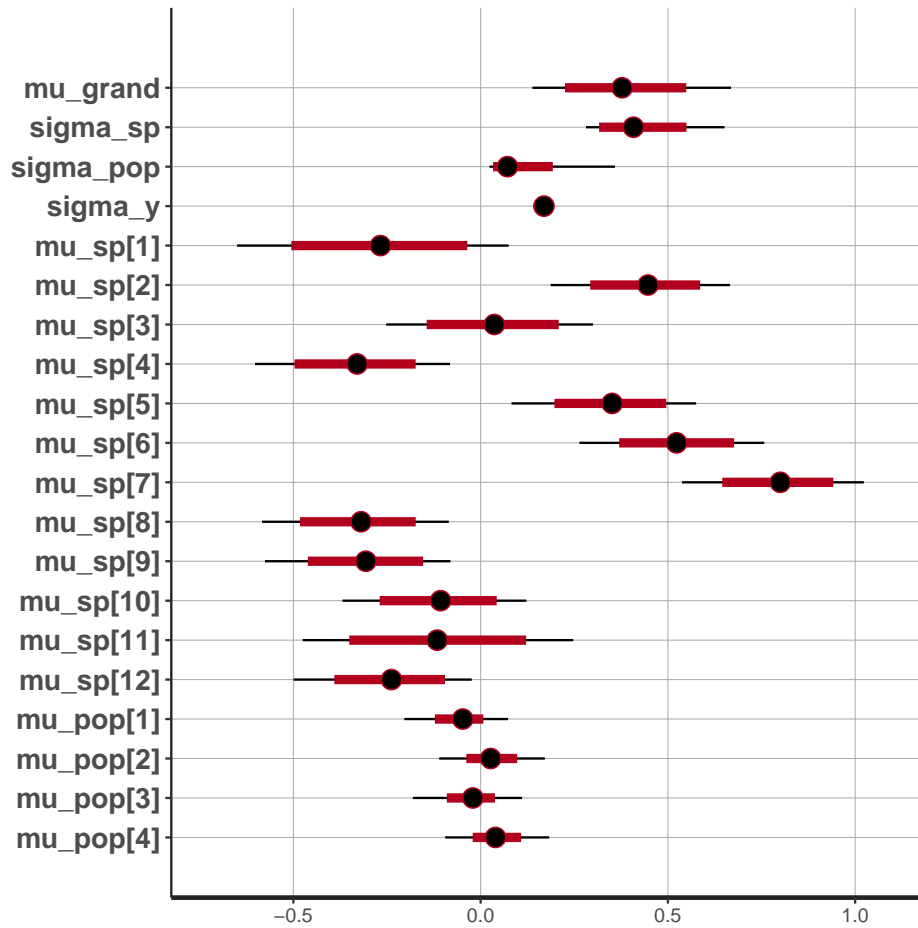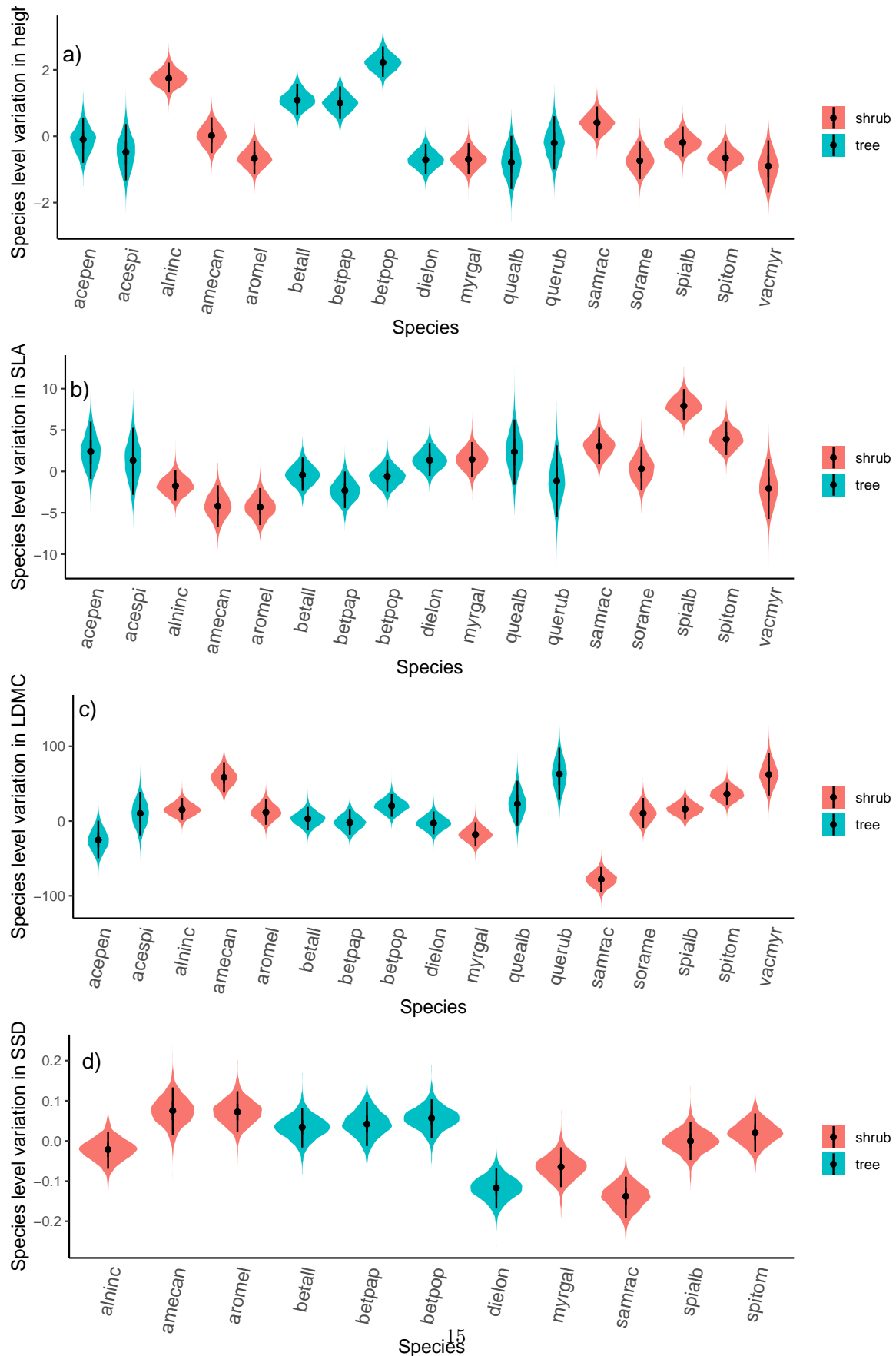
Figure 2: Species-level variation ($\mu_s p$) across traits: (a) height, (b) Specific leaf area, (c) Leaf dry matter content, (d) Specific stem density. Species are coloured by their architecture, with shrub species shown in red and trees in blue.