

Manuscript 53345: “The predictive adaptive response: modeling the life history of *Bicyclus anyana*, in seasonal environments”

Supplement Tables S1, S2 and Figures S1, S2, S3

Figure Legends

Figure S1. Seasonal variation in proportion of good patches (red) and in temperature (blue). The panel below indicates the season, and the line represents the proportion of good patches in each time step (numbers in x-axes).

Figure S2. Size at the start of pupation in good (A) and bad (B) habitat patches. The x-axis indicates time steps in days in the wet (1st & 2nd generation) and dry (3rd generation) seasons.

Figure S3. Mean (\pm sd, over one simulation) allocation to fat, abdomen and thorax in absolute (above) and relative terms (below). In every panel the 1st, 2nd, and 3rd generations are shown. Green and brown bars represent individuals from good and bad patches, respectively.

Tables

Table S1. Environmental variation. For every day the temperature and proportion of good patches are shown. The proportion of bad patches is equal to one minus the proportion of good patches.

Day	Temperature	Proportion good patches
1	20.0448	0
2	20.0682	0
3	20.0605	0
4	20.0398	0
5	20.0125	0
6	19.9815	0
7	19.9485	0
8	19.9142	0
9	19.8791	0
10	19.8434	0
11	19.8073	0
12	19.7709	0
13	19.7342	0
14	19.6972	0
15	19.6599	0
16	19.6223	0
17	19.5843	0
18	19.5458	0
19	19.5069	0
20	19.4674	0
21	19.4272	0
22	19.3865	0
23	19.345	0
24	19.3027	0
25	19.2597	0
26	19.2157	0
27	19.1709	0
28	19.1251	0
29	19.0783	0
30	19.0305	0
31	18.9817	0
32	18.9319	0
33	18.881	0
34	18.829	0
35	18.776	0
36	18.7219	0
37	18.6668	0
38	18.6107	0
39	18.5536	0
40	18.4956	0
41	18.4367	0
42	18.3769	0
43	18.3163	0
44	18.255	0
45	18.193	0
46	18.1304	0
47	18.0673	0
48	18.0037	0
49	17.9398	0
50	17.8756	0
51	17.8113	0

52	17.7469	0
53	17.6825	0
54	17.6182	0
55	17.5542	0
56	17.4905	0
57	17.4273	0
58	17.3647	0
59	17.3028	0
60	17.2416	0
61	17.1814	0
62	17.1222	0
63	17.0641	0
64	17.0072	0
65	16.9517	0
66	16.8977	0
67	16.8453	0
68	16.7945	0
69	16.7455	0
70	16.6984	0
71	16.6532	0
72	16.6102	0
73	16.5693	0
74	16.5306	0
75	16.4943	0
76	16.4604	0
77	16.429	0
78	16.4002	0
79	16.3741	0
80	16.3507	0
81	16.3301	0
82	16.3123	0
83	16.2975	0
84	16.2856	0
85	16.2769	0
86	16.2711	0
87	16.2686	0
88	16.2692	0
89	16.2731	0
90	16.2802	0
91	16.2906	0
92	16.3044	0
93	16.3215	0
94	16.3421	0
95	16.3661	0
96	16.3935	0
97	16.4245	0
98	16.4589	0
99	16.4968	0
100	16.5382	0
101	16.5832	0
102	16.6317	0
103	16.6838	0
104	16.7393	0
105	16.7985	0
106	16.8611	0
107	16.9273	0
108	16.997	0
109	17.0702	0
110	17.1469	0

111	17.227	0
112	17.3106	0
113	17.3976	0
114	17.4879	0
115	17.5816	0
116	17.6787	0
117	17.7789	0
118	17.8824	0
119	17.9891	0
120	18.0989	0
121	18.2117	0
122	18.3275	0
123	18.4462	0
124	18.5678	0
125	18.6921	0
126	18.8192	0
127	18.9488	0
128	19.081	0
129	19.2156	0
130	19.3525	0
131	19.4916	0
132	19.6328	0
133	19.7761	0
134	19.9212	0
135	20.068	0
136	20.2165	0
137	20.3665	0
138	20.5178	0
139	20.6704	0
140	20.824	0
141	20.9785	0
142	21.1339	0
143	21.2898	0
144	21.4463	0
145	21.603	0
146	21.7599	0
147	21.9169	0
148	22.0736	0
149	22.2301	0
150	22.386	0
151	22.5413	0
152	22.6958	0
153	22.8494	0
154	23.0018	0
155	23.1529	0
156	23.3026	0
157	23.4508	0
158	23.5972	0
159	23.7418	0
160	23.8843	0
161	24.0248	0
162	24.163	0
163	24.2988	0
164	24.4321	0
165	24.5629	0
166	24.6909	0
167	24.8162	0.000945
168	24.9386	0.002282
169	25.0581	0.004024

