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Floristic and vegetational features of Monte Marganai (SW Sardinia)*

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Abstract

A floristic and vegetational study of Monte Marganai (SW Sardinia) is presented. Monte Marganai is a limestone massif located between the Cixerri plain to the south and Monte Linas to the north. The field and bibliographic investigation allowed 686 taxa to be assessed, 648 of which were observed, belonging to 395 genera, 93 families and 38 orders. Considering only the observed taxa, the most represented subclass is Magnoliidae (625 taxa), and within it the Eudicotyledones is the most represented systematic group with 23 orders, 64 families and 479 species and subspecies. The most represented orders are Asterales (78 taxa), Poales (76), Fabales (68), Lamiales, and Asparagales (58). Asteraceae, with 74 species, is the most represented family, followed by Fabaceae (66) and Poaceae (56). The most numerous genera are *Galium* (12), *Trifolium* and *Euphorbia* (11), *Medicago* and *Ophrys* (10). From the viewpoint of biological strategies, therophytes prevail (38.1%), which is typical for the Mediterranean region. Other forms present in the area are the hemicryptophytes (29.0%) and the geophytes (14.8%).

The chorological spectrum of the flora of the study area shows a prevalence of Mediterranean distributions. Among the strictly Mediterranean species (54.3%), those with a circum-Mediterranean range are prevalent (31.0%), followed by endemic species (11.3%), and by W-Mediterranean species (7.8%). Taxa more widespread but with a distribution centred on the Mediterranean basin amount to 25.1%. Among the endemics (73 species altogether) the most numerous families are the Asteraceae (12) and the Orchidaceae (7). From a biogeographical viewpoint the Sardo-Corsican endemics (27) are most abundant, followed by those from the Italo-Tyrrhenian super-province (17) and from the Sardinian sub-province (14). Besides these, 1 taxon (*Genista valsecchiae*) is endemic of the Sulcis Iglesiente sector, and 3 (*Genista sulcitana*, *Linum muelleri* and *Sesleria insularis* subsp. *morisiana*) are exclusive of the Iglesiente sub-sector.

The analysis of rarity showed that the most common category (158 taxa) is that of the widespread generalist species with sometimes an extensive and/or dominant population (WBL), while the least frequent category (1 taxon) is that of generalist species with a limited distribution and with sometimes dominant populations (NBL).

Protected species or those deemed worthy of protection are 51, of which 31 are included in the Habitats Directive 92/43/EEC and in the Bern and Washington conventions, while 23 species are included in the IUCN Regional Red Lists.

Vegetation analyses were mainly focused on the forest community and allowed the physiognomic and structural description of the forests, shrublands, maquis, and the edaphoxerophilous, climatophilous and edaphohygrophilous serial phases. In addition, the psammophilous, rupicolous and synanthropic vegetations were analysed, with particular reference to the vegetation of post-mining sites. These analyses allowed the characterization of 6 vegetation series and 1 riparian geosigmetum. Finally, a syntaxonomic scheme of the forest vegetation is proposed, from which 3 classes, 4 orders, 6 alliances, 3 sub-alliances, 7 associations, and 7 sub-associations turned out to be present in the Marganai area.

Key words: *Sardinia, Iglesiente, flora, endemics, analysis of rarity, vegetation, conservation.*

Riassunto

Lineamenti floristici e vegetazionali del Monte Marganai (Sardegna sud-occidentale)

Si presenta lo studio floristico e vegetazionale del Monte Marganai, massiccio carbonatico situato tra la piana del Cixerri a sud ed il complesso del Monte Linas a nord. Le indagini di campo e bibliografiche hanno consentito di censire 686 taxa, dei quali 648 osservati in campo, appartenenti a 395 generi, 93 famiglie e 38 ordini. Tra i taxa osservati la sottoclasse maggiormente rappresentata è quella delle Magnoliidae (625 taxa), all'interno della quale le Eudicotyledones rappresentano il gruppo sistematico più numeroso con 23 ordini, 64 famiglie e 479 specie. Gli ordini più frequenti sono Asterales con 78 taxa, Poales (76), Fabales (68), Lamiales e Asparagales (58). La famiglia delle Asteraceae è quella con il maggior numero di entità (74), seguita dalle Fabaceae (66) e dalle Poaceae (56). I generi più rappresentati sono Galium *(12),* Trifolium *ed* Euphorbia *(11),* Medicago *e* Ophrys *(10). I dati relativi allo spettro biologico mostrano la prevalenza delle terofite (38,1%), tipiche delle regioni dell'area mediterranea, seguite dalle emicriptofite (29,0%) e dalle geofite (14,8%).*

Lo spettro corologico della flora nel suo complesso mette in evidenza la dominanza della componente mediterranea. Tra le specie mediterranee

*s.s. (54,3%) sono maggiormente rappresentate le entità ad areale circum-mediterraneo (31,0%), seguite dalle endemiche (11,5%) e dalle entità a baricentro occidentale (7,8%). I taxa a distribuzione più ampia, ma sempre con areale centrato sul bacino del Mediterraneo, ammontano complessivamente al 25,1%. Per quanto riguarda la componente endemica, pari a 73 entità, le famiglie che contano il numero maggiore di taxa sono le Asteraceae (12) e le Orchidaceae (7). Per quanto concerne la caratterizzazione biogeografica, la componente più numerosa è quella della provincia Sardo-corsa (27), seguita da quella riferibile alla superprovincia Italo-tirrenica (17) e della subprovincia Sarda (14). Oltre a queste 1 taxon (*Genista valsecchiae*) risulta esclusivo del settore Sulcitano-Iglesiente e 3 del sottosettore Iglesiente (*Genista sulcitana, Linum muelleri *e* Sesleria insularis *subsp.* morisiana*).*

L'analisi della rarità rivela come la categoria più numerosa (158 taxa) sia quella delle specie ampiamente diffuse sul territorio, con una ecologia ampia e popolamenti talora estesi e/o dominanti (WBL), mentre quella meno numerosa (1) si riferisce alle specie che hanno una limitata diffusione sul territorio, una ecologia ampia e formano popolamenti ampi e talora dominanti (NBL).

Le entità tutelate o considerate meritevoli di tutela sono 51, delle quali 31 sono incluse negli allegati della Direttiva CEE 43/92 e delle convenzioni di Berna e di Washington, mentre 23 taxa sono inclusi nelle Liste Rosse Regionali della IUCN.

Per quanto concerne la vegetazione, le analisi si sono riferite in particolare alle cenosi di tipo forestale ed hanno consentito di descrivere dal punto di vista fisionomico-strutturale i boschi, le boscaglie, le macchie e tutti gli stadi seriali di tipo edafoxerofilo, climatofilo ed edafoigrofilo. Oltre a ciò è stata analizzata la vegetazione psammofila, rupicola e degli ambienti sinantropici con particolare riferimento a quella mineraria. Tali analisi hanno permesso di individuare 6 serie di vegetazione e 1 geosigmeto ripariale. Viene infine proposto uno schema sintassonomico della vegetazione forestale, dal quale risultano presenti per l'area di Marganai 3 classi, riferibili a 4 ordini, 6 alleanze, 3 suballeanze, 7 associazioni e 7 subassociazioni.

INTRODUCTION

If one excludes the work of Ballero & Angiolino (1991), no accurate botanical analyses exist to date for the limestone massif of Monte Marganai (SW Sardinia, Iglesiente).

This area is of particular interest because of its peculiar geological features, which distinguish it from the Hercynian crystalline mountain complex of Monte Linas and from the adjacent territories. The mesoclimate shows strong oceanic features due to its proximity to the sea and westerly exposure.

In the past this region has undergone strong modifications due to mining activities and, to a lesser extent, silvicultural ones. Currently, mining has been abandoned altogether and grazing is reduced to a minimum, so the study area is predominantly used for forestry. Since 1980 these activities have been regulated through the establishment of a region-owned property managed by the Sardinian Forestry Service (Ente Foreste Sardegna). Since 1995 the study area is included in the proposal for the institution of the Site of Community Importance "Monte Linas-Marganai", identified by the code Nature 2000 ITB041111.

Today, Monte Marganai shows a high level of naturalness and natural restoration processes are taking place following the abandonment of mining activities and the consequent exodus of human populations connected with mining.

The area has not been subject to detailed studies; it is rich in endemic and phytogeographically interesting species, and in mesophilous forest coenoses very rare in southern Sardinia. For these reasons we consider it useful to present a complete picture of the floristic and vegetational features of this area.

PHYSIOGRAPHIC SITUATION

The study area (fig. 1) covers a total surface area of 3,608 ha and is located in the municipalities of Iglesias, Domusnovas and Fluminimaggiore. It is included in sheet n. 555, section I of the topographic map of Italy (scale 1:25,000).

Geographically it is located between 39°19.567' and 39°22.471' latitude north and between 8°33.762' and 8°37.689' longitude east. The area is delimited by the Cuccuru Contu (807 m a.s.l.), Punta Arbona (851 m a.s.l.) and Campu Spina (939 m a.s.l.) peaks to the west, Valle Oridda with Rio Sa Duchessa to the north, San Giovanni cave with the San Giovanni torrent to the east, and the Cixerri plain, circumscribed by the rivers Corongiu and Arriali, to the south.

The altitude of the region ranges from 200 m to the 939 m of Campu Spina peak, the second highest peak being Punta San Michele (906 m), situated in the southernmost part of the massif, opposite the Cixerri plain.

The mountain ridge extends in a NW-SE direction for about 7.5 km and the peak situated closest to the sea (11 km away) is Cuccuru Contu.

The massif constitutes a wide anticline – its main axis directed almost E-W – formed during the Sardinian phase of the Caledonian orogeny and the early Hercynian phase.

Geologically, sedimentary lithologic formations of the Early Palaeozoic are dominant. The main part of the succession is the carbonate platform of the Gonnesa Group, or Metalliferous formation (Carmignani 2001), constituted by the San Giovanni formation or member of the Ceroid Limestone (Pillola 1991), formed by metacalcareous rocks deriving

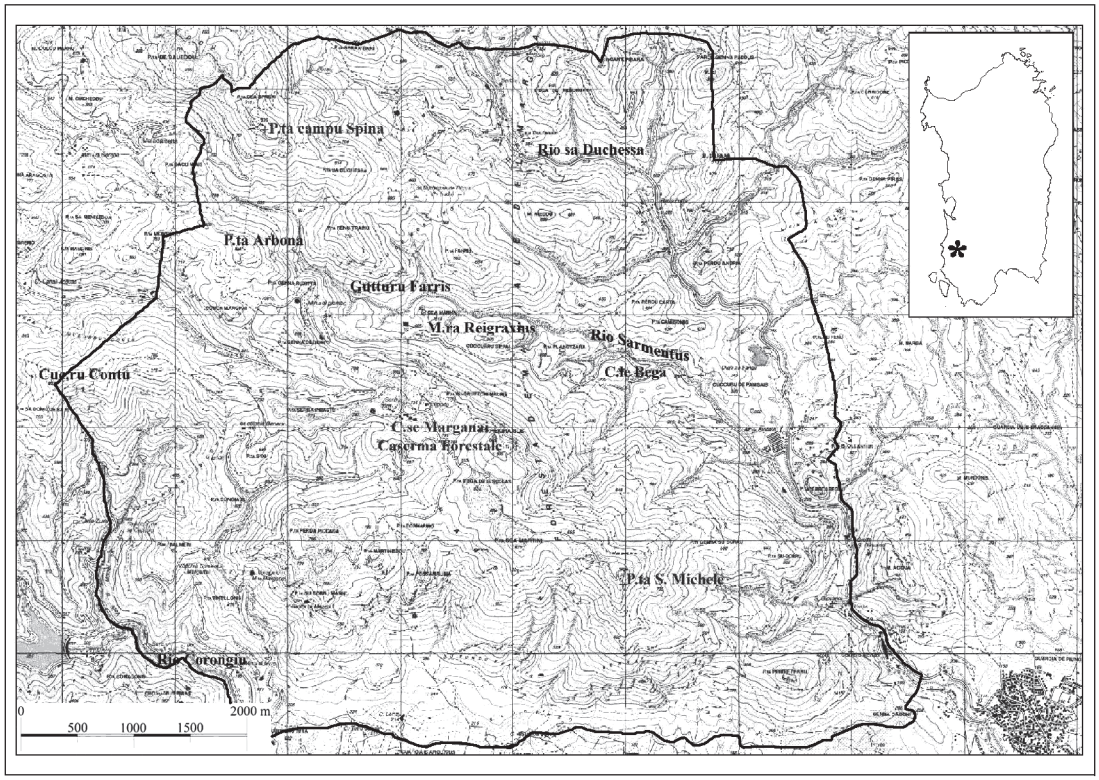

Fig. 1. Index map of the study area.

from marine sedimentation in Bahamas-type carbonate platform conditions. These formations dominate the terrigenous sediment platform of the Nebida Group (Arenarie formation), present in the northwestern part of the area from Punta Serra Pirastu to Su Murru is Covas. In the medium-low parts of the eastern slope, between the Reigraxius mine and Canale Bega and descending towards Rio Sarmensus, the Gonnesa Group is substituted by the Iglesias Group (Cabitza argillo-schists). The characteristics of the sediments suggest a transition from a neritic to a shallow pelagic environment (Gandin et al. 1987).

Cracking and karst phenomena and the consequent average to high permeability of the rocks make Monte Marganai one of the most important limestone aquifers of the region; this gives origin to the San Giovanni cave spring – which flows on the eastern side of Monte Acqua (Domusnovas) – and to the underground aquifer of Cuccuru Tiria; the latter spreads its waters over the alluvial areas of the Cixerri valley and feeds Rio Corongiu during periods of maximum flow.

Due to the karst nature of the area, the superficial water network is not very developed, becoming more consistent only at the base of the massif. The morphology of the region is rough, with vertical walls and karst structures such as the valley of Rio Sarmentus, which flows into the San Giovanni cave, the several dolines south of Punta Perda Piccada, between Punta Martineddu and Punta Rosmarino, and the characteristic ridges of the highest areas and the western slope of Valle Oridda.

Two pedological units can be identified with reference to explanatory notes of the Soil Map of Sardinia (Aru et al. 1991): a calcareous one (the most representative) and a metamorphic one. Dominant soil types are: Typic Xerochrepts, Lithic Rhodoxeralfs and Xerochrepts, from shallow to deep, with sandy-clay-loam to clayey texture and a medium to high organic matter content.

Climatic data (tabs 1–2, fig. 2) were collected by weather stations at Fluminimaggiore, Montimannu, Punta Gennarta, and San Giovanni. The available data are characteristic of a Mediterranean climate. Average annual temperatures range from 15.4°C at Punta Gennarta – average maximum temperature of 29.8°C in August (hottest month) and average minimum temperature of 5.9°C in January (coldest month) – to 16.5°C at San Giovanni – average maximum temperature of 31.4°C in August and average minimum temperature of 5.6°C in January.

Rainfall shows the following pattern in all four stations: rainy winters and dry summers, July being the driest month (only 3 mm at Fluminimaggiore), December and November being the rainiest months at Montimannu, Fluminimaggiore and Punta Gennarta, and San Giovanni, respectively. The station with the highest annual rainfall is Montimannu with

Tab. 1. Monthly and annual average temperatures, monthly and annual average rainfall. Ti = average temperature in °C; Mi = average of maximum temperatures in °C; mi = average of minimum temperatures in °C; Pi = average monthly rainfall in mm.

	Fluminimaggiore				**Montimannu**				**Punta Gennarta**				**San Giovanni**			
	observation period of temperatures: 1935-1980 (46); observation period of rainfall: 1935-1980 (46)				observation period of temperatures: 1935-2002 (65); observation period of rainfall: 1935-2005 (71)				observation period of temperatures: 1966-82 (17); observation period of rainfall: 1966-1980 (16)				observation period of temperatures:1935-2004 (65); observation period of rainfall: 1935-2005 (70)			
	Altitude: 45 m Latitude: 39° 26' N Longitude: 8° 29' E				Altitude: 350 m Latitude: 39° 23' N Longitude: 8° 39' E				Altitude: 258 m Latitude: 39° 19' N Longitude: 8° 32' E				Altitude: 170 m Latitude: 39° 20' N Longitude: 8° 37' E			
	Ti	**Mi**	**mi**	**Pi**	**Ti**	**Mi**	**mi**	**Pi**	**Ti**	**Mi**	**mi**	**Pi**	**Ti**	**Mi**	**mi**	**Pi**
January	10.3	13.8	6.8	110.0	8.2	11.6	4.8	148.9	8.9	11.9	5.9	125	9.5	13.3	5.6	08.9
February	10.7	14.3	7.0	92.0	8.6	12.2	4.9	138.4	9.4	12.8	6.0	118	9.9	13.9	5.8	98.9
March	12.2	16.2	8.2	76.0	10.3	14.5	6.1	110.1	10.4	14.0	6.8	83	11.6	16.1	7.1	75.1
April	14.2	18.5	9.9	59.0	12.6	17.2	8.0	84.8	12.5	16.4	8.6	88	13.5	18.3	8.8	67.9
May	17.8	22.6	12.9	40.0	16.7	22.1	11.3	51.2	16.7	21.5	11.8	53	17.5	23.0	12.0	39.5
June	21.7	26.8	16.6	13.0	20.8	26.6	14.8	22.6	20.1	25.1	15.0	18	21.6	27.5	15.6	17.3
July	24.6	29.9	19.2	3.0	24.0	30.4	17.6	7.2	23.3	29.0	17.6	6	24.6	31.0	18.2	6.5
August	25.1	30.4	19.7	10.0	24.5	30.7	18.3	14.8	24.0	29.8	18.1	14	25.2	31.4	18.8	13.1
September	22.7	27.5	17.9	40.0	21.3	26.7	15.9	48.3	20.9	26.0	15.8	49	22.2	27.7	16.8	39.3
October	18.8	23.0	14.6	93.0	17.0	21.4	12.5	114.6	17.2	21.4	12.9	84	18.3	22.9	13.6	86.5
November	14.5	18.2	10.7	119.0	12.4	16.1	8.7	159.0	12.2	15.7	8.7	130	13.6	17.7	9.6	116.3
December	11.6	15.0	8.2	125.0	9.5	12.8	6.1	173.5	9.7	12.6	6.7	132	10.5	14.3	6.9	115.5
Year	17.0	21.4	12.6	780	15.5	20.2	10.8	1,073.4	15.4	19.7	11.2	900	16.5	21.4	11.6	784.8

Tab. 2. Bioclimatic indices and diagnosis according to Rivas-Martínez (2007).

