Table S1. Backward model selection procedure for sub-quadrat level analyses. We sequentially removed single terms from the full model until the simplest model that maximised the probability of the observed data was found for the probability of a piggy transitioning to a rock attached limpet as well as the probability of a rock-attached limpet being a host or non-host. Abbreviations: SL (shell length), RAN (rock-attached number), RASL (rock-attached shell length), PN (piggy number), PSL (piggy shell length), R (availability of rock), L (location), S (site), Q (quadrat), SQ (subquadrat).

Model no.	**Model terms**
Model 1: Full model including random effects	Y = SL + RAN + RASL + PN + PSL + R + SL×RAN + SL×RASL + SL×PSL + SL× PN + SL×R + L + S + Q + SQ
Random effects models 2a-d: Does the probability of being a pig or a host vary among:	
a) locations (L),	Y = SL + RAN + RASL + PN + PSL + R + SL×RAN + SL×RASL + SL×PSL + SL× PN + SL×R + S + Q + SQ
b) sites nested within locations (S),	Y = SL + RAN + RASL + PN + PSL + R + SL×RAN + SL×RASL + SL×PSL + SL× PN + SL×R + L + Q + SQ
c) quadrats nested within sites (Q) or	Y = SL + RAN + RASL + PN + PSL + R + SL×RAN + SL×RASL + SL×PSL + SL× PN + SL×R + L + S + SQ
d) sub-quadrats nested within quadrats (SQ)	Y = SL + RAN + RASL + PN + PSL + R + SL×RAN + SL×RASL + SL×PSL + SL× PN + SL×R + L + S + Q
Fixed effects models 3a-e:	
Does the relationship between shell length (SL) and the probability of being a pig or the probability of hosting vary depending on:	
a) availability of rock (SL×R),	Y = SL + RAN + RASL + PN + PSL + R + SL×RAN + SL×RASL + SL×PSL + SL× PN + *random effects*
b) piggy number (SL×PN),	
c) piggy shell length (SL×PSL),	Y = SL + RAN + RASL + PN + PSL + R + SL×RAN + SL×RASL + SL×PSL + SL×R + *random effects*

d) host shell length (SL×RASL) or	Y = SL + RAN + RASL + PN + PSL + R + SL×RAN + SL×RASL + SL× PN + SL×R + *random effects*
e) host number (SL×RAN)	Y = SL + RAN + RASL + PN + PSL + R + SL×RAN + SL×PSL + SL× PN + SL×R + *random effects*
	Y = SL + RAN + RASL + PN + PSL + R + SL×RASL + SL×PSL + SL× PN + SL×R + *random effects*
Best supported model for probability of being a piggy-backing limpet	Y = SL + RAN + RASL + PSL + SL×RASL + SL×RAN + SL×PSL + *subquadrat*
Best supported model for probability of being a host limpet	Y = SL + RASL + PN + PSL + SL×RASL + SL×PN + SL×PSL + *subquadrat*

Table S2. Summary statistics of the backward model selection procedure for the subquadrat-level analyses for the probability of a rock-attached limpet transitioning into a piggy (PProb) and probability of a rock-attached limpet hosting piggies (HProb). Abbreviations: SL (shell length), RAN (rock-attached number), RASL (rock-attached shell length), PN (piggy number), PSL (piggy shell length), R (availability of rock), L (location), S (site), Q (quadrat), SQ (subquadrat).

	PProb			HProb		
	df	-LL	*P*	*df*	-LL	*P*
Model 1: Full Model	16	-210.05	-	16	-143.65	-
Model 2a: Random effects model: no L	15	-210.05	1	15	-143.65	1
Model 2b: Random effects model: no S	15	-210.05	1	15	-143.65	1
Model 2c: Random effects model: no Q	15	-210.06	1	15	-143.65	1
Model 2d: Random effects model: no SQ	15	-215.01	0.002	15	-143.67	0.840
Model 3a: (SL×R)	11	-222.66	0.073	11	-154.91	0.470
Model 3b: (SL×PN)	11	-221.95	0.179	11	-160.39	<0.001
Model 3c: (SL×PSL)	11	-228.64	<0.001	12	-158.05	0.009
Model 3d: (SL×RASL)	11	-231.84	<0.001	11	-157.67	0.014
Model 3e: (SL×RAN)	11	-226.09	0.002	11	-154.94	0.453

Table S3. Total and partial R^2 values for the fixed effects included in our best model (see Supp. Table 1, Supp. Table 2) Abbreviations: SL (shell length), RAN (rock-attached number), RASL (rock-attached shell length), PSL (piggy shell length), R (availability of rock).

Fixed effects	**R^2**
Full model	0.391
SL	0.278
SL×RASL	0.090
RASL	0.088
SL×PSL	0.029
SL×RAN	0.028
RAN	0.013
PSL	0.000

Table S4. Backward model selection procedure for individual-level analyses. We sequentially removed single terms from the full model until the simplest model that maximised the probability of the observed data was found for the relationship between piggy number (PN) and host size (HS), and piggy size and host number. Abbreviations: HS (host size (mm), L (location), S (site), Q (quadrat).

