

Ecological connectivity of bee communities in fragmented areas of Volcano Etna (Sicily, Italy) at different degrees of anthropogenic disturbance (Hymenoptera, Apoidea, Anthophila)

Supplementary material

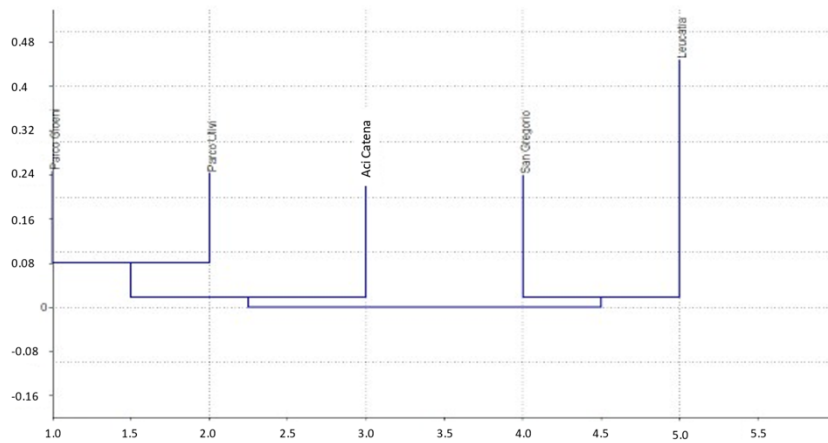


Figure S1. Dendrogram with the presence-absence matrix of the species in the four studied sites and the Leucatia site with the “neighbour-joining” method, and the Horn algorithm.

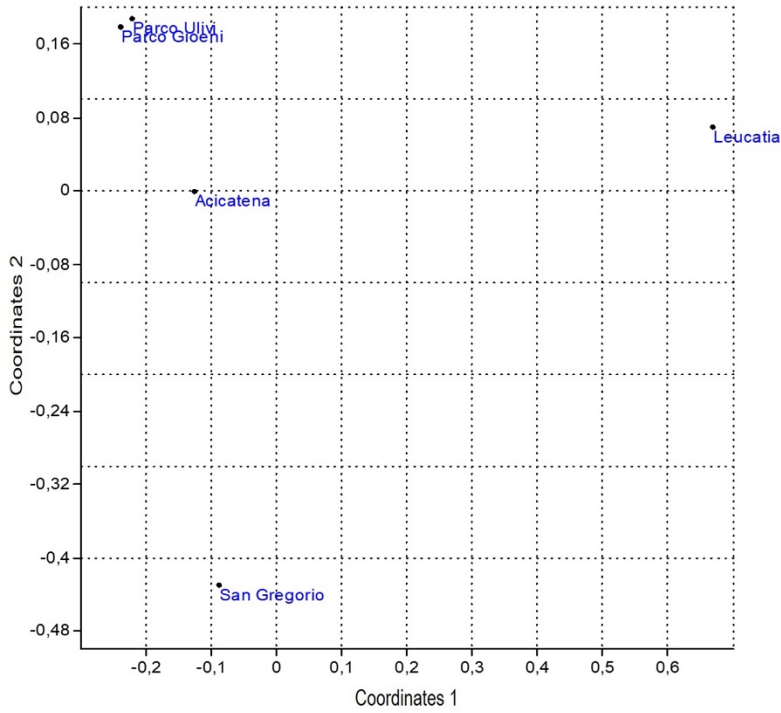


Figure S2. nMDS obtained from the presence-absence matrix of the species reported in the four studied sites and the reference site, Leucatia.

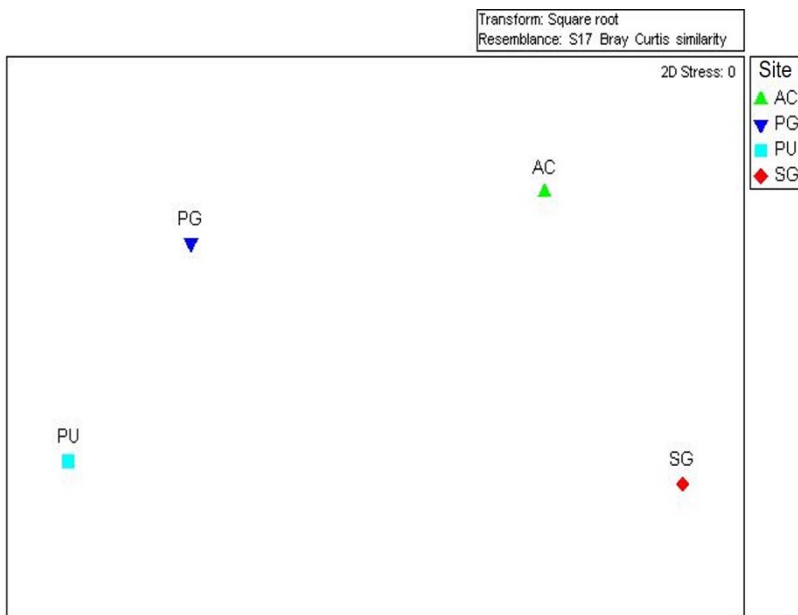


Figure S3. nMDS plot of the samples based on the presence-absence in the four investigated sites in the three years of the study.

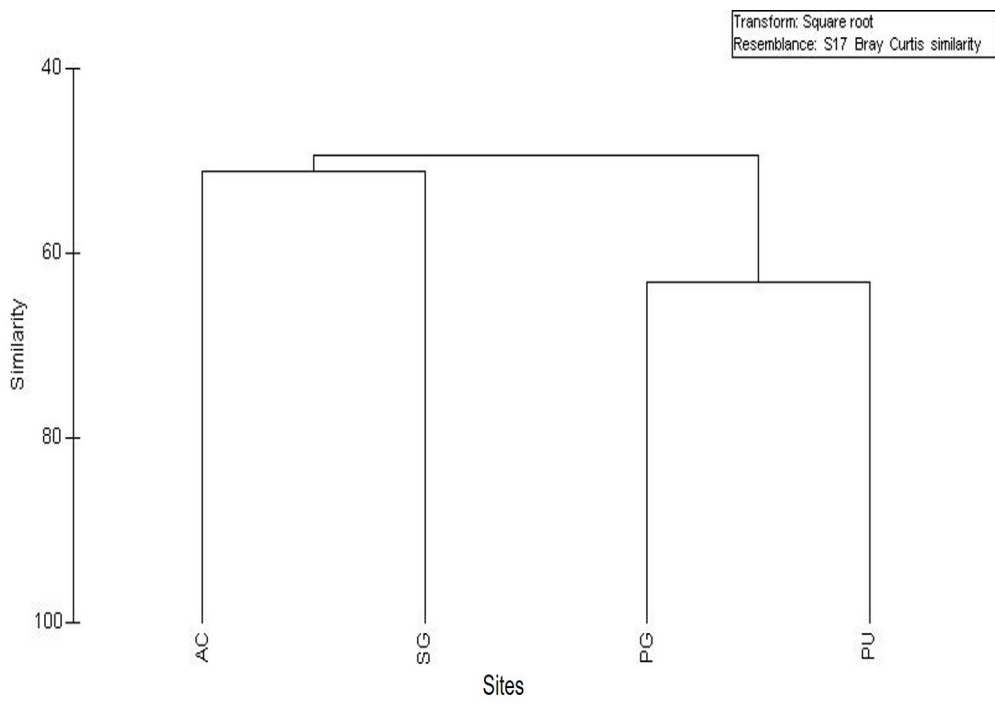


Figure S4. Hierarchical grouping that includes all the samples of the four investigated sites.

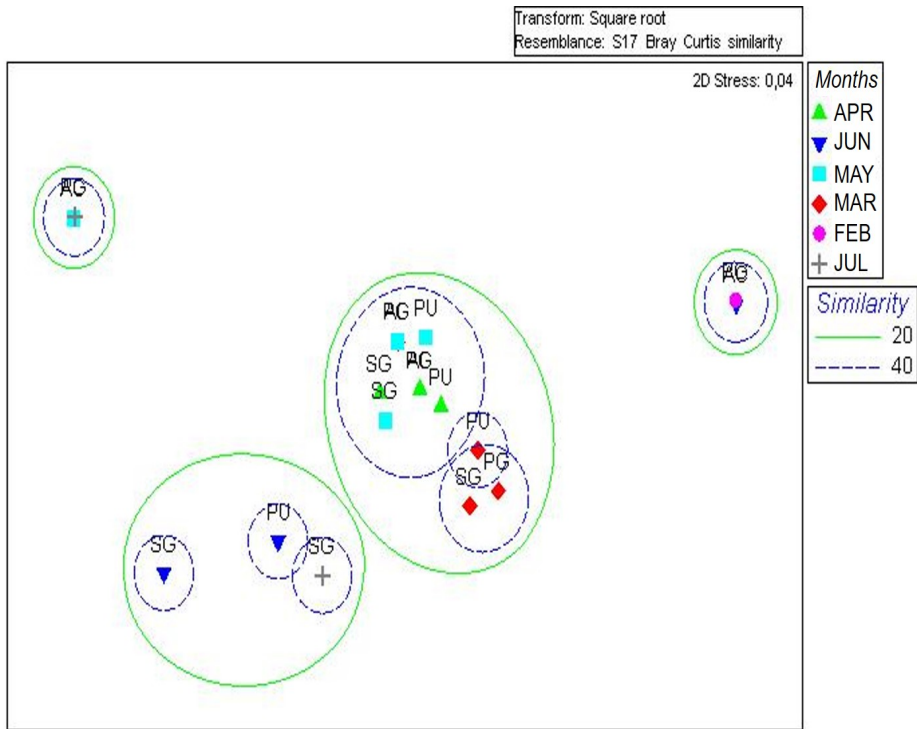


Figure S5. nMDS plot for all the samplings of the four investigated sites in the different months.