	Fluminimaggiore	**Montimannu**	**Punta Gennarta**	**San Giovanni**
Thermicity index	(It): 376	(It): 319	(It): 332	(It): 354
Compensated thermicity index	(Itc): 376	(Itc): 319	(Itc): 332	(Itc): 354
Simplex continentality index	(Ic): 14.8	(Ic): 16.3	(Ic): 15.1	(Ic): 15.7
Diurnality index	(Id): 6.8	(Id): 12.8	(Id): 8.5	(Id): 12.8
Annual ombrothermic index	(Io): 3.82	(Io): 5.8	(Io): 4.86	(Io): 4.0
Bimonthly estival ombrothermic index	(Ios2): 0.26	(Ios2): 0.50	(Ios2): 0.42	(Ios2): 0.43
Threemonthly estival ombrothermic index	(Ios3): 0.36	(Ios3): 0.66	(Ios3): 0.56	(Ios3): 0.51
Fourmonthly estival ombrothermic index	(Ios4): 0.74	(Ios4): 1.18	(Ios4): 1.08	(Ios4): 0.86
Annual ombro-evaporation index	(Ioe): 0.90	(Ioe): 1.45	(Ioe): 1.13	(Ioe): 0.96
Annual aridity index	(Iar): 1.1	(Iar): 0.7	(Iar): 0.9	(Iar): 1.0
Annual positive temperature	(Tp): 2042	(Tp): 2066	(Tp): 1853	(Tp): 1980
Annual negative temperature	(Tn): 0	(Tn): 0	(Tn): 0	(Tn): 0
Estival temperature	(Ts): 724	(Ts): 692	(Ts): 682	(Ts): 713
Positive precipitation	(Pp): 780	(Pp): 1073	(Pp): 900	(Pp): 785

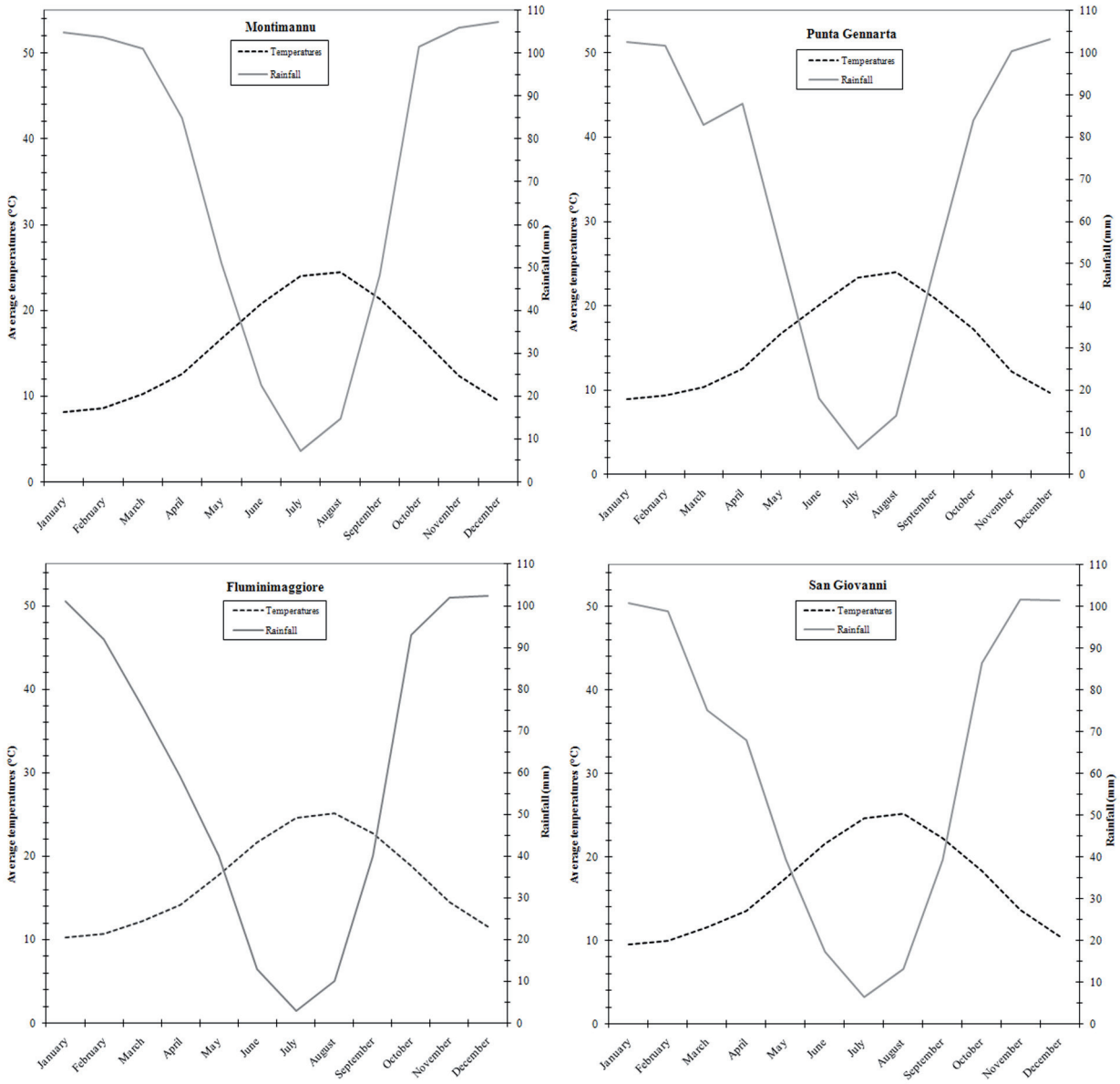

Fig. 2. Bioclimatic graphs for the stations of Montimannu (2a), Punta Gennarta (2b), Fluminimaggiore (2c) and San Giovanni (2d).

1,073.4 mm, followed by Punta Gennarta with 900 mm, and San Giovanni and Fluminimaggiore with 784.8 and 780 mm, respectively.

Bioclimatic measures by Bacchetta (2000) and Pontecorvo (2006), carried out according to the methodology of Rivas-Martínez (1999, 2007) and Rivas-Martínez et al. (2002) and based on data provided by the Regional Agrometeorological Service and the Regional Hydrographic Service, allowed to classify the area as belonging to the Mediterranean oceanic-pluviseasonal bioclimate type. Thermotypes vary from upper thermo-Mediterranean at Fluminimaggiore and San Giovanni to low meso-Mediterranean at Montimannu and Punta Gennarta; ombrotypes range from upper dry at San Giovanni to lower humid at Montimannu. A complete bioclimatic report cannot be provided due to the lack of stations at altitudes above 350 m. Based on forest types occurring at the highest elevations of the massif, the presence of an upper meso-Mediterranean bioclimate with ombrotypes ranging from upper sub-humid to lower humid can be hypothesized.

MATERIAL AND METHODS

Field work took place between the winter of 2001 and the spring of 2006. During this period, several field trips were carried out to cover all seasons and the various habitats present in the area; herbarium samples were collected from several sites. In addition to this, herbarium and bibliographic studies were car-

ried out with reference to all botanical works at a regional scale (Allioni 1759; Moris 1827, 1837-1859; Barbey 1885; Martelli 1896–1901, 1904; Fiori 1913; Terracciano 1914–1930; Arrigoni et al. 1977–1991; Arrigoni 2006) and concerning the Marganai massif in particular (Desole 1966; Arrigoni 1972; Berta & Chiappini 1978; Ballero & Angiolino 1991; Marchioni Ortu 1993; Angiolini & Bacchetta 2003; Bacchetta & Mossa 2004; Bacchetta et al. 2004; Scrugli et al. 2004; Angiolini et al. 2005; Bacchetta & Pontecorvo 2005; Bacchetta et al. 2007a).

For the taxa of uncertain taxonomic position, germplasm was collected, multiplied and grown in order to study their full life cycle. Samples were put in the CAG Herbarium (University of Cagliari) or preserved ex-situ at the Sardinian germplasm bank (BG-SAR) and the Cagliari Botanical Gardens.

The nomenclature follows the Checklist of the Italian flora (Conti et al. 2005) except in the Orchidaceae, for which Bateman et al. (2003) was used as reference, and in a few other cases mentioned in the Appendix.

For author abbreviations, "Authors of plant names" (Brummitt & Powell 1992) was used, as recommended by the International Code of Botanical Nomenclature (Greuter et al. 2000).

Authors of suprageneric taxa were verified using "Index nominum supragenericorum plantarum vascularium" (Kiger & Reveal 2006). The taxa Monocotyledones and Eudicotyledones were also used, according to art. 16 of the International Code of Botanical Nomenclature. We used the taxonomic system suggested by APG III and Chase & Reveal (APG III 2009; Chase & Reveal 2009).

For each taxon the following information is provided: biological form, chorology, ecology, collection sites (inferred from the literature, examined specimens from herbaria and direct field observations) and rarity in the field.

Biological form and sub-form, based on the classification of Raunkiaer (1934), were directly verified in the field and are coded according to Pignatti (1982).

Chorotypes were classified following the work of Pignatti (1982), modified by Brullo et al. (1996) with regard to the Mediterranean ones. The name "circum-Mediterranean" is considered more appropriate and used instead of "steno-Mediterranean", although it does not imply the occurrence of a given taxon in the whole of the Mediterranean Basin. Distributional data are taken from the most recent floristic studies (Tutin et al. 1964–1980; Jalas & Suonimen 1972–1994; Greuter et al. 1984–1989; De Bolòs & Vigo 1984–2001; Castroviejo 1986–2006; Salvo Tierra 1990; Tutin et al. 1993; Gamisans & Marzocchi 1996; Jalas et al. 1996–1999; Kurtto et al. 2004; Marchetti 2004; Delforge 2005).

The chorological categories suggested by Arrigoni & Di Tommaso (1991), modified and integrated by Bacchetta & Pontecorvo (2005), were used for the endemic species, and abbreviations were taken from the Med-Checklist (Greuter et al. 1984–1989).

Alien species and their degree of integration with the spontaneous flora were evaluated using the categories of Pyšek et al. (2004).

For each taxon, a brief description of the ecology of the collecting sites is given together with the name of the sites in which samples were herborized.

For frequency data the categories advanced by Rabinowitz (1981) and Rabinowitz et al. (1986) were used; these resulted from the analysis of three factors, each with two options: distribution [wide (W)/narrow (N)], ecological breadth [broad (B)/restricted (R)], population size [large (L)/ everywhere small (S)]. Combining these three factors, 8 categories of rarity could be defined.

Floristic calculations were carried out considering all collected species.

For verification of the class of protection of the flora the IUCN Regional Red Lists (Conti et al. 1997) and the Annexes of CITES (2011), Bern convention (EC 1982) and Habitats Directive 92/43/EEC (EC 1992) were checked.

The vegetation analysis was performed using the phytosociological method of the Zurich-Montpellier sigmatist school (Braun-Blanquet 1951).

For the real vegetation map, the following cartographic and photo-interpretation tools were used as a basis for reconnaissance in the field:

- IGM tablets at scale 1:25,000;
- Regional Technical Map (CTR) at scale 1:10,000 [sheets 546 (sections 150 and 160) and 555 (sections 030, 040, 070 and 080];
- Colour ortophoto of the year 2006 at scale 1: 10,000.

Field analyses were performed during different seasons of the year in order to better identify the different vegetation types through phytosociological and physiognomic-structural surveys, necessary for the detection, characterization and mapping of vegetation types, and to define their boundaries on the territory.

The mapping, geo-referenced according to UTM and Gauss-Boaga coordinates, was achieved by photo-interpretation techniques and was later verified in the field.

The map was drawn at scale 1:15,000 with CAD software (AutoCAD 2007) and GIS [Kosmogis (Saig),

Quantum GIS (OSGeo) and ArcGIS (Esri)].
The legend, the detail of which reaches up to the sixth level in some cases, was developed in V-level system Corine Land Cover (CEC 1993; Bossard et al. 2000, 2002). The colours used in the legend follow the guidelines of the Regione Autonoma della Sardegna (2008) and represent the types of vegetation, for which it was based primarily on the Forest Environmental Plan of Regione Autonoma della Sardegna (Bacchetta et al. 2007b). Where the coenoses were too small to be mapped at this scale, they were mapped as a mosaic of catenal formations.

RESULTS

FLORA

Altogether, 686 taxa are recorded from the study area (see Appendix), belonging to 395 genera, 93 families and 38 orders. The presence of 648 taxa was confirmed, while the remaining 37 are cited in the literature but were not found during this study. Considering only the observed taxa, the most represented subclass is Magnoliidae with 625; within it the Eudicotyledones is the most numerous group with 23 orders, 64 families and 479 species and subspecies (fig. 3). Asterales with 78 taxa, followed by Poales with 76, Fabales with 68, Lamiales and Asparagales with 58, are the most represented orders. Among the families (fig. 4), the most numerous are the Asteraceae (74 taxa), followed by the Fabaceae (66) and Poaceae (56). The most species-rich genera are *Galium* (12 taxa), *Trifolium* and *Euphorbia* (11), *Medicago* and *Ophrys* (10).
Data on biological forms (fig. 5) highlight the strong Mediterranean character of the study area and the problems related to land-use, as confirmed by the percentages of therophytes (38.1%) and geophytes (14.8%). Due to the remarkable extension of forest cover and outcropping rocks in the area, and to the limited extension of annual grasslands and pastures, the percentage of therophytes is probably lower than that calculated by Mossa et al. (2003) (40%). This hypothesis is confirmed by the high percentages of chamaephytes (6.8%) – that can be related to the wide distribution of garrigue communities – and of phanerophytes which, summed to the nanophanerophytes, exceed (10.9%) the value calculated by Bocchieri (1995) for the flora of Sardinia (8.8%). In particular, the high percentages of nanophanerophytes (4.0%) can be related to the abundance and diversity of small shrubs, especially of the genus *Genista*. Hydrophytes show very low values (0.3%) due to the limestone nature of the terrain and consequent paucity of aquatic habitats.
The analysis of the biological sub-forms shows an abundance of "simple" plants with low energy needs: scapose therophytes are prevalent (35.2%), followed by scapose hemicryptophytes (14.7%); caespitose therophytes are just 0.9% of the total, whereas bulbous plants (9.1%) are largely the most abundant among the geophytes.
In fig. 6, chorological categories are grouped into similar larger categories to allow a quicker comparison. The graph shows a clear dominance of species with distribution in the Mediterranean basin (352 taxa), which are shown in detail in fig. 7: the Circum-Mediterranean (201) and Euro-Mediterranean (87) components are dominant, followed by the W-Mediterranean (51 taxa) and Atlantic-Mediterranean (32) ones, which are important to define the biogeographical barycentre of the area under study, clearly located in the W-Mediterranean. The endemic species (73 taxa) correspond to 11.3% of the total (648).
Families with the highest number of endemics are the Asteraceae (12), Orchidaceae (7), Lamiaceae (5), Caryophyllaceae and Fabaceae (4); the genera with the most endemic species are *Ophrys* (5) and *Genista* (4).
The chorological spectrum of the endemic species (fig. 8) shows that the Sardo-Corsican endemics (ESC – 27 taxa) are the most consistent category, followed by the strictly Sardinian ones (ESA – 18) and Tyrrhenian elements (ETI+ET+ESS – 17) – with a prevalence of insular Tyrrhenians (ETI – 12) – and the west insular Mediterranean ones (EMOI – 10). Biogeographically (fig. 9), the largest group is that of the Sardo-Corsican species (27), followed by those referable to the Italian-Tyrrhenian superprovince (17), the Sardinian subprovince (14) and the W-Mediterranean subregion (11). These data show that the distribution ranges of the Monte Marganai endemic flora are primarily centred upon the Sardo-Corsican province (from which about 60% of the species are exclusive), and secondarily Tyrrhenian. A comparison with the endemic flora of the entire Iglesiente area (Bacchetta & Pontecorvo 2005) – in which the dominant group is that of the Sardinian endemics (35%) – further confirms the specificity of the Marganai massif's endemic flora, which also includes one taxon exclusive of the Sulcis-Iglesiente biogeographical sector and 3 taxa exclusive of the Iglesiente sub-sector. This would appear to be related to the calcareous nature and morphology of the region, which create selective habitats rich in endemic species even at low altitudes due to reactions of the soil and the existence of numerous ecological niches.
The flora of Monte Marganai also includes 14 alloch-

thonous species (2.2% of the total), 4 of which have been considered occasional, 8 naturalized, and 2 invasive. The low number of alien species – particularly of invasive ones – confirms the high degree of naturalness and resilience of the autochthonous flora and vegetation in spite of human activities, especially mining.

The analysis of rarity using the method of Rabinowitz (1981) gave the following results (fig. 10): 485 taxa show a wide distribution in the study area (W), 157 a limited distribution (N); 251 show a broad ecological niche (B), 391 a narrow one (R); finally, 288 form extensive populations and are sometimes dominant (L), whereas 354 form small and non-dominant populations (S). All 8 categories resulting from the combination of the three parameters were used: the category with most taxa was WBL (158), followed by WRS (144) and NRS (118); the category with the least taxa was NBL (1).

The analysis of the protection status (tab. 3; fig. 11) of the flora showed that 31 species are protected by international law: 28 are listed by CITES, 3 in the Habitats Directive and 1 in the Bern Convention. Comparison with the IUCN Regional Red Lists (Conti et al. 1997) showed that 23 taxa are considered worthy of protection, 4 of which listed as Critically Endangered (CR). The protected species, or those deemed worthy of protection, add up to a total of 51, representing 7.9% of the total flora.

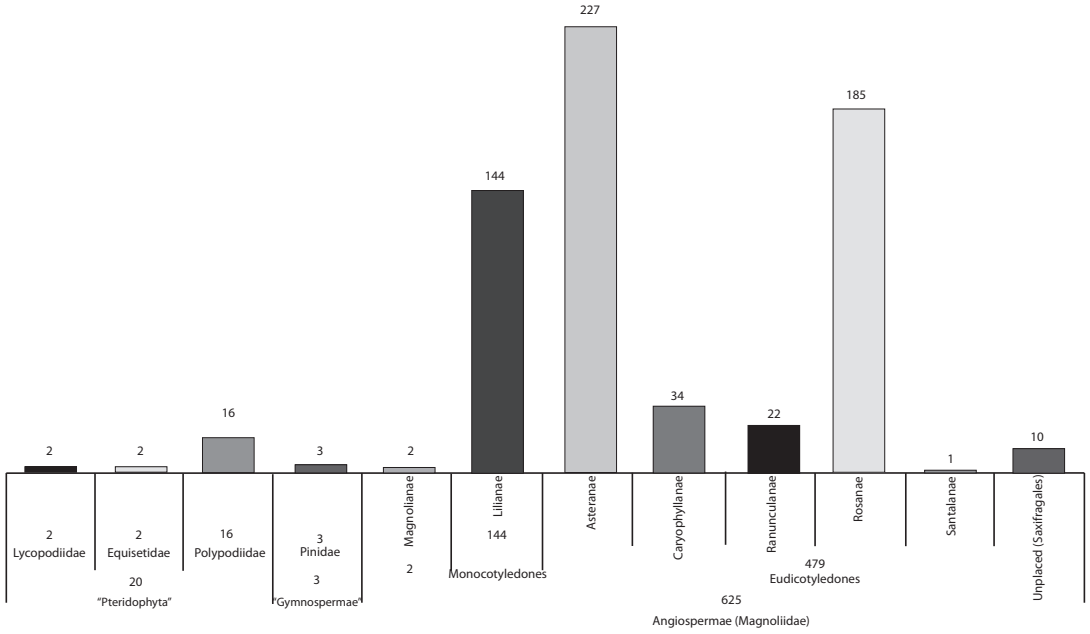

Fig. 3. Systematic groups of the flora of Monte Marganai.

