Oikos

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Appendix 1

Table A1. Number of plants for which the stage of reproductive development at the time of butterfly flight and incidences of oviposition were recorded for each region, species and year.

Region	Species	No. of plants 2010	No. of plants 2011	No. of plants 2012	No. of plants 2013
Uppland	*Arabis glabra*	379	202	151	111
Ångermanland	*Arabis glabra*	62	5	110	12
Skåne	*Arabis hirsuta*	639	686	363	393
Uppland	*Arabis hirsuta*	263	465	296	350
Skåne	*Cardamine pratensis*	655	1098	588	546
Uppland	*Cardamine pratensis*	791	1132	603	598
Ångermanland	*Cardamine pratensis*	704	441	394	292
Skåne	*Arabidopsis thaliana*	446	664	315	304
Uppland	*Arabidopsis thaliana*	448	551	522	443
Ångermanland	*Arabidopsis thaliana*	427	301	358	114
Skåne	*Capsella bursa-pastoris*	395	429	319	223
Uppland	*Capsella bursa-pastoris*	338	456	425	107
Ångermanland	*Capsella bursa-pastoris*	157	264	210	172
Uppland	*Thlaspi caerulescens*	180	204	164	229
Ångermanland	*Thlaspi caerulescens*	373	373	317	376

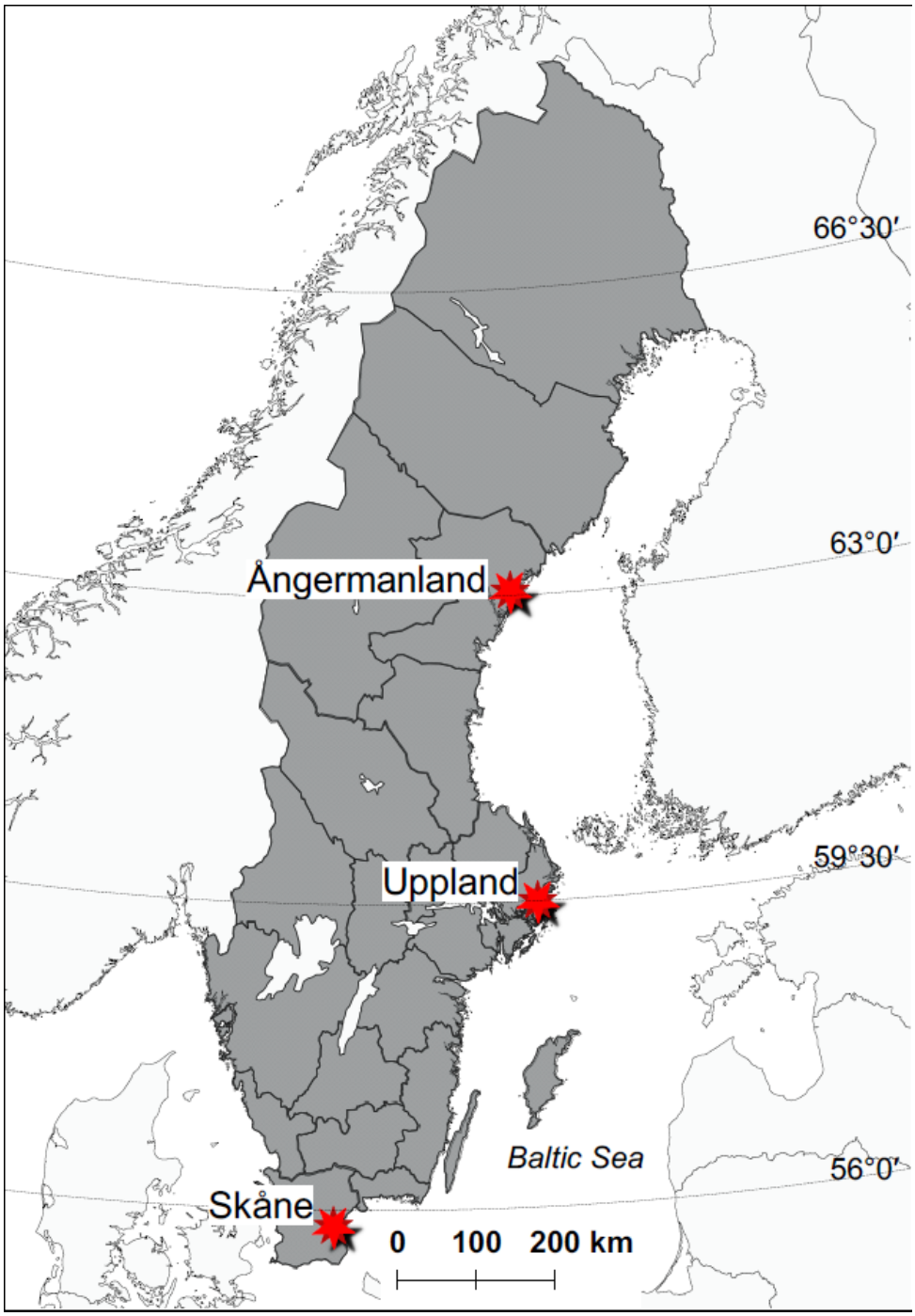

Figure A1. Map of Sweden with the three study regions marked by stars.

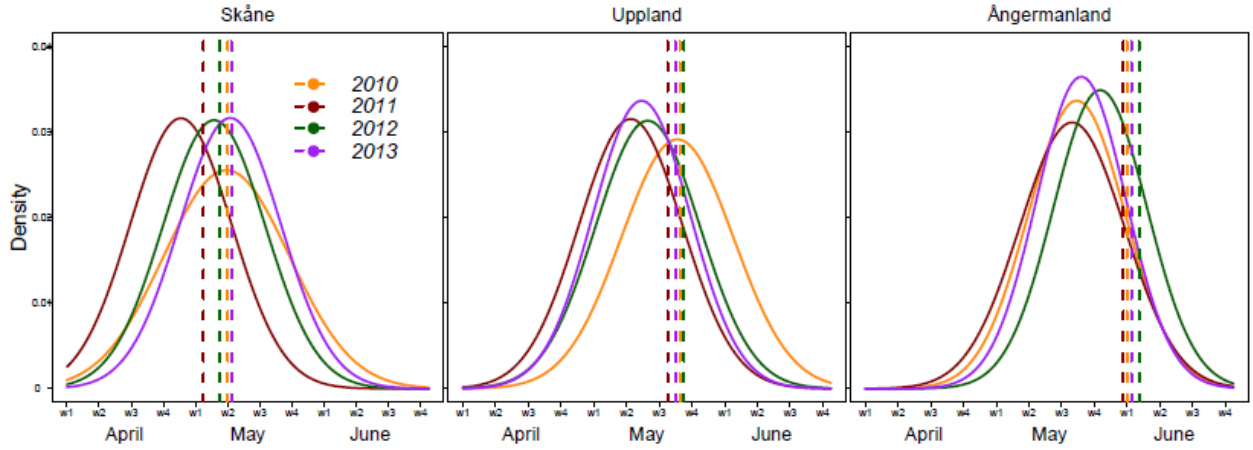