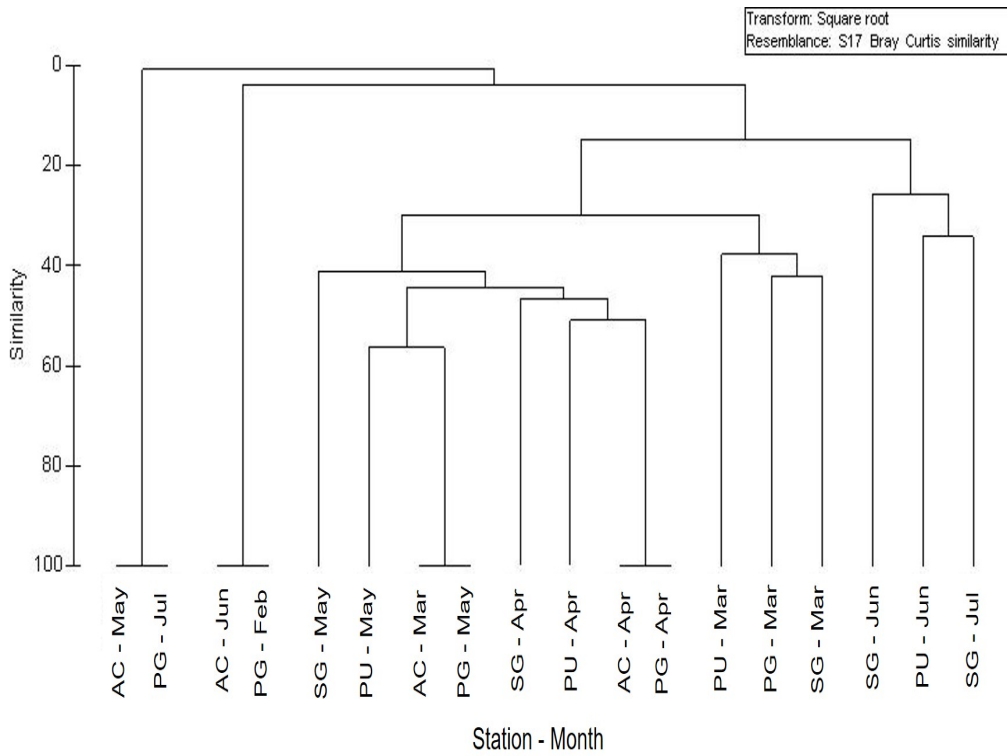


Figure S6. Hierarchical grouping achieved through the similarity gradient (0-100).

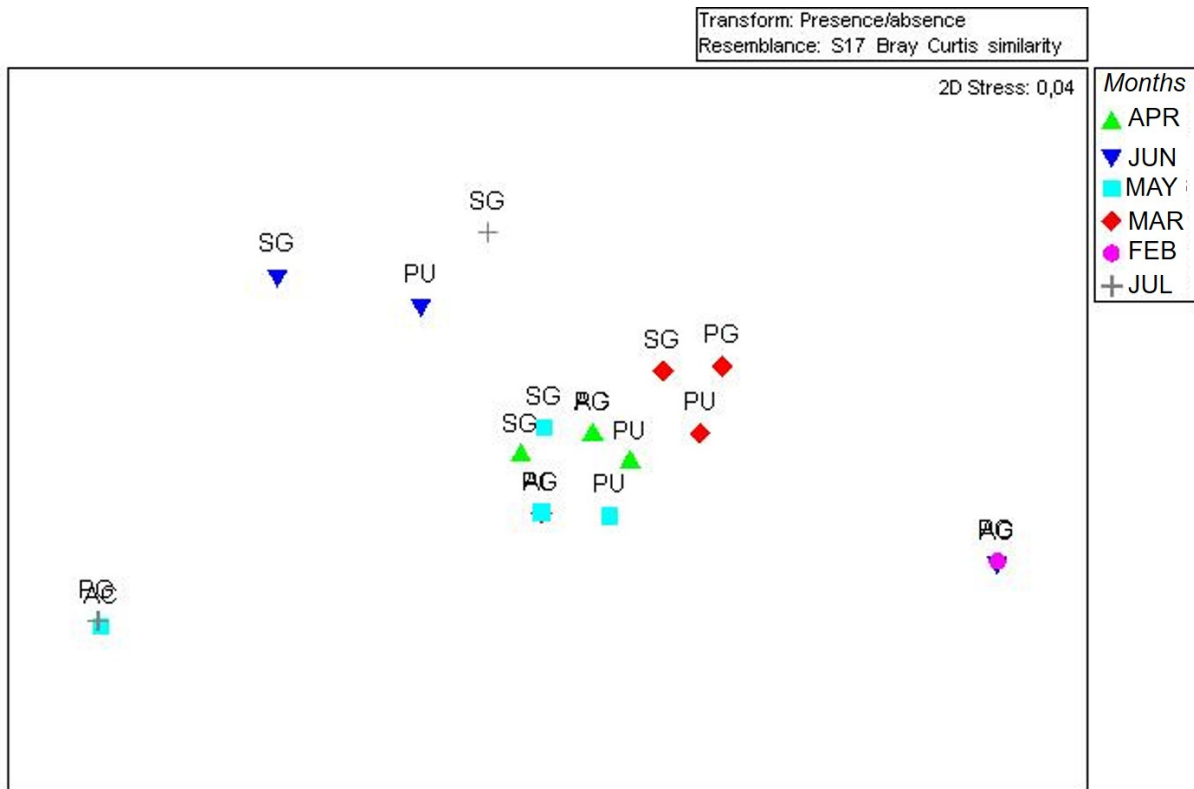


Figure S7. nMDS plot of the phenology of the species in the three years of investigation grouped in a single year.

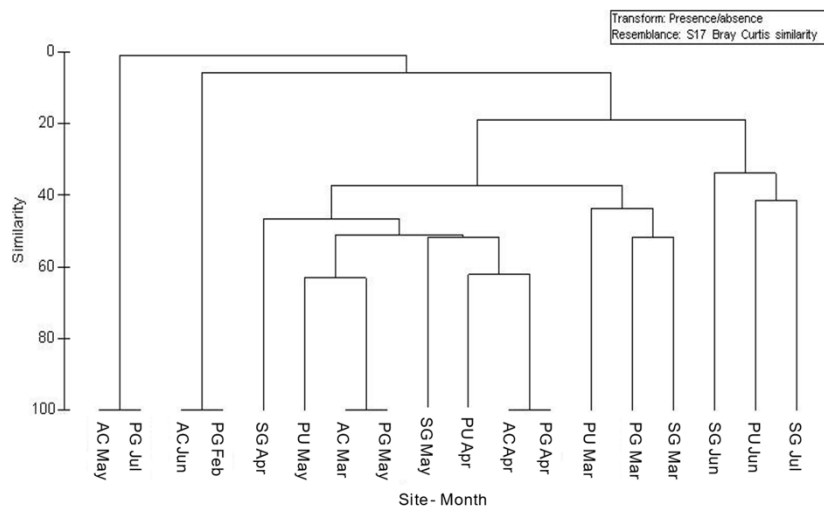


Figure S8. Hierarchical grouping of the phenology of the species in the three years of investigation grouped in a single year.