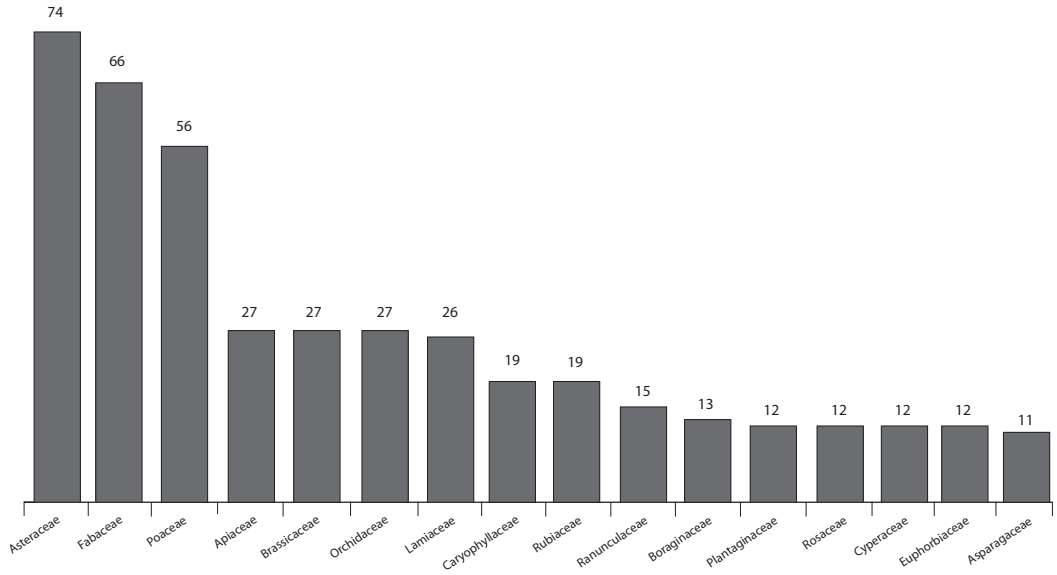

Fig. 4. Most represented families.

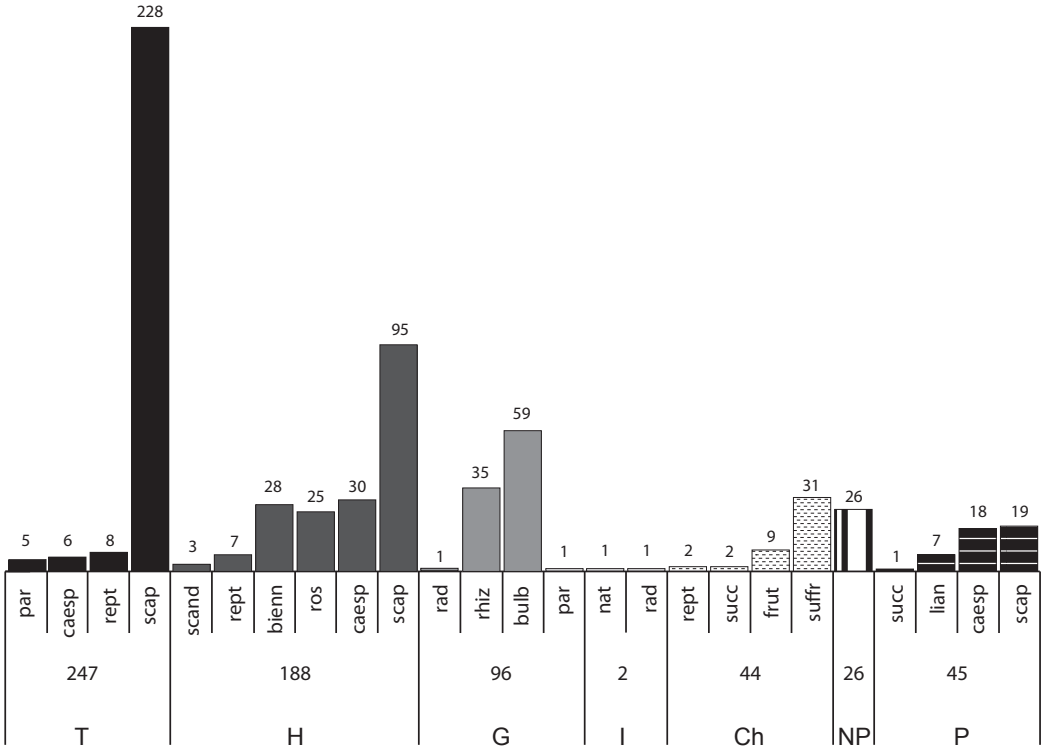

Fig. 5. Detailed biological spectrum (for abbreviations see Appendix).

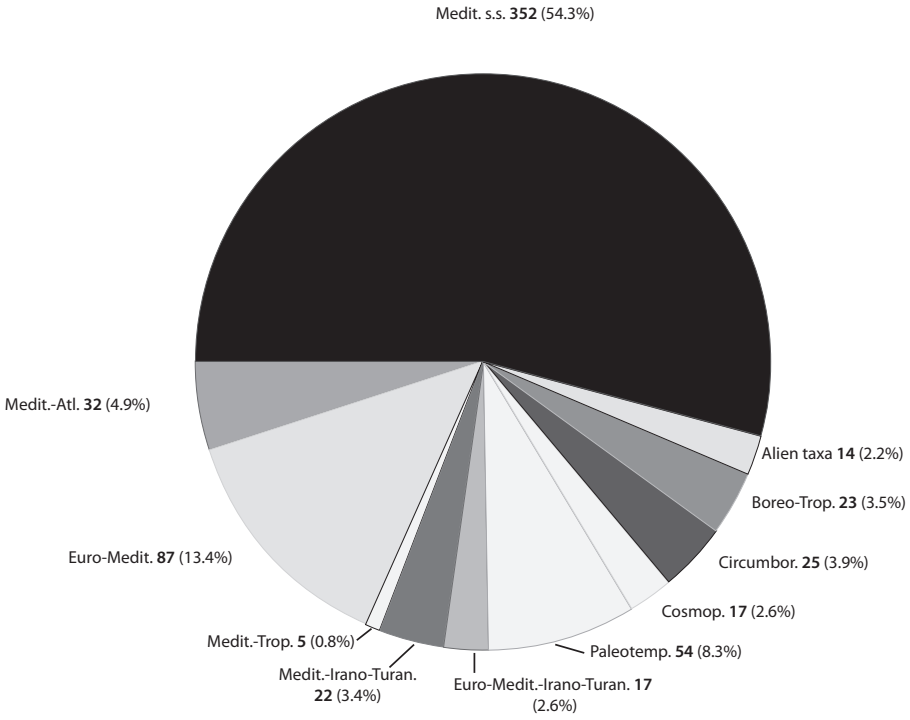

Fig. 6. General chorological spectrum.

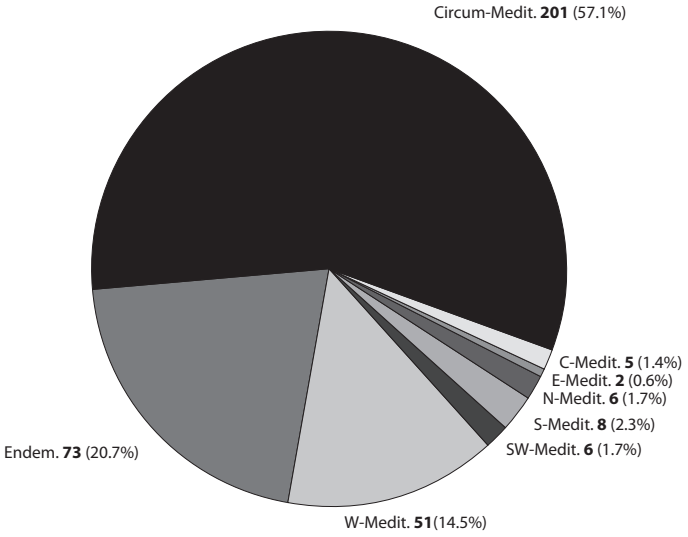

Fig. 7. Chorological spectrum of the Mediterranean component.

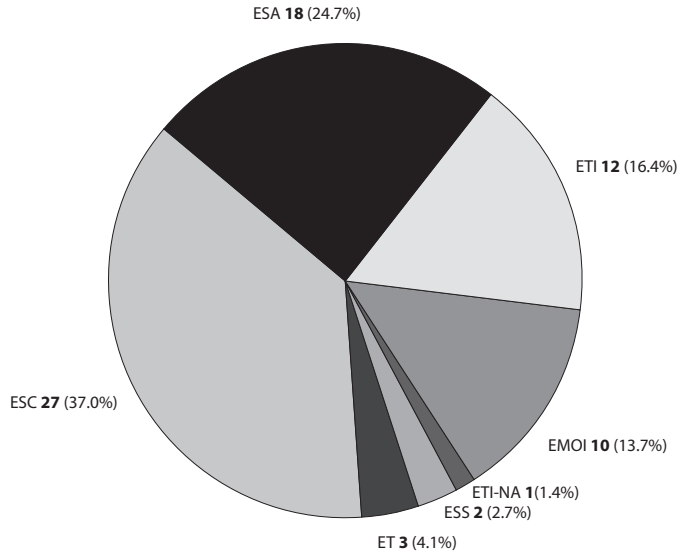

Fig. 8. Chorological spectrum of the endemic component. ESA = strict Sardinian endemics; ESC = Sardo-Corsican endemics; ESS= Sardo-Sicilian endemics; ET = strict Tyrrhenian endemics; ETI = Tyrrhenian insular endemics; ETI-NA = Tyrrhenian insular endemics stretching to N-Africa; EMOI = Western Mediterranean insular endemics.

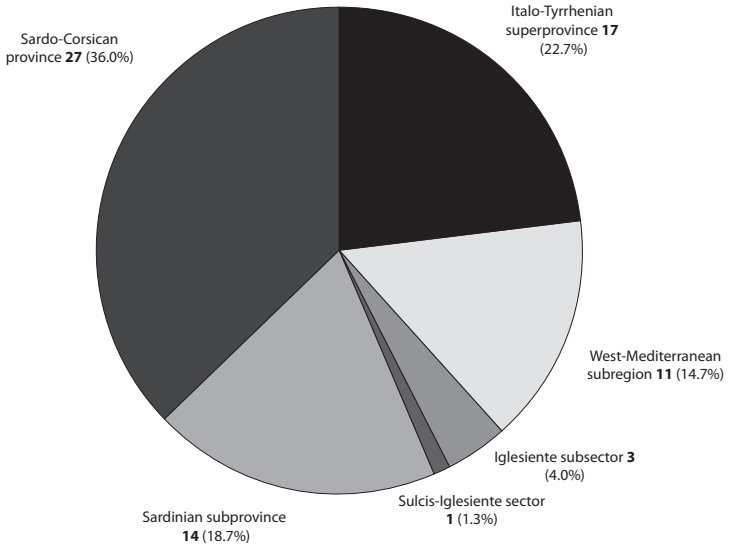

Fig. 9. Biogeographical analysis of the endemic component.

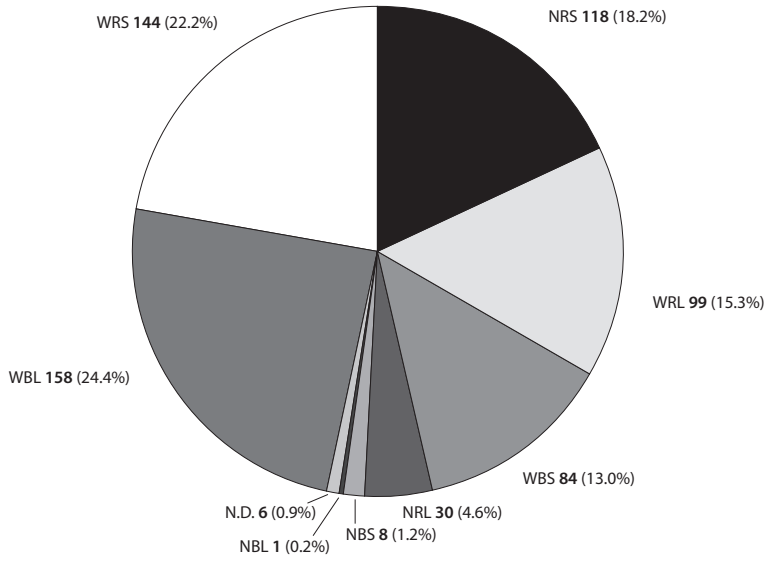

Fig. 10. The rarity of taxa according to the tri-factorial categories proposed by Rabinowitz (1981). WBL = widely distributed, wide ecology and large populations, sometimes dominant; WBS = widely distributed, wide ecology and invariably small populations, non-dominant; WRL = widely distributed, restricted ecology and large populations, sometimes dominant; WRS = widely distributed, restricted ecology and invariably small populations, non-dominant; NBL = small territorial distribution, wide ecology and large populations, sometimes dominant; NBS = small territorial distribution, restricted ecology and invariably small populations, non-dominant; N.D. = not defined; NRL = small territorial distribution, restricted ecology and large populations, sometimes dominant; NRS = small territorial distribution, restricted ecology and invariably small populations, non-dominant.

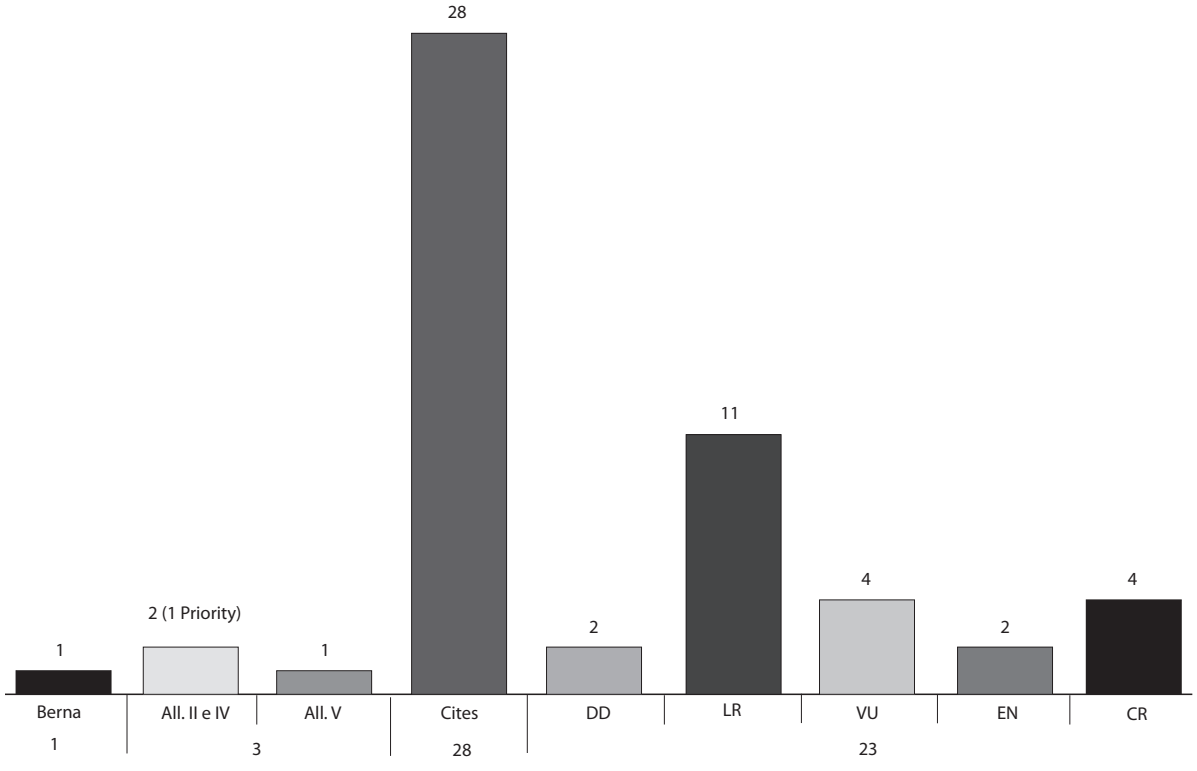

Fig. 11. Protected taxa or taxa listed in the IUCN Regional Red Lists (Conti et al. 1997) (for abbreviations see tab. 3).

Tab. 3. List of taxa and categories of protection: CITES Appendix II, Bern Convention, Habitats Directive 92/43/EEC (Annexes II-IV-V). Threat levels according to National and Regional IUCN Red Lists (Data Deficient, Lower Risk, VUlnerable, ENdangered, CRitically endangered). All taxa observed and/or cited for M. Marganai are considered in the table.

Taxa	Protection or threat level
Anacamptis collina (Banks et Sol. ex Russel) R.M. Bateman, Pridgeon et M.W. Chase	CITES (II)
Anacamptis longicornu (Poir.) R.M. Bateman, Pridgeon et M.W. Chase	CITES (II)
Anagallis monelli L. subsp. *monelli*	IUCN (LR)
Asplenium obovatum Viv. subsp. *lanceolatum* (Fiori) P. Silva	IUCN (CR)
Bifora testiculata (L.) Spreng.	IUCN (EN)
Brassica insularis Moris	Berna, Dir. 43/92 (All. II-IV)
Cheilanthes acrosticha (Balb.) Tod.	IUCN (LR)
Crepis vesicaria L. subsp. *hyemalis* (Biv.) Babc.	IUCN (DD)
Cyclamen repandum Sm. subsp. *repandum*	CITES (II)
Delphinium pictum Willd. subsp. *pictum*	IUCN (LR)
Epipactis helleborine (L.) Crantz var. *helleborine*	CITES (II)
Epipactis microphylla (Ehrh.) Sw.	CITES (II)
Epipactis tremolsii C. Pau	CITES (II); IUCN (EN)
Galium glaucophyllum Em. Schmid	IUCN (LR)
Genista morisii Colla	IUCN (LR)
Geranium robertianum L.	IUCN (VU)
Himantoglossum robertianum (Loisel.) P. Delforge	CITES (II)
Iris foetidissima L.	IUCN (VU)
Isoëtes duriei Bory	IUCN (CR)
Limodorum abortivum (L.) Sw. var. *abortivum*	CITES (II)
Limodorum abortivum (L.) Sw. var. *trabutianum* (Batt.) Schlechter	CITES (II); IUCN (DD)
Linum muelleri Moris	Dir. 43/92 (All. II*-IV); IUCN (EN)
Mentha requienii Benth. subsp. *requienii*	IUCN (LR)
Nananthea perpusilla (Loisel.) DC.	IUCN (LR)
Narcissus tazetta L. subsp. *tazetta*	IUCN (LR)
Ophrys apifera Huds. var. *apifera*	CITES (II)
Ophrys bombyliflora Link	CITES (II)
Ophrys chestermanii (J.J. Wood) Gölz et H.R. Reinhard	CITES (II)
Ophrys conradiae Melki et Deschâtres	CITES (II)
Ophrys eleonorae Devillers-Tersch. et Devillers	CITES (II)
Ophrys fusca Link	CITES (II)
Ophrys morisii (Martelli) Soò	CITES (II)
Ophrys neglecta Parl.	CITES (II)
Ophrys speculum Link	CITES (II)
Ophrys x *daissiorum* Baumann, Kundele, Lorenz et Picc. (*O. chestermanii* x *O. morisii*)	CITES (II)
Orchis anthrophophora (L.) All.	CITES (II)
Orchis ichnusae (Corrias) Devillers-Tersch. et Devillers	CITES (II)
Orchis intacta Link	CITES (II)
Orchis provincialis Balbis ex Lam. et DC.	CITES (II)
Orchis x *bornemannii* Asch. (*O. longicornu* x *O. papilionacea*)	CITES (II)
Orchis x *penzigiana* A. Camus nsubsp. *sardoa* Scrugli et Grasso (*Orchis mascula* subsp. *ichnusae* x *O. provincialis*)	CITES (II)
Pinus pinea L.	IUCN (LR)
Polygonatum odoratum (Mill.) Druce	IUCN (CR)
Romulea ligustica Parl.	IUCN (CR)
Ruscus aculeatus L.	Dir. 43/92 (All. V)
Serapias lingua L.	CITES (II)
Serapias parviflora Parl.	CITES (II)
Sesleria insularis Sommier subsp. *morisiana* Arrigoni	IUCN (LR)
Silene bellidifolia Jacq.	IUCN (LR)
Soleirolia soleirolii (Req.) Dandy	IUCN (VU)
Sorbus torminalis (L.) Crantz	IUCN (VU)
Spiranthes spiralis (L.) Chevall.	CITES (II)
Thymus capitatus (L.) Hoffmanns. et Link	IUCN (VU)
Urginea fugax (Moris) Steinh.	IUCN (LR)

Tab. 4. Comparison of the flora of Monte Marganai and those of selected mountain massifs of southern Sardinia.