170	25.1746	0.006192
171	25.288	0.00881
172	25.3983	0.01191
173	25.5054	0.015529
174	25.6093	0.019711
175	25.71	0.024508
176	25.8074	0.029983
177	25.9016	0.036209
178	25.9925	0.043268
179	26.0801	0.051259
180	26.1645	0.060297
181	26.2456	0.070515
182	26.3236	0.082068
183	26.3983	0.095135
184	26.4699	0.109928
185	26.5383	0.126692
186	26.6037	0.144389
187	26.6661	0.163024
188	26.7255	0.182597
189	26.7821	0.203104
190	26.8357	0.224533
191	26.8867	0.246866
192	26.9349	0.27008
193	26.9804	0.294144
194	27.0235	0.319018
195	27.064	0.344657
196	27.1021	0.371008
197	27.1379	0.398008
198	27.1715	0.42559
199	27.2029	0.453676
200	27.2321	0.482182
201	27.2594	0.511017
202	27.2847	0.540082
203	27.3081	0.569274
204	27.3297	0.598481
205	27.3496	0.627587
206	27.3679	0.656471
207	27.3845	0.685008
208	27.3997	0.713071
209	27.4133	0.740529
210	27.4256	0.767251
211	27.4365	0.793104
212	27.4461	0.817957
213	27.4545	0.841682
214	27.4617	0.864151
215	27.4677	0.885241
216	27.4727	0.904836
217	27.4766	0.922825
218	27.4794	0.939102
219	27.4813	0.953573
220	27.4822	0.96615
221	27.4821	0.976757
222	27.4811	0.985327
223	27.4793	0.991806
224	27.4766	0.996151
225	27.473	0.998333
226	27.4685	0.998333
227	27.4632	0.998333
228	27.4571	0.998333

229	27.4501	0.99724
230	27.4423	0.996148
231	27.4337	0.995057
232	27.4243	0.993968
233	27.414	0.992879
234	27.4029	0.991792
235	27.3909	0.990706
236	27.378	0.98962
237	27.3643	0.988536
238	27.3497	0.987453
239	27.3341	0.986371
240	27.3177	0.98529
241	27.3003	0.984211
242	27.282	0.983132
243	27.2627	0.982054
244	27.2424	0.980978
245	27.2211	0.979902
246	27.1987	0.978828
247	27.1753	0.977754
248	27.1509	0.976682
249	27.1253	0.97454
250	27.0987	0.972402
251	27.0709	0.970268
252	27.042	0.967073
253	27.0119	0.963889
254	26.9807	0.959655
255	26.9482	0.954384
256	26.9146	0.948091
257	26.8798	0.940792
258	26.8437	0.93251
259	26.8064	0.923267
260	26.7678	0.913089
261	26.728	0.90402
262	26.6869	0.896032
263	26.6446	0.884688
264	26.6011	0.875328
265	26.5562	0.871054
266	26.5102	0.866779
267	26.4628	0.862505
268	26.4143	0.858231
269	26.3645	0.853957
270	26.3135	0.849683
271	26.2613	0.845409
272	26.2079	0.841135
273	26.1534	0.836861
274	26.0978	0.832587
275	26.041	0.828313
276	25.9832	0.824039
277	25.9243	0.819765
278	25.8644	0.815491
279	25.8036	0.811217
280	25.7418	0.806943
281	25.6791	0.802669
282	25.6155	0.798395
283	25.5512	0.794121
284	25.4862	0.789847
285	25.4204	0.785573
286	25.354	0.781299
287	25.287	0.777025

