

## Supplementary Material

**Tab. S1** - Land units of the surveyed areas in the hierarchical classification in systems and facets according to Blasi et al. (2000). (PV): potential vegetation (Anonymous 1996).

Systems	Facets
1.1 Calcareous mountain range of the Cozzo Giammeri system	1.1.1 Geological substrates belonging to the Crisanti formation (radiolarites and spongolites with redeposited calcarenites and calcirudites) and Mufara formation (calcilutites and marls, Ladinian-Carnian) under thermo-Mediterranean upper sub-humid bioclimate. Complex landscape, where cork oak ( <i>Quercus suber</i> ) stands are pure or mixed with several evergreen or deciduous trees, and intermingled with more open thermophilous maquis on S-facing ridges and summits. Very limited occurrence of natural woodlands and frequent occurrence of perennial grasslands dominated by <i>Ampelodesmos mauritanicus</i> . Territory largely characterized by major disturbance factors (mostly cattle grazing and fires), with deep impacts on soil and vegetation features. Leptosols, Regosols and Phaeozem. PV: <i>Quercetalia pubescenti-petraeae</i> with downy oak as dominant tree species.
1.2 Calcareous mountain range of the Cozzo Secco system	1.2.1 Geological substrates belonging to the Numidian flysch formation (Geraci Siculo member), with yellowish graded quartzarenites and brown clays and silicoclastic deposits and olistostromes (“argille brecciate”) of the Castellana sicula formation under thermo-Mediterranean lower sub-humid bioclimate. Scattered and discontinuous cork oak ( <i>Quercus suber</i> ) stands, mixed with evergreen sclerophyllous maquis species and, at higher altitudes, with downy oaks. The cork oak stands are one of the few remnants of natural woodlands. Frequent occurrence of perennial grasslands dominated by <i>Ampelodesmos mauritanicus</i> . High frequency of disturbance factors in the neighboring areas, especially cattle grazing and wildfires, as well as of cultivated areas, especially olive groves. Leptosols. PV: <i>Quercion ilicis</i> .
1.3 Calcareous mountain range of the “Colline della media Valle del fiume Oreto e del Monrealese”	1.3.1 Cozzo Barone locality. Geological substrates belonging to the Crisanti formation (radiolarites and spongolites with redeposited calcarenites and calcirudites) and Mufara formation (calcilutites and marls, Ladinian-Carnian) under thermo-Mediterranean upper sub-humid bioclimate. Territory largely physionomised by semi-natural landscapes, where S-facing slopes usually host thermophilous taxa, while N-facing slopes host some remnant nuclei of Mediterranean oak forests. Frequent occurrence of perennial grasslands dominated by <i>Ampelodesmos mauritanicus</i> . Intense and widespread soil erosion processes and frequent wildfires caused extreme soil and habitat degradation. Lithosols. PV: <i>Oleo-Ceratonion</i> .  1.3.2 Loghi Vecchi locality. Geological substrates belonging to the pelagic to slope deposits of the carbonate platform: M. Quacella formation (reef and scarp deposits, composed of dolomite or dolomitic limestones, cherty limestones, breccias). Territory largely physionomised by semi-natural landscapes, with only some remnant nuclei of Mediterranean oak forests. Frequent occurrence of perennial grasslands dominated by <i>Ampelodesmos mauritanicus</i> and of cultivated areas, especially olive groves. Intense and widespread soil erosion processes, as well as frequent wildfires. Lithosols. PV: <i>Oleo-Ceratonion</i> and <i>Quercion ilicis</i> .

Systems	Facets
	<p>1.3.3 Suvarelli locality. Geological substrates belonging to the Numidian flysch, Geraci Siculo member (yellowish graded quartzarenites and brown clays), the Crisanti formation (radiolarites and spongolites with redeposited calcarenites and calcirudites), and the Mufara formation (calcilutites and marls). Territory largely physionomised by semi-natural landscapes, with limited areas with remnants woodlands. Frequent occurrence of perennial grasslands dominated by <i>Ampelodesmos mauritanicus</i> and of cultivated areas, especially olive groves. Intense and widespread soil erosion processes, as well as frequent wildfires. Regosols, Phaeozem, Cambisols. PV: <i>Quercion ilicis</i> and <i>Quercetalia pubescenti-petraeae</i>, with downy oak as dominant tree species.</p>
	<p>1.3.4 Masseria Amenta (Passo Scifo) locality. Geological substrates belonging to the Mufara formation (calcilutites and marls, Ladinian-Carnian). Territory largely physionomised by semi-natural landscapes, with limited areas with remnants woodlands. The most extended forest areas are afforestation with Mediterranean conifers. Frequent occurrence of perennial grasslands dominated by <i>Ampelodesmos mauritanicus</i> and of cultivated areas, especially olive groves. Intense and widespread soil erosion processes, as well as frequent wildfires. Lithosols. PV: <i>Quercetalia pubescenti-petraeae</i>, with downy oak as dominant tree species.</p>

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**Tab. S2** - Results of the phytosociological surveys carried out within the densest cork oak stands (cover of *Quercus suber*  $\geq 20\%$ ). Macro-area denomination: A = Pianetto; B = Cozzo Secco; C = Colline della media valle del fiume Oreto e del Monrealese. Freq. = Frequency. Locality names: PI = Pianetto, VR = Viole Rosse, CZ = Costa Zolia, CS = Cozzo Secco, CA = Caputo, BA = Barone, MA = Maglio. Lithology: ca, carbonates; fl, flysch, i.e. quartz sandstones, and other siliceous substrates. + = relatively frequent plant species; r = species with only one individual. The highest number of species within each plot and phytosociological alliance is shown in bold.