Study area	Surface (km²)	Predominant substrate	N° taxa	N° taxa/km²	N° and % endemics
Marganai	36	Palaeozoic limestones and dolomites	648	18.0	73 11.3%
M. Arcuentu (Bacchetta et al. 2007c)	52	Tertiary volcanics	556	10.8	54 9.7%
Basin of river S. Lucia (Mossa & Bacchetta 1998)	73	Palaeozoic granites and metamorphites	669	9.2	60 9.0%
M. Arcosu (Mossa et al. 1996)	32	Palaeozoic metamorphites	520	16.3	46 8.8%
M. Arci (Mulas 1990)	70	Tertiary volcanics	532	7.6	23 4.3%
M. Linas (Angiolino & Chiappini 1983)	n.d.	Palaeozoic granites and metamorphites	454	n.d.	48 10.6%

VEGETATION

The knowledge of the vegetation of the Iglesiente area is rather incomplete and patchy in relation to the methodologies used and to the investigated areas and habitats. The first, general information on the subject was provided by Della Marmora (1839) and Angius (1851).

More recent and detailed contributions can be found in the works of De Marco & Mossa (1983), Mossa (1990) and Bartolo et al. (1992) on the psammophilous vegetation of SW Sardinia, the Portixeddu dune field (Buggerru and Fluminimaggiore communes) and the stretch of coast reaching the dune system of Pistis and Torre dei Corsari (Arbus). The publication of the real vegetation map (scale 1:200,000) of the Cagliari province by Mossa et al. (1991) represented the basis for all subsequent synphytosociological studies in the area.

At the end of the 1990s research in this field was greatly boosted with regard to the study of the post-mining landscape, particularly in the districts of Monteponi, Montevecchio, and all the post-mining areas of Marganai (Barraxiutta, Sa Duchessa, Arenas, Tinny and Malacalzetta). Angiolini & Bacchetta's (2003) paper on a *Santolina insularis* community was followed by a more in-depth analysis of the vegetation growing on substrates polluted by heavy metals (Angiolini et al. 2005); more recently, specific geosynphytosociological studies have been carried out in the post-mining areas of Monteponi and Montevecchio (Zavattero et al. 2006; Bacchetta et al. 2007a).

Several analyses of the forest vegetation have also been recently concluded, such as those on thermoxerophilous wild olive formations (Bacchetta et al. 2003) and cork oak-holm oak forests (Bacchetta et al. 2004); additionally, phytosociological analyses of the riparian vegetation (Bacchetta & Mossa 2004) and caespitose Graminaceae permanent meadows (Bacchetta et al. 2005) have been performed.

In 2006 a vegetational survey of the Iglesiente region was carried out in the framework of the PFAR project (Piano Forestale ed Ambientale Regionale): a forest district (Linas-Marganai n. 19) and two sub-districts (19a centre-north and 19b south) (Bacchetta et al. 2007a) were characterized in the area.

Based upon the above studies and planning tools, the physiognomic-structural vegetation types of Marganai are reported below.

Climatophilous and edaphoxerophilous forest vegetation

Holm oak forests. Holm oak forests dominate the vegetational landscape of the Marganai massif and, in general, that of Sardinia. *Quercus ilex* shows a wide ecological breadth and can be found from the lowest altitudes to the summits of Punta San Michele and Campu Spina, forming extensive forests particularly on the western and northern slopes. Bacchetta et al. (2004) placed the Marganai holm oak forests within 3 associations: *Pyro spinosae-Quercetum ilicis* corr., *Prasio majoris-Quercetum ilicis* and *Aceri monspessulani-Quer-*

cetum ilicis. These associations are attributed to the Sardo-Corsican sub-alliance *Clematido cirrhosae-Quercenion ilicis* of the alliance *Fraxino orni-Quercion ilicis*.
Cork oak forests. Approximately 80% of the entire Italian cork oak cover can be found in Sardinia (Corona et al. 1989). *Quercus suber* is frequently considered a more xerophilous and thermophilous species than holm oak (Giacomini & Fenaroli 1958), and cork oak forests have been considered until now as a degradation, transitional and often non-dynamic phase of holm oak forests (Mossa 1985; Pignatti 1998).
Recently, Serra et al. (2002) and Rivas-Martínez et al. (2003) have recognized, also in the Iglesiente area, the presence of Sardinian *Quercus suber* associations within the *Quercion ilicis* alliance (sub-alliance *Quercenion ilicis*). In particular, Rivas-Martínez et al. (2003) proposed the association *Galio scabri-Quercetum suberis*. Bacchetta et al. (2004) accepted these interpretations and refer the cork oak forest of the north-western part of Marganai to the association *Galio scabri-Quercetum suberis*, placing this coenosis within the sub-alliance *Clematido cirrhosae-Quercenion ilicis* of the alliance *Fraxino orni-Quercion ilicis*.
Olive forests. The wild olive forests situated on the northern slopes of Monte Marganai are usually referred to the association *Asparago albi-Oleetum sylvestris* (Bacchetta et al. 2003). This phytocoenosis occurs on calcareous substrates up to 400–500 m, always in thermoxerophilous locations.
Juniper forests. *Juniperus oxycedrus* subsp. *oxycedrus* is lacking in the whole Marganai area, and only *J. phoenicia* subsp. *turbinata* can be found, forming thermo-Mediterranean edaphoxerophilous micro-forests on the southern slope of the massif, all referable to the association *Oleo sylvestris-Juniperetum turbinatae*.

Edaphohygrophilous forest vegetation

Deciduous forest communities of *Populus alba*, *P. nigra*, *Fraxinus oxycarpa*, *Salix alba*, *S. atrocinerea* and *Ulmus minor* can be found along the river banks on the northern side of the massif near Tempio di Antas, and outside the Domusnovas caves. Such coenoses have not been described and can be framed, at the syntaxonomic level, within the alliance *Populion albae*, sub-alliances *Populenion albae* and *Fraxino angustifoliae-Ulmenion minoris*.

Deciduous shrublands

The deciduous mantle of the more mesophilous forests of Monte Marganai can be referred to the associations *Vinco sardoae-Rubetum ulmifolii*, *Clematido cirrhosae-Crataegetum monogynae* and *Crataego monogynae-Pyretum spinosae* corr. (Filigheddu et al. 1999; Biondi et al. 2002). Bramble scrublands can be found mainly around Iglesias towards the Punta Gennarta basin, whereas hawthorn and blackthorn formations are characteristic of the north-western (Malacalzetta) and eastern parts of the study area, particularly in the higher areas of the Oridda and Matzanni valleys.

Evergreen shrublands

Maquis formations, generally resulting from the degradation of evergreen forest coenoses, and ascribed to the order *Quercetalia calliprini* (= *Pistacio-Rhamnetalia alaterni*) of the class *Quercetea ilicis*. Communities growing on mainly calcareous substrates, included in the alliance *Oleo-Ceratonion siliquae*, have been referred to the associations *Clematido cirrhosae-Pistacietum lentisci* (Arrigoni & Di Tommaso 1991) and *Asparago albi-Euphorbietum dendroidis* (Biondi & Mossa 1992). On the other hand, calcifugous shrublands of the Marganai area, belonging to the associations *Erico arboreae-Arbutetum unedonis Ericion arboreae* in meso-Mediterranean habitats (Biondi et al. 2001; Rivas-Martínez et al. 2003) and *Pistacio lentisci-Calicotometum villosae* in thermo-Mediterranean habitats, are ascribed to the alliance *Ericion arboreae*.

Garrigues

The chamaephyte and nanophanerophyte communities of Sardinia in general, and of the Iglesiente area in particular, are referred to two vegetation classes: the prevalently calcifugous and silicolous *Cisto-Lavanduletea*, and the mainly calcicolous *Rosmarinetea officinalis*. Garrigues belonging to the first class are referred to two different alliances: *Teucrion mari* and *Anthyllion hermanniae*. In the study area only the former one occurs: a Sardo-Corsican endemic alliance grouping together all the thermo-meso-Mediterranean chamaephytic communities, particularly of the associations *Stachydi glutinosae-Genistetum corsicae* (Biondi et al. 2001) and *Lavandulo stoechadis-Cistetum monspeliensis* (Arrigoni et al. 1996).
The calcicolous garrigues of the class *Rosmarinetea officinalis* have been ascribed to the central Mediterranean alliance *Cisto eriocephali-Ericion multiflorae* (Biondi 2000), which includes the associations *Rosmarino officinalis-Thymelaeetum tartonrairae* and *Dorycnio*

pentaphylli-Cistetum eriocephali (Biondi et al. 2001).
In the post-mining landscapes there are also many types of garrigue belonging to the special Sardinian vegetation series of substrates polluted by heavy metals, which includes many associations treated separately in the section about azonal vegetation.

Perennial grasslands

The meadow and pasture vegetation, dominated by perennial species (hemicryptophytes and geophytes), has been subject to few phytosociological studies in Sardinia. The dense *Brachypodium retusum* formations, ascribable to the alliance *Thero-Brachypodion ramosi* and widespread in the thermo and meso-Mediterranean belts of the island, have been included in the association *Asphodelo africani-Brachypodietum retusi* corr., described from the Cagliari hills (Biondi & Mossa 1992) and later found also in other areas of Sardinia (Biondi et al. 2001) including the Marganai massif. Recently, Bacchetta et al. (2005) – in the framework of a revision of the above-mentioned alliance – described other associations (*Dorycnio suffruticosi-Stipetum offneri*, *Stipo bromoidis-Astragaletum verrucosi*, *Triseto splendentis-Brachypodietum retusi*, *Ranunculo graminei-Brachypodietum retusi* and *Melico ciliatae-Brachypodietum retusi*) occurring on several parts of the island.
The anthropogenic perennial grasslands, with a predominantly autumn phenology, were studied in the Nurra area (Biondi et al. 2001) and have been referred, in the study area and within the class *Artemisietea vulgaris*, to the associations *Scillo obtusifoliae-Bellidetum sylvestris* and *Scillo autumnalis-Bellidetum sylvestris*. Both coenoses are frequently found throughout the massif: the first in more rupicolous habitats, the second generally in more nitrified areas with deeper soils.
The tall thermo-Mediterranean savannah-like grasslands, found only in the thermophilous basal areas of the southern slope of Monte Marganai, are included in the class *Lygeo-Stipetea* and referred to the association *Hyparrhenietum hirto-pubescentis* (Valsecchi 1976).
Pastures – prevalently sheep grazing ones – can be found only in the north-western parts of Marganai and belong to the association *Poo bulbosae-Trifolietum subterranei* of the class *Poetea bulbosae* (Ladero et al. 1992).

Annual grasslands

Annual grasslands are generally ascribable, in the Mediterranean region, to the class *Tuberarietea guttatae*. In Sardinia, and particularly in the study area, the following associations belonging to this class occur: *Bupleuro fontanesii-Scorpiuretum muricati* (Biondi et al. 2001), *Allietum chamaemoly* (Valsecchi 1976), *Lophochloo cristatae-Plantaginetum lagopi*, *Valantio muralis-Sedetum caerulei* (Biondi & Mossa 1992), *Tuberario guttati-Plantaginetum bellardii* and *Sedetum caerulei* (Biondi & Bagella 2005).

Azonal vegetation

Psammophilous vegetation. The coastal psammophilous communities of Sardinia have been thoroughly investigated (Valsecchi & Diana-Corrias 1973; De Marco & Mossa 1975; Chiesura-Lorenzoni & Lorenzoni 1984; Géhu et al. 1984; Mossa 1990; Valsecchi & Bagella 1991; Bartolo et al. 1992; Biondi 1992; Biondi & Mossa 1992; Filigheddu & Valsecchi 1992; Mayer 1995; Biondi et al. 2001; Biondi & Bagella 2005). However, these analyses did not include inland dune systems such as that of Arenas in the northernmost part of Marganai. In this area, therophyte communities with a late winter-spring phenology can be found; they fall within the alliance *Tuberarion guttatae* and form a mosaic with garrigues belonging to the endemic alliance *Teucrion mari* and to forest coenoses and maquis of the alliance *Juniperion turbinatae*.
Rupicolous vegetation. From a phytosociological standpoint the rupicolous vegetation of Sardinia falls mostly within the class *Asplenietea trichomanis*, while the chomophytic communities of the order *Anomodonto-Polypodietea* are included in the class *Anomodonto-Polypodietalia*. The plant communities colonizing the rocky habitats – sometimes also the walls – of the Marganai area can be referred to the following alliances: *Dianthion mossani* nom. prov. and *Hyoserido taurinae-Bellidion canescentis* nom. prov. of the order *Asplenietalia glandulosi*; *Phagnalo saxatilis-Cheilanthion maderensis* of the order *Cheilanthetalia maranto-maderensi*; and *Polypodion serrati*, *Bartramio-Polypodion serrati* and *Arenarion balearicae* of the order *Anomodonto-Polypodietalia*. However, phytosociological studies on the chasmophytic, chasmochomophytic and chomophytic vegetation of the area, allowing to classify the coenoses into associations, have yet to be pursued.
Riparian vegetation. The riparian vegetation of Sardinia – intended not only as riparian forest vegetation but also including the other vegetation types found within the banks of water courses – has been studied generically (Pedrotti & Gafta 1996) or with regard

to individual basins (Arrigoni 1986; Camarda et al. 1995) or single associations (Brullo 1993; Filigheddu et al. 1999). The only study on the Iglesiente region is the one by Bacchetta & Mossa (2004) on the rhizophytic hydrophilic vegetation (*Caricion microcarpae*), for which two sub-associations placed in *Hyperico hircini-Caricetum microcarpae* are described. These communities can only be found close to the main springs and sources along the lower parts of the San Benedetto and Antas rivers, as well as upstream and downstream the San Giovanni caves.

Vegetation of post-mining environments. The Sulcis-Iglesiente region is one of the most important mining areas of Sardinia. The Marganai massif, in particular, is part of the territory commonly indicated as the "metalliferous ring". Ever since very ancient times these areas have been exploited for various types of mineral, essentially ones containing lead and zinc (e.g. galena and blenda), and particular vegetation series have developed in connection with mine dumps and decantation and flotation basins. In recent years specific analyses have been carried out in the area, with the description of new taxa (e.g. *Echium anchusoides*) and syntaxa. The coenoses found so far in the Marganai area are: *Helichryso tyrrhenici-Dianthetum sardoi*, *Coincyo recurvatae-Helichrysetum tyrrhenici*, *Resedo luteolae-Limonietum merxmuelleri*, *Ptilostemono casabonae-Iberidetum integerrimae* (Angiolini et al. 2005), and *Euphorbio cupanii-Santolinetum insularis* (Angiolini & Bacchetta 2003), all of which are referable to the Sardinian endemic alliance *Ptilostemono casabonae-Euphorbion cupanii*, order *Scrophulario-Helichrysetalia italici* and class *Scrophulario-Helichrysetea italici*. On the other hand, the associations *Dorycnio suffruticosi-Genistetum corsicae* and *Polygalo sardoae-Linetum muelleri* (Angiolini et al. 2005) belong to class *Cisto-Lavanduletea*, order *Lavanduletalia stoechadis*, alliance *Teucrion mari*.

As concerns the synphytosociological and geosynphytosociological approach, all vegetation series and geoseries found in the area of Marganai are schematically described hereunder.

Sardinian thermo-Mediterranean *Juniperus turbinata* series (*Oleo-Juniperetum turbinatae*)

Physiognomy, structure and floristic features of the climax. Micro-forests or maquis formations, consisting of prostrate small trees strongly shaped by the wind, with a prevalence of *Juniperus phoenicea* subsp. *turbinata* and *Olea europaea* var. *sylvestris*. The shrub layer is characterized by distinctly thermophilous species such as *Asparagus albus*, *Euphorbia dendroides*, *Pistacia lentiscus* and *Phillyrea angustifolia*. The most frequent herbaceous species seems to be *Brachypodium retusum*.

Lithomorphological and climatic characterization. The series occurs along the piedmont belt and in small summit areas of Punta S. Michele on limestone soils. It can be found between 100 and 800 m. in Mediterranean oceanic-pluviseasonal bioclimatic conditions, in the dry thermo-Mediterranean phytoclimatic belt, sometimes with penetrations into the lower meso-Mediterranean upper dry to upper subhumid belt. Prefers SE-, S- and SW-facing slopes.

Serial succession. Substitution communities consist of thermophilous shrublands (*Asparago albi-Euphorbietum dendroidis*) which, in particular morphological and lithological conditions, can form permanent communities, e.g. pioneer and edaphically little demanding garrigues (*Stachydi glutinosae-Genistetum corsicae* subass. *teucrietosum mari*); discontinuous perennial grasslands (*Asphodelo africani-Brachypodietum retusi*, *Melico ciliatae-Brachypodietum retusi*); and therophytic formations (*Sedetum caerulei*, *Lophochloo cristatae-Plantaginetum lagopi*, *Aveno sterilis-Stipetum capensis*, and *Hypochaeris achyrophorus* and *Tuberaria guttata* formations).

Sardinian thermo-Mediterranean wild olive series (*Asparago albi-Oleetum sylvestris*)

Physiognomy, structure and floristic features of the climax. Climatophilous and edaphoxerophilous micro-forests with *Olea europaea* var. *sylvestris* and *Pistacia lentiscus* dominance. Together with the juniper communities they are the most xeric formations of the area, and are accompanied by a thermophilous flora that includes species such as *Euphorbia dendroides*, *Asparagus albus* and, more rarely, *Chamaerops humilis*. *Arisarum vulgare* and *Umbilicus rupestris* are frequently found in the herb layer.

Lithomorphological and climatic characterization. This series reaches altitudes of 300–400 m in the piedmont belt, independent of soil characteristics; it is limited to the upper thermo-Mediterranean bioclimate, with ombrotypes varying from low dry to low sub-humid.

Serial succession. Substitution communities consist of shrublands dominated by *Pistacia lentiscus* and *Calicotome villosa* (*Pistacio-Chamaeropetum humilis* subass. *calicotometosum villosae*), garrigues of the classes *Cisto-Lavanduletea* and *Rosmarinetea*, perennial *Dactylis hispanica* and *Brachypodium retusum* grasslands and therophytic formations of the class *Tuberarietea guttatae*, order *Trachynetalia distachyae*.