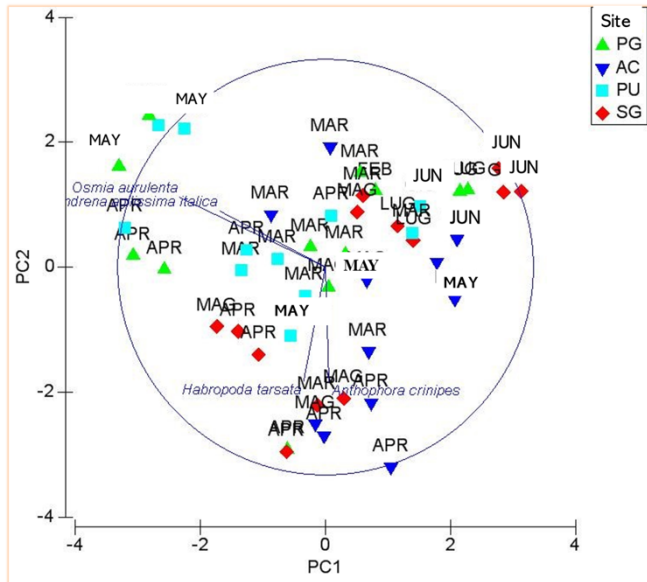


Figure S9. PCA plot of sites in relation to months and vector species of the main components.

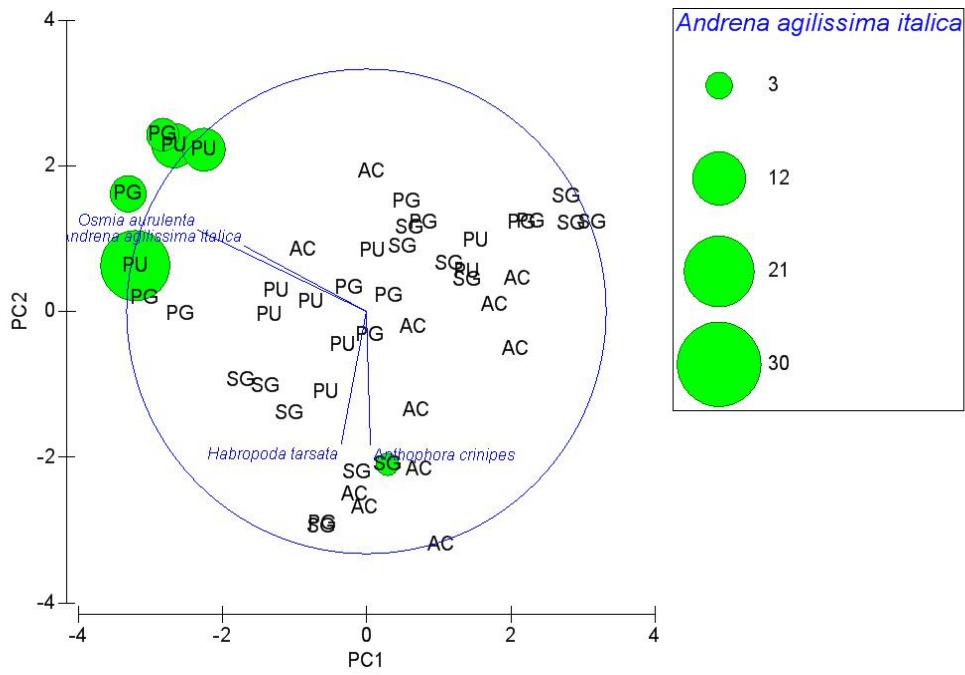


Figure S10. PCA plot of sites in relation to months for *Andrena agilissima italica*.

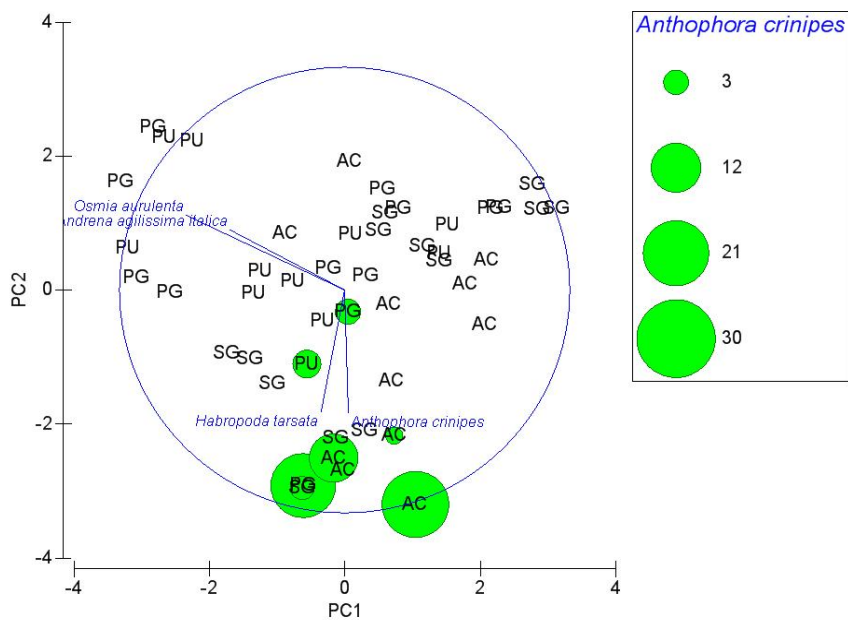


Figure S11. PCA plot of sites in relation to months for *Anthophora crinipes*.

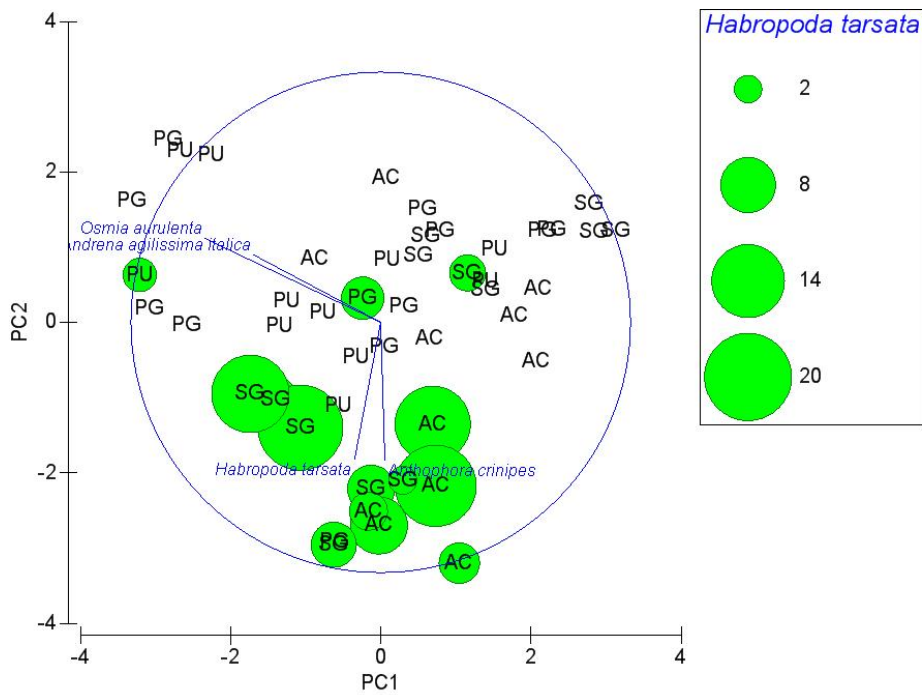


Figure S12. PCA plot of sites in relation to months for *Habropoda tarsata*.

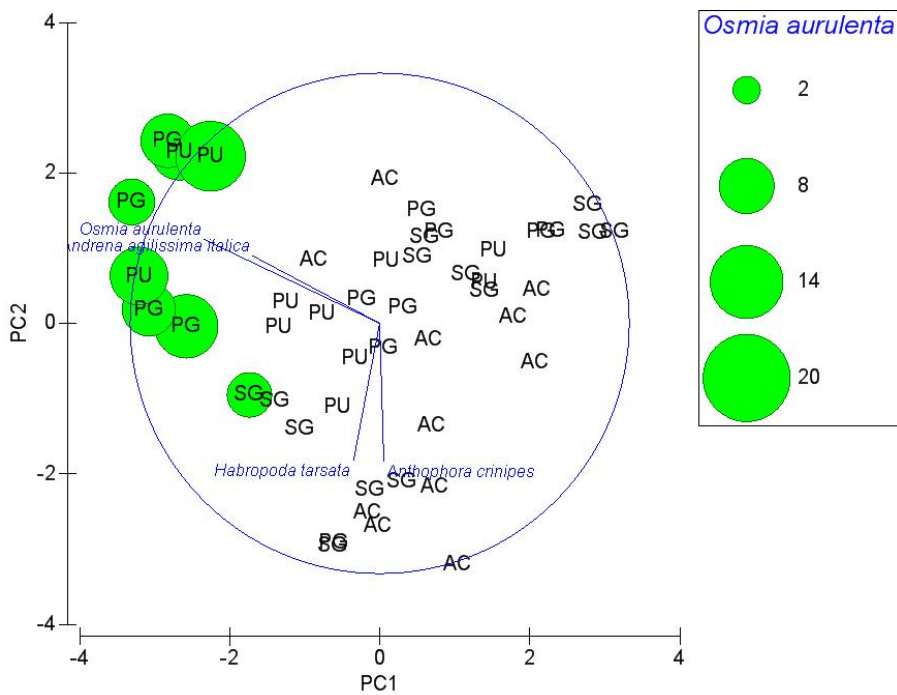


Figure S13. PCA plot of sites in relation to months for *Osmia aurulenta*.

