

Supplementary Tables

Supplementary Table S1: Number of samples per species and landscape in the final dataset. Details on the landscapes C, I, A and P are provided in the methods and their locations are shown in Fig. S1.

Species	C	I	A	P
<i>D. marsupialis</i>	21	10	42	31
<i>P. opossum</i>	10	0	43	15
<i>P. semispinosus</i>	94	129	136	38

Supplementary Table S2: Effects of landscape type on the gut bacterial diversity of *D. marsupialis*.

Results from generalized linear models indicating the effects of landscape type, field season and sex on alpha diversity using a) Faith's PD); b) Number of ASVs and c) Shannon diversity. Results from pairwise comparisons (Contrasts) of landscapes using d) Faith's PD; e) Number of ASVs and f) Shannon diversity. g) Results from PERMANOVA for pairwise comparisons of landscapes on beta diversity (weighted and unweighted UniFrac). SE = standard error; df = degrees of freedom.

a) Faith's PD

Coefficients:

	Estimate	SE	t value	Pr(> t)	
(Intercept)	2.99	0.07	41.51	< 2e-16	***
A	0.04	0.06	0.69	0.49	
I	0.17	0.08	2.09	0.04	*
P	-0.25	0.07	-3.5	<0.001	***
2014/15	0.12	0.07	1.82	0.07	.
2016/17	0.02	0.07	0.23	0.82	
Male	0.01	0.05	0.15	0.88	

b) Number of ASVs

Coefficients:

	Estimate	SE	t value	Pr(> t)	
(Intercept)	5.47	0.09	63.87	< 2e-16	***
A	0.08	0.07	1.05	0.3	
I	0.25	0.1	2.55	0.01	*
P	-0.26	0.09	-2.87	<0.01	**
2014/15	0.06	0.08	0.81	0.42	
2016/17	-0.01	0.09	-0.11	0.92	
Male	0	0.06	-0.09	0.93	

c) Shannon diversity

Coefficients:

	Estimate	SE	t value	Pr(> t)	
(Intercept)	1.45	0.04	34.26	<2e-16	***
A	0.05	0.04	1.3	0.2	
I	0.12	0.05	2.35	0.02	*
P	-0.08	0.04	-1.95	0.05	.
2014/15	0	0.04	-0.09	0.93	
2016/17	-0.02	0.04	-0.36	0.72	
Male	-0.01	0.03	-0.48	0.63	

d) Contrasts Faith's PD

Contrast	Estimate	SE	df	z.ratio	P
C – A	-0.04	0.06	Inf	-0.69	0.49
C – I	-0.17	0.08	Inf	-2.09	0.06
C – P	0.25	0.07	Inf	3.5	<0.001
A – I	-0.13	0.08	Inf	-1.69	0.11
A – P	0.3	0.06	Inf	4.82	<0.001
I – P	0.42	0.09	Inf	4.84	<0.001

e) Contrasts number of ASVs

Contrast	Estimate	SE	df	z.ratio	P
C – A	-0.08	0.07	Inf	-1.05	0.3
C – I	-0.25	0.1	Inf	-2.55	0.02
C – P	0.26	0.09	Inf	2.87	<0.01
A – I	-0.17	0.09	Inf	-1.89	0.07
A – P	0.34	0.08	Inf	4.42	<0.001
I – P	0.51	0.1	Inf	4.84	<0.001

f) Contrasts Shannon diversity

Contrast	Estimate	SE	df	z.ratio	P
C – A	-0.05	0.04	Inf	-1.3	0.19
C – I	-0.12	0.05	Inf	-2.35	0.04
C – P	0.08	0.04	Inf	1.95	0.08
A – I	-0.07	0.05	Inf	-1.48	0.17
A – P	0.13	0.04	Inf	3.73	<0.001
I – P	0.2	0.05	Inf	3.86	<0.001

g) Beta diversity

Comparison	weighted UniFrac	unweighted UniFrac
C – F	0.553	0.135
C – I	0.526	0.135
C – P	0.514	0.03
F – I	0.526	0.208
F – P	0.072	0.013
I – P	0.269	0.03

Supplementary Table S3 Effects of landscape type on the gut bacterial diversity of *P. opossum*.

Results from generalized linear models indicating the effects of landscape type, field season and sex on alpha diversity using a) Faith's PD); b) Number of ASVs and c) Shannon diversity. Results from pairwise comparisons (Contrasts) of landscapes using d) Faith's PD; e) Number of ASVs and f) Shannon diversity. g) Results from PERMANOVA for pairwise comparisons of landscapes on beta diversity (weighted and unweighted UniFrac). SE = standard error; df = degrees of freedom.

a) Faith's PD

Coefficients:

	Estimate	SE	t value	Pr(> t)	
(Intercept)	2.86	0.15	18.89	<2e-16	***
A	0.07	0.07	1.05	0.3	
P	0.02	0.08	0.33	0.74	
2014/15	0.02	0.07	0.28	0.78	
2016/17	-0.03	0.07	-0.41	0.69	
Female	0.04	0.14	0.3	0.76	
Male	0.07	0.13	0.53	0.6	

b) Number of ASVs

Coefficients:

	Estimate	SE	t value	Pr(> t)	
(Intercept)	5.34	0.21	25.48	<2e-16	***
A	0.1	0.09	1.21	0.23	
P	0.1	0.1	1.06	0.3	
2014/15	-0.06	0.08	-0.79	0.43	
2016/17	-0.09	0.08	-1.08	0.29	
Female	0.14	0.19	0.72	0.48	
Male	0.16	0.19	0.83	0.41	

c) Shannon diversity

Coefficients:

	Estimate	SE	t value	Pr(> t)	
(Intercept)	1.49	0.09	17.38	<2e-16	***
A	0.08	0.04	1.97	0.05	.
P	0.1	0.04	2.34	0.02	*
2014/15	-0.07	0.04	-1.72	0.09	.
2016/17	-0.05	0.04	-1.22	0.23	
Female	-0.02	0.08	-0.3	0.76	
Male	-0.02	0.08	-0.3	0.76	

d) Contrasts Faith's PD

Contrast	Estimate	SE	df	z.ratio	P
C – A	-0.07	0.07	Inf	-1.05	0.65
C – P	-0.02	0.08	Inf	-0.33	0.74
A – P	0.04	0.06	Inf	0.79	0.65

e) Contrasts number of ASVs

Contrast	Estimate	SE	df	z.ratio	P
C – A	-0.1	0.09	Inf	-1.21	0.44
C – P	-0.1	0.1	Inf	-1.06	0.44
A – P	0	0.07	Inf	0.03	0.98

f) Contrasts Shannon diversity

Contrast	Estimate	SE	df	z.ratio	P
C – A	-0.08	0.04	Inf	-1.97	0.07
C – P	-0.1	0.04	Inf	-2.34	0.06
A – P	-0.03	0.03	Inf	-0.82	0.41

g) Beta diversity

Comparison	weighted UniFrac	unweighted UniFrac
C – F	0.26	0.014
C – P	0.26	0.013
F – P	0.45	0.037

Supplementary Table S4: Effects of landscape type on the gut bacterial diversity of *P. semispinosus*.

Results from generalized linear models indicating the effects of landscape type, field season and sex on alpha diversity using a) Faith's PD); b) Number of ASVs and c) Shannon diversity. Results from pairwise comparisons (Contrasts) of landscapes using d) Faith's PD; e) Number of ASVs and f) Shannon diversity. g) Results from PERMANOVA for pairwise comparisons of landscapes on beta diversity (weighted and unweighted UniFrac). SE = standard error; df = degrees of freedom.

a) Faith's PD

Coefficients:

	Estimate	SE	t value	Pr(> t)	
(Intercept)	2.89	0.07	39.29	< 2e-16	***
A	-0.12	0.02	-5.85	<0.001	***
I	0	0.02	-0.14	0.89	
P	-0.12	0.03	-3.82	<0.001	***
2014/15	0.07	0.02	3.14	<0.01	**
2016/17	-0.01	0.02	-0.63	0.53	
Female	-0.06	0.07	-0.89	0.37	
Male	-0.06	0.07	-0.84	0.4	

b) Number of ASVs

Coefficients:

	Estimate	SE	t value	Pr(> t)	
(Intercept)	5.7	0.11	53.88	< 2e-16	***
A	-0.23	0.03	-6.94	<0.001	***
I	0.01	0.03	0.34	0.74	
P	-0.23	0.05	-4.39	<0.001	***
2014/15	0.12	0.04	3.3	<0.01	**
2016/17	0	0.04	-0.08	0.94	
Female	-0.2	0.1	-2.01	<0.05	*
Male	-0.17	0.1	-1.76	0.08	.

c) Shannon diversity

Coefficients:

	Estimate	SE	t value	Pr(> t)	
(Intercept)	1.57	0.04	35.99	< 2e-16	***
A	-0.08	0.01	-6.41	<0.001	***
I	-0.01	0.01	-0.61	0.55	
P	-0.06	0.02	-3.29	<0.01	**
2014/15	0.01	0.01	0.43	0.67	
2016/17	0.01	0.01	0.62	0.54	
Female	-0.07	0.04	-1.72	0.09	.
Male	-0.07	0.04	-1.59	0.11	

d) Contrasts Faith's PD

Contrast	Estimate	SE	df	z.ratio	P
C – A	0.12	0.02	Inf	5.85	<0.001
C – I	0	0.02	Inf	0.14	0.98
C – P	0.12	0.03	Inf	3.82	<0.001
A – I	-0.12	0.02	Inf	-5.98	<0.001
A – P	0	0.03	Inf	0.02	0.98
I – P	0.12	0.03	Inf	3.86	<0.001

e) Contrasts number of ASVs

Contrast	Estimate	SE	df	z.ratio	P
C – A	0.23	0.03	Inf	6.94	<0.001
C – I	-0.01	0.03	Inf	-0.34	0.89
C – P	0.23	0.05	Inf	4.39	<0.001
A – I	-0.24	0.03	Inf	-7.58	<0.001
A – P	0	0.05	Inf	0.04	0.97
I – P	0.24	0.05	Inf	4.73	<0.001

f) Contrasts Shannon diversity

Contrast	Estimate	SE	df	z.ratio	P
C – A	0.07616	0.0119	Inf	6.405	<0.001
C – I	0.01	0.01	Inf	0.61	0.54
C – P	0.06	0.02	Inf	3.29	<0.01
A – I	-0.07	0.01	Inf	-6.14	<0.001
A – P	-0.02	0.02	Inf	-1.14	0.31
I – P	0.05	0.02	Inf	2.99	<0.01

g) Beta diversity

Comparison	weighted UniFrac	unweighted UniFrac
C – F	0.001	0.001
C – I	0.001	0.001
C – P	0.001	0.001
F – I	0.001	0.001
F – P	0.001	0.001
I – P	0.001	0.001