Macro-area	A		A		B		B		B		C		C		C		C		Freq.
Locality	PI (1)	PI (2)	VR	CZ	CS (1)	CS (2)	CS (3)	CS (4)	CS (5)	CS (6)	CS (7)	CA (1)	CA (2)	BA (1)	BA (2)	BA (3)	MA (1)	MA (2)	
Relevé number	3	4	1	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Area (m <sup>2</sup> )	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Altitude (m a.s.l.)	730	700	690	750	500	525	550	575	600	645	660	525	525	260	270	280	260	260	
Aspect	NW	SE	SSW	NW	SE	SW	SE	SW	SE	Z	Z	NE	NE	WSW	WSW	WSW	NNW	NNW	
Inclination (°)	15	25	10	10	10	25	30	25	15	25	20	25	25	25	25	25	25	25	
Lithology	fl	ca	ca	ca	fl	fl	fl	fl	fl	fl	fl	ca	ca	ca	ca	ca	ca	ca	
Outcropping rocks/stones cover (%)	10	10	30	25	10	15	20	15	10	5	5	40	20	15	15	35	50	50	
Total vegetation cover (%)	100	90	60	75	95	85	80	85	95	95	100	60	80	85	85	65	50	50	
Woody layer cover (%)	15	35	30	30	50	45	50	45	60	35	40	35	25	55	30	25	25	45	
Woody layer height (m)	4.5	3.8	3.8	4.0	3.8	3.6	3.8	3.8	4.2	3.8	4.0	3.6	3.8	3.4	3.2	3.6	4.2	4.2	
Shrub layer/understorey cover (%)	70	55	15	25	15	40	40	15	50	80	85	10	10	60	60	55	30	30	
Shrub layer height (m)	1.4	1.3	0.9	1.4	0.8	1.0	1.0	0.8	1.4	1.6	1.8	0.8	1.2	0.8	0.8	0.7	1.0	1.0	
Herb layer cover (%)	25	40	30	35	30	25	20	35	15	20	15	30	60	30	30	35	55	45	
Herb layer height (m)	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.6	0.4	0.5	0.4	0.5	0.6	0.4	0.4	0.5	0.5	0.6	

**EQi: pure evergreen or mixed ever- and summergreen oak forest species linked to neutrocline-acid soils (*Erico-Quercion ilicis*)**

<i>Quercus suber</i> L.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	100.0
<i>Eryngium bocconeii</i> Lam.	1	1		1	2	1	2	1	1	1	1	+		r		r	+	1	77.8
<i>Pulicaria odora</i> (L.) Rehb.			+		+	1	1	1	1	1	1			1		+			55.6
<i>Melica minuta</i> subsp. <i>latifolia</i> (Coss.) W.Hempel	+	+			+		+			+	+						+		38.9
<i>Erica arborea</i> L.					2	2	1	3	1	+									33.3
<i>Cytisus villosus</i> Pourr.	3	3								4	4								22.2
<i>Drymochloa drymeia</i> (Mert. & W.D.J.Koch) Holub		+		+	1		+												22.2
<i>Arbutus unedo</i> L.					r			r		+									16.7
<i>Pimpinella anisoides</i> Briganti	+	+																	11.1
<i>Trifolium biconvexum</i> Guss.								1		+									11.1
<i>Clinopodium vulgare</i> L. subsp. <i>orientale</i> Bothm.		+																	5.6
<i>Luzula forsteri</i> (Sm.) DC.		+																	5.6
<i>Poa trivialis</i> L. subsp. <i>sylycolica</i> (Guss.) H.Lindb.		+																	5.6
<i>Quercus</i> cfr. <i>congesta</i> C. Presl												+							5.6

**Qi: pure evergreen or mixed ever- and summergreen oak forest species (*Quercion ilicis*)**

<i>Asparagus acutifolius</i> L.		r	1	+	+	+	+	+	+			1	+	1	+	+	1	1	88.9
<i>Rubia peregrina</i> L. s.l.	+	+	1	+	+	+	1	+	+			1	1	+	1		1	1	83.3
<i>Daphne gnidium</i> L.	+		1		+	+	1	1	+	+	+	+	1		r	+			72.2
<i>Carex distachya</i> Desf.		+	1		+	+	1	+	+	+	+	+		+	1	+	+	1	66.7
<i>Rosa sempervirens</i> L.	1	+				r		1	+			+	+				1	+	50.0
<i>Smilax aspera</i> L.						+	+			+	+	+	1	1			1	1	50.0
<i>Allium subhirsutum</i> L.		1		+	+				+	+	+						+	+	44.4
<i>Quercus virgiliana</i> (Ten.) Ten.	2	2		2				1				1	+						33.3
<i>Pistacia terebinthus</i> L.				r								r	r		r		+	+	33.3
<i>Cyclamen hederifolium</i> Aiton		+									r	+	+					+	27.8
<i>Carex hallerana</i> Asso	r	+							r	1									22.2
<i>Tamus communis</i> L.		+											+					+	16.7
<i>Quercus amplifolia</i> Guss.												1					1	2	16.7
<i>Pyrus spinosa</i> Forssk.			r											r					11.1
<i>Cephalanthera longifolia</i> L.	r	r																	11.1
<i>Limodorum abortivum</i> (L.) Schwartz						r	r												11.1
<i>Vicia ochroleuca</i> Ten.												+							5.6
<i>Thalictrum calabricum</i> Spreng.																	r		5.6