Figure A2. *A. cardamines* flight time distribution in three sampled regions (Skåne, Uppland and Ångermanland) and during four years (2010–2013). Density is the probability density, i.e. the proportion of all observations during a season occurring at a given date. Curves are observations fitted to a Gaussian curve. Data are from the Swedish Species Observation System data base 'Artportalen'. The dashed vertical lines indicate the mean date of the field surveys in each of the four years.

Appendix 2

Table A1. Population mean deviation from the development stage most preferred by the butterfly *Anthocharis cardamines* for oviposition (mean and range).

	Population deviation: mean (range)
All species pooled	-0.294 (-0.782 - 0.156)
Cardamine pratensis	-0.089 (-0.476- 0.104)
Arabis hirsuta	-0.030 (-0.247 - 0.156)
Capsella bursa-pastoris	-0.285 (-0.504 - -0.068)
Arabis glabra	-0.320 (-0.500 - -0.055)
Arabidopsis thaliana	-0.606 (-0.760 - -0.294)
Thlaspi caerulescens	-0.741 (-0.781 - -0.703)

Table A2. Oviposition probability by *A. cardamines* as a function of individual and mean deviation and inflorescence height for each of six host plant species. In some species, the interaction between individual and mean deviations was removed as a result of model selection (based on likelihood-ratio test and Akaike information criteria).