Sardinian thermo-Mediterranean holm oak series (*Pyro spinosae-Quercetum ilicis*)

Physiognomy, structure and floristic features of the climax. Climatophilous evergreen micro-forests of *Quercus ilex* and *Quercus suber*. The shrub layer is formed by deciduous species such as *Pyrus spinosa*, *Prunus spinosa* and *Crataegus monogyna*, along with thermophilous species like *Myrtus communis* subsp. *communis*, *Pistacia lentiscus* and *Rhamnus alaternus*. The vine/liana stratum is rich in species, with *Clematis cirrhosa*, *Tamus communis*, *Smilax aspera*, *Rubia peregrina*, *Lonicera implexa* and *Rosa sempervirens*; the herbaceous layer consists of *Stipa bromoides* and *Brachypodium retusum*.
Lithomorphological and climatic characterization. The series is found on clayey soils with a mixed calcareous-siliceous matrix, especially in the alluvial plains; always occurs in Mediterranean oceanic-pluviseasonal bioclimatic conditions, in the thermo-Mediterranean phytoclimatic belt, with ombrotypes varying from upper dry (soil-compensated) to low sub-humid.
Serial succession. Substitution communities are represented by tall and dense shrublands with *Pistacia lentiscus*, *Rhamnus alaternus*, *Pyrus spinosa*, *Crataegus monogyna*, *Myrtus communis* subsp. *communis* (association *Crataego monogynae-Pistacietum lentisci*), garrigues of the alliance *Teucrion mari*, perennial grasslands of *Brachypodion ramosi*, sometimes mixed with hemicryptophytic and geophytic autumn-flowering meadows of the association *Scillo obtusifoliae-Bellidetum sylvestris*.

Sardinian thermo-meso-Mediterranean holm oak series (*Prasio majoris-Quercetum ilicis quercetosum ilicis* and *phillyreetosum angustifoliae*)

Physiognomy, structure and floristic features of the climax. Climatophilous micro-mesoforest of *Quercus ilex*, with *Juniperus phoenicea* subsp. *turbinata* and *Olea europaea* var. *sylvestris*. The shrub layer includes *Pistacia lentiscus*, *Rhamnus alaternus*, *Phillyrea latifolia*, *Erica arborea* and *Arbutus unedo*. *Phillyrea angustifolia*, *Myrtus communis* subsp. *communis* and *Quercus suber* characterize the more acidophilous communities (subass. *phyllireetosum angustifoliae*) growing on metamorphic rocks at the margins of the metalliferous ring. The presence of vine/liana species such as *Clematis cirrhosa*, *Prasium majus*, *Smilax aspera*, *Rubia peregrina*, *Lonicera implexa* and *Tamus communis* is consistent. Geophytes (*Arisarum vulgare*, *Cyclamen repandum*, *Asparagus acutifolius*, *Ruscus aculeatus*) are also abundant, whereas hemicryptophytes (*Carex distachya*, *Pulicaria odora*, *Asplenium onopteris*) are less frequent.
Lithomorphological and climatic characterization. Edaphically indifferent series. The typical subassociation *quercetosum ilicis* occurs on several types of substrate between 60 and 340 m, in upper thermo-Mediterranean and low meso-Mediterranean bioclimates with ombrotypes ranging from upper dry to low sub-humid. On the other hand, the subassociation *phillyreetosum angustifoliae* grows on metamorphic soils between 20 and 160 m, under the same bioclimatic conditions.
Serial succession. Pre-forest substitution communities are represented by tall maquis of the association *Erico arboreae-Arbutetum unedonis*. Shrublands growing on acidic soils are referable to the association *Pistacio lentisci-Calicotometum villosae*, those growing on alkaline substrates to the association *Clematido cirrhosae-Pistacietum lentisci*. *Cistus monspeliensis* garrigues (*Lavandulo stoechadis-Cistetum monspeliensis*) are dominant on acidic soils, whereas on calcareous substrates nanophanerophytic communities of the association *Dorycnio pentaphylli-Cistetum eriocephali* occur. Herbaceous substitution coenoses are represented by permanent meadows of the class *Poetea bulbosae*, and therophytic communities of the class *Tuberarietea guttatae*.

Sardinian calcicolous meso-supra-Mediterranean holm oak series (*Aceri monspessulani-Quercetum ilicis*)

Physiognomy, structure and floristic features of the climax. Climatophilous micro-mesoforest dominated by holm oak and sclerophyllic species such as *Phillyrea latifolia*, and secondarily by lauriphyllic (*Ilex aquifolium*), deciduous (*Acer monspessulanum*) and geophytic (e.g. *Paeonia corsica*, *Epipactis microphylla* and *E. helleborine*) species. The sub-association *arbutetosum unedi* is the most thermophilous and characteristic feature of the highly decarbonated Palaeozoic substrate of the Sulcis and southern Iglesiente areas. Here, it forms a particular vegetation series the degradation phases of which invariably consist of mantles of the *Pruno-Rubion* alliance, the edges of which are generally formed by shrubs such as *Bupleurum fruticosum* and *Erica scoparia*, followed by hemicryptophytic grasslands of ferrous clay soils belonging to the association *Poo-Trifolietum subterranei*.
Lithomorphological and climatic characterization. Series occurring exclusively on limestone sub-

strates of calcareous and calcareous-dolomitic origin and, in the Sulcis area only, on metacalcareous soils. Its bioclimatic optimum is represented by the low supra-Mediterranean belt with a lower humid ombrotype. In the study area it is found only above 650 m on the north- and west-facing slopes.
Serial succession. Substitution communities are given by mantle shrublands of the *Pruno-Rubion* alliance, with herbaceous edges predominantly belonging to the order *Geranio purpurei-Cardaminetalia hirsutae*.

Sardinian calcifugous thermo-meso-Mediterranean cork oak series (*Galio scabri-Quercetum suberis*)

Physiognomy, structure and floristic features of the climax. *Quercus suber* meso-forest with *Quercus ilex*, *Arbutus unedo*, *Erica arborea*, *Phillyrea latifolia*, *Myrtus communis* subsp. *communis* and *Juniperus oxycedrus* subsp. *oxycedrus*. *Herbaceous layer* characterized by *Galium scabrum*, *Cyclamen repandum* subsp. *repandum* and *Ruscus aculeatus*.
Lithomorphological and climatic characterization. This series mainly occurs on the granitic substrates of eastern and southern-central Sardinia (subass. *quercetosum suberis*), sometimes also on metamorphic substrates (subass. *rhamnetosum alaterni*), between 200 and 550 m, always in Mediterranean oceanic-pluviseasonal bioclimates with thermotypes and ombrotypes varying from upper thermo-Mediterranean low sub-humid to low meso-Mediterranean upper sub-humid. The series seems to be restricted to the most northern part of Marganai, particularly in the areas descending from Malacalzetta to Antas; it is also present on the southern slope of Punta Serra Pirastru, between 625 and about 770 m, below Punta s'Ixi.
Serial succession. The forest vegetation is substituted by shrubland formations referable to the association *Erico arboreae-Arbutetum unedoni* and by *Cistus monspeliensis* and *C. salviifolius* garrigues; these are followed by permanent hemicryptophytic grasslands of the class *Poetea bulbosae* and therophytic grasslands of the class *Tuberarietea guttatae*.

Edaphohygrophilous plain geosigmetum (*Populenion Albae*, *Fraxino Angustifoliae-Ulmenion Minoris*, *Salicion Albae*)

Physiognomy, structure and floristic features of the climax. Edaphohygrophilous and/or plain deciduous meso-forests formed by *Populus alba*, *Populus nigra*, *Ulmus minor*, *Fraxinus oxycarpa* and *Salix* spp., generally showing a two-layer structure. Herbaceous layer variable according to flood periods; shrub layer frequently absent or consisting of thorny bushes.
Lithomorphological and climatic characterization. This geosigmetum is found in Mediterranean pluviseasonal-oceanic bioclimates with thermotypes varying from upper thermo-Mediterranean to lower meso-Mediterranean; occurs on different types of substrate always characterized by containing fine sedimentary material, mainly silt and clay, part of which can be found in suspension. The waters show a high nitrate and carbonate content, are rich in organic matter, and often show signs of eutrophication.
Serial succession. The serial phases are spatially arranged in an outward direction from the water course. Generally, scrublands formed by *Salix* spp., *Rubus* spp., *Tamarix* spp. and other caespitose phanerophytes such as *Nerium oleander* or *Sambucus nigra* are present. External to these, helophytic and/or helophytic-rhizophytic communities ascribable to the class *Phragmito-Magnocaricetea* occur.

Syntaxonomic scheme

Finally, a syntaxonomic scheme is proposed summarizing all the forest phytocoenoses described so far in the Marganai area.

QUERCETEA ILICIS Br.-Bl. ex A. & O. Bolòs 1950
Quercetalia ilicis Br.-Bl. ex Molinier 1934
Fraxino orni-Quercion ilicis Biondi, Casavecchia & Gigante 2003
Clematido cirrhosae-Quercenion ilicis Bacch., Bagella, Biondi, Farris, Filigheddu & Mossa 2004
Pyro spinosae-Quercetum ilicis Biondi, Filigheddu & Farris 2001 corr.
Prasio majoris-Quercetum ilicis Bacch., Bagella, Biondi, Farris, Filigheddu & Mossa 2004
quercetosum ilicis Bacch., Bagella, Biondi, Farris, Filigheddu & Mossa 2004
phillyreetosum angustifoliae Bacch., Bagella, Biondi, Farris, Filigheddu & Mossa 2004
Galio scabri-Quercetum ilicis Gamisans (1977) 1986
ilicetosum aquifolii Bacch., Bagella, Biondi, Farris, Filigheddu & Mossa 2004
clematidetosum cirrhosae (Ubaldi 2003) Bacch., Bagella, Biondi, Farris, Filigheddu & Mossa 2004
Aceri monspessulani-Quercetum ilicis Arrigoni, Di Tommaso & Mele 1985
arbutetosum unedonis Bacch., Bagella, Bion-

di, Farris, Filigheddu & Mossa 2004
Galio scabri-Quercetum suberis Rivas-Martínez, Biondi, Costa & Mossa 2003
quercetosum suberis Rivas-Martínez, Biondi, Costa & Mossa 2003
rhamnetosum alaterni Bacch., Bagella, Biondi, Farris, Filigheddu & Mossa 2004
Ericion arboreae (Rivas-Martínez ex Rivas-Martínez, Costa & Izco 1986) Rivas-Martínez 1987
Erico arboreae-Arbutetum unudi Allier & Lacoste 1980
Quercetalia calliprini Zohary (1955)
Juniperion turbinatae Rivas-Martínez 1975 corr. 1987
Oleo-Juniperetum turbinatae Arrigoni, Bruno, De Marco & Veri 1985 corr.
Oleo-Ceratonion siliquae Br.-Bl. ex Guinochet & Drouineau 1944 em. Rivas-Martínez 1975
Asparago albi-Oleetum sylvestris Bacch., Bagella, Biondi, Farris, Filigheddu & Mossa 2003

SALICI PURPUREAE-POPULETEA NIGRAE Rivas-Martínez & P. Canto ex Rivas-Martínez, Bascones, T.E. Díaz, Fernández González & Loidi 2001
Populetalia albae Br.-Bl. ex Tchou 1948
Populion albae Br.-Bl. ex Tchou 1948
Populenion albae Br.-Bl. 1931 em. Rivas-Martínez 1975
Fraxino angustifoliae-Ulmenion minoris Rivas-Martínez 1975

NERIO-TAMARICETEA Br.-Bl. & O. Bolòs 1958
Tamaricetalia Br.-Bl. & O. Bolòs 1958
Tamaricion africanae Br.-Bl. & O. Bolòs 1958
Rubo ulmifolii-Nerion oleandri O. Bolòs 1985

DISCUSSION

Chorological data (figs 6–8), both for the flora as a whole and for the endemic flora, confirm the biogeographical classification proposed by Bacchetta & Pontecorvo (2005), who characterized a Sulcis-Iglesiente sector subdivided into two sub-sectors: Sulcis and Iglesiente. These can be placed within the Mediterranean biogeographical region, W-Mediterranean subregion and Italo-Tyrrhenian superprovince (Giacomini & Fenaroli 1958; Takhtajan 1986; Ladero Alvarez et al. 1987). The latter includes three biogeographical provinces, among which the Sardo-Corsican one (Giacomini 1958; Ladero Alvarez et al. 1987), formed by the two sub-provinces – Sardinian and Corsican – as suggested already by Giacomini & Fenaroli (1958).
The present analyses show that the flora of Monte Marganai is richer – both in terms of quantity and quality – than in other areas of southern Sardinia of comparable size (tab. 4). The higher number of taxa found at Marganai (648) compared to other mountain ranges studied in Sulcis and Iglesiente can be attributed to the prevalently calcareous nature of the geological substrate, the rough morphology which allows the presence of numerous ecological niches, and the altitudinal range of the area that includes various thermotypes and ombrotypes. The flora of Monte Marganai is numerically only just lower than that of Rio Santa Lucia (Mossa & Bacchetta 1998), where 669 species were assessed. This is not the result of different lithological and pedological conditions in both territories, but can be ascribed to the greater climatic variability of the Rio Santa Lucia basin in relation to its proximity to the sea and its wider altitudinal range. The number of endemic species found at Rio Santa Lucia (60 = 9%) is lower than at Marganai (75 = 11.5%), which shows the highest absolute value in this respect despite its smaller size. This shows that the biodiversity richness of Marganai is qualitative as well as quantitative and confirms the high naturalness of the area. Several interesting taxa can be counted among the endemics, like those exclusive of the Sulcis-Iglesiente sector (1 taxon) and of the Iglesiente sub-sector (3). Two of the latter are exclusive of the Palaeozoic limestones of southern Iglesiente: *Sesleria insularis* subsp. *morisiana*, the main areale of which is included within the study area, and *Linum muelleri*. The other species exclusive of the above sector and sub-sector are *Helychrysum montelinasanum*, which occurs in various areas of Sulcis besides on Monte Linas, and *Genista sulcitana*, exclusive of the Iglesiente in spite of its name. All eight categories of rarity suggested by Rabinowitz (1981) were used to describe the Monte Marganai flora. This would appear to be in contrast with what expressed in the subsequent work by Rabinowitz et al. (1986), but it can be related to the limited extension of the study area. The category the existence of which is considered doubtful by Rabinowitz (NBS) was used for eight taxa, while the least used category was NBL (1). It is understandable that in a large territory it is improbable for a species to show a reduced distribution, wide ecological breadth and occur in small populations; however, this can occur at the scale of just a few square kilometres in territories with fragmented and localized habitats.
From a vegetational point of view, noteworthy is the presence in the area of a high diversity of forest habi-

tats, which can be ascribed to 3 classes, 4 orders, 6 alliances, 3 sub-alliances, 7 associations and 7 sub-associations. In addition, 6 vegetation series and 1 riparian geosigmetum are present in the area.
The dominant forests are the holm oak ones with three associations: *Pyro spinosae-Quercetum ilicis*, *Prasio majoris-Quercetum ilicis* and *Aceri monspessulani-Quercetum ilicis*, distributed from the base to the summit of the massif. *Quercus suber* forests belonging to the association *Galio scabri-Quercetum suberis* develop on the crystalline substrates of the northern part of the massif. All these forest formations are to be referred to the endemic Sardo-Corsican sub-alliance *Clematido cirrhosae-Quercenion ilicis*.
The forest formations of *Ilex aquifolium* and *Acer monspessulanum* are of great interest; these formations, which besides at Marganai can only be found in a few localities of Monte Linas and Sulcis in southern Sardinia, witness the high degree of oceanity of the area, caused by the proximity of the massif to the sea and the dominance of cool and humid westerly streams. The dune system of Arenas, in the north, is one of the main particularities of the study area: situated at a mean altitude of approximately 550 m, it hosts therophytic communities with a late winter-spring phenology that form a mosaic with garrigue types referable to the endemic alliance *Teucrion mari* and to the forest and maquis communities of the *Juniperion turbinatae* alliance. Some very interesting formations, which are the subject of ongoing studies, are the rupicolous ones and those growing on post-mining substrates; these are characterized by a high percentage of endemic taxa that underline the high specificity and selectivity of these environments.
As far as conservation aspects are concerned (tab. 3; fig. 11), the high naturalness of the study area – an aspect which is improving further still after the abandoning of mining activities – allows to confirm the presence of many habitats included in Annex I of the Habitats Directive 92/43/EEC. These are: *Quercus ilex* and *Quercus rotundifolia* forests (Code 9340), arborescent matorral with *Juniperus* spp. (5210), pseudo-steppe with grasses and annuals of the *Thero-Brachypodietea* (6220), thermo-Mediterranean and pre-desert scrub (5330), *Quercus suber* forests (9330), *Olea* and *Ceratonia* forests (9320), calcareous rocky slopes with chasmophytic vegetation (8210), southern riparian galleries and thickets (*Nerio-Tamaricetea* and *Securinegion tinctoriae*) (92D0).
The analyses carried out during the present study confirm that the Marganai massif is an area of high naturalness in which important natural restoration processes are taking place, and which shows high coefficients of both qualitative and quantitative floristic and vegetational diversity.

Acknowledgements
We would like thank the staff at the Ente Foreste Sardegna barracks of Case Marganai for their constant support and Dr. Mauro Casti (Centro Conservazione Biodiversità (CCB), Dipartimento di Scienze della Vita e dell'Ambiente, Università degli Studi di Cagliari) for the collaboration and information given.

Plants of Monte Marganai – 1
Top row: *Arenaria balearica* L. (photo by C. Pontecorvo); *Biscutella morisiana* Raffaelli (photo by C. Pontecorvo); *Bituminaria morisiana* (Pignatti & Metlesics) Greuter (photos by C. Pontecorvo & G. Bacchetta).
Middle row: *Brimeura fastigiata* (Viv.) Chouard; *Borago pygmaea* (DC.) Chater & Greuter; *Brassica insularis* Moris (photos by G. Bacchetta).
Bottom row: *Bryonia marmorata* Petit (photo by G. Bacchetta); *Cymbalaria aequitriloba* (Viv.) A. Chev. subsp. *aequitriloba* (photo by C. Pontecorvo); *Crocus minimus* DC (photo by G. Bacchetta).

Plants of Monte Marganai – 2
Top row: *Digitalis purpurea* L. var. *gyspergerae* (Rouy) (photo by G. Bacchetta); *Dipsacus ferox* Loisel. (photo by G. Bacchetta); *Echium anchusoides* Bacch., Brullo & Selvi (photo by G. Bacchetta).
Middle row: *Euphorbia pithyusa* L. subsp. *cupanii* (Guss. ex Bertol.) Radcl.-Sm.; *Euphorbia spinosa* L. subsp. *spinosa*; *Helichrysum montelinasanum* Ed. Schmid (photos by C. Pontecorvo).
Bottom row: *Iberis integerrima* Moris (photo by C. Pontecorvo); *Linum muelleri* Moris (photo by C. Pontecorvo); *Mentha requienii* Benth. subsp. *requienii* (photo by G. Bacchetta).

Plants of Monte Marganai – 3
Top row: *Nananthea perpusilla* (Loisel.) DC.; *Ptilostemon casabonae* (L.) Greute; *Romulea ligustica* Parl. (photos by C. Pontecorvo).
Middle row: *Santolina insularis* (Gennari ex Fiori) Arrigoni (photo by G. Bacchetta); *Stachys corsica* Pers. (photo by G. Bacchetta); *Seseli praecox* (Gamisans) Gamisans (photo by C. Pontecorvo).
Bottom row: *Sesleria insularis* Sommier ssp. *morisiana* Arrigoni (photos by C. Pontecorvo); *Urtica atrovirens* Req. ex Loisel. (photo by C. Pontecorvo); *Ornithogalum corsicum* Jord. et Fourr (photo by G. Bacchetta).

