

Ecography

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Supplementary material

Supplementary material Appendix 1, Table A1. List of bee species in the southwest France dataset, corresponding abundance of individuals over all sites and trait values for bee species (females only).

Species	ITD	Sociality	Diet breadth	Foraging		Nest location	Abundance
				duration (number of months)	Beginning of the foraging period		
<i>Andrena angustior</i>	1.88	solitary	polylectic	3	april	below-ground	4
<i>Andrena bucephala</i>	2.15	solitary	polylectic	3	april	below-ground	2
<i>Andrena distinguenda</i>	1.68	solitary	oligolectic	5	february	below-ground	2
<i>Andrena ferox</i>	1.88	solitary	oligolectic	3	april	below-ground	1
<i>Andrena flavipes</i>	2.3	solitary	polylectic	8	march	below-ground	61
<i>Andrena haemorrhoa</i>	2.64	solitary	polylectic	4	april	below-ground	5
<i>Andrena humilis</i>	2.4	social	oligolectic	4	april	below-ground	22
<i>Andrena lagopus</i>	2.34	solitary	oligolectic	4	march	below-ground	5
<i>Andrena nigroaenea</i>	2.84	solitary	polylectic	4	april	below-ground	5

						ground	
<i>Andrena nigroolivacea</i>	2.46	solitary	oligolectic	5	march	below-ground	10
<i>Andrena nitida</i>	2.97	solitary	polylectic	5	march	below-ground	6
<i>Andrena ranunculi</i>	1.75	solitary	oligolectic	2	march	below-ground	1
<i>Andrena ventricosa</i>	1.63	solitary	oligolectic	4	april	below-ground	3
<i>Anthophora plumipes</i>	4.3	solitary	polylectic	4	march	below-ground	6
<i>Bombus hortorum</i>	5.7	social	polylectic	7	march	below-ground	13
<i>Bombus humilis</i>	4.77	social	polylectic	4	june	below-ground	1
<i>Bombus lapidarius</i>	4.9	social	polylectic	7	march	below-ground	11
<i>Bombus pratorum</i>	4.6	social	polylectic	9	february	below-ground	6
<i>Bombus ruderarius</i>	4.73	social	polylectic	5	april	above-ground	5
<i>Bombus sylvarum</i>	4.44	social	polylectic	5	may	above-ground	9
<i>Bombus terrestris</i>	5.7	social	polylectic	12	january	below-ground	71
<i>Ceratina cucurbitina</i>	1.45	solitary	polylectic	8	april	above-ground	2

						ground	
<i>Chelostoma</i>			oligolecti			above-	
<i>florisomne</i>	1.79	solitary	c	5	april	ground	2
<i>Colletes cunicularius</i>	3.5	solitary	polylectic	2	february	below-	2
						ground	
<i>Eucera clypeata</i>	2.75	solitary	oligolecti			below-	
			c	1	may	ground	23
<i>Eucera interrupta</i>	0.67	solitary	oligolecti			below-	
			c	1	may	ground	1
<i>Eucera nigrescens</i>	3.5	solitary	oligolecti			below-	
			c	2	may	ground	20
<i>Eucera nigrifacies</i>	2.8	solitary	oligolecti			below-	
			c	1	june	ground	123
<i>Halictus fulvipes</i>	2.13	social	polylectic	2	july	below-	1
						ground	
<i>Halictus maculatus</i>	1.55	social	polylectic	7	april	below-	9
						ground	
<i>Halictus quadricinctus</i>	2.93	solitary	polylectic	3	june	below-	57
						ground	
<i>Halictus scabiosae</i>	2.44	social	polylectic	6	april	below-	524
						ground	
<i>Halictus simplex</i>	1.9	social	polylectic	5	april	below-	750
						ground	
<i>Halictus smaragdulus</i>	1.03	social	polylectic	3	june	below-	1
						ground	
<i>Halictus tumulorum</i>	1.49	social	polylectic	6	april	below-	3

						ground	
<i>Lasioglossum albipes</i>	1.64	social	polylectic	5	april	below-ground	4
<i>Lasioglossum corvinum</i>	1.29	solitary	polylectic	2	june	below-ground	459
<i>Lasioglossum glabriusculum</i>	0.73	social	polylectic	5	may	below-ground	134
<i>Lasioglossum interruptum</i>	2.23	social	polylectic	3	june	below-ground	68
<i>Lasioglossum laevigatum</i>	1.84	solitary	polylectic	4	april	below-ground	9
<i>Lasioglossum lativentre</i>	1.55	solitary	polylectic	7	april	below-ground	13
<i>Lasioglossum leucozonium</i>	1.91	solitary	polylectic	7	april	below-ground	37
<i>Lasioglossum malachurum</i>	1.79	social	polylectic	7	april	below-ground	359
<i>Lasioglossum marginatum</i>	1.59	social	polylectic	3	march	below-ground	182
<i>Lasioglossum minutissimum</i>	0.86	solitary	polylectic	7	april	below-ground	21
<i>Lasioglossum morio</i>	1.1	social	polylectic	8	march	below-ground	14
<i>Lasioglossum nigripes</i>	1.97	social	polylectic	2	june	below-ground	216
<i>Lasioglossum pallens</i>	1.59	solitary	polylectic	6	april	below-ground	48