288	25.2195	0.772751
289	25.1516	0.768477
290	25.0832	0.764203
291	25.0145	0.759929
292	24.9456	0.755655
293	24.8765	0.75138
294	24.8072	0.747106
295	24.7379	0.742832
296	24.6687	0.738558
297	24.5995	0.734284
298	24.5305	0.73001
299	24.4618	0.725736
300	24.3933	0.721462
301	24.3253	0.717188
302	24.2577	0.712914
303	24.1907	0.70864
304	24.1242	0.704366
305	24.0584	0.700092
306	23.9934	0.695818
307	23.9292	0.691544
308	23.8658	0.68727
309	23.8033	0.682996
310	23.7418	0.678722
311	23.6812	0.674448
312	23.6218	0.670174
313	23.5634	0.6659
314	23.506	0.661626
315	23.4499	0.657352
316	23.3948	0.653078
317	23.3409	0.648592
318	23.2881	0.643762
319	23.2364	0.638594
320	23.1858	0.633096
321	23.1363	0.627275
322	23.0878	0.621139
323	23.0402	0.614698
324	22.9936	0.607961
325	22.9477	0.600936
326	22.9026	0.593634
327	22.8581	0.586064
328	22.8141	0.578238
329	22.7705	0.570164
330	22.7271	0.561856
331	22.6839	0.553323
332	22.6406	0.544577
333	22.597	0.53563
334	22.5531	0.526493
335	22.5086	0.517178
336	22.4633	0.507696
337	22.4171	0.498061
338	22.3697	0.488283
339	22.3209	0.47721
340	22.2706	0.465776
341	22.2185	0.454009
342	22.1645	0.441942
343	22.1083	0.429603
344	22.0498	0.417024
345	21.9887	0.404236
346	21.925	0.391268

347	21.8585	0.378152
348	21.7891	0.358303
349	21.7167	0.338454
350	21.6411	0.318606
351	21.5624	0.298757
352	21.4804	0.278908
353	21.3953	0.259059
354	21.3069	0.239211
355	21.2155	0.219362
356	21.1209	0.199513
357	21.0234	0.179664
358	20.923	0.159815
359	20.82	0.139967
360	20.7145	0.120118
361	20.6067	0.100269
362	20.4969	0.08042
363	20.3853	0.060572
364	20.2722	0.040723
365	20.1579	0.020874
366	20.0428	0.001025

Table S2. List of traits with their minima, maxima, and number of steps for the larval, pupal and adult stage.

Larval stage			
Trait	Minimum	Maximum	Number of steps
Weight	1	290	500
Pupal stage			
Trait	Minimum	Maximum	Number of steps
Weight	65	300	42
Development time	0	540	55
Adult stage			
Traits	Minimum	Maximum	Number of steps
Weight fat storage	0	147.5	60
Weight abdomen	0	110	12
Weight thorax	0	12	3
Ageing	0	197.5	80

Figures

Figure S1.