Model no.	**Model terms**
Model 1: Full model including random effects	Y = HS + L + S + Q
Random effects models a-c: Does the piggy number/size vary among	Y = HS + S + Q
a) locations (L)	Y = HS + L + Q
b) sites nested within locations (S)	Y = HS + L + S
c) quadrats nested within sites (Q)	
Model 3: Fixed effects models:	
Is there a relationship between host size and piggy number as well as piggy size?	Y = HS + *random effects*
Best-supported model for piggy size	Y = HS + L
Best-supported model for piggy number	Y = HS + Q

Table S5. Summary statistics of the backward model selection procedure for the individual-level analyses. Abbreviations: piggy number (PN), piggy size (PS), L (location), S (site), Q (quadrat)

	PN			PS		
	df	-LL	*P*	*df*	-LL	*P*
Model 1 Full Model	5	-192.50	-	6	-619.42	-
Model 2a Random effects model: no Q	4	-192.50	1	5	-619.48	0.719
Model 2b Random effects model: no S	4	-192.50	1	5	-619.42	1
Model 2c Random effects model: no L	4	-193.77	0.111	5	-622.09	0.021
Model 3: Fixed effects model: HS	1	-192.50	0.003	1	-615.65	<0.001

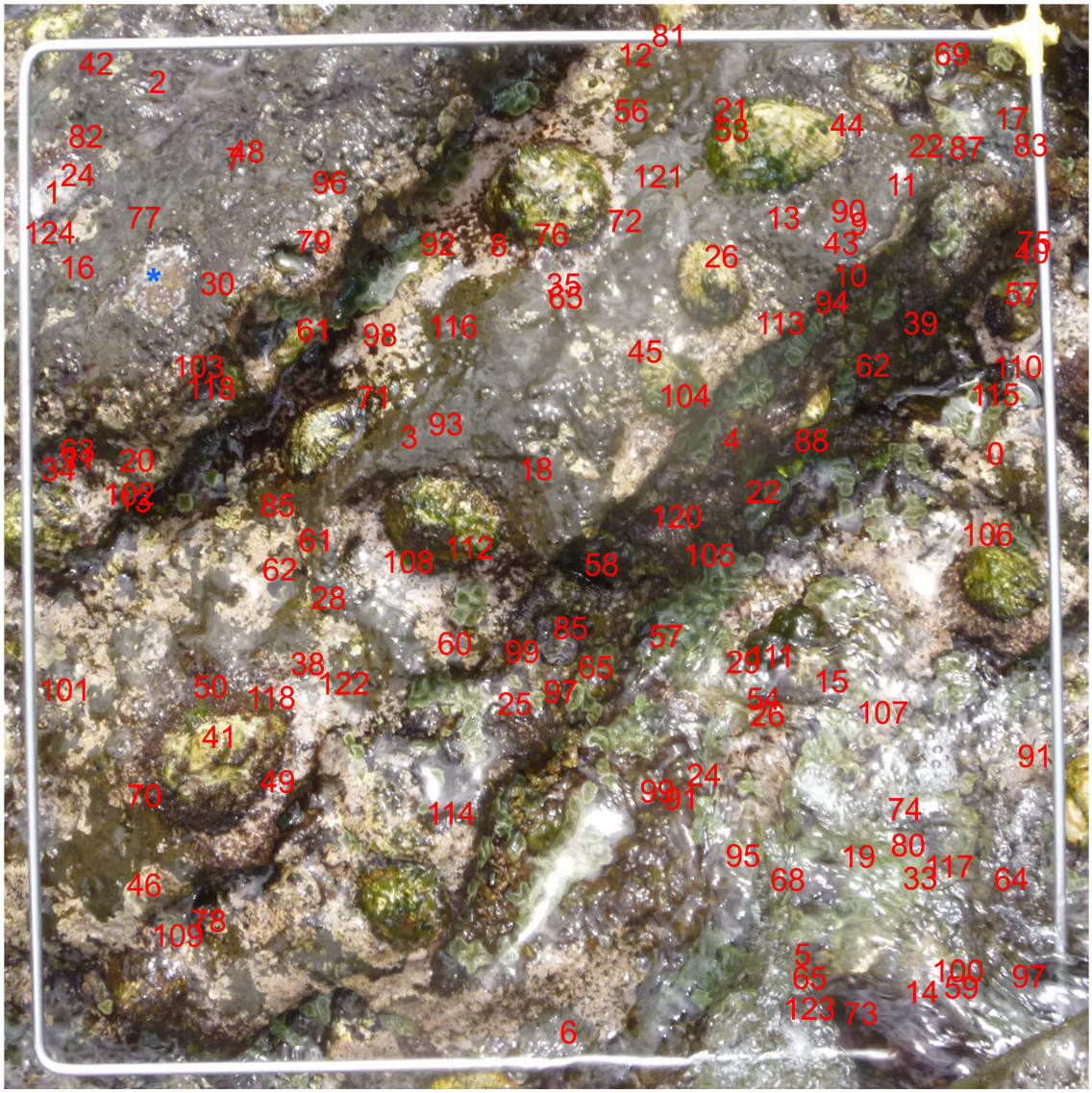

Fig. S1. Example photo of a quadrat with 125 points (red numbers) taken at Boat Cove showing a high density of limpets (the raised bumps on the rock surface) covered in epiphytic algal growth. (Photo shown at lower resolution than those used in data generation). The blue asterisk indicates a home scar for a limpet no longer attached to that site. The reasons underlying why limpets would leave their home scar are unknown, but they must have occupied the same patch for a period of weeks to months to prevent the growth of algae.