						ground	
<i>Lasioglossum</i>						below-	
<i>pauxillum</i>	1.24	social	polylectic	7	april	ground	144
<i>Lasioglossum politum</i>	0.82	social	polylectic	5	april	below-	455
						ground	
<i>Lasioglossum</i>						below-	
<i>punctatissimum</i>	1.23	solitary	polylectic	7	april	ground	26
<i>Lasioglossum</i>						below-	
<i>puncticolle</i>	1.49	social	polylectic	5	may	ground	341
<i>Lasioglossum</i>						below-	
<i>villosulum</i>	1.33	social	polylectic	8	april	ground	133
<i>Lasioglossum</i>						below-	
<i>xanthopus</i>	2.37	solitary	polylectic	7	april	ground	3
<i>Lasioglossum zonulum</i>	1.95	solitary	polylectic	7	april	below-	82
						ground	
<i>Osmia bicornis</i>	3.1	solitary	polylectic	3	march	above-	9
						ground	
<i>Osmia cornuta</i>	3.36	solitary	polylectic	3	march	above-	2
						ground	
<i>Osmia rufohirta</i>	2.53	solitary	polylectic	4	april	above-	5
						ground	
<i>Xylocopa iris</i>	4.33	solitary	polylectic	4	march	above-	2
						ground	
<i>Xylocopa violacea</i>	6.5	solitary	polylectic	9	february	above-	7
						ground	

Supplementary material Appendix 2, Table A2 List of bee species in the NSW Australia dataset, corresponding abundance of individuals over all sites and trait values for bee species (females only).

Species	ITD (mm)	Sociality	Diet breadth	Nest location	Abundance
<i>Amegilla asserta</i>	3.42	solitary	polylectic	below-ground	1
<i>Amegilla chlorocyanea</i>	3.68	solitary	polylectic	below-ground	303
<i>Homalictus sphecodoides</i>	0.96	solitary	polylectic	below-ground	44
<i>Homalictus urbanus</i>	1	solitary	polylectic	below-ground	8
<i>Hylaeus albocuneatus</i>	1.58	solitary	oligolectic	above-ground	1
<i>Lasioglossum cabbagei</i>	1.64	solitary	polylectic	below-ground	276
<i>Lasioglossum clelandi</i>	1.94	solitary	polylectic	below-ground	10
<i>Lasioglossum cognatum</i>	1.31	solitary	polylectic	below-ground	219
<i>Lasioglossum ebeneum</i>	1.77	solitary	polylectic	below-ground	32
<i>Lasioglossum expansifrons</i>	1.53	solitary	polylectic	below-ground	577
<i>Lasioglossum</i>	1.5	solitary	polylectic	below-	9

<i>helichrysi</i>				ground	
<i>Lasioglossum hemichalceum</i>	1.07	solitary	polylectic	below-ground	108
<i>Lasioglossum imitator</i>	1.45	solitary	polylectic	below-ground	206
<i>Lasioglossum lanarium</i>	2.03	solitary	polylectic	below-ground	377
<i>Lasioglossum mundulum</i>	1.35	solitary	polylectic	below-ground	3
<i>Lasioglossum sexsetum</i>	0.8	solitary	polylectic	below-ground	2
<i>Lasioglossum speculatum</i>	1.58	solitary	polylectic	below-ground	1
<i>Lasioglossum sulthicum</i>	1.78	solitary	polylectic	below-ground	2
<i>Lasioglossum willsi</i>	1.66	solitary	polylectic	below-ground	9
<i>Lipotriches flavoviridis</i>	1.45	solitary	polylectic	below-ground	4
<i>Lipotriches moerens</i>	1.76	solitary	polylectic	below-ground	90
<i>Megachile atrella</i>	2.57	solitary	polylectic	above-ground	1
<i>Megachile callura</i>	1.51	solitary	polylectic	above-ground	1
<i>Megachile canifrons</i>	3	solitary	polylectic	above-ground	3

				ground	
<i>Megachile captionis</i>	2.67	solitary	polylectic	above-ground	4
<i>Megachile oblonga</i>	1.84	solitary	polylectic	above-ground	6
<i>Megachile semiluctuosa</i>	4.21	solitary	polylectic	above-ground	1
<i>Megachile serricauda</i>	2.63	solitary	polylectic	above-ground	1

Supplementary material Appendix 3, Table A3 Spearman rank correlations or Kruskal-Wallis chi-square statistics (*italic*) among landscape variables describing habitat amount and habitat isolation in the SW France region (n=78) and NSW Australia region (n=24) ($P < 0.05$ *; $P < 0.01$ **; $P < 0.001$ ***).

SW France

	<i>prox_hedg</i>	<i>woodland_edg</i>	<i>prox_woodland_ed</i>	<i>grasslan</i>	<i>prox_grasslan</i>
	<i>e</i>	<i>e</i>	<i>ge</i>	<i>d</i>	<i>d</i>
<i>hedge</i>	0.84 ***	-0.31 **	-0.2	0.1	0.3 **
<i>prox_hedge</i>		-0.17	-0.14	0.15	0.33 **
<i>woodland_edge</i>			0.67 ***	0.32 **	0.23 *
<i>prox_woodland_ed</i>				0.26 *	0.16
<i>grassland</i>					0.76 ***

NSW Australia

	<i>woodland_edge</i>	<i>prox_woodland_edge</i>	<i>grassland</i>	<i>prox_grassland</i>
<i>crop</i>	12.22 *	7.22	7.8	6.12
<i>woodland_edge</i>		0.62 **	0.68 ***	0.58 **
<i>prox_woodland_edge</i>			0.35	0.24
<i>grassland</i>				0.84 ***

Supplementary material Appendix 4, Figure A4 Polytomous, ultrametric tree of bee species captured in SW France (a) and NSW Australia (b), based on their taxonomy.