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Macro-area	A	A	A	A	B	B	B	B	B	B	B	C	C	C	C	C	C	Freq.		
Locality	PI (1)	PI (2)	VR	CZ	CS (1)	CS (2)	CS (3)	CS (4)	CS (5)	CS (6)	CS (7)	CA (1)	CA (2)	BA (1)	BA (2)	BA (3)	MA (1)	MA (2)		
Relevé number	3	4	1	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
<i>Ruscus aculeatus</i> L.												r							5.6	
<i>Fraxinus ornus</i> L.																r			5.6	
<i>Cyclamen repandum</i> Sm.																		+	5.6	
<i>Emerus major</i> Mill.																			+	5.6
<b>OCs: maquis species (<i>Oleo-Ceratonion siliquae</i>)</b>																				
<i>Arisarum vulgare</i> O.Targ.Tozz.				+			+	r		+	+	+	+		+		+		50.0	
<i>Prasium majus</i> L.				r			r				+		+	+	1		1	1	44.4	
<i>Osyris alba</i> L.	+	+							+	+				1	+				33.3	
<i>Lonicera implexa</i> Aiton							+			r	r							+	+	27.8
<i>Teucrium fruticans</i> L.														2	2	+	+	+	27.8	
<i>Rhamnus alaternus</i> L.														+	+	+		r	22.2	
<i>Asparagus albus</i> L.							r							+					11.1	
<i>Pistacia lentiscus</i> L.							r							r					11.1	
<i>Anagyris foetida</i> L.																		+	5.6	
<i>Chamaerops humilis</i> L.									r										5.6	
<i>Olea europaea</i> L. var. <i>europaea</i>																	r		5.6	
<i>Olea europaea</i> L. var. <i>sylvestris</i> (Mill.) Lehr.				r															5.6	
<b>PRu: mantle species (<i>Pruno-Rubion ulmifolii</i>)</b>																				
<i>Rubus ulmifolius</i> Schott	1	+	r	+	+	r					r	+		+		r			61.1	
<i>Crataegus monogyna</i> Vill.	+	1	+		r						r	+	+					+	+	50.0
<i>Spartium junceum</i> L.			1	r								r	+				1	2	33.3	
<i>Rhus coriaria</i> L.				2										+					11.1	
<i>Prunus spinosa</i> L.													r						5.6	
<i>Rosa canina</i> L.		r																	5.6	
<b>CEm: garrigue species (<i>Cisto-Ericion multiflorae</i>)</b>																				
<i>Cytisus infestus</i> C.Presl			2			1	2	1	+	1				+	2	+	+		55.6	
<i>Cistus salvifolius</i> L.	2	2			+	1	1	1	3	1	1							+	55.6	
<i>Cistus creticus</i> L. s.l.	2	1	1							+				1	1	3			38.9	
<i>Cistus monspeliensis</i> L.						1	+		+										16.7	
<i>Erica multiflora</i> L.						+												+	11.1	
<i>Polygala preslii</i> Spreng.												+	+						11.1	
<i>Lavandula stoechas</i> L.							+												5.6	
<b>Hh: xerophilous grassland species (<i>Hyparrhenion hirtae</i>)</b>																				
<i>Ampelodesmos mauritanicus</i> (Poir.) T.Durand & Schinz	1	2	2	1	1	1	2	3	1	+	1	2	3	4	4	3	1	+	100.0	
<i>Carlina sicula</i> Ten. subsp. <i>sicula</i>			r	+	+		+	+	+	r	+	+		+	+	+	+	+	77.8	
<i>Asphodelus ramosus</i> L.					+	+	+	+	+	+	+	+	+	+	+	+	+	+	72.2	
<i>Scorpiurus muricatus</i> L. subsp. <i>subvillosus</i> (L.) Thell.			+	+	+	1	+	+						+	+		+		50.0	
<i>Helminthoteca aculeata</i> (Vahl) Lack	+	r	1			r	+							1	+	1			44.4	
<i>Brachypodium distachyon</i> (L.) P.Beauv.			+	+	+	+	+	+										+	38.9	
<i>Dactylis glomerata</i> L. subsp. <i>hispanica</i> (Roth) Nyman					+	+				+		1		+	+			+	38.9	
<i>Hyparrhenia hirta</i> (L.) Stapf s.l.					+	1	+	+						+	+	+			38.9	
<i>Kundmannia sicula</i> L.			1	r	r	+						+		+		+			38.9	
<i>Bituminaria bituminosa</i> (L.) C.H.Stirton				2								+		1	1	+	+	1	38.9	
<i>Micromeria graeca</i> (L.) Benth. ex Rchb.			r		r	+	+		+						+		r		38.9	
<i>Anemone hortensis</i> L.		+	+									+	+	+				+	33.3	
<i>Anthyllis vulneraria</i> L. subsp. <i>maura</i> (G.Beck) Maire		r		+								+	1			+	+		33.3	
<i>Biscutella maritima</i> Ten.					+					+	+	+			+	+			33.3	
<i>Magydaris pastinacea</i> (Lam.) Paol.							r		+	+	r						+	1	33.3	
<i>Carlina gummifera</i> (L.) Less.			1											r	+	+	+		27.8	
<i>Scorzonera gr. villosa</i> Scop.			1				r	r	+	+									27.8	
<i>Scorzonera deliciosa</i> Guss.			+		+	+	+	+											27.8	
<i>Bellis perennis</i> L.			+		+	+					+								22.2	
<i>Clinopodium nepeta</i> (L.) Kuntze			r	r	r				r										22.2	
<i>Dactylis glomerata</i> L. subsp.			+	2				+						+					22.2	