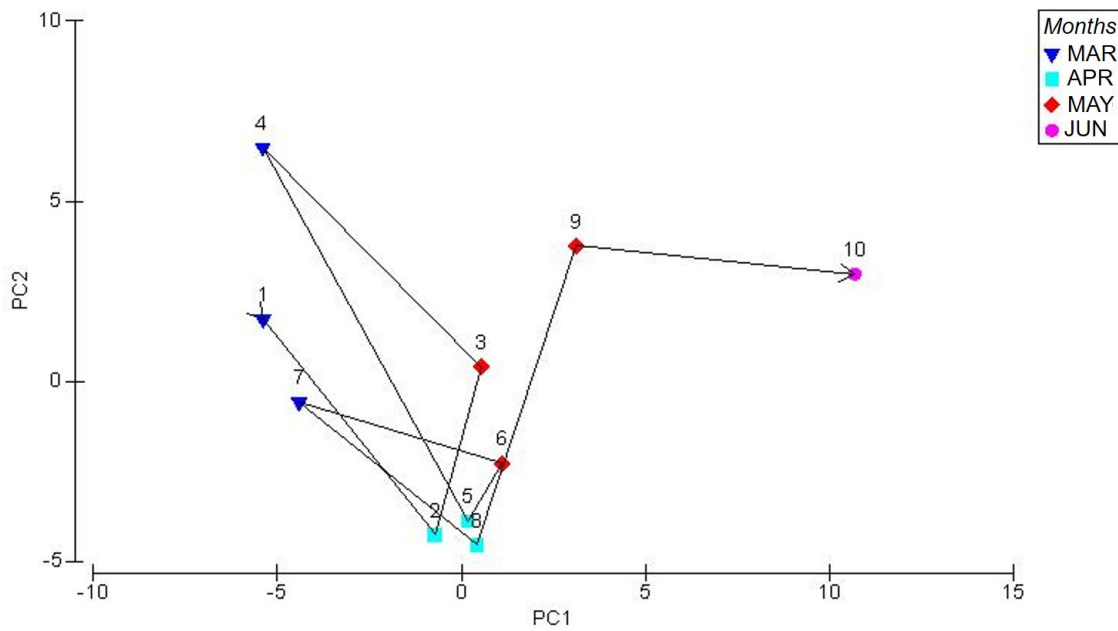


Figure S14. PCA of the specimens sampling in the agroecosystem (AC) site in ascending order per month.

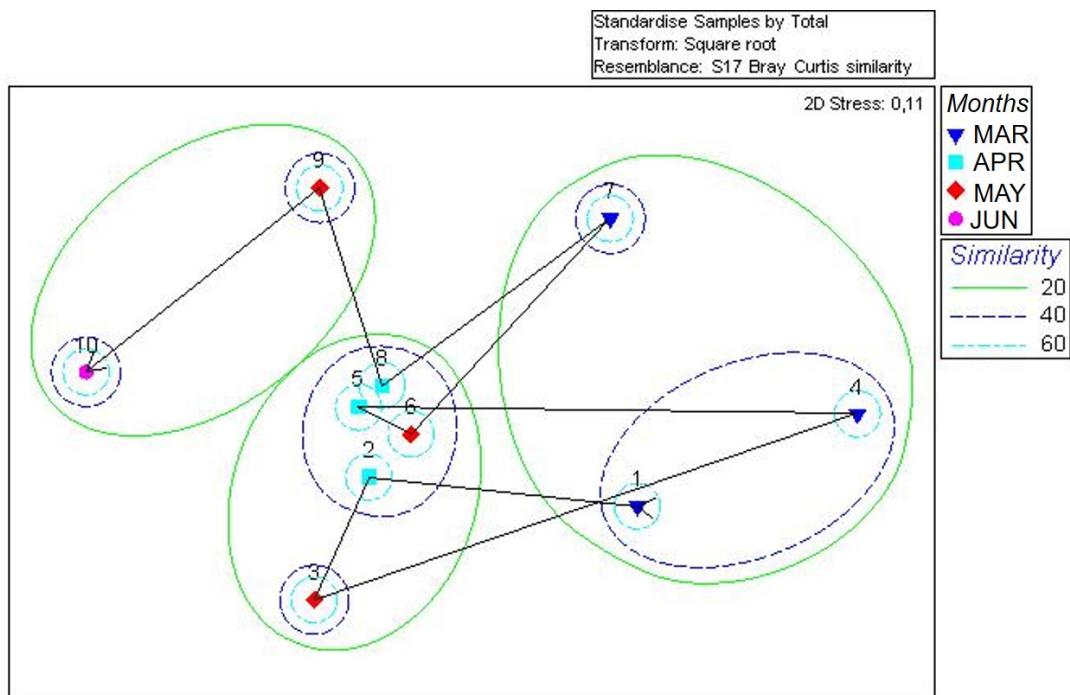


Figure S15. nMDS and hierarchical grouping of the variations of the populations in the agroecosystem (AC) site in relation to the different months in the years of the surveys.

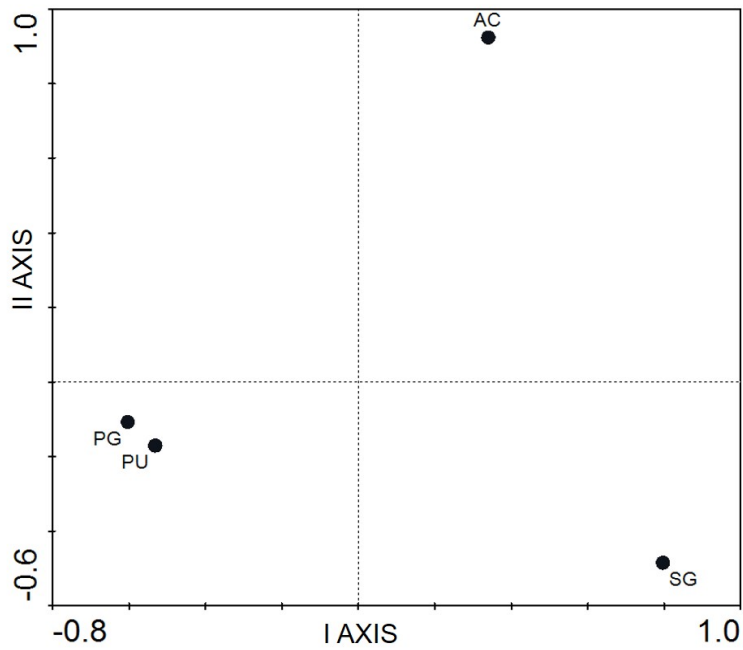


Figure S16. Analysis of species-sites correspondence, considering axes I and II as references.

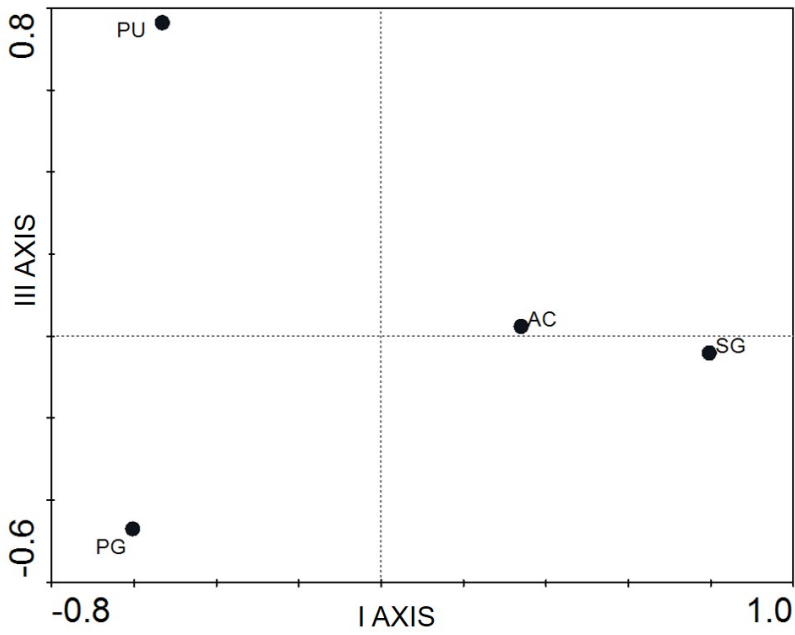


Figure S17. Analysis of species-sites correspondence, considering axes I and III as references.