Plant species	Parameter	Estimate	SE	p
C. pratensis	Intercept	-3.13	0.38	**<0.0001**
	Individual deviation	-2.58	0.35	**<0.0001**
	Mean deviation	0.13	0.78	0.86
	Inflorescence height	0.91	0.05	**<0.0001**
	Individual deviation × Mean deviation	-6.12	1.79	**0.0006**
A. hirsuta	Intercept	-3.51	0.74	**<0.0001**
	Individual deviation	-2.41	0.42	**<0.0001**
	Mean deviation	2.06	0.47	0.16
	Inflorescence height	1.30	0.10	**<0.0001**
	Individual deviation × Mean deviation	-6.45	3.12	**0.03**
C. bursa-pastoris	Intercept	-3.77	0.72	**<0.0001**
	Individual deviation	-0.64	1.97	0.74
	Mean deviation	5.16	1.87	**0.005**
	Inflorescence height	1.26	0.11	**<0.0001**
	Individual deviation × Mean deviation	-15.81	6.94	**0.02**
A. glabra	Intercept	-2.62	1.12	**0.01**
	Individual deviation	0.46	0.40	0.25
	Mean deviation	-4.44	2.68	0.09
	Inflorescence height	0.32	0.10	**0.002**
A. thaliana	Intercept	-11.7	2.21	**<0.0001**
	Individual deviation	0.51	0.63	0.42
	Mean deviation	-9.72	2.86	**0.0006**
	Inflorescence height	1.31	0.09	**<0.0001**
T. caerulescens	Intercept	25.8	7.73	**0.0008**
	Individual deviation	-0.77	0.82	0.34
	Mean deviation	40.6	10.54	**0.0001**
	Inflorescence height	0.43	0.09	**<0.0001**