APPENDIX – CHECKLIST OF THE FLORA OF MARGANAI

Index of suprageneric taxa of the class Equisetopsida

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Aspleniaceae Newman (1840) 85
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Abbreviations

Abbreviations of territories constituting the distributional range of the endemics (Endem.), based on the acronyms of the Med-Checklist (Greuter et al. 1984–1989) (a code in brackets indicates that the presence of a taxon in that given area is uncertain):

AG = Algeria	GR = Greece	SI = Sicily
AT = Tuscan Archipelago	H = Hyères Islands	TN = Tunisia
BL = Balearic Islands	ITM = Southern Italy	
CO = Corsica	SA = Sardinia	

Abbreviations of rarity parameters (according to Rabinowitz 1981):

Distribution	Ecological breadth	Population size / dominance
N = narrow	B = broad	L = large, taxon sometimes dominant
W = wide	R = restricted	S = everywhere small, never dominant

The following eight combinations result from the above: WBL, WBS, WRL, WRS, NBL, NBS, NRL, NRS.

Biological forms and subforms, following Pignatti (1982):

Biological forms

Ch = Chamaephytes	I = Hydrophytes	T = Therophytes
G = Geophytes	NP = Nanophanerophytes	
H = Hemicryptophytes	P = Phanerophytes	

Biological subforms

bienn = biennial	nat = natant	ros = rosulate
bulb = bulbose	par = parassitic	scand = scandent
caesp = caespitose	rad = radicant	scap = scapose
frut = fruticose	rept = reptant	succ = succulent
lian = lianous	rhiz = rhizomatose	suffr = suffruticose

Degree of integration of the alien flora with the autochthonous one (according to Pyšek et al. 2004). The following abbreviations are followed by the area of origin, in brackets:

Avv. = adventitious. Taxon the presence of which is accidental and that does not seem capable of maintaining viable populations without the help of man.

Nat. = naturalised. Taxon well integrated with the autochthonous flora and capable of maintaining viable populations without the help of man.

Inv. = invasive. Naturalised taxon which shows a high capacity of expansion, causing serious threat to the autochthonous flora.

Herbaria:

CAG = University of Cagliari.

FI = University of Florence.

SS = Dipartimento di Scienze Botaniche, Ecologiche e Geologiche, University of Sassari.

SASSA = Historic herbarium of Dipartimento di Scienze del Farmaco, University of Sassari.

Checklist

(Taxa marked with an asterisk were directly observed by the Authors.)

LYCOPODIIDAE Beketov (1863)

Selaginellales Prantl (1874)
Selaginellaceae Willk. (1854)

1. ***Selaginella denticulata*** (L.) Spring (*) – H rept – Medit. – rocky ravines, woods and shrublands; WBL.
Massiccio del Marganai, nella macchia; comune (Ballero & Angiolino 1991).

Isoetales Prantl (1874)
Isoetaceae Rchb. (1828)

2. ***Isoëtes duriei*** Bory (*) – G bulb – W-Medit. – edge of streams; WRS.
Massiccio del Marganai, pozzette nei pressi del Rio Sarmentus; rara (Ballero & Angiolino 1991, sub *I. duriei* Bory).
Marganai, Ingurtosu, Gennamari, Fluminimaggiore (Arrigoni 2006).

OPHIOGLOSSIDAE Klinge (1882)

Ophioglossales Newman (1840)
Ophioglossaceae C. Agardh (1822)

3. ***Ophioglossum lusitanicum*** L. – G rhiz – Medit.-Atl. – ephemeral puddles on acid soils. Not observed in the study area.
Massiccio del Marganai, solamente in una località nei pressi di P.ta Marganai; raro (Ballero & Angiolino 1991).
Marganai, Sulcis-Iglesiente (Arrigoni 2006).

EQUISETIDAE Warm. (1883)

Equisetales DC. ex Bercht. et J. Presl (1820)
Equisetaceae Michx. ex DC. (1804)

4. ***Equisetum ramosissimum*** Desf. (*) – G rhiz – Boreo-Trop. – sources, sandy and humified soils constantly moist; WRL.
Presso le Grotte, Domusnovas. Martelli, 7.VI.1917 (CAG).
Massiccio del Marganai, comune nei pratelli umidi del Rio Sarmentus (Ballero & Angiolino 1991).
Sorgente presso l'ingresso della Grotta di S. Giovanni, Domusnovas. Quota 190 m s.l.m.; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
5. ***Equisetum telmateia*** Ehrh. (*) – G rhiz – Circumbor. – humid and shady places; WRL.
Domusnovas (Gennari ex Barbey 1885, sub *E. maximum* Lmk.).
Massiccio del Marganai, solo in prossimità di fontanili in Su Corovau; sporadico (Ballero & Angiolino 1991).
Marganai, Domusnovas. Quota 640 m s.l.m.; esp. WNW; incl. 10°; substrato calcari; 21.VI.2001. Bacchetta & Mossa (2004).
Marganai (Arrigoni 2006).

POLYPODIIDAE Cronquist, Takht. et Zimmerm. (1966)

Polypodiales Schimp. (1822)
Dennstaedtiaceae Lotsy (1909)

6. ***Pteridium aquilinum*** (L.) Kuhn subsp. (*) – G rhiz – Cosmop. – flooded areas; WBL.
Massiccio del Marganai, nella lecceta; diffusa (Ballero & Angiolino 1991).
Tintillonis, Monte Marganai, Iglesias. Fogu, 24.V.1993 (CAG).

Pteridaceae Newman (1840)

7. ***Adiantum capillus-veneris*** L. (*) – G rhiz – Boreo-Trop. – sources and dripping rocks, often associated with *Samolus valerandi* L.; WRS.
Uscita Grotte di S. Giovanni, Domusnovas. Martinoli, 16.XII.1951 (CAG).
Massiccio del Marganai, comune nelle zone fresche ed umide (Ballero & Angiolino 1991).
8. ***Anogramma leptophylla*** (L.) Link (*) – T caesp – Boreo-Trop. – wet rocks and rocky ravines; WRS.
Uscita Grotte di S. Giovanni, Domusnovas. Martinoli, 16.XII.1951 (CAG).
Massiccio del Marganai, pareti rocciose ed ombrose (Ballero & Angiolino 1991).
9. ***Cheilanthes acrosticha*** (Balb.) Tod. (*) – H ros – Medit.-Irano-Turan. – sunny and dry rocky fissures; WRS.
Massiccio del Marganai, sottobosco, anfratti ombrosi; sporadica (Ballero & Angiolino 1991, sub *C. pteridioides* (Reichard) C. Chr.).
10. ***Cheilanthes maderensis*** Lowe (*) – H ros – W-Medit. – rocks; NRS.

Marganai (Arrigoni 2006, sub *C. pteridioides* (Reichard) C. Chr.).

Aspleniaceae Newman (1840)

11. ***Asplenium obovatum*** Viv. – subsp. ***lanceolatum*** (Fiori) P. Silva (*) – H ros – Medit.-Atl. – rock fissures, drywall, consolidated debris, mainly on acid substrates;WRS.
Domusnovas. Substrato: metamorfiti; esposizione NNW 350°; inclinazione 30°; 450 m s.l.m. Bacchetta, Casti, Sotgiu-Cocco, 20.IV.2002 (CAG, sub *A. billotii* F.W. Schultz).
Obs. Pranu Sartu, Buggerru; M. Marganai.
12. ***Asplenium obovatum*** Viv. subsp. ***obovatum*** (*) – H ros – Medit. – shaded siliceous rocks, WRS.
S. Giovanni, Domusnovas. Gennari, 1869 (CAG). Revidit Marchetti, 30.III.1987.
Massiccio del Marganai, sottobosco; comune (Ballero & Angiolino 1991).
13. ***Asplenium onopteris*** L. (*) – H ros – Euro-Medit. – shrublands and ilex groves; WBS.
Alla Grotta di S. Giovanni, Domusnovas. Sine coll., 31.I.1867 (CAG, sub *A. adiantum nigrum* L., Revidit: Marchetti, 30.III.1987).
Uscita Grotta di S. Giovanni, Domusnovas. Martinoli, 16.XII.1951 (CAG, sub *A. adiantum-nigrum* L. Revidit: Marchetti, 30.III.1987).
Massiccio del Marganai, anfratti rocciosi; diffuso (Ballero & Angiolino 1991).
Massiccio del Marganai, Iglesias. Fogu, 25.V.1993 (CAG).
14. ***Asplenium ruta-muraria*** L. subsp. ***ruta-muraria*** – H ros – Circumbor. – rock fissures, mainly calcareous. Not observed in the study area.
Massiccio del Marganai, sui costoni freschi (Ballero & Angiolino 1991).
Sulle rupi dei monti calcarei più elevati: (...) M. Marganai (Arrigoni 2006).
15. ***Asplenium trichomanes*** L. subsp. ***quadrivalens*** D.E. Mey. (*) – H ros – Cosmop. – rocky ravines and rocky walls; WRS.
Uscita Grotta di S. Giovanni, Domusnovas. Martinoli, 16.XII.1951 (CAG). Revidit: Marchetti, 16.XII.1951.
16. ***Asplenium trichomanes*** L. subsp. ***trichomanes*** – H ros – Cosmop. – rocky ravines and rocky walls; probably confused with subsp. *quadrivalens*, widely represented in the study area.
Massiccio del Marganai, zone ombrose; comune (Ballero & Angiolino 1991).
17. ***Ceterach officinarum*** Willd. subsp. ***officinarum*** (*) – H ros – Euro-Medit.-Irano-Turan. – rocks exposed to the sun; WRS.
Uscita Grotte di S. Giovanni, Domusnovas. Martinoli, 16.XII.1951 (CAG).
Marganai case, Iglesias. Marchioni, 12.IV.1989 (CAG).
Massiccio del Marganai, lecceta, anfratti; comune (Ballero & Angiolino 1991).
Bacino montano del Riu Mannu di Fluminimaggiore, comune (Marchioni Ortu 1993).
18. ***Phyllitis scolopendrium*** (L.) Newman subsp. ***scolopendrium*** (*) – H ros – Boreo-Trop. – humid woods, streams, caves, wells and shady walls; NRS.
Iglesias: S. Giovanni (V. Bornemann ex Barbey 1885, sub *Scolopendrum vulgare* Sm.).

Dryopteridaceae Herter (1849)

19. ***Dryopteris pallida*** (Bory) C. Chr. ex Maire et Petitm. subsp. ***pallida*** (*) – G rhiz – Medit. – metamorphic, shady and wet rocks, preferably neutral or sub-alkaline; WBS.
S. Benedetto (Bornemann ex Barbey 1885, sub *Nephrodium rigidum* (Hoffm.) Desv. var. *pallidum* Bory).
Iglesias: S. Giovanni (V. Bornemann ex Barbey 1885, sub *N. rigidum* (Hoffm.) Desv. var. *pallidum* Bory).
Massiccio del Marganai, schiarite fra la macchia (Ballero & Angiolino 1991).
Uscita della Grotta di S. Giovanni, (lato opposto rispetto a Domusnovas), Domusnovas. Substrato: calcari paleozoici; 230 m s.l.m.; esp. E; incl. 25°. Pontecorvo, 4.VI.2006.
Presso il Passo della Croce, Iglesias. Quota 660 m s.l.m.; esp. 350° N; incl. 30°; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
Presso la Grotta di S. Giovanni, lato opposto a Domusnovas, Domusnovas. Quota 210 m s.l.m.; esp. 90° E; incl. 30°; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
20. ***Polystichum aculeatum*** (L.) Roth (*) – G rhiz/H ros – Euro-Medit. – rocks and shrublands; NRS.
Grotta S. Michele, Domusnovas. Zona liminare in penombra; umidità 74% (21.II.1971) (Berta & Chiappini 1978, sub *P. lonchitis* (L.) Roth)[1].
21. ***Polystichum setiferum*** (Forssk.) Woyn. (*) – G rhiz – Euro-Medit. – mesophilous woods on the edge of streams; WRS.

[1] Species not reported for Sardinia (Marchetti 2004); presumably it was confused with *P. aculeatum*, which is derived from the allotetraploid *P. x lonchitiforme* (Halácsy) Bech., hybrid between *P. lonchitis* and *P. setiferum* (Marchetti, 2004), and therefore close to the species reported by Berta & Chiappini (1978).

Polypodiaceae Bercht. et J. Presl (1820)

22. ***Polypodium cambricum*** L. (*) – H ros – Euro-Medit. – rocks, rock walls and tree trunks; WBL.
Uscita Grotta S. Giovanni, Domusnovas. Martinoli, 16.XII.1951 (CAG, sub *P. vulgare* L.).
Grotta di S. Giovanni, Domusnovas. Inizio zona subliminare a luce tenue; umidità 75% (12.V.1978) (Berta & Chiappini 1978, sub *Thelypteris phegopteris* (L.) Slosson)[2].
Massiccio del Marganai, anfratti, sottobosco; comune (Ballero & Angiolino 1991, sub *P. cambricum* L. subsp. *serrulatum* (Sch. ex Arcang.) Pichi-Serm.).
Monte Marganai, Domusnovas. Fogu, 25.V.1993 (CAG, sub *P. australe* Fée).

PINIDAE Cronquist, Takht. et Zimmerm. ex Reveal (1996)
Pinales Gorozh. & Lekts (1904)
Cupressaceae Gray (1821)

23. ***Juniperus oxycedrus*** L. subsp. ***oxycedrus*** (*) – P scap – Medit.-Irano-Turan. – woods and shrublands; WBL.
Massiccio del Marganai, macchie; comune (Ballero & Angiolino 1991).
Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005).
24. ***Juniperus phoenicea*** L. subsp. ***turbinata*** (Guss.) Nyman (*) – P scap – Medit.-Irano-Turan. – thermophilous shrublands; WBL.
Massiccio del Marganai, comune alle quote intermedie, sporadico altrove (Ballero & Angiolino 1991, sub *J. phoenicea* L.).
Marganai, Punta S. Michele, Domusnovas. Fogu, 26.V.1993 (CAG, sub *J. phoenicea* L.).
Punta S. Michele, Domusnovas. Substrato: calcari paleozoici; coordinate: UTM E 464873 N 4354504; esposizione 260 W; inclinazione 30°; 900 m s.l.m. Bacchetta, Gamper et Pontecorvo, 9.VI.2004 (CAG).

Pinaceae Adans. (1763)

25. ***Pinus pinea*** L. (*) – P scap – Medit. – coastal and reforestation areas; NRL.
Massiccio del Marganai, introdotto nei pressi di Case Marganai (Ballero & Angiolino 1991).

[2] Species present in northern Italy on the Alps and Apennines, on siliceous substrates. Its presence in Sardinia, at low altitude and on limestone, is considered unlikely. Probably confused with *Polypodium*, given the affinity with this genus.

MAGNOLIIDAE Novak ex Takht. (1967)
Magnolianae Takht. (1967)
Piperales Dumort. (1829)
Aristolochiaceae Juss. (1789)

26. ***Aristolochia rotunda*** L. subsp. ***insularis*** E. Nardi et Arrigoni (*) – G rhiz – Endem. SA-CO – edges of paths and mule tracks; WRS.
Massiccio del Marganai, fra le fenditure della roccia in alcune schiarite della macchia; non molto diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2006).

Laurales Perleb (1826)
Lauraceae Juss. (1789)

27. ***Laurus nobilis*** L. (*) – P caesp – Medit.-Atl. – valleys with a relatively hot and humid microclimate; WRL.
Massiccio del Marganai, introdotta tra i coltivi; comune (Ballero & Angiolino 1991).
Obs. Benedetto, between Outskirts of Iglesias and Lago Corsi.

Lilianae[3] Takht. (1967)
Alismatales Dumort. (1829)
Araceae Juss. (1789)

28. ***Ambrosina bassii*** L. (*) – G rhiz – S-Medit. – grasslands, clearings, garrigues and shrublands; WBS.
Domusnovas. *Sine coll.*, 1876 (CAG, sub *A. bassii* var. *reticulata* Tineo).
Massiccio del Marganai, nei pratelli; sporadica (Ballero & Angiolino 1991).
29. ***Arisarum vulgare*** Targ.-Tozz. (*) – G rhiz – Medit. – garrigues, shrublands and woods; WBL.
Massiccio del Marganai, fra la macchia, nei pratelli; comune (Ballero & Angiolino 1991).
Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
30. ***Arum italicum*** Mill. subsp. ***italicum*** (*) – G rhiz – Medit.-Atl. – riparian woods and shrublands; WBS.
Massiccio del Marganai, diffusa alla base dei muri e nei pressi dei ruderi (Ballero & Angiolino 1991, sub *A. italicum* Mill.).
31. ***Arum pictum*** L. f. subsp. ***pictum*** (*) – G rhiz – Endem. SA-CO – clearings and shrublands, WBL.
Domusnovas, dalla grotta di S. Giovanni alla miniera di Sa Duchessa, calcare m 250-350, 6.V.1982, Corrias

[3] Corresponding to Monocotyledones.

et Diana (SS).
Massiccio del Marganai, sporadica nelle radure fra i cisti e lentischi nonché ai margini dei sentieri (Ballero & Angiolino 1991).
32. ***Lemna minor*** L. (*) – I nat – Boreo-Trop. – puddles and stagnant waters; NRL.
Massiccio del Marganai, solo in alcune anse del torrente Riu Gutturu di M.ti Nieddu; molto rara (Ballero & Angiolino 1991).

Dioscorales Hook.f. (1873)
Dioscoreaceae R. Br. (1810)

33. ***Tamus communis*** L. (*) – G rad – Medit.-Atl. – clearings, shrublands and woods; WBL.
Massiccio del Marganai, comune nella macchia (Ballero & Angiolino 1991).
Massiccio del Marganai, Iglesias. Fogu, 25.V.1993 (CAG).
Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
Punta Tintillonis – Massiccio del Marganai, Iglesias. Fogu, 24.V.2003 (CAG).
Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).

Liliales Perleb (1826)
Colchicaceae DC. (1804)

34. ***Colchicum lusitanum*** Brot. (*) – G bulb – W-Medit. – arid pastures, reaped grasslands; NRS.
Monte Marganai, Domusnovas. Ballero et Angiolino, IX.1989 (CAG).
Massiccio del Marganai, P.ta Reigraxius; diffusa solo in alcuni pratelli (Ballero & Angiolino 1991).
35. ***Colchicum neapolitanum*** (Ten.) Ten. (*) – G bulb – W-Medit. – prati aridi; NRS.
Massiccio del Marganai, pratelli; sporadica (Ballero & Angiolino 1991).

Smilacaceae Vent. (1799)

36. ***Smilax aspera*** L. (*) – NP – Medit. – shrublands, woods, mostly in valleys; WBL.
Massiccio del Marganai, nella lecceta e fra le siepi; comune (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Miniera di Acquaresi, Iglesias, 29.IV.1999; Tinny, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
S. Giovanni Miniera, Iglesias, 11.VI.1998; 6.VI.2002; Arenas, Fluminimaggiore, 26.VI.1999; Montepo-ni, Iglesias, 13.VII.2000; 3.VI.2001; 13.VII.2001; Agruxiau, Iglesias, 13.VII.2000; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).