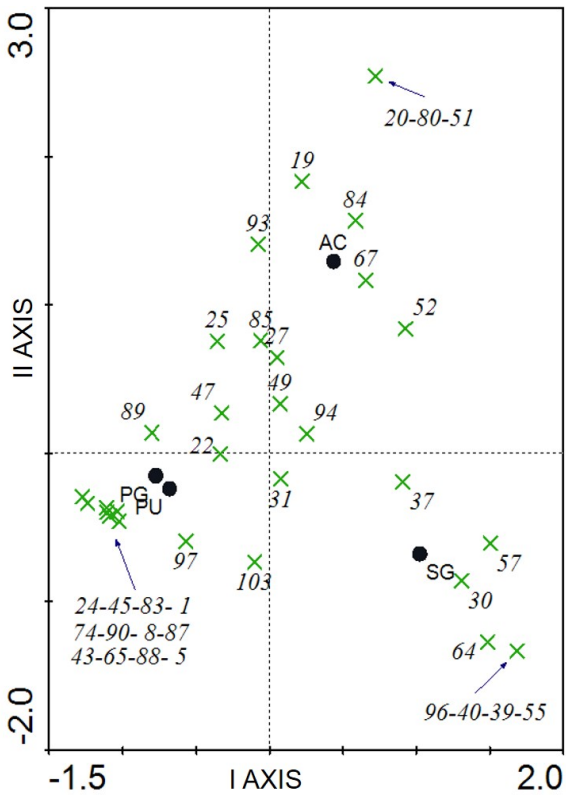


Figure S18. Analysis of species-sites correspondences, with details of the characterising species.

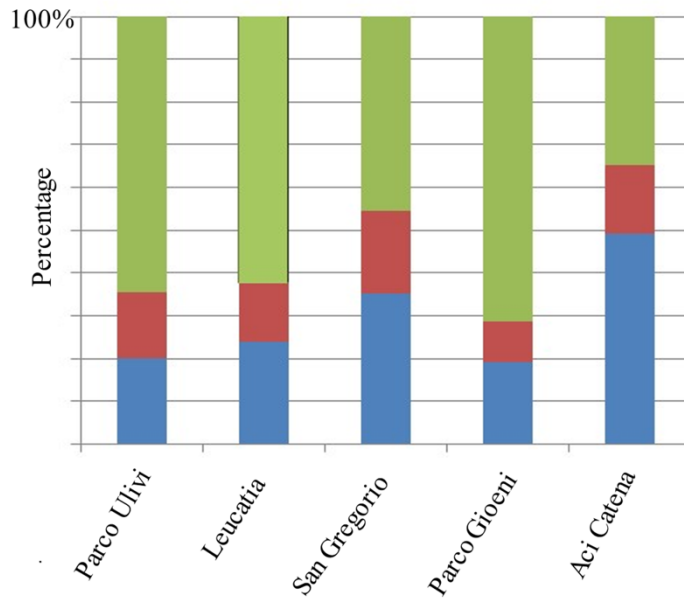


Figure S19. Biopermeability of the large area (4 km buffer) with the survey sites. Low to absent biopermeability (green), medium (red), high (blue).

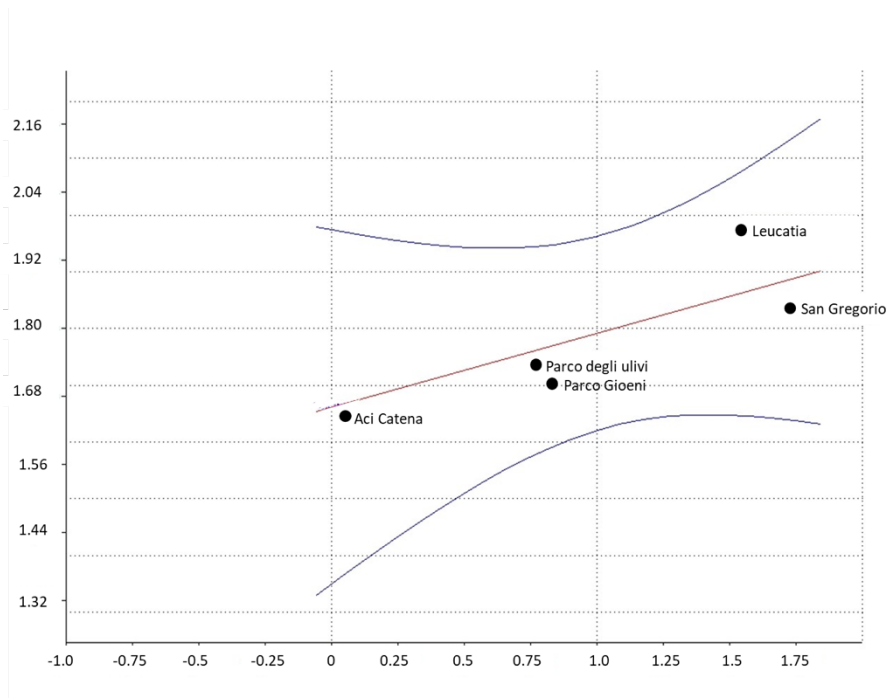


Figure S20. Linear regression for the correlation between the number of species and the sizes of the sites.

Table S1. Presence/absence matrix of the species recorded in the five sites studied: Aci Catena (AC), San Gregorio (SG), Parco Gioeni (PG), Parco degli Ulivi (PU), and Leucatia (LE).

Species/Site	AC	SG	PG	PU	LE
<i>Hylaeus angustatus</i> (Schenck, 1861)	0	0	0	0	1
<i>Hylaeus annularis</i> (Kirby, 1802)	0	0	0	0	1
<i>Hylaeus brevicornis</i> Nylander, 1852	0	0	0	0	1
<i>Hylaeus clypearis</i> (Schenck, 1853)	0	0	0	0	1
<i>Hylaeus gibbus</i> Saunders, 1850	0	0	0	0	1
<i>Hylaeus imparilis</i> Förster, 1871	0	0	0	0	1
<i>Hylaeus lineolatus</i> (Schenck, 1859)	0	0	0	0	1
<i>Hylaeus punctatus</i> (Brullé, 1832)	0	0	0	0	1
<i>Colletes fodiens</i> (Geoffroy, 1765)	0	0	0	0	1
<i>Colletes similis</i> Schenck, 1853	0	0	0	0	1
<i>Panurgus siculus</i> Morawitz, 1871	1	1	1	1	0

<i>Andrena aeneiventris</i> Morawitz, 1872	0	0	0	0	1
<i>Andrena agilissima italica</i> Warncke, 1968	0	1	1	1	1
<i>Andrena albopunctata</i> (Rossi, 1792)	0	0	0	1	1
<i>Andrena combinata</i> (Christ, 1791)	1	1	0	1	0
<i>Andrena decipiens</i> Schenck, 1859	0	0	0	0	1
<i>Andrena ferrugineicrus</i> Dours, 1872	0	0	0	0	1
<i>Andrena fimbriata</i> Brullé, 1832	0	0	0	0	1
<i>Andrena flavipes</i> Panzer, 1799	0	1	0	0	0
<i>Andrena florea</i> Fabricius, 1793	0	0	0	0	1
<i>Andrena forsterella</i> Osytshnjuk, 1978	0	0	0	0	1
<i>Andrena fumida</i> Pérez, 1895	0	0	0	1	0
<i>Andrena gravida</i> Imhoff, 1832	0	0	0	0	1
<i>Andrena hesperia</i> Smith, 1853	0	0	1	0	0
<i>Andrena kamarti</i> Schmiedeknecht, 1900	0	0	1	0	0
<i>Andrena limata</i> Smith, 1853	0	0	1	0	0
<i>Andrena minutula</i> (Kirby, 1802)	0	1	0	0	0
<i>Andrena morio</i> Brullé, 1832	0	0	1	0	0
<i>Andrena nigroaenea</i> (Kirby, 1802)	1	0	0	1	1
<i>Andrena nigroolivacea</i> Dours, 1873	0	0	1	1	0
<i>Andrena ovatula</i> (Kirby, 1802)	1	1	1	1	0
<i>Andrena panurgina</i> De Stefani, 1889	0	0	1	0	0
<i>Andrena schmiedeknechti</i> Magretti, 1883	1	1	0	0	0
<i>Andrena similis</i> Smith, 1849	1	0	1	0	0
<i>Andrena spreta pseudasuniensis</i> Strand, 1921	0	0	1	1	0
<i>Andrena stabiana</i> Morice, 1889	1	0	0	0	0
<i>Andrena wilkella</i> (Kirby, 1802)	0	1	0	0	0
<i>Halictus asperulus</i> Pérez, 1895	1	1	1	1	1
<i>Halictus brunnescens</i> (Eversmann, 1852)	0	0	0	0	1