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Locality	PI (1)	PI (2)	VR	CZ	CS (1)	CS (2)	CS (3)	CS (4)	CS (5)	CS (6)	CS (7)	CA (1)	CA (2)	BA (1)	BA (2)	BA (3)	MA (1)	MA (2)	
Relevé number	3	4	1	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
<i>glomerata</i>																			
<i>Euphorbia ceratocarpa</i> Ten.		+	+														l	l	22.2
<i>Helictotrichon convolutum</i> (C. Presl) Henard				r						+		l					r		22.2
<i>Ranunculus</i> cfr. <i>bulbosus</i> L.			+		r			+			r								22.2
<i>Achillea ligustica</i> All.	+	+				+													16.7
<i>Blackstonia perfoliata</i> (L.) Huds. s.l.												+		+				r	16.7
<i>Brachypodium retusum</i> (Pers.) P. Beauv.									l	l	l								16.7
<i>Convolvulus althaeoides</i> L.				+								r	+						16.7
<i>Ferula communis</i> L.		+		l														r	16.7
<i>Hyoseris radiata</i> L.			+											r				r	16.7
<i>Hypochoeris achyrophorus</i> L.			+															r	16.7
<i>Ornithopus</i> sp.						+	r				r								16.7
<i>Piptatherum miliaceum</i> (L.) Cosson s.l.					r		+	+											16.7
<i>Ranunculus paludosus</i> Poir.			+								+	+							16.7
<i>Reichardia picroides</i> (L.) Roth				+		r		r											16.7
<i>Scopisorbis minor</i> Scop. s.l.	r					r						r							16.7
<i>Sideritis romana</i> L.		+												r				r	16.7
<i>Allium roseum</i> L.						+		r											11.1
<i>Andropogon distachyos</i> L.						l													11.1
<i>Tripodion tetraphyllum</i> (L.) Fourr.				+											+				11.1
<i>Carthamus caeruleus</i> L.		+	r																11.1
<i>Elaeoselinum asclepium</i> (L.) Bertol. s.l.		+	l																11.1
<i>Foeniculum vulgare</i> Mill. s.l.				+											+				11.1
<i>Pallenis spinosa</i> (L.) Cass.			r	+															11.1
<i>Phagnalon saxatile</i> (L.) Cass.												r	r						11.1
<i>Silene italica</i> (L.) Pers. subsp. <i>sicula</i> (Ucria) Jeanmonod												r			r				11.1
<i>Charybdis pancration</i> (Steinh.) Speta															+	r			11.1
<i>Allium</i> cfr. <i>pallens</i> L.														r					5.6
<i>Asphodeline lutea</i> (L.) Rchb.				l															5.6
<i>Crepis vesicaria</i> L. s.l.			+																5.6
<i>Biarum tenuifolium</i> (L.) Schott				+															5.6
<i>Centaurium maritimum</i> (L.) Fritsch										r									5.6
<i>Crupina crupinastrum</i> (Moris) Vis.															r				5.6
<i>Dactylorrhiza romana</i> (Sebast.) Soó		r																	5.6
<i>Daucus bocconeii</i> Guss.								r											5.6
<i>Eryngium amethystinum</i> L.															+				5.6
<i>Eryngium campestre</i> L.				+															5.6
<i>Filago pygmaea</i> L.						+													5.6
<i>Iris planifolia</i> (Mill.) Fiori			+																5.6
<i>Linaria multicaulis</i> (L.) Mill. subsp. <i>multicaulis</i>																	r		5.6
<i>Oenanthe</i> cfr. <i>fistulosa</i> L.								+											5.6
<i>Ophrys</i> gr. <i>fusca</i> Link		r																	5.6
<i>Anacamptis longicornu</i> (Poir.) R.M.Bateman, Pridgeon & M.W.Chase			r																5.6
<i>Origanum vulgare</i> L. subsp. <i>viridulum</i> (Martr.-Don.) Nym.			+																5.6
<i>Romulea bulbocodium</i> (L.) Sebast. & Mauri			r																5.6
<i>Tuberaria guttata</i> (L.) Fourr.						+													5.6
<b>Other species</b>																			
<i>Daucus carota</i> L. s.l.	+	+	+	l	+	+		+		+	+	+		+	+		+	+	77.8
<i>Hypericum perforatum</i> L.	+	+	r			+	r	+		+	+	+	+					+	66.7
<i>Urospermum dalechampii</i> (L.) F.W.Schmidt			+	+	+	r	+	+	+	+	+	+	+					+	66.7
<i>Linum bienne</i> Mill.			+	+		+	+	+				+	+	+	+			+	55.6
<i>Lotus ornithopodioides</i> L.		+	l	+	+	r		+				+	+	+				+	55.6
<i>Briza maxima</i> L.			+		+			+	+	+	+				+	+		+	50.0
<i>Trifolium campestre</i> Schreb.		r		+		+	+	+				+	+					+	50.0

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Macro-area	A	A	A	A	B	B	B	B	B	B	B	C	C	C	C	C	C	Freq.	
Locality	PI (1)	PI (2)	VR	CZ	CS (1)	CS (2)	CS (3)	CS (4)	CS (5)	CS (6)	CS (7)	CA (1)	CA (2)	BA (1)	BA (2)	BA (3)	MA (1)	MA (2)	
Relevé number	3	4	1	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
<i>Vicia villosa</i> Roth s.l.		+	r	l					+		r	+	l				+	+	50.0
<i>Avena</i> cfr. <i>barbata</i> Link s.l.		r	+	+				r				+			+	+	+		44.4
<i>Sherardia arvensis</i> L.	+	+	+	+								+			+		r	+	44.4
<i>Aira cupaniana</i> Guss.		+			+		r	+		r		+						+	38.9
<i>Anagallis arvensis</i> L. subsp. <i>arvensis</i>		+			+	r	+			+		+			+				38.9
<i>Catapodium rigidum</i> (L.) C.E.Hubb.			+	+										r	r	+	+	+	38.9
<i>Galactites tomentosus</i> Moench			l	+	l	+							r	+	+				38.9
<i>Lotus edulis</i> L.		r		+		+		l	l			+		+					38.9
<i>Geranium purpureum</i> Vill.		+								+		+	+				+	+	33.3
<i>Gladiolus</i> sp.			r	r						r		+	+					r	33.3
<i>Lathyrus odoratus</i> L.	r			r								+	+				+	+	33.3
<i>Poa bulbosa</i> L.		+				+		+				+	+		+				33.3
<i>Serapias vomeracea</i> (Burm.f.) Briq.				r	+	+		r							r	r			33.3
<i>Trifolium stellatum</i> L.				+	r	+		+		+		+							33.3
<i>Vicia bithynica</i> (L.) L.		+	r									+	+				r	+	33.3
<i>Anisantha rigida</i> (Roth) Hyl.			+			+						+				+		r	27.8
<i>Coleostephus myconis</i> (L.) Cass.					+	+	r			r				+					27.8
<i>Euphorbia peplis</i> L. s.l.		+		r		r						+	+						27.8
<i>Lathyrus clymenum</i> L.		+		+								+	l			r			27.8
<i>Lotus biflorus</i> Desr.			+		l	l		l	l										27.8
<i>Scolymus</i> sp.			+	+	+	+							r						27.8
<i>Serapias lingua</i> L.						+	+	+	+		+								27.8
<i>Sonchus oleraceus</i> L.													r		r	+	r	r	27.8
<i>Vicia peregrina</i> L.			+		+			+	r	r									27.8
<i>Lathyrus sphaericus</i> Retz.			+		+	+		+											22.2
<i>Medicago polymorpha</i> L.			+		+						r	+							22.2
<i>Medicago</i> sp.				+				+					+					+	22.2
<i>Picris hieracioides</i> L. s.l.	+	+	+									r							22.2
<i>Polypodium cambricum</i> L.		+										+	+				+		22.2
<i>Sedum rubens</i> L.		+					+	+								+			22.2
<i>Tolpis</i> sp.				r	r	+		+											22.2
<i>Vicia disperma</i> DC.							+		+	+								+	22.2
<i>Vicia sativa</i> L. s.l.				+	+	+					+								22.2
<i>Acanthus mollis</i> L.										+							+	+	16.7
<i>Arundo plinii</i> Turra				r		+	r												16.7
<i>Centranthus ruber</i> L.			r									l	r						16.7
<i>Hypericum perforatum</i> L.					+				r			+							16.7
<i>Lupinus angustifolius</i> L. s.l.					+			+		+									16.7
<i>Orobanche</i> sp.			l					+										+	16.7
<i>Orobanche lavandulacea</i> Rchb.				r								r			+				16.7
<i>Oxalis pes-caprae</i> L.					+	+												+	16.7
<i>Silene gallica</i> L.					+	r										+			16.7
<i>Trifolium angustifolium</i> L.					+							+						r	16.7
<i>Umbilicus horizontalis</i> Guss.												+	+					+	16.7
<i>Anthoxanthum odoratum</i> L.			+								+								11.1
<i>Asplenium ceterach</i> L. s.l.													r					r	11.1
<i>Coronilla scorpioides</i> (L.) Koch												+						+	11.1
<i>Cymbalaria pubescens</i> (C.Presl) Cufod.													r						11.1
<i>Cynosurus effusus</i> Link				r								+							11.1
<i>Fumaria officinalis</i> L. s.l.					+								+						11.1
<i>Galium mollugo</i> L.		+	l																11.1
<i>Galium murale</i> (L.) All.						+												+	11.1
<i>Hypochoeris achyrophorus</i> L.				+														+	11.1
<i>Melilotus sulcatus</i> Desf.			+									+							11.1
<i>Misopates orontium</i> (L.) Rafin.															+	+			11.1
<i>Orobanche sanguinea</i> C.Presl					r		+												11.1
<i>Tragopogon porrifolius</i> L. subsp. <i>porrifolius</i>				r	+														11.1
<i>Trifolium arvense</i> L. subsp. <i>arvense</i>						r	+												11.1
<i>Umbilicus rupestris</i> (Salisb.) Dandy		r				r													11.1
<i>Urospermum picroides</i> (L.) F.W.Schmidt																r		+	11.1
<i>Aegilops geniculata</i> Roth				+															5.6