Liliaceae Juss. (1789)

37. ***Gagea granatellii*** (Parl.) Parl. (*) – G bulb – S-Medit. – grasslands and garrigues of cacuminal areas; WRS.
M. Marganai prope Iglesias (Martelli 1904).
Massiccio del Marganai, solo in alcuni pratelli nei pressi di Punta Su Corru Mannu tra la roccia affiorante; rara (Ballero & Angiolino 1991).

Asparagales Bromhead (1838)
Orchidaceae Adans. (1763)

38. ***Anacamptis collina*** (Banks et Sol. ex Russel) R.M. Bateman Pridgeon et M.W. Chase [*Orchis collina* Banks et Sol. ex Russel] (*) – G bulb – Medit. – arid grasslands, prefers limestone; WRS.
39. ***Anacamptis longicornu*** (Poir.) R.M. Bateman Pridgeon et M.W. Chase [*O. longicornu* Poir.] (*) – G bulb – W-Medit. – roadsides, grasslands and garrigues; WBL.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991, sub *O. longicornu* Poir.).
Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003, sub *O. longicornu* Poiret).
40. ***Epipactis helleborine*** (L.) Crantz (*) – G bulb – Paleotemp. – woods, clearings and mesophilous woods, on limestone; WRS.
Iglesias in monte Marganai (Martelli 1896).
Massiccio del Marganai, ritrovata solo in prossimità della miniera di Reigraxius; molto rara (Ballero & Angiolino 1991).
Domusnovas. Scrugli, 19.V.1994 (CAG).
Barraxiutta, Domusnovas. Substrato: discariche minerarie; esposizione E 80°; inclinazione 5-10°; bioclima mesomedit. inf./subumido inf.; quota 530 m s.l.m. Bacchetta, Brullo, Cogoni et Scrugli, 4.VI.2002 (CAG).
41. ***Epipactis microphylla*** (Ehrh.) Sw. (*) – G bulb – Euro-Medit. – woods and clearings of mesophilous woods, calcicolous; WRS.
Grotte S. Giovanni, Domusnovas. Scrugli, Cogoni et Del Prete, 16.V.1987 (CAG).
Grotte di S. Giovanni, Domusnovas. Scrugli et Cogoni, 28.V.1989 (CAG).
Massiccio del Marganai, in alcune modeste radure; molto rara (Ballero & Angiolino 1991).
Su Corovau, Massiccio Marganai, Domusnovas. Fogu,

26.V.1993 (CAG).
Domusnovas. Scrugli, 19.V.1994 (CAG).
42. ***Epipactis tremolsii*** C. Pau[4] (*) – G rhiz – W-Medit. – clearings, garrigues and permanent grasslands, calcicolous; NRS.
Marganai, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
Sa Duchessa, Domusnovas, 3.IX.2000; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005).
43. ***Himantoglossum robertianum*** (Loisel.) P. Delforge (*) – G bulb – Medit. – shrublands and arid grasslands; WBL.
Massiccio del Marganai, comunissima (Ballero & Angiolino 1991, sub *Barlia robertiana* (Loisel.) W. Greuter).
Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003, sub *B. robertiana* (Loisel.) W. Greuter).
44. ***Limodorum abortivum*** (L.) Swartz var. ***abortivum*** (*) – G rhiz – Euro-Medit. – shrublands and woods; WRS.
Maremma, dopo Sa Duchessa verso Arenas, Domusnovas. Scrugli, 16.VI.1994 (CAG).
Sa Duchessa, presso abbeveratoio, Domusnovas. Scrugli, 16.V.1994 (CAG).
45. ***Limodorum abortivum*** (L.) Swartz var. ***trabutianum*** (Batt.) Schlechter (*) – G rhiz – Medit.-Atl. – calcicolous shrublands and woods,; NRS.
Sa Duchessa, Marganai, Domusnovas. Scrugli, Del Prete et Cogoni, 16.V.1987 (CAG, sub *L. trabutianum* Batt.).
Pressi miniera Sa Duchessa – Marganai, Domusnovas. Scrugli et Cogoni, 28.V.1989 (CAG, sub *L. trabutianum* Batt.).
Domusnovas. Scrugli, 28.IV.1997 (CAG, sub *L. trabutianum* Batt.).
46. ***Ophrys apifera*** Huds. var. ***apifera*** (*) – G bulb – Euro-Medit. – grasslands and clearings in shrublands; WRS.
47. ***Ophrys bombyliflora*** Link (*) – G bulb – Medit. – bush, garrigues, shrublands and untilled lands; WBS.
48. ***Ophrys chestermanii*** (J.J. Wood) Gölz et H.R. Reinhard (*) – G bulb – Endem. SA – fresh and partly shady places, limestone, shale, often in rocky places; WBS.
Grotte di S. Giovanni, Domusnovas. Wood. et Chestermann, 20.V.1982. Determinavit: Scrugli (CAG, sub *O. holoserica* (N.L. Burm.) Greuter subsp. *chestermanii* J.J. Wood).
Domusnovas (CA) MJ 70.52 (Corrias 1983, sub *O. holoserica* (N.L. Burm.) Greuter subsp. *chestermannii* J.J. Wood).
Massiccio del Marganai, in poche radure tra la macchia; sporadica (Ballero & Angiolino 1991, sub *O. holoserica* (N.L. Burm.) Greuter subsp. *chestermannii* J.J. Wood).
49. ***Ophrys conradiae*** Melki et Deschâtres (*) – G bulb – Endem. SA-CO – shrublands and clearings of holm oak woods; NRS.
Sa Duchessa, Marganai, Domusnovas. Scrugli et Cogoni, 16.VI.1992 (CAG).
50. ***Ophrys eleonorae*** Devillers-Terschuren et Devillers (*) – G bulb – Endem. SA-CO-TN – garrigues, clearings, especially on alkaline substrates; WRS.
51. ***Ophrys fusca*** Link (*) – G bulb – Medit. – shrublands, garrigues and untilled lands; NRS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
52. ***Ophrys morisii*** (Martelli) Soò (*) – G bulb – Endem. SA-CO – roadsides, grasslands, garrigues and shrublands; WBS.
Domusnovas. Grasso, 23.IV.1984 (CAG, sub *O. arachnitiformis* Gren et Philippe. Revidit: Scrugli, 7.IX.1991).
53. ***Ophrys neglecta*** Parl.[5] (*) – G bulb – C-Medit. – calcicolous grasslands and garrigues; WBS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991, sub *O. tenthredinifera* Willd.).
Sentiero sul bordo del Rio Sarmentus, Domusnovas. Coordinate E 46682 N 4356934; quota 275 m s.l.m.; esp./incl.=0; substrato metamorfiti. Pontecorvo et Carai, 8.IV.2006 (CAG).
54. ***Ophrys speculum*** Link (*) – G bulb – Medit. – grasslands and garrigues; WBL.
Foresta del Monte Marganai, presso il Rio Sarmentus, Domusnovas. Quota 280 m s.l.m.; incl. 40°; esp. 254° WSW; substrato calcari paleozoici. Pontecorvo et Carai, 8.IV.2006 (CAG).
55. ***Ophrys*** x ***daissiorum*** (H. Baumann, Giotta, Künkele, R. Lorenz et Piccitto) P. Delforge [*O. chestermanii* x *O. morisii*] (*) – G bulb – Endem. SA – shady places; NRS.
Sa Duchessa, Domusnovas. Scrugli, 2.V.2003 (CAG).
Barraxiutta, Domusnovas. Scrugli, 5.V.2004 (CAG).
56. ***Orchis anthrophophora*** (L.) All. (*) – G bulb – Medit.-Atl. – bush, arid grasslands, calcicolous; WBL.
La Duchessa (Martelli 1896).
Massiccio del Marganai, prati; sporadica (Ballero & Angiolino 1991, sub *Aceras anthropophorum* (L.) R. Br.).

[4] *E. tremolsi* is a calcicolous species with a range centered on the eastern Iberian Peninsula. Its different ecology in Iglesiente, where it shows preference for calaminarian substrates, deserves to be investigated also from a taxonomic point of view.

[5] Delforge (2005) reported only *O. neglecta* from Sardinia, to which records of *O. tenthredinifera* Willd have been attributed.

Domusnovas. Scrugli, 19.V.1994 (CAG, sub *A. antropophorum* (L.) R. Br.).
Tinny, Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003, sub *A. anthropophorum* (L.) R. Br. ex Aiton *fil.*).
Sa Duchessa, Domusnovas, 3.IX.2000; S. Giovanni Miniera, Iglesias, 6.VI.2002 (Angiolini et al. 2005).
Rio Cruccureu, nella foresta del Monte Marganai, Domusnovas. Coordinate E 466564 N 4357158; substrato calcari paleozoici; quota 280 m s.l.m.; esp. 254° WSW; incl. 40°. Pontecorvo et Carai, 8.IV.2006 (CAG).
57. ***Orchis ichnusae*** (Corrias) Devillers-Terschuren et Devillers (*) – G bulb – Endem. SA (BL) – clearings of mesophilous woods, WRS.
Iglesias, Malacalzetta, calcarei paleozoici da Arcu sa Cruxi e q. 751 a Nord di Punta Genna Aragosta, 16.V.1967, Arrigoni et Ricceri (FI, sub *O. mascula* L.).
Domusnovas, strada per la miniera di Sa Duchessa, dopo la grotta di S. Giovanni, 26.IV.1978, Diana et Corrias (SS, sub *O. mascula* L.).
Massiccio del Marganai, sporadica (Ballero & Angiolino 1991, sub *O. mascula* (L.). subsp. *ichnusae* Corrias).
Domusnovas. Scrugli, 11.IV.1997 (CAG, sub *O. mascula* (L.) L. subsp. *ichnusae* Corrias).
Domusnovas. Scrugli, 2.V.2003 (CAG, sub *O. mascula* (L.) L. subsp. *ichnusae* Corrias).
58. ***Orchis intacta*** Link (*) – G bulb – Medit.-Atl. – edges of paths and clearings of woods; WBS.
Grotte di S. Giovanni, Domusnovas. Scrugli, Del Prete et Cogoni, 16.V.1987 (CAG, sub *Neotinea maculata* (Desf.) Stearn).
Pressi miniera Sa Duchessa – Marganai, Domusnovas. Scrugli et Cogoni, 28.V.1989 (CAG, sub *N. maculata* (Desf.) Stearn).
Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991, sub *N. maculata* (Desf.) Rchb.).
Tinny, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003, sub *N. maculata* (Desf.) Stearn).
Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999 (Angiolini et al. 2005).
59. ***Orchis provincialis*** Balbis ex Lam. et DC. (*) – G bulb – Medit.-Irano-Turan. – clearings and edges of woods; WRS.
Nei boschi dei monti sopra Domusnovas. Gennari, V.1861 (CAG).
Massiccio del Marganai, radure e pratelli; comune (Ballero & Angiolino 1991).
60. ***Orchis*** x ***bornemannii*** Asch. (*) [*Anacamptis longicornu* x *O. papilionacea*] – G bulb – W-Medit. – grasslands; WRS.
Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991, sub *O. Bornemannii* Asch.).
61. ***Orchis*** x ***penzigiana*** A. Camus nsubsp. *sardoa* Scrugli et Grasso [*Orchis ichnusae* x *O. provincialis*] (*) – G bulb – Endem. SA – grasslands; NRS.
Barraxiutta, Domusnovas (CA), MJ 66.58 (Scrugli et al. 2004).
62. ***Serapias lingua*** L. (*) – G bulb – Medit.-Atl. – grasslands, garrigues and clearings in shrublands; WBL.
Grotta di Domusnovas, Domusnovas. Camarda et Ballero, V.1969 (CAG).
63. ***Serapias parviflora*** Parl. (*) – G bulb – Medit.-Atl. – grasslands and garrigues; WRS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
64. ***Spiranthes spiralis*** (L.) Chevall. (*) – G rhiz – Medit.-Atl. – roadsides and grasslands; WRS.
Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991).
Oltre le grotte di S. Giovanni, Domusnovas. Scrugli et Cogoni, 21.X.1992 (CAG).

Iridaceae Juss. (1789)

65. ***Crocus minimus*** DC. (*) – G bulb – Endem. SA-CO-AT – grasslands and garrigues; WBL.
In herbosis sylvaticis Montis Marganai, m 700. Martelli, 8.IV.1894 (FI, sub *C. imperati* var. *sardoa*).
In sylvis montis Marganai, m 700. Martelli, 8.IV.1894 (FI, sub *C. imperati* Ten. var. *sardoa* Martelli).
In sylvis montis Marganai in ditione Iglesias (Martelli 1901, sub *C. imperati* Ten. var. *sardoa* Martelli).
Massiccio del Marganai, comune nei pratelli e radure (Ballero & Angiolino 1991).
66. ***Gladiolus communis*** L. subsp. ***byzantinus*** (Mill.) A.P. Ham. (*) – G bulb – Medit. – tilled lands; WRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
67. ***Gladiolus italicus*** Mill. (*) – G bulb –Medit.-Irano-Turan. – grasslands and untilled lands at low altitude; NRS.
Massiccio del Marganai, diffusa nei luoghi erbosi (Ballero & Angiolino 1991).
68. ***Gynandriris sisyrinchium*** (L.) Parl. (*) – G bulb – Medit. – arid grasslands at low altitude; WRL.
69. ***Iris foetidissima*** L. (*) – G rhiz – Euro-Medit. – moist soils in woods and mesophilous bush; WRS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
Marganai, Iglesias. Angius, 19.VI.1997 (CAG).
70. ***Romulea columnae*** Sebast. et Mauri (*) – G bulb – Medit. – grasslands, garrigues and clearings; WRS.
Massiccio del Marganai, diffusa nelle radure (Ballero

& Angiolino 1991).
71. ***Romulea ligustica*** Parl. (*) – G bulb – SW-Medit. – grasslands, clearings; WBL.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
Presso Punta S. Michele, Massiccio del Marganai, Iglesias. Substrato: calcari paleozoici; 815 m s.l.m.; esp. SW. Pontecorvo, 2.VI.2006 (CAG).
72. ***Romulea requienii*** Parl. (*) – G bulb – Endem. SA-CO – grasslands and garrigues; WRL.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
73. ***Romulea rollii*** Parl. – G bulb – W-Medit. – sandy riparian areas. Not observed in the study area.
Massiccio del Marganai, radure, margine dei sentieri; comune (Ballero & Angiolino 1991)[6].

Xanthorrhoeaceae Dumort. (1829)

74. ***Asphodelus fistulosus*** L. (*) – H bienn – Medit. – pastures and arid untilled lands; WRL.
Massiccio del Marganai, cunette, radure fresche; sporadica (Ballero & Angiolino 1991).
Rio Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini et al. 2005).
75. ***Asphodelus ramosus*** L. subsp. ***ramosus*** (*) – G rhiz – Medit. – grasslands, garrigues and shrublands; WBL.
Massiccio del Marganai, lande e pratelli; comune (Ballero & Angiolino 1991, sub *A. microcarpus* Salzm. et Viv.).
Marganai, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; San Giovanni Miniera, Iglesias, 6.VI.2002 (Angiolini et al. 2005).

Amaryllidaceae J. St.-Hil.(1805)

76. ***Allium ampeloprasum*** L. (*) – G bulb – Medit. – stony grounds and rocky walls; WRS.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).
77. ***Allium chamaemoly*** L. subsp. ***chamaemoly*** (*) – G bulb – W-Circum.-Medit. – grasslands and roadsides NRS.
Obs. Grasslands near Rio Sarmentus.
78. ***Allium parciflorum*** Viv. (*) – G bulb – Endem. SA-CO – rocks and rocky walls; WRS.
Massiccio del Marganai, solo in prossimità di P.ta San Michele, insinuata di sovente fra *Euphorbia spinosa*; sporadica (Ballero & Angiolino 1991).
79. ***Allium roseum*** L. (*) – G bulb – Medit. – garrigues and clearings; WBL.
Massiccio del Marganai, siepi, pratelli; comune (Ballero & Angiolino 1991).
80. ***Allium subhirsutum*** L. (*) – G bulb – Medit. – grasslands, garrigues and shrublands; WBL.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
81. ***Allium triquetrum*** L. (*) – G bulb – W-Medit. – roadsides, clearings, shrublands and woods; WBL.
Massiccio del Marganai, siepi, pratelli umidi; comune (Ballero & Angiolino 1991).
82. ***Allium vineale*** L. (*) – G bulb – Euro-Medit. – roadsides and edges of tilled land; WRS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
83. ***Leucojum autumnale*** L. (*) – G bulb – Medit. – grasslands and clearings; WBL.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
Presso Punta Nicola Garau, Domusnovas. Pratello di terofite e geofite, coord. 39°21'265 N 8°37'886 E; 315 m s.l.m.; esp./incl.=0. Substrato: metamorfiti paleozoiche. Pontecorvo, 13.IX.2006 (CAG).
84. ***Narcissus tazetta*** L. subsp. ***tazetta*** (*) – G bulb – Medit. – grasslands and grassy slopes; WBL.
Massiccio del Marganai, comune nei pratelli (Ballero & Angiolino 1991, sub *N. tazetta* L.).
85. ***Pancratium illyricum*** L. (*) – G bulb – Endem. SA-CO-AT – rocky areas, cool and humid, often at the edge of streams; WBS.
Massiccio del Marganai, radure fra litosuoli; diffusa (Ballero & Angiolino 1991).

Asparagaceae Juss. (1789)

86. ***Asparagus acutifolius*** L. (*) – NP (G rhiz) – Medit. – shrublands and woods; WBL.
Massiccio del Marganai, siepi e radure; comune (Ballero & Angiolino 1991).
Capo Frasca, macchia, gariga e bordi delle strade; diffuso (Bocchieri & Mulas, 1992).
87. ***Asparagus albus*** L. (*) – Ch frut – W-Medit. – rocky areas, garrigues and degraded shrublands; WBL.
Massiccio del Marganai, radure assolate; diffusa (Ballero & Angiolino 1991).
88. ***Brimeura fastigiata*** (Viv.) Chouard (*) – G bulb – Endem. SA-CO-BL-(GR) – rocks and rocky ravines; WRS.
Massiccio del Marganai, nei pressi della grotta di San

[6] *R. rolli* was not observed during this investigation. The report, which contains an ecology incorrect for that species, probably refers to *R. columnae* Sebast. et Mauri.