<i>Halictus compressus</i> (Walckenaer, 1802)	0	1	0	0	1
<i>Halictus constantinensis</i> Strand, 1910	0	1	0	0	0
<i>Halictus fulvipes</i> (Klug, 1817)	1	1	0	0	1
<i>Halictus langobardicus</i> Blüthgen, 1944	0	0	0	0	1
<i>Halictus quadricinctus</i> (Fabricius, 1776)	0	1	0	0	1
<i>Halictus scabiosae</i> (Rossi, 1790)	0	1	1	1	1
<i>Halictus sexcinctus</i> (Fabricius, 1775)	0	1	0	0	0
<i>Seladonia gemmea</i> (Dours, 1872)	0	0	0	0	1
<i>Seladonia kessleri</i> (Bramson, 1879)	0	1	0	0	0
<i>Seladonia pollinosa</i> (Sichel, 1860)	0	1	0	0	1
<i>Seladonia subaurata</i> (Rossi, 1792)	0	0	0	0	1
<i>Seladonia vestita tecta</i> (Radoszkowski, 1875)	0	0	0	0	1
<i>Lasioglossum bimaculatum</i> (Dours, 1872)	1	1	1	0	1
<i>Lasioglossum calceatum</i> (Scopoli, 1763)	1	0	0	1	0
<i>Lasioglossum callizonium</i> (Pérez, 1895)	0	0	0	0	1
<i>Lasioglossum glabriusculum</i> (Morawitz, 1872)	0	0	0	0	1
<i>Lasioglossum interruptum opacum</i> (Pérez, 1895)	1	0	1	1	0
<i>Lasioglossum laeve</i> (Kirby, 1802)	0	0	0	1	0
<i>Lasioglossum laterale</i> (Brullé, 1832)	0	0	0	0	1
<i>Lasioglossum lativentre</i> (Schenck, 1853)	0	0	0	0	1
<i>Lasioglossum malachurum</i> (Kirby, 1802)	0	0	1	1	0
<i>Lasioglossum morio</i> (Fabricius, 1793)	0	0	0	0	1
<i>Lasioglossum nitidulum</i> (Fabricius, 1804)	0	0	0	0	1

<i>Lasioglossum pauxillum</i> (Schenck, 1853)	0	0	0	0	1
<i>Lasioglossum politum</i> (Schenck, 1853)	0	0	0	0	1
<i>Lasioglossum truncaticolle</i> (Morawitz, 1878)	0	0	0	0	1
<i>Sphecodes gibbus</i> (Linnaeus, 1758)	0	0	0	0	1
<i>Nomioides facilis</i> (Smith, 1853)	0	0	1	0	0
<i>Nomiapis diversipes</i> (Latreille, 1806)	0	0	0	0	1
<i>Dasygaster hirtipes</i> (Fabricius, 1793)	0	0	0	0	1
<i>Megachile albisepta</i> (Klug, 1817)	0	0	0	1	1
<i>Megachile apicalis</i> Spinola, 1808	0	0	0	0	1
<i>Megachile argentata</i> (Fabricius, 1793)	0	0	0	0	1
<i>Megachile centuncularis</i> (Linnaeus, 1758)	0	0	0	0	1
<i>Megachile circumcincta aetnensis</i> Zanden, 1989	1	1	1	1	0
<i>Megachile giraudi intermixta</i> Gerstaecker, 1869	0	0	1	1	0
<i>Megachile lagopoda</i> (Linnaeus, 1761)	0	1	0	0	1
<i>Megachile maritima</i> (Kirby, 1802)	0	0	0	0	1
<i>Megachile melanopyga</i> Costa, 1863	0	0	0	0	1
<i>Megachile nigrita</i> (Radoszkowski, 1876)	0	0	0	0	1
<i>Megachile parietina</i> (Geoffroy, 1762)	1	1	1	1	1
<i>Megachile pusilla</i> Pérez, 1884	0	0	0	0	1
<i>Megachile rotundata</i> (Fabricius, 1787)	0	0	0	0	1
<i>Megachile sicula</i> (Rossi, 1792)	0	1	1	1	0
<i>Coelioxys afra</i> Lepeletier, 1841	0	0	0	0	1
<i>Coelioxys inermis</i> (Kirby, 1802)	0	0	0	0	1
<i>Dioxys cincta</i> (Jurine, 1807)	1	0	0	1	0
<i>Hoplitis acuticornis</i> (Dufour & Perris, 1840)	0	1	0	1	0
<i>Hoplitis adunca</i> (Panzer, 1798)	1	1	1	1	1

<i>Hoplitis anthocopoides</i> (Schenck, 1853)	0	1	1	1	1
<i>Hoplitis illyrica</i> Noskiewicz, 1926	0	1	0	0	0
<i>Hoplitis leucomelana</i> (Kirby, 1802)	0	1	0	0	0
<i>Osmia aurulenta</i> (Panzer, 1799)	0	1	1	1	0
<i>Osmia bicornis</i> (Linnaeus, 1758)	0	0	0	0	1
<i>Osmia brevicornis</i> (Fabricius, 1798)	0	0	0	0	1
<i>Osmia caerulescens</i> (Linnaeus, 1758)	1	1	1	1	1
<i>Osmia gallarum</i> Spinola, 1808	0	0	0	0	1
<i>Osmia kohli</i> Ducke, 1900	0	1	1	1	1
<i>Osmia latreillei iberofafricana</i> Peters, 1975	1	0	1	1	1
<i>Osmia ligurica</i> (Morawitz, 1868)	1	0	0	0	0
<i>Osmia melanogaster</i> Spinola, 1808	1	1	1	1	1
<i>Osmia niveata</i> (Fabricius, 1804)	0	0	0	0	1
<i>Osmia niveocincta</i> Pérez, 1897	0	0	0	0	1
<i>Osmia notata</i> (Fabricius, 1804)	0	0	0	1	0
<i>Osmia rufohirta</i> (Latreille, 1811)	0	0	0	1	0
<i>Osmia signata</i> Erichson, 1835	0	1	1	0	0
<i>Osmia submicans hebraea</i> Benoist, 1934	1	1	0	0	0
<i>Osmia tunensis</i> (Fabricius, 1787)	1	0	1	0	0
<i>Heriades crenulata</i> Nylander, 1856	0	1	0	0	1
<i>Anthidium florentinum</i> (Fabricius, 1775)	0	0	0	0	1
<i>Anthidium manicatum</i> (Linnaeus, 1758)	1	1	1	0	1
<i>Anthidiellum strigatum luteum</i> (Friese, 1897)	0	0	0	0	1
<i>Icteranthidium grohmanni</i> (Spinola, 1838)	0	1	0	0	1
<i>Pseudoanthidium gregoriense</i> Nobile, 1989	0	1	0	0	0
<i>Pseudoanthidium scapulare</i> (Latreille, 1809)	0	1	0	0	1

<i>Rhodanthidium septemdentatum</i> (Latreille, 1809)	0	0	1	1	1
<i>Rhodanthidium sticticum</i> (Fabricius, 1787)	0	1	1	1	0
<i>Stelis breviscula</i> (Nylander, 1848)	0	0	0	0	1
<i>Stelis nasuta</i> (Latreille, 1809)	0	0	1	0	0
<i>Habropoda tarsata</i> (Spinola, 1838)	1	1	1	1	1
<i>Habropoda zonatula</i> (Smith, 1854)	0	1	1	0	1
<i>Anthophora atroalba</i> Lepeletier, 1841	0	0	0	0	1
<i>Anthophora balneorum</i> Lepeletier, 1841	1	1	1	1	0
<i>Anthophora crassipes</i> Lepeletier, 1841	0	0	1	0	0
<i>Anthophora crinipes</i> Smith, 1854	1	1	1	1	1
<i>Anthophora mucida</i> Gribodo, 1873	0	1	0	0	0
<i>Anthophora plumipes</i> (Pallas, 1772)	1	1	1	1	1
<i>Anthophora quadricolor</i> (Erichson, 1840)	0	1	0	0	0
<i>Anthophora retusa</i> (Linnaeus, 1758)	1	0	0	0	0
<i>Amegilla albigena</i> (Lepeletier, 1841)	0	0	1	1	1
<i>Amegilla garrula</i> (Rossi, 1790)	0	1	0	0	1
<i>Melecta albifrons nigra</i> Spinola, 1806	1	0	0	1	1
<i>Melecta funeraria</i> (Smith, 1854)	1	0	0	0	1
<i>Melecta obscura</i> (Friese, 1895)	1	1	0	0	1
<i>Thyreus affinis</i> (Morawitz, 1873)	0	1	0	0	0
<i>Thyreus histrionicus</i> (Illiger, 1806)	0	0	0	0	1
<i>Thyreus orbatus</i> (Lepeletier, 1841)	1	0	1	0	0
<i>Thyreus ramosus</i> (Lepeletier, 1841)	1	0	1	1	1
<i>Eucera algira</i> Brullé, 1840	0	0	1	0	0
<i>Eucera caspica</i> Morawitz, 1873	1	1	1	1	0
<i>Eucera eucnemidea</i> Dours, 1873	1	1	1	1	0
<i>Eucera longicornis</i> (Linnaeus, 1758)	0	1	0	0	0
<i>Eucera nigrescens</i> Pérez, 1879	1	1	1	1	1
<i>Eucera oraniensis</i> Lepeletier, 1841	1	0	0	1	1
<i>Eucera vulpes</i> Brullé, 1832	0	0	0	0	1