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Macro-area	A	A	A	A	B	B	B	B	B	B	B	C	C	C	C	C	C	Freq.	
Locality	PI (1)	PI (2)	VR	CZ	CS (1)	CS (2)	CS (3)	CS (4)	CS (5)	CS (6)	CS (7)	CA (1)	CA (2)	BA (1)	BA (2)	BA (3)	MA (1)	MA (2)	
Relevé number	3	4	1	2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
<i>Arabis hirsuta</i> (L.) Scop.		r																	5.6
<i>Borago officinalis</i> L.								r											5.6
<i>Bromus hordeaceus</i> L. s.l.				+															5.6
<i>Bromus madritensis</i> L.				+															5.6
<i>Carduus nutans</i> L. subsp. <i>siculus</i> (Franco) Greuter	r																		5.6
<i>Centaurea nicaeensis</i> All.				+															5.6
<i>Cerastium glomeratum</i> Thuill.												r							5.6
<i>Cuscuta</i> sp.										+									5.6
<i>Dasypyrum villosum</i> (L.) Borbás				+															5.6
<i>Dryopteris pallida</i> (Bory) Maire & Petitmengin														r					5.6
<i>Erodium</i> sp.							+												5.6
<i>Galium pallidum</i> C.Presl													+						5.6
<i>Galium spurium</i> L. s.l.		r																	5.6
<i>Geranium dissectum</i> L.					+														5.6
<i>Hedypnois</i> sp.				+															5.6
<i>Lagurus ovatus</i> L. subsp. <i>ovatus</i>								r											5.6
<i>Melilotus infestus</i> Guss.														+					5.6
<i>Muscari comosum</i> (L.) Mill.														r					5.6
<i>Nigella damascena</i> L.				+															5.6
<i>Notobasis syriaca</i> (L.) Cass.			r																5.6
<i>Orchis brancifortii</i> Biv.												r							5.6
<i>Orobanche amethystea</i> Thuill.											r								5.6
<i>Petrorhagia prolifera</i> (L.) P.W.Ball & Heywood					+														5.6
<i>Plantago lanceolata</i> L.			r																5.6
<i>Plantago serraria</i> L.					r														5.6
<i>Polygala mospeliaca</i> L.														r					5.6
<i>Pteridium aquilinum</i> (L.) Kuhn	l																		5.6
<i>Rumex bucephalophorus</i> L. s.l.					+														5.6
<i>Sedum album</i> L. s.l.							+												5.6
<i>Petrosedum sediforme</i> (Jacq.) Grulich																		+	5.6
<i>Serapias cordigera</i> L.															+				5.6
<i>Serapias parviflora</i> Parl.												+							5.6
<i>Silene coeli-rosa</i> (L.) Godron												r							5.6
<i>Silene latifolia</i> Poir.			r																5.6
<i>Silene vulgaris</i> (Moench) Garcke subsp. <i>angustifolia</i> Hayek														+					5.6
<i>Stachys arvensis</i> (L.) L.				+															5.6
<i>Stellaria media</i> (L.) Vill.					+														5.6
<i>Lotus tetragonolobus</i> L.			+																5.6
<i>Theligonum cynocrambe</i> L.														+					5.6
<i>Trifolium incarnatum</i> L. subsp. <i>molinerii</i> (Hornem.) Syme										r									5.6
<i>Trifolium repens</i> L. subsp. <i>repens</i>				r															5.6
<b>EQi</b>	5	<b>8</b>	2	1	5	6	5	5	6	6	<b>8</b>	3	1	3	1	3	3	2	
<b>Qi</b>	6	10	5	5	5	6	6	6	4	7	5	<b>13</b>	9	4	5	4	10	11	
<b>OCs</b>	1	1	0	3	0	2	3	1	2	4	2	1	2	<b>6</b>	5	3	5	4	
<b>PRu</b>	2	3	3	3	2	1	0	0	0	1	2	2	<b>5</b>	0	1	0	2	3	
<b>CEm</b>	2	2	2	0	1	<b>4</b>	<b>4</b>	2	3	3	1	1	1	2	2	<b>4</b>	1	0	
<b>Hh</b>	4	12	<b>27</b>	19	14	19	12	17	7	11	10	16	13	16	13	11	13	11	
<b>Other species</b>	7	22	29	35	29	30	13	25	8	16	10	<b>37</b>	28	9	13	11	21	23	
<b>EQi + Qi</b>	11	<b>17</b>	7	5	9	12	11	11	10	12	12	15	10	7	6	7	12	12	
<b>EQi + Qi + PRu</b>	13	<b>20</b>	10	8	11	13	11	11	10	13	14	17	15	7	7	7	14	15	
<b>Hh + other species</b>	11	36	<b>56</b>	55	44	49	25	42	15	28	21	54	41	25	26	22	35	35	
<b>Tot. species</b>	27	58	68	66	56	68	43	56	30	48	38	<b>73</b>	59	40	40	36	55	54	