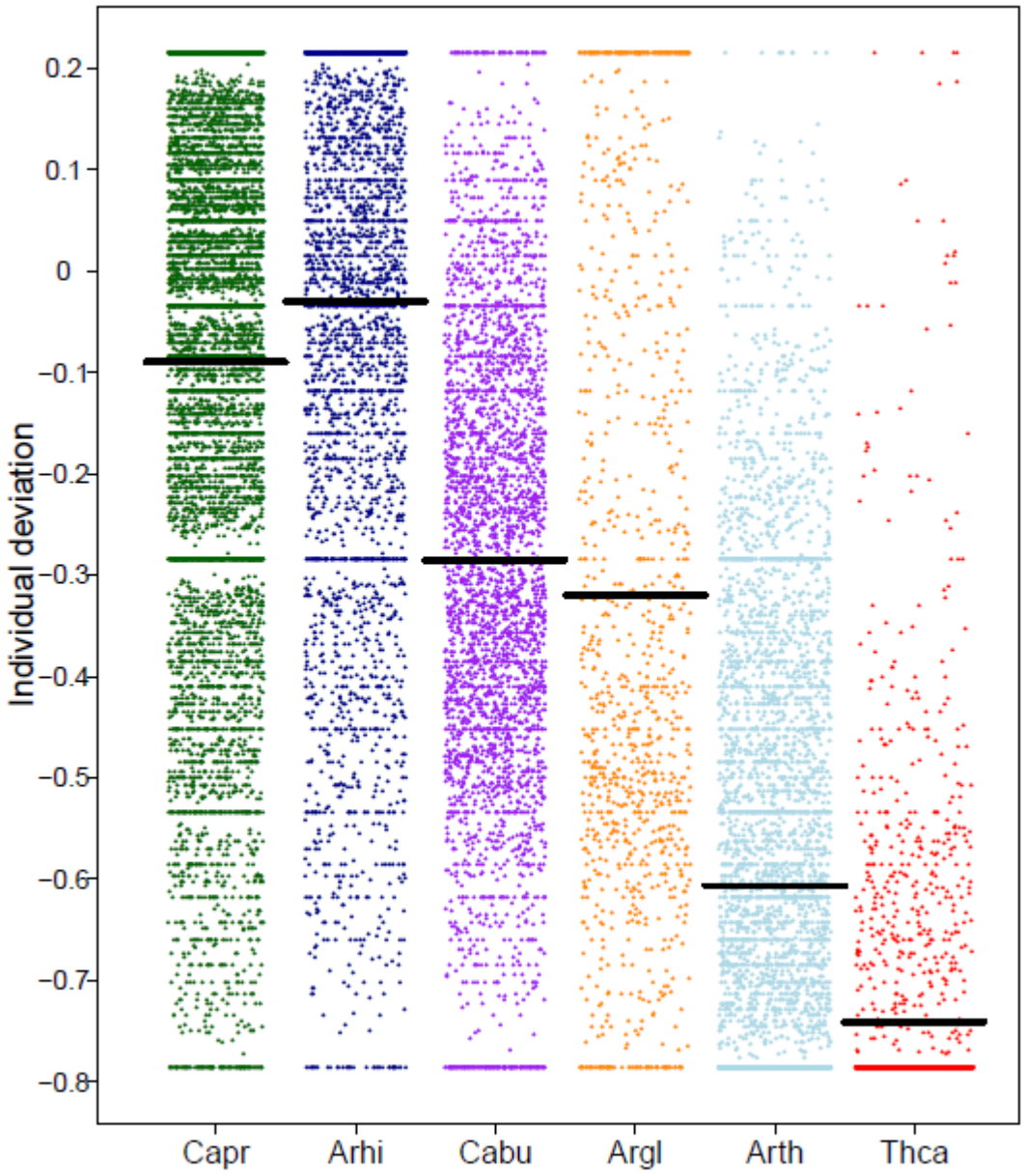

Figure A1. Individual deviations from the development stage most preferred by the butterfly *Anthocharis cardamines* for six host plant species. Each point represent one plant individual and data is pooled for three regions and four years. Black lines represent the averages. Capr – *Cardamine pratensis*, Arhi – *Arabis hirsuta*, Cabu – *Capsella bursa-pastoris,* Argl – *Arabis glabra*, Arth – *Arabidopsis thaliana*, Thca – *Thlaspi caerulescens*

Table A3. Oviposition probability by *A. cardamines* in the field as a function of plant individual deviation (centred on a mean deviation) from the preferred developmental stage, mean deviation from the preferred stage for each combination of species × region × year, and inflorescence height (standardized). The model includes host plant species and its interactions with mean deviation and individual deviation. Here are the model estimates of the model results shown in Table 2(b).

Parameter	Estimate	SE	p
Intercept	-3.11	0.52	**<0.0001**
Individual deviation	0.21	1.02	0.83
Mean deviation	-1.83	1.10	0.096
Inflorescence height	0.90	0.03	**<0.0001**
Species *A. hirsuta*	-0.57	0.38	0.13
Species *A. thaliana*	-0.29	0.73	0.69
Species *C. bursa-pastoris*	0.08	0.54	0.88
Species *C. pratensis*	0.51	0.39	0.18
Species *T. caerulescens*	15.6	3.69	**<0.0001**
Individual deviation × Mean deviation	-3.83	2.98	0.19
Mean deviation × Species *A. hirsuta*	0.35	1.33	0.79
Mean deviation × Species *A. thaliana*	4.06	1.51	**0.007**
Mean deviation × Species *C. bursa-pastoris*	6.63	1.84	**0.0003**
Mean deviation × Species *C. pratensis*	3.64	1.25	**0.003**
Mean deviation × Species *T. caerulescens*	24.8	5.20	**<0.0001**
Individual deviation × SpeciesArhi	-3.11	1.08	**0.0042**
Individual deviation × SpeciesArth	-3.19	3.36	0.34
Individual deviation × SpeciesCabu	-2.97	1.99	0.13
Individual deviation × SpeciesCapr	-2.64	1.07	**0.01**
Individual deviation × SpeciesThca	111.6	15.5	**<0.0001**
Individual deviation × Mean deviation × Species *A. hirsuta*	-1.94	4.03	0.62
Individual deviation × Mean deviation × Species *A. thaliana*	-2.12	6.23	0.73
Individual deviation × Mean deviation × Species *C. bursa-pastoris*	-18.2	6.90	**0.008**
Individual deviation × Mean deviation × Species *C. pratensis*	-2.06	3.40	0.54
Individual deviation × Mean deviation × Species *T. caerulescens*	161.4	21.7	0.62