<i>Xylocopa iris</i> (Christ, 1791)	0	1	1	1	1
<i>Xylocopa valga</i> Gerstaecker, 1872	0	0	0	1	0
<i>Xylocopa violacea</i> (Linnaeus, 1758)	1	1	1	1	1
<i>Ceratina chalcites</i> Latreille, 1809	0	0	0	0	1
<i>Ceratina chalybea</i> Chevrier, 1872	1	1	1	0	1
<i>Ceratina cucurbitina</i> (Rossi, 1792)	1	0	0	0	1
<i>Ceratina cyanea</i> (Kirby, 1802)	1	1	1	1	1
<i>Ceratina dallatorreana</i> Friese, 1896	0	1	0	0	0
<i>Ceratina dentiventris</i> Gerstaecker, 1869	0	1	0	0	0
<i>Ceratina parvula</i> Smith, 1854	1	0	0	0	0
<i>Nomada mauritanica manni</i> Morawitz, 1872	0	0	0	0	1
<i>Nomada sexfasciata</i> Panzer, 1799	0	0	0	0	1
<i>Epeolus siculus</i> Giordani Soika, 1944	0	0	0	0	1
<i>Bombus bohemicus</i> Seidl, 1837	0	0	1	0	0
<i>Bombus hortorum</i> (Linnaeus, 1761)	1	1	1	1	0
<i>Bombus maxillosus</i> Klug, 1817	0	0	0	1	0
<i>Bombus pascuorum siciliensis</i> Tkalcu, 1977	1	1	0	1	1
<i>Bombus ruderatus autumnalis</i> Fabricius, 1793	1	1	0	1	0
<i>Bombus terrestris calabricus</i> Krueger, 1958	1	1	1	1	1
Number of species	46	63	54	53	102

Table S2. Contingency table with the number of specimens of the species, the value of the abundance ranks (°), and the average number of specimens collected in the four sites investigated.

Species	SG (°)	AC (°)	PU (°)	PG (°)	Average
<i>Halictus constantinensis</i>	2				0.50
<i>Heriades crenulata</i>	2				0.50
<i>Megachile lagopoda</i>	2				0.50

<i>Eucera longicornis</i>	3							0.75
<i>Icterantheidium grohmanni</i>	3							0.75
<i>Pseudoanthidium scapulare</i>	10	⁸						2.50
<i>Ceratina dallatorreana</i>	6							1.50
<i>Ceratina dentiventris</i>	6							1.50
<i>Andrena flavipes</i>	1							0.25
<i>Andrena minutula</i>	1							0.25
<i>Andrena wilkella</i>	1							0.25
<i>Anthophora mucida</i>	1							0.25
<i>Anthophora quadricolor</i>	1							0.25
<i>Halictus compressus</i>	4							1.00
<i>Seladonia kessleri</i>	1							0.25
<i>Seladonia pollinosa</i>	1							0.25
<i>Halictus quadricinctus</i>	1							0.25
<i>Halictus sexcinctus</i>	1							0.25
<i>Hoplitis illyrica</i>	1							0.25
<i>Hoplitis leucomelana</i>	1							0.25
<i>Pseudoanthidium gregoriense</i>	1							0.25
<i>Thyreus affinis</i>	1							0.25
<i>Amegilla garrula</i>	3							0.75
<i>Halictus fulvipes</i>	13	⁶	3					4.00
<i>Hoplitis acuticornis</i>	13	⁷			1			3.50
<i>Bombus pascuorum siciliensis</i>	8	¹⁰	1		1			2.50
<i>Melecta obscura</i>	2		2					1.00
<i>Andrena schmiedeknechti</i>	1		1					0.50
<i>Habropoda zonatula</i>	5					1		1.50
<i>Osmia signata</i>	5					1		1.50
<i>Osmia submicans hebraea</i>	1		2					0.75
<i>Habropoda tarsata</i>	14	⁵	20	²	1		2	9.25
<i>Ceratina cucurbitina</i>	9	⁹	4		2		1	4.00
<i>Ceratina cyanea</i>	6		2				2	2.50
<i>Andrena combinata</i>	2		1		1			1.00
<i>Bombus ruderatus autumnalis</i>	2		1		1			1.00

<i>Halictus scabiosae</i>	4				1		1		1.50
<i>Anthophora retusa</i>			1						0.25
<i>Ceratina chalybea</i>			1						0.25
<i>Ceratina parvula</i>			1						0.25
<i>Dioxys cincta</i>			1						0.25
<i>Melecta funeraria</i>			4						1.00
<i>Osmia ligurica</i>			1						0.25
<i>Andrena stabiana</i>			2						0.50
<i>Melecta albifrons</i>			5	¹⁰					1.25
<i>Hoplitis adunca</i>	8	¹⁰	20	²	1		4		8.25
<i>Megachile circumcincta aetnensis</i>	8	¹⁰	7	⁸	4		1		5.00
<i>Osmia caerulescens</i>	3		15	⁴	2		1		5.25
<i>Lasioglossum bimaculatum</i>	1		2				1		1.00
<i>Anthophora balneorum</i>	16	³	6	⁹	4		10	¹²	9.00
<i>Halictus asperulus</i>	5		1		3		2		2.75
<i>Panurgus siculus</i>	10	⁸	9	⁷	9	⁷	4		8.00
<i>Andrena similis</i>			3				1		1.00
<i>Bombus hortorum</i>	2		2		2		1		1.75
<i>Megachile parietina</i>	7		1		1		7		4.00
<i>Bombus terrestris calabricus</i>	18	²	10	⁶	16	²	12	¹⁰	14.00
<i>Eucera nigrescens</i>	28	¹	38	¹	20	¹	34	¹	30.00
<i>Anthophora plumipes</i>	7		16	³	3		14	⁸	10.00
<i>Osmia melanogaster</i>	3		12	⁵	8	⁸	5		7.00
<i>Andrena ovatula</i>	1		2		2		1		1.50
<i>Osmia tunensis</i>			3				2		1.25
<i>Xylocopa iris</i>	15	⁴			9	⁷	15	⁷	9.75
<i>Eucera oraniensis</i>			1		1				0.50
<i>Lasioglossum calceatum</i>			1		1				0.50
<i>Xylocopa violacea</i>	10	⁸	5	¹⁰	12	⁵	14	⁸	10.25
<i>Eucera eucnemidea</i>	5		9	⁷	3		18	⁵	8.75
<i>Anthidium manicatum</i>	8	¹⁰	7	⁸			25	³	10.00
<i>Anthophora crinipes</i>	1		9	⁷	2		11	¹¹	5.75
<i>Thyreus ramosus</i>			2		2		1		1.25

<i>Andrena nigroaenea</i>			5	¹⁰	4		5		3.50
<i>Eucera caspica</i>	3		2		7	⁹	7		4.75
<i>Rhodanthidium sticticum</i>	8	¹⁰			16	²	13	⁹	9.25
<i>Thyreus orbatus</i>			1				3		1.00
<i>Osmia latreillei iberoafricana</i>			4		13	⁴	4		5.25
<i>Lasioglossum interruptum opacum</i>			1		1		3		1.25
<i>Andrena agilissima italica</i>	1				12	⁵	6		4.75
<i>Osmia kohli</i>	2				3		22	⁴	6.75
<i>Hoplitis anthocopoides</i>	1				15	³	12	¹⁰	7.00
<i>Megachile sicula</i>	2				5	¹⁰	33	²	10.00
<i>Osmia aurulenta</i>	1				10	⁶	16	⁶	6.75
<i>Osmia notata</i>					3				0.75
<i>Andrena albopunctata</i>					1				0.25
<i>Andrena fumida</i>					4				1.00
<i>Bombus bohemicus</i>					1				0.25
<i>Bombus maxillosus</i>					1				0.25
<i>Megachile albisecta</i>					1				0.25
<i>Melecta albifrons nigra</i>					1				0.25
<i>Osmia rufohirta</i>					1				0.25
<i>Xylocopa valga</i>					1				0.25
<i>Lasioglossum laeve</i>					2				0.50
<i>Rhodanthidium septemdentatum</i>					2		1		0.75
<i>Andrena nigroolivacea</i>					2		2		1.00
<i>Andrena spreta pseudasuniensis</i>					1		2		0.75
<i>Lasioglossum malachurum</i>					2		4		1.50
<i>Megachile giraudi intermixta</i>					2		5		1.75
<i>Amegilla albigena</i>					2		6		2.00
<i>Nomioides facilis</i>							5		1.25
<i>Andrena hesperia</i>							1		0.25
<i>Andrena kamarti</i>							1		0.25
<i>Andrena limata</i>							1		0.25
<i>Andrena morio</i>							1		0.25
<i>Andrena panurgina</i>							1		0.25

<i>Stelis nasuta</i>							1		0.25
<i>Anthophora crassipes</i>							3		0.75
<i>Eucera algira</i>							3		0.75

Table S3. Distribution of the number of specimens for the selected species with inertial values greater than 1.5% for axis I.