**Tab. S3** - Morphological characteristics of the pedons collected in the field.

Pedon	Horizon	Depth (cm)	Color <sup>a</sup>	Structure <sup>b</sup>	Consistency <sup>c</sup>	Roots <sup>d</sup>	Rock fragments <sup>e</sup>	Horizon boundaries <sup>f</sup>
Ag1	Oe	1-0						
	A	0-4	10YR 5/3	gr, f, 3	l, fi, st	p, f/m, 3	s, m, 1	c, l
	Bw	4-23	10YR 3/4	gr, m, 2	l, fi, st	p, f/m, 1	s, m, 1	c, l
	B/C	23-45	10YR 3/3	gr, m, 2	h, vfi, st	p, f/m, 1	s, m, 1	ab, l
	C	45-55	10YR 5/3	ma, mf, 1	h, vfi, st		s, m, 1	ab, ir
R	>55							
Ag2	Oe	1-0						
	A	0-3	10YR 5/3	gr, m, 2	l, f, nst	p, f/m, 2	a, m, 1	c, w
	A/B	3-25	10YR 5/3	gr, m, 1	l, fi, nst	p, f/m, 1	f, m, 1	c, w
	Bw	25-60	10YR 6/3	gr, m, 1	l, fi, nst	p, f/m, 1	r, m, 1	c, l
	R	>60					s, m, 1	
Az3	Oe	1-0						
	A	0-23	7.5YR 3/2	gr, m, 1	sha, vfi, st	p, f/m, 2	s, m, 1	a, l
	Bw	23-60	7.5YR 4/4	gr, m, 1	sha, vfi, st	cr, f/m, 1		a, ir
	R	>60						
Az4	Oe	1-0						
	A	0-22	7.5YR 4/2	gr, m, 1	sha, fi, st	cr, f, 2	s, m, 1	c, w
	Bw1	22-60	7.5YR 4/2	gr, m, 1	sha, fi, st	p, f/m, 1	f, m, 1	c, l
	Bw2	60-130						
	R	>130						
B	Oe	1-0						
	A	0-7	7.5YR 5/6	gr, mf, 2	sha, l, st	p, f, 2	a, m, 1	c, ir
	A/B	7-38	7.5YR 5/8	gr, mf, 2	sha, l, st	p, f, 1	a, m, 1	g, ir
	Bw	38-100	10YR 6/3	abk, f, 1	l, f, sst	p, m, 1	s, c, 3	
	C	100-180						

<sup>a</sup>Soil matrix color, Munsell Soil Color Chart, Dry sample; <sup>b</sup>Shape: gr, granular; sbk, sub-angular blocky; abk, angular blocky; pr, prismatic; ma, massive. Size: f, fine; m, medium; c, coarse. Grade: 1, strong; 2, moderate; 3, weak; <sup>c</sup>Dry: l, loose; s, soft; sha, slightly hard; h, hard; vh, very hard; eh, extremely hard. Moist: l, loose; vf, very friable; f, friable; fi, firm; vfi, very firm; efi, extremely firm. Stickiness: nst, non-sticky; sst, slightly sticky; st, sticky; vst, very sticky; <sup>d</sup>Location: p, between pedons; cr, in cracks; t, throughout. Size: f, fine; m, medium; c, coarse. Quantity: 1, few; 2, common; 3, many; <sup>e</sup>Shape: f, flat; a, angular; s, sub-rounded; r, rounded. Weathering: f, fresh or slightly weathered; w, weathered; s, strongly weathered. Size f, fine; m, medium; c, coarse. Quantity: 1, few; 2, common; 3, many; <sup>f</sup>Distinctness: a, abrupt; c, clear; g, gradual; d, diffuse. Topography: l, linear; s, smooth; w, wavy; ir, irregular.



**Tab. S4** - Results of the autocorrelation tests in richness and diversity across the three different distance matrix.

	2300		4300		Queen	
	Moran I	p	Moran I	p	Moran I	p
Richness	0.21	0.09	0.11	0.15	0.07	0.19
Shannon	-0.28	0.13	-0.07	0.43	0.110	0.15
Pielou	-0.46	0.009	-0.26	0.03	0.11	0.15

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**Tab. S5** - Plant taxa characteristic of forest and pre-forest communities (maquis, mantle, garrigue and grassland) recorded in areas close to the *Q. suber* populations and the soil sampling sites. The list includes also species characteristic of rocky and scree habitats. + = relatively frequent plant species; r = species with only one individual; \* = species present nearby but outside the cork oak stand. The plant species occurring in Sicily in acid or sub-acid substrates are followed by the symbol §.