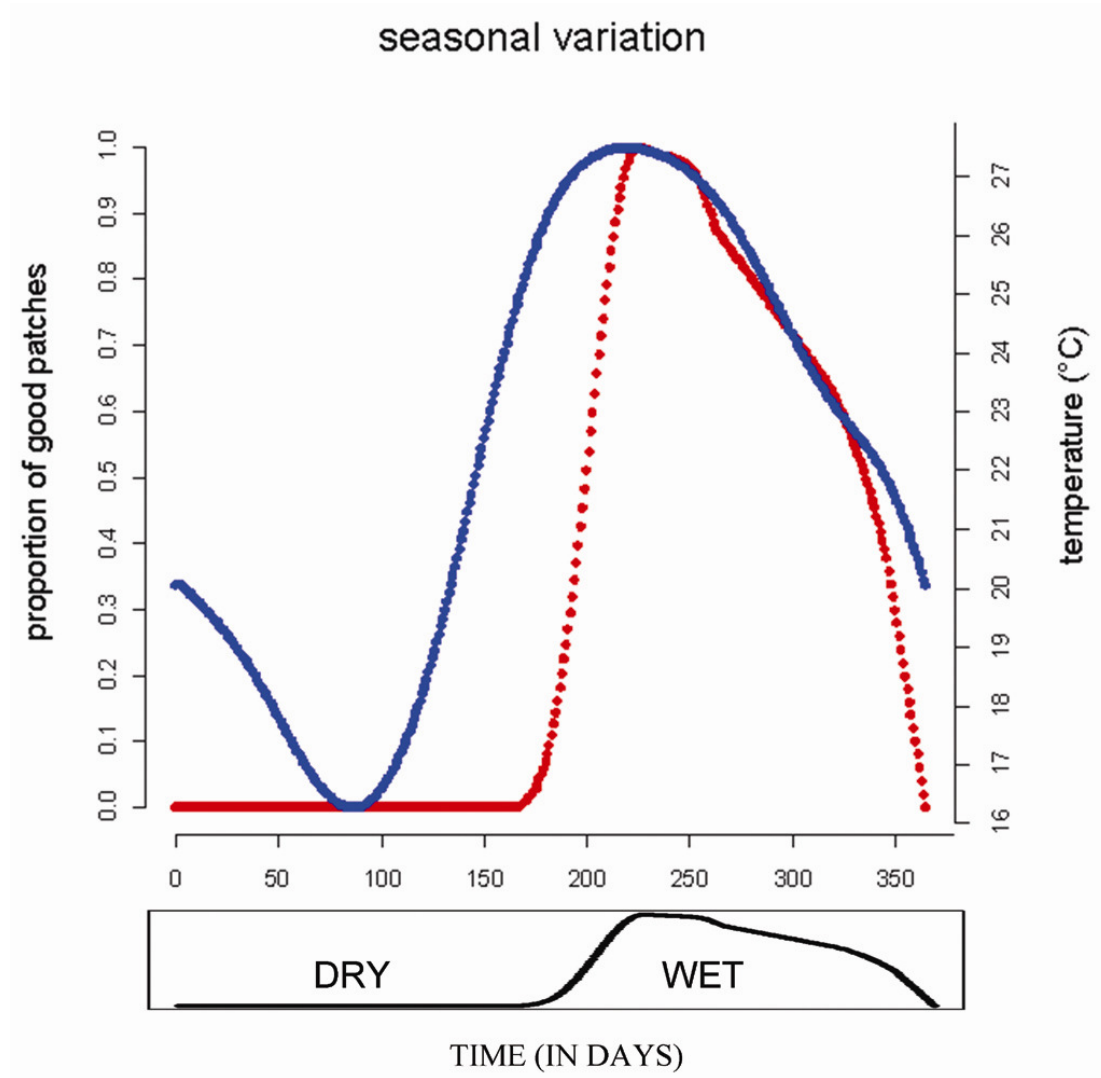


Figure S2.

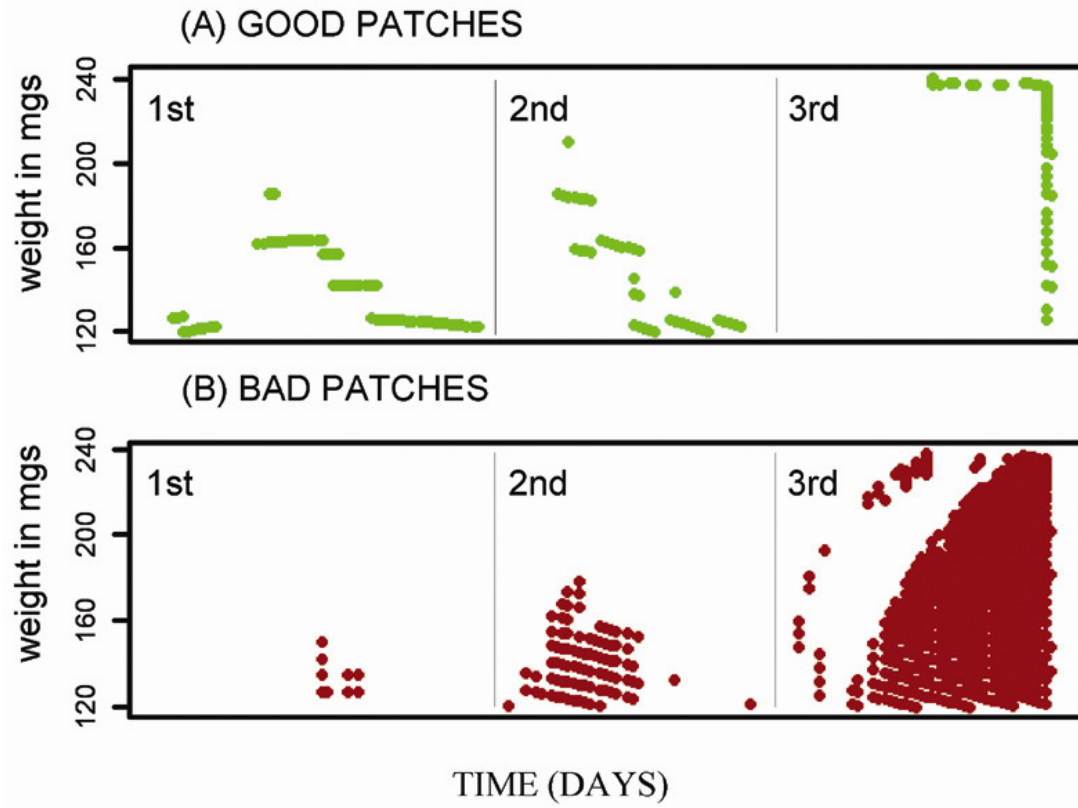


Figure S3.