ID Species and inertia (%)	Species	PG	PU	AC	SG	Tot.
1 (1.8)	<i>Amegilla albigena</i>	6	2	-	-	8
87 (4.8)	<i>Osmia aurulenta</i>	16	10	-	1	27
43 (7.1)	<i>Megachile sicula</i>	33	5	-	2	40
65 (4.8)	<i>Hoplitis anthocopoides</i>	12	15	-	1	28
88 (4.2)	<i>Osmia kohli</i>	22	3	-	2	27
5 (2.9)	<i>Andrena agilissima italica</i>	6	12	-	1	19
89 (2.0)	<i>Osmia latreillei iberofrancia</i>	4	13	4	-	19
97 (1.7)	<i>Rhodanthidium sticticum</i>	13	16	-	8	37
67 (2.0)	<i>Hoplitis adunca</i>	4	1	20	8	33
37 (1.9)	<i>Ceratina cucurbitina</i>	1	2	4	9	16
52 (4.6)	<i>Habropoda tarsata</i>	2	1	20	14	37
30 (2.5)	<i>Bombus pascuorum siciliensis</i>	-	1	1	8	10
64 (4.5)	<i>Hoplitis acuticornis</i>	-	1	-	13	14
57 (5.2)	<i>Halictus fulvipes</i>	-	-	3	13	16
96 (4.1)	<i>Pseudoanthidium scapulare</i>	-	-	-	10	10
39 (2.5)	<i>Ceratina dallatorreana</i>	-	-	-	6	6
40 (2.5)	<i>Ceratina dentiventris</i>	-	-	-	6	6

55 (1.6)	<i>Halictus compressus</i>	-	-	-	4	4
		119	82	52	106	359

Table S4. Distribution of the number of specimens for the selected species with inertial values greater than 1.5% for axis II.

ID Species and inertia (%)	Species	PG	PU	AC	SG	Tot.
80 (5.6)	<i>Melecta albifrons nigra</i>	-	-	5	.	5
51 (4.5)	<i>Melecta funeraria</i>	-	-	4	-	4
20 (2.2)	<i>Andrena stabiana</i>	-	-	2	-	2
19 (2.3)	<i>Andrena similis</i>	1	-	3	-	4
84 (8.9)	<i>Osmia caerulescens</i>	1	2	15	3	21
93 (1.7)	<i>Osmia tunensis</i>	2	-	3	-	5
67 (7.8)	<i>Hoplitis adunca</i>	4	1	20	8	33
52 (4.5)	<i>Habropoda tarsata</i>	2	1	20	14	37
85 (2.8)	<i>Osmia melanogaster</i>	5	8	12	3	28
25 (2.3)	<i>Anthophora crinipes</i>	11	2	9	1	23
27 (2.9)	<i>Anthophora plumipes</i>	14	3	16	7	40
49 (2.3)	<i>Eucera nigrescens</i>	34	20	38	28	120
97 (2.3)	<i>Rhodanthidium sticticum</i>	13	16	-	8	37
103 (3.6)	<i>Xylocopa iris</i>	15	9	-	15	39
64 (3.9)	<i>Hoplitis acuticornis</i>	-	1	-	13	14
96 (3.1)	<i>Pseudoanthidium scapulare</i>	-	-	-	10	10
39 (1.8)	<i>Ceratina dallatorreana</i>	-	-	-	6	6
40 (1.8)	<i>Ceratina dentiventris</i>	-	-	-	6	6
Total		102	63	147	122	434

Table S5. Distribution of the number of specimens for the selected species with inertial values greater than 1.5% for axis III.

ID Species and inertia(%)	Species	PG	PU	AC	SG	Tot.
8(6.0)	<i>Andrena fumida</i>	-	4	-	-	4
90(4.5)	<i>Osmia notata</i>	-	3	-	-	3
74(3.0)	<i>Lasioglossum laeve</i>	-	2	-	-	2
89(8.1)	<i>Osmia latreillei iberoafricana</i>	4	14	4	-	21
5(5.4)	<i>Andrena agilissima italica</i>	6	12	-	1	19
65(3.1)	<i>Hoplitis anthocopoides</i>	12	15	-	1	28
97(2.3)	<i>Rhodanthidium sticticum</i>	13	16	-	8	37
94(1.9)	<i>Panurgus siculus</i>	4	9	9	10	32
31(1.7)	<i>Bombus terrestris calabricus</i>	12	16	10	18	56
47(2.8)	<i>Eucera eucnemidea</i>	18	3	9	5	35
43(8.9)	<i>Megachile sicula</i>	33	5	-	2	40
22(9.1)	<i>Anthidium manicatum</i>	25	-	7	8	40
88(6.3)	<i>Osmia kohli</i>	22	3	-	2	27
83(2.8)	<i>Nomioides facilis</i>	5	-	-	-	5
24(1.7)	<i>Anthophora crassipes</i>	3	-	-	-	3
45(1.7)	<i>Eucera algira</i>	3	-	-	-	3
Total		160	101	39	55	355

Table S6. Distribution of the number of specimens for the selected species in the sites investigated with an inertial value greater than 1.5%.

ID Species and inertia (%)	Species	PG	PU	AC	SG	Tot.
24 (1.7)	<i>Anthophora crassipes</i>	3	-	-	-	3
45 (1.7)	<i>Eucera algira</i>	3	-	-	-	3
83 (2.8)	<i>Nomioides facilis</i>	5	-	-	-	5
1 (1.8)	<i>Amegilla albigena</i>	6	2	-	-	8
74 (3.0)	<i>Lasioglossum laeve</i>	-	2	-	-	2
90 (4.5)	<i>Osmia notata</i>	-	3	-	-	3
8 (6.0)	<i>Andrena fumida</i>	-	4	-	-	4
87 (4.8)	<i>Osmia aurulenta</i>	16	10	-	1	27
43 (7.1)	<i>Megachile sicula</i>	33	5	-	2	40
65 (4.8)	<i>Hoplitis anthocopoides</i>	12	15	-	1	28
88 (4.2)	<i>Osmia kohli</i>	22	3	-	2	27
5 (2.9)	<i>Andrena agilissima italica</i>	6	12	-	1	19
89 (2)	<i>Osmia latreillei iberoafricana</i>	4	13	4	-	19
97 (1.7)	<i>Rhodanthidium sticticum</i>	13	16	-	8	37
25 (2.3)	<i>Anthophora crinipes</i>	11	2	9	1	23
22 (9.1)	<i>Anthidium manicatum</i>	25	-	7	8	40
47 (2.8)	<i>Eucera eucnemidea</i>	18	3	9	5	35
103 (3.6)	<i>Xylocopa iris</i>	15	9	-	15	39
93 (1.7)	<i>Osmia tunensis</i>	2	-	3	-	5
85 (2.8)	<i>Osmia melanogaster</i>	5	8	12	3	28
27 (2.9)	<i>Anthophora plumipes</i>	14	3	16	7	40
49 (2.3)	<i>Eucera nigrescens</i>	34	20	38	28	120
31 (1.7)	<i>Bombus terrestris calabricus</i>	12	16	10	18	56
19 (2.3)	<i>Andrena similis</i>	1	-	3	-	4
94 (1.9)	<i>Panurgus siculus</i>	4	9	9	10	32
84 (8.9)	<i>Osmia caerulescens</i>	1	2	15	3	32

67 (2.0)	<i>Hoplitis adunca</i>	1	2	15	3	21
20 (2.2)	<i>Andrena stabiana</i>	4	1	20	8	33
51 (4.5)	<i>Melecta funeraria</i>	-	-	2	-	2
80 (5.6)	<i>Melecta albifrons nigra</i>	-	-	4	-	4
37 (1.9)	<i>Ceratina cucurbitina</i>	-	-	5	-	5
52 (4.6)	<i>Habropoda tarsata</i>	1	2	4	9	16
30 (2.5)	<i>Bombus pascuorum siciliensis</i>	2	1	20	14	37
64 (4.5)	<i>Hoplitis acuticornis</i>	-	1	1	8	10
57 (5.2)	<i>Halictus fulvipes</i>	-	1	-	13	14
55 (1.6)	<i>Halictus compressus</i>	-	-	3	13	16
39 (2.5)	<i>Ceratina dallatorreana</i>	-	-	-	4	4
40 (2.5)	<i>Ceratina dentiventris</i>	-	-	-	6	6
96 (4.1)	<i>Pseudoanthidium scapulare</i>	-	-	-	6	6
Total		59	53	134	150	396