Plant taxa	Locality							
	A	B	C	C	C	C	C	C
	Pianetto	Cozzo secco	Suvarelli - Sàgana	Suvarelli - Altofonte	Loghi Vecchi (= Mt. Caputo)	Alotta	Patellaro	Barone
<b>EQi: pure evergreen or mixed ever- and summer-green oak forest species linked to neutroline-acid soils (<i>Erico-Quercion ilicis</i>)</b>								
<i>Arbutus unedo</i> L. §		+						*
<i>Clinopodium vulgare</i> L. subsp. <i>orientale</i> Bothm. §	+	+						
<i>Cytisus villosus</i> Pourr. §	+	+	+					
<i>Erica arborea</i> L. §	+	+						*
<i>Eryngium bocconeii</i> Lam. §	+	+			+			+
<i>Drymochloa drymeia</i> (Mert. & W.D.J.Koch) Holub §	+							
<i>Genista monspessulana</i> (L.) L.A.S.Johnson §	+	+						
<i>Iris foetidissima</i> L. §	+							
<i>Luzula forsteri</i> (Sm.) DC. §	+							
<i>Melica minuta</i> subsp. <i>latifolia</i> (Coss.) W.Hempel §		+						
<i>Pimpinella anisoides</i> Briganti §	+	+						
<i>Poa trivialis</i> L. subsp. <i>sylvicola</i> (Guss.) H.Lindb.	+							
<i>Pulicaria odora</i> (L.) Rchb. §	+	+			+			+
<i>Quercus congesta</i> C.Presl	+				+			
<i>Quercus suber</i> L. §	+	+		+	+	+	+	+
<i>Trifolium bivonae</i> Guss. §		+						
<b>Qi: pure evergreen or mixed ever- and summergreen oak forest species (<i>Quercion ilicis</i>)</b>								
<i>Acer campestre</i> L.	+							
<i>Allium subhirsutum</i> L.	+	+			+	+		
<i>Asparagus acutifolius</i> L.	+	+		+	+	+		+
<i>Buglossoides purpureo-coerulea</i> (L.) I.M.Johnston	+							
<i>Carex distachya</i> Desf.				+				
<i>Carex hallerana</i> Asso		+		+				+
<i>Cephalanthera longifolia</i> (L.) Fritsch §	+							
<i>Clematis vitalba</i> L.	+							
<i>Emerus major</i> Mill.				+	+			*
<i>Cyclamen hederifolium</i> Aiton	+	+			+	+		
<i>Cyclamen repandum</i> Sm.	+	+			+			
<i>Fraxinus ornus</i> L.	+	+	+	+				+
<i>Hedera helix</i> L. subsp. <i>helix</i>	+		+					
<i>Limodorum abortivum</i> (L.) Schwartz §		+						
<i>Lonicera etrusca</i> G.Santi	+	+						
<i>Myrtus communis</i> L. §		+		+				*
<i>Ornithogalum montanum</i> Cyr.			+					
<i>Paeonia mascula</i> (L.) Mill. subsp. <i>russoi</i> (Biv.) Cullen & Heywood			+					
<i>Pistacia terebinthus</i> L.	+	+	+		+	+	+	+
<i>Pyrus spinosa</i> Forssk.	+	+		+				+
<i>Prunella laciniata</i> (L.) L.		+						
<i>Quercus amplifolia</i> Guss.	+				+		+	
<i>Quercus ilex</i> L.	+		+		+			

Plant taxa	Locality							
	A	B	C	C	C	C	C	C
<i>Quercus virgiliana</i> (Ten.) Ten.	+	r	+	+	+			+
<i>Rosa sempervirens</i> L.	+	+		+	+	+	*	
<i>Rubia peregrina</i> L. s.l.	+	+		+	+		+	
<i>Ruscus aculeatus</i> L.	+	+	+		+		*	*
<i>Thalictrum calabricum</i> Spreng.	+		+					
<i>Viola alba</i> Bess. subsp. <i>dehnhardtii</i> (Ten.) W.Becker		+						
<b>OCs: maquis species (<i>Oleo-Ceratonion siliquae</i>)</b>								
<i>Anagyris foetida</i> L.	+			+			+	*
<i>Arisarum vulgare</i> O.Targ.Tozz.	+	+		+	+	+	+	+
<i>Asparagus albus</i> L.		+		+			+	+
<i>Chamaerops humilis</i> L.		*						
<i>Clematis cirrhosa</i> L.	+		+				+	
<i>Daphne gnidium</i> L.	+	+		+	+		+	+
<i>Euphorbia dendroides</i> L.	*			*				
<i>Jasminum fruticans</i> L.								*
<i>Lonicera implexa</i> L.	+	+		+	+			+
<i>Olea europaea</i> L. var. <i>sylvestris</i> (Mill.) Lehr.		+					+	
<i>Osyris alba</i> L.	+	+	+	+	+		+	+
<i>Phillyrea latifolia</i> L.	+	+						
<i>Pistacia lentiscus</i> L.		+		+		+	+	+
<i>Prasium majus</i> L.	+	+		+	+	+	+	
<i>Rhamnus alaternus</i> L.	+			+		+	+	*
<i>Ruta chalepensis</i> L.	+			+			+	
<i>Smilax aspera</i> L.	+	+	+	+	+	+	+	*
<i>Teucrium fruticans</i> L.		+		+		+	+	+
<b>PRu: mantle species (<i>Pruno-Rubion ulmifolii</i>)</b>								
<i>Crataegus monogyna</i> Jacq.	+	+		+	+		+	+
<i>Euphorbia characias</i> L. subsp. <i>characias</i>	+	+	+					
<i>Prunus spinosa</i> L.	+	+						
<i>Rhus coriaria</i> L.		+		+			+	+
<i>Rosa canina</i> L.	+	+						
<i>Rubus ulmifolius</i> Schott	+	+			+	+	+	
<i>Rubus canescens</i> DC.		+						
<i>Spartium junceum</i> L.	+		+	+	+	+	+	+
<i>Ulmus minor</i> Mill.	+					+	+	
<b>CEm: garrigue species (<i>Cisto-Ericion multiflorae</i>)</b>								
<i>Cytisus infestus</i> C.Presl	+	+			+			+
<i>Cistus creticus</i> L. s.l.	+							+
<i>Cistus salvifolius</i> L.	+	+		+		+		+
<i>Cistus monspeliensis</i> L <sup>§</sup>		+						
<i>Erica multiflora</i> L.					r			
<i>Polygala preslii</i> Spreng.	+				+			
<b>Hh: xerophilous grassland species (<i>Hyparrhenion</i> and <i>Hyparrhenietalia hirtae</i>)</b>								
<i>Achillea ligustica</i> All. <sup>§</sup>	+	+						
<i>Ambrosina bassii</i> L.		+					+	+
<i>Ampelodesmos mauritanicus</i> (Poir.) T.Durand & Schinz	+	+	+	+	+	+	+	+
<i>Andropogon distachyos</i> L.		+						+
<i>Anemone hortensis</i> L.	+	+		+	+		+	*
<i>Tripodion tetraphyllum</i> (L.) Fourr.	+						+	+
<i>Anthyllis vulneraria</i> L. subsp. <i>maura</i> (G.Beck) Maire	+							
<i>Arundo plinii</i> Turra		+				+	+	
<i>Asperula aristata</i> Lf. subsp. <i>longiflora</i> (Waldst. & Kit.) Hayek					+			
<i>Asphodeline lutea</i> (L.) Rehb.	+							
<i>Asphodelus ramosus</i> L.	+	+		+	+		+	+
<i>Bellis perennis</i> L.	+	+		+	+		+	+
<i>Brachypodium retusum</i> (Pers.) P.Beauv.		+			+			
<i>Carlina gummifera</i> (L.) Less.		+		+	+		+	+
<i>Carlina sicula</i> Ten. subsp. <i>sicula</i>	+	+			+		+	+

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Plant taxa	Locality							
	A	B	C	C	C	C	C	C
<i>Convolvulus altheoides</i> L.	+			+	+		+	+
<i>Convolvulus cantabrica</i> L.		+						+
<i>Dactylis glomerata</i> L. subsp. <i>hispanica</i> (Roth) Nyman	+	+		+	+		+	+
<i>Elaeoselinum asclepium</i> (L.) Bertol. s.l.	+				+			+
<i>Euphorbia ceratocarpa</i> Ten.	+			+	+		+	*
<i>Ferula communis</i> L.	+			+			+	+
<i>Foeniculum vulgare</i> Mill. subsp. <i>piperitum</i> (Ucria) Bég.	+	+			+		+	*
<i>Hyoseris radiata</i> L.	+	+			+		+	
<i>Hyparrhenia hirta</i> (L.) Stapf.		+		+			+	+
<i>Hypochaeris laevigata</i> (L.) Ces., Pass. & Gibelli	+				+			
<i>Iris planifolia</i> (Mill.) Fiori	+						+	+
<i>Kundmannia sicula</i> L.	+	+			+		+	+
<i>Magydaris pastinacea</i> (Lam.) Paol.	+	+	+	+	+		+	
<i>Origanum heracleoticum</i> L.	+	+						
<i>Phagnalon saxatile</i> L.	+				+			
<i>Helminthoteca aculeata</i> (Vahl) Lack	+							+
<i>Piptatherum miliaceum</i> (L.) Cosson s.l.	+	+		+		+		
<i>Psoralea bituminosa</i> L.	+	+		+	+	+	+	+
<i>Ranunculus bulbosus</i> L. s.l.	+	+						
<i>Reichardia picroides</i> (L.) Roth	+	+			+	+		*
<i>Sanguisorba minor</i> Scop. s.l.	+	+			+		+	
<i>Micromeria graeca</i> (L.) Benth. ex Rehb.	+			+	+			+
<i>Clinopodium nepeta</i> (L.) Kuntze	+	+						
<i>Silene italica</i> (L.) Pers. subsp. <i>sicula</i> (Ucria) Jeanmonod	+							
<i>Sixalix atropurpurea</i> L. subsp. <i>maritima</i> (L.) Greuter & Burdet	+	+				+		+
<i>Thapsia garganica</i> L.		+			+			
<i>Charybdis pancracion</i> (Steinh.) Speta	+			+			+	+
<b>Ag-GP: cliff and/or scree species (<i>Asplenietalia glandulosi</i>, <i>Galio-Parietaria</i>, etc.)</b>								
<i>Asplenium ceterach</i> L. s.l.	+				+		+	
<i>Athamanta sicula</i> L.	+							
<i>Calendula suffruticosa</i> Vahl subsp. <i>fulgida</i> (Raf.) Ohle	+		+	+			+	+
<i>Centranthus ruber</i> L.					+	+		
<i>Cymbalaria muralis</i> P.Gaertn., B.Mey. & Scherb. subsp. <i>pubescens</i> (C. Presl) D.A. Webb	+		+		+			
<i>Dryopteris pallida</i> (Bory) Maire & Petitm.	+		+					
<i>Galium pallidum</i> C.Presl					+			
<i>Polypodium cambricum</i> L.	+	+	+	+	+			+
<i>Sedum album</i> L. s.l.	+							
<i>Sedum dasyphyllum</i> L. s.l.					+			
<i>Sedum sedifome</i> (Jacq.) Pau	+	+		+	+		+	+
<i>Selaginella denticulata</i> (L.) Spring.		+		+				
<i>Silene fruticosa</i> L. subsp. <i>fruticosa</i>	+			+	+			+
<i>Triglochin laxiflora</i> Guss.		+						
<i>Umbilicus horizontalis</i> Guss.		+						
<i>Umbilicus rupestris</i> (Salisb.) Dandy	+							
<b>EQi</b>	13	11	1	1	4	1	1	5
<b>Qi</b>	20	17	9	10	12	5	5	9
<b>OCs</b>	12	12	3	13	6	6	13	11
<b>PRu</b>	7	7	2	3	3	3	5	3
<b>CEm</b>	4	3	0	1	3	1	0	3
<b>Hh</b>	33	27	2	14	23	6	22	25
<b>Ag-GP</b>	10	5	4	5	8	1	3	4