Giovanni; sporadica (Ballero & Angiolino 1991).
89. ***Charybdis maritima*** (L.) Speta (*) – G bulb – Medit – grasslands and garrigues; NRS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
90. ***Charybdis undulata*** (Desf.) Speta (*) – G bulb – S-Medit. – poorly evolved soils and rock fissures; WRS.
Massiccio del Marganai, solo nei pressi di Tintillonis fra le fenditure del calcare; molto rara (Ballero & Angiolino 1991, sub *Urginea undulata* (Desf.) Steinh.).
91. ***Muscari comosum*** (L.) Mill. (*) – G bulb – Euro-Medit. – rocky areas, grasslands and garrigues; WBL.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991, sub *Leopoldia comosa* (L.) Parl.).
92. ***Ornithogalum corsicum*** Jord. et Fourr. (*) – G bulb – Endem. SA-CO – shrublands, clearings and grasslands; WRS.
In Monte Marganai, majo, sine die, Moris (SASSA, sub *O. biflorum* Jord et Fourr.).
Iglesias, Monte Marganai, 5.V.1963, Arrigoni (FI, sub *O. biflorum* Jord et Fourr.).
Monte Marganai, Domusnovas, Ballero, IV.1988 (CAG, sub *O. biflorum* Jord. et Fourr.).
Massiccio del Marganai, pratelli; diffuso (Ballero & Angiolino 1991, sub *O. sandalioticum* (Tor. et Garb.) Zahariadi).
Presso Punta S. Michele, Domusnovas. Quota 815 m s.l.m.; esp. SW; substrato calcarei paleozoici. Pontecorvo, 2.IV.2006 (CAG).
93. ***Polygonatum odoratum*** (Mill.) Druce (*) – G rhiz – Circumbor. – arid places in mesophilous woods; NRS.
Monte Marganai, pressi Grotte S. Giovanni. Ballero, VI.1990 (CAG).
Massiccio del Marganai, solo in due stazioni nei pressi della Grotta di S. Giovanni; rara (Ballero & Angiolino 1991).
94. ***Prospero autumnale*** (L.) Speta subsp. ***autumnale*** (*) – G bulb – Medit. – grasslands and garrigues; WBL.
Massiccio del Marganai, pratelli, cunette; comune (Ballero & Angiolino 1991, sub *S. autumnalis* L.).
95. ***Ruscus aculeatus*** L. (*) – Ch frut – Medit. – shrublands and woods; WRL.
Massiccio del Marganai, comune nella macchia (Ballero & Angiolino 1991).
96. ***Urginea fugax*** (Moris) Steinh. (*) – G bulb – SW-Medit. – rocky areas, grasslands and garrigues; WRS.
Fluminese, ambienti aridi; rara (Ballero et al. 2000).
Obs. Stable grasslands of Punta S. Michele.

Poales Small (1903)
Typhaceae Juss. (1789)

97. ***Typha latifolia*** L. (*) – G rhiz – Cosmop. – stagnant waters; WRL.
Massiccio del Marganai, comune lungo alcuni corsi e raccolte d'acqua (Ballero & Angiolino 1991).

Juncaceae Juss. (1789)

98. ***Juncus acutus*** L. subsp. ***acutus*** (*) – H caesp – Euro-Medit. – slushy areas and ditches; WRL.
Massiccio del Marganai, zone pantanose; rara (Ballero & Angiolino 1991).
99. ***Juncus articulatus*** L. (*) – G rhiz – Circumbor. – riverbeds; WRL.
Massiccio del Marganai, cunette; diffusa (Ballero & Angiolino 1991).
100. ***Juncus bufonius*** L. (*) – T caesp – Boreo-Trop. – humid areas, slushy areas and streams; WRL.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
101. ***Juncus capitatus*** Weigel (*) – T scap – Medit.-Atl. – depositional areas and riverbeds; WBS.
102. ***Juncus inflexus*** L. (*) – H caesp (G rhiz) – Paleotemp. – slushy areas, ditches and humid grasslands; NBS.
Domos novas, *junio*. Herb. Moris ex Barbey (1885).
103. ***Juncus pygmaeus*** Rich. ex Thuill. (*) – T caesp – Medit.-Atl. – humid and sandy areas; NRL.
Massiccio del Marganai, pratelli freschi; diffusa (Ballero & Angiolino 1991).
104. ***Luzula forsteri*** (Sm.) DC. (*) – H caesp – Euro-Medit. –shrublands and mesophilous woods; WRS.
Massiccio del Marganai, diffusa nella lecceta (Ballero & Angiolino 1991).
M. Sigue, Iglesias. M. Miai, Iglesias. Bacchetta & Mossa, 16.IV.1992 ex Bacchetta et al. (2004).
Arenas, Fluminimaggiore, 26.VI.1999 (Angiolini et al. 2005).
Rio Oridda, Domusnovas. Substrato: graniti, detriti alluvionali; ontaneto nell'altopiano di Oridda. Legit Angius, determinavit Bacchetta, 1.IV.2005 (CAG).

Cyperaceae Juss. (1789)

105. ***Blysmus compressus*** (L.) Panz. ex Link (*) – G rhiz – Circumbor. – edges of muddy paths, wet grasslands, mostly trampled; NRS.
Grotte di S. Giovanni; Domusnovas. Legit Martinoli, 5.V.1949, determinavit Zedda, 5.X.1990 (CAG).
106. ***Carex distachya*** Desf. (*) – H caesp – Medit. –shrublands and woods; WRL.

Massiccio del Marganai, pratelli freschi; diffusa (Ballero & Angiolino 1991).
Sa Duchessa, Domusnovas, 27.IV.1999; Buggerru, 29.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas. 27.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
Foresta del Monte Marganai, presso il Rio Sarmentus, Domusnovas. Quota 280 m s.l.m.; substrato: calcari paleozoici. Pontecorvo et Carai, 8.IV.2006 (CAG).
107. ***Carex divisa*** Huds. (*) – G rhiz – Medit.-Atl. – humid grasslands, slushy areas and edges of streams; WRS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
108. ***Carex divulsa*** Stokes (*) – H caesp – Circumbor. – clearings, shrublands and woods; WBS.
Colli a nord di Iglesias a 600 m (Fiori 1913, sub *C. muricata* L. var. *divulsa* (Good.)).
Massiccio del Marganai, ristagni d'acqua; diffusa (Ballero & Angiolino 1991).
M. Sigue, Iglesias. M. Miai, Iglesias. Bacchetta & Mossa, 16.IV.1992 ex Bacchetta et al. (2004).
109. ***Carex flacca*** Schreber subsp. ***serrulata*** (Biv.) Greuter (*) – G rhiz – Medit.-Irano-Turan. – arid grasslands, shrublands and garrigues; WBS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
110. ***Carex halleriana*** Asso (*) – H caesp –. Euro-Medit. –shrublands and woods;WBS.
Obs. holm oak woods managed coppice, edges of woods and along paths.
111. ***Carex microcarpa*** Bertol. ex Moris (*) – G rhiz – Endem. SA-CO-AT – sources, slushy areas and riverbeds; WBL.
Massiccio del Marganai, luoghi umidi e freschi; diffusa (Ballero & Angiolino 1991).
Marganai, Domusnovas. Quota 640 m s.l.m.; esp. WNW; incl. 10°; substrato calcari; 21.VI.2001.
112. ***Cyperus badius*** Desf. (*) – G rhiz – Paleotemp. – sources, slushy areas and riverbeds; WRL.
Presso sorgente all'Ingresso della Grotta di S. Giovanni, Domusnovas. Quota 190 m s.l.m.; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
113. ***Cyperus longus*** L. (*) – G rhiz – Circumbor. – stagnant or weakly flowing waters; NRS.
Marganai, Iglesias. Ballero, IV.1989 (CAG).
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
114. ***Eleocharis palustris*** (L.) Roem. et Schult. subsp. ***palustris*** (*) – G rhiz – Boreo-Trop. – slushy areas and ditches; NRL.
Grotte di S. Giovanni, Domusnovas. Martinoli, 5.V.1949. Determinavit: Zedda, 17.V.1989 (CAG).
115. ***Schoenus nigricans*** L. (*) – H caesp – Boreo-Trop. – humid grasslands; WRS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
116. ***Scirpoides romanus*** (L.) Soják (*) – G rhiz – Medit. – humid grasslands, ditches; NRS.
Massiccio del Marganai, cunette; diffuso (Ballero & Angiolino 1991, sub *Holoschoenus romanus* (L.) Fritsch.).

Poaceae (R. Br.) Barnh. (1895)

117. ***Achnatherum bromoides*** (L.) P. Beauv. (*) – H caesp – Medit. – clearings and shrublands; WBL.
In collinis aridis prope Iglesias Sardiniae, *junio*, U.-S. Muller. Herb. (Moris ex Barbey 1885, sub *Stipa bromoides* (L.) Dörfl.).
Massiccio del Marganai, siepi, pratelli; comune (Ballero & Angiolino 1991, sub *S. bromoides* (L.) Dörfl.).
118. ***Aira cupaniana*** Guss. – T scap – W-Medit. (*) – sandy areas, grasslands and garrigues; WRS.
Massiccio del Marganai, praterie; comune (Ballero & Angiolino 1991).
119. ***Ampelodesmos mauritanicus*** (Poir.) T. Durand et Schinz (*) – H caesp – W-Medit. – garrigues and thermophilous shrublands; WRS.
Massiccio del Marganai, comune nel versante orientale, alla base del massiccio (Ballero & Angiolino 1991).
120. ***Anthoxanthum aristatum*** Boiss. s.l. (*) – T scap – Medit.-Atl. – grasslands and untilled lands; NRS.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).
121. ***Arundo donax*** L. (*) – G rhiz – Medit. – humid areas; NRL.
Massiccio del Marganai, zone maggiormente antropizzate; comune (Ballero & Angiolino 1991).
122. ***Avena barbata*** Pott ex Link (*) – T scap – Cosmop. – ruderal areas, roadsides, untilled lands and grasslands; WBL.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).
123. ***Avena sativa*** L. s.l.[7] (*) – T scap – Nat. (Paleotemp.) – tilled lands, untilled lands, ruderal areas; NRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
124. ***Brachypodium retusum*** (Pers.) P. Beauv. (*) – H caesp – Medit. – garrigues and degraded shrublands; WRL.

[7] In Conti et al. (2005) only subsp. *sativa* is mentioned of Sardinia. However, the presence of other subspecies is conceivable.

Baueddu, Iglesias, 26.IV.1999 (Angiolini & Bacchetta 2003).

125. ***Brachypodium rupestre*** (Host) Roem. et Schult – H caesp – Euro-Medit. (*) – substeppe pastures and edges of woods; NRS.

Barraxiutta, Domusnovas, 29.IV.1999 (Angiolini & Bacchetta 2003).

Arenas, Fluminimaggiore, 26.VI.1999 (Angiolini et al. 2005).

126. ***Brachypodium sylvaticum*** (Huds.) P. Beauv. subsp. ***sylvaticum*** (*) – H caesp – Paleotemp. – mesophilous and riparian woods; WBL.

Bois de chênes sous Gennamari. Ascherson & Reinhardt ex Barbey (1885).

Massiccio del Marganai, radure e pratelli; diffusa (Ballero & Angiolino 1991, sub *B. sylvaticum* (Huds.) P. Beauv.).

M. Sigue, Iglesias. M. Miai, Iglesias. Bacchetta & Mossa, 16.IV.1992 ex Bacchetta et al. (2004).

127. ***Briza maxima*** L. (*) – T scap – Medit. – grasslands, garrigues and degraded shrublands; WBL.

Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).

128. ***Briza minor*** L. (*) – T scap – Medit. – grasslands, garrigues and shrublands; WBS.

Massiccio del Marganai, zone ombrose e fresche; comune (Ballero & Angiolino 1991).

129. ***Bromus diandrus*** Roth subsp. ***maximus*** (Desf.) Soó (*) – T scap – Medit. – untilled lands, ruderal areas and arid pastures; WRS.

Massiccio del Marganai, radure e luoghi erbosi; diffusa (Ballero & Angiolino 1991, sub *B. rigidus* Roth).

130. ***Bromus hordeaceus*** L. s.l.[8] (*) – T scap – Paleotemp. – roadsides, sheepfolds, untilled lands and grasslands; WBL.

Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991, sub *B. hordeaceus* L.).

131. ***Bromus intermedius*** Guss. subsp. ***intermedius*** (*) – T scap – Medit. – grasslands and garrigues; WRS.

Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).

132. ***Bromus madritensis*** L. (*) – T scap – Medit-Atl. – grasslands, garrigues and degraded bush; WBS.

Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).

133. ***Bromus sterilis*** L. (*) – T scap – Paleotemp. – ruderal areas, roadsides, untilled lands and grasslands; WBL.

Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).

134. ***Catabrosa aquatica*** (L.) P. Beauv. – G rhiz – Circumbor. – ditches, sources and marshes; not observed in the study area.

Massiccio del Marganai, radure erbose; comune (Ballero & Angiolino 1991).

135. ***Catapodium rigidum*** (L.) C.E. Hubb. ex Dony s.l.[9] (*) – T scap – Euro-Medit.-Irano-Turan. – roadsides, untilled lands, sandy areas; WBL.

Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).

136. ***Cutandia divaricata*** (Desf.) Bentham (*) – T scap – SW-Medit. – arid and sandy areas; NRS.

Massiccio del Marganai, radure; sporadica (Ballero & Angiolino 1991).

137. ***Cynodon dactylon*** (L.) Pers. (*) – H rept – Boreo-Trop. – untilled and ruderal areas, often infestant; WRL.

Massiccio del Marganai, pratelli, luoghi ruderali; comune (Ballero & Angiolino 1991).

138. ***Cynosurus cristatus*** L. (*) – H caesp – Paleotemp. – reaped and manured meadows; WRL.

Massiccio del Marganai, nei prati; diffusa (Ballero & Angiolino 1991).

Punta S. Michele, Domusnovas. Substrato: calcari paleozoici; coordinate: UTM E 465873 N 4354504; esposizione 260° W; inclinazione 30°; 900 m s.l.m. Bacchetta, Gamper et Pontecorvo, 9.VI.2004 (CAG).

139. ***Cynosurus echinatus*** L. (*) – T scap – Medit. – edges of paths, grasslands and garrigues; WBL.

Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).

M. Sigue, Iglesias. Bacchetta & Mossa, 16.IV.1992 ex Bacchetta et al. (2004).

140. ***Cynosurus effusus*** Link (*) – T scap – Medit. – grasslands, garrigues and clearings in shrublands; WBS.

Massiccio del Marganai, fra la macchia; sporadica (Ballero & Angiolino 1991, sub *C. elegans* Desf.).

141. ***Dactylis glomerata*** L. subsp. ***hispanica*** (Roth) Nyman (*) – H caesp – Medit. – rocky areas, arid grasslands and garrigues; WBL.

Massiccio del Marganai, radure aride; diffusa (Ballero & Angiolino 1991, sub *D. glomerata* L.).

Baueddu, Iglesias, 26.IV.1999; Miniera di Acquaresi, Iglesias, 29.IV.1999; Tinny, Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003, sub *D. hispanica* Roth).

Rio Sa Duchessa, Domusnovas, 27.IV.1999; Sa

[8] These records are certainly for the most part to be attributed to the *hordeaceus* subspecies; there can be no assurance, however, that none refer to subsp. *molliformis* (Loyd ex Godr.) Maire et Weiller.

[9] Brullo et al. (2003) showed how widespread the subspecies *rigidus* and *majus* (C. Presl.) Perring et Sell. are in Sardinia.

Duchessa, Domusnovas, 3.IX.2000; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005, sub *D. hispanica* Roth).
Radura presso Punta Sca Martini, Iglesias. Quota 860 m s.l.m.; substrato: calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).
142. ***Dasypyrum villosum*** (L.) P. Candargy (*) – T scap – Medit.-Irano-Turan. – ruderal zones, untilled lands and grasslands; WBL.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
143. ***Festuca arundinacea*** Schreb. subsp. ***arundinacea*** (*) – H caesp – Paleotemp. – riverbeds and riparian woods; NRS.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).
144. ***Gastridium ventricosum*** (Gouan) Schinz et Thell. (*) – T scap – Medit – arid untilled lands and shrublands; WBL.
Massiccio del Marganai, ai margini delle siepi; comune (Ballero & Angiolino 1991).
145. ***Glyceria notata*** Chevall (*) – G rhiz – Cosmop. – wet or temporarily flooded grasslands; WRS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991, sub *G. fluitans* (L.) R. Br.).
146. ***Holcus lanatus*** L. (*) – H caesp – Circumbor. – grasslands and clearings in riparian woods; WRS.
Massiccio del Marganai, prati e pratelli; sporadica (Ballero & Angiolino 1991).
Obs. Rio S. Giovanni, downstream of the caves, in the *Populus alba* vegetation; Rio Canonica, downstream of the dam of Punta Gennarta.
147. ***Hordeum bulbosum*** L. – G bulb –Medit. – arid grasslands, untilled lands, roadsides; not observed in the study area.
Massiccio del Marganai, praterie e lande; comune (Ballero & Angiolino 1991).
148. ***Hordeum murinum*** L. subsp. ***murinum*** (*) – T scap – Circumbor. – ruderal areas, roadsides, untilled lands and grasslands; WRL.
Massiccio del Marganai, luoghi interessati da calpestio; comune (Ballero & Angiolino 1991).
149. ***Hyparrhenia hirta*** (L.) Stapf subsp. ***hirta*** (*) – H caesp – Medit.-Trop. – roadsides, rocks and slightly inclined rock walls; WBL.
Massiccio del Marganai, radure limitate; comune (Ballero & Angiolino 1991, sub *Cymbopogon hirtus* (L.) Janchen).
150. ***Lagurus ovatus*** L. subsp. ***ovatus*** (*) – T scap – Medit. – ruderal areas, roadsides, grasslands and untilled lands; WBL.
Massiccio del Marganai, pratelli nella macchia; comune (Ballero & Angiolino 1991).
151. ***Lamarckia aurea*** (L.) Moench (*) – T scap – Medit.-Irano-Turan. – roadsides, untilled lands, grasslands and garrigues; WBL.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
152. ***Lolium rigidum*** Gaudin subsp. ***rigidum*** (*) – T scap – Medit.-Irano-Turan. – roadsides, untilled lands and grasslands; WRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991, sub *L. rigidum* Gaudin).
153. ***Melica arrecta*** Kuntze (*) – H caesp – Medit. – rocky areas, shrublands and garrigues; WRS.
S. Giovanni Miniera, Iglesias, 11.VI.1998; Rio Sa Duchessa, Domusnovas. 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005).
154. ***Melica ciliata*** L. subsp. ***ciliata*** (*) – H caesp – Euro-Medit. – rocky areas and grasslands; WRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
155. ***Melica minuta*** L. (*) – H caesp – Medit. – roadsides, grasslands and garrigues; WBL.
Massiccio del Marganai, prati; sporadica (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Barraxiutta, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
156. ***Phalaris aquatica*** L. – H caesp – Medit. – untilled lands, edges of paths and roadsides; not observed in the study area.
Massiccio del Marganai, ai margini dei rigagnoli, anche stagionali; sporadica (Ballero & Angiolino 1991, sub *P. nodosa* L.).
157. ***Phalaris coerulescens*** Desf. (*) – H caesp - Medit. – untilled lands, edges of paths and roadsides; WRL.
158. ***Phleum pratense*** L. (*) – H caesp – Circumbor. – reaped and manured stable meadows; NRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
159. ***Piptatherum miliaceum*** (L.) Coss. subsp. ***miliaceum*** (*) – H caesp – Medit.-Atl. – roadsides, untilled lands, grasslands and garrigues; WBL.
Massiccio del Marganai, diffusa (Ballero & Angiolino 1991, sub *Oryzopsis miliacea* (L.) Asch. et Schweinf.).
Barraxiutta, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003, sub *O. miliacea* (L.) Asch. et Schweinf. subsp. *miliacea*).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; Agruxiau, Iglesias, 13.VII.2000; San Giovanni Miniera, Iglesias, 3.VI.2001; 6.VI.2002; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005, sub *O. miliacea* (L.) Asch. et Schweinf. subsp. *miliacea*).
160. ***Poa annua*** L. (*) – T caesp – Cosmop. – an-

thropized areas, untilled lands and grasslands; WBL.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
161. ***Poa compressa*** L. (*) – H caesp – Paleotemp. – slopes, untilled lands, roadsides, often on clay soils; NRS.
Massiccio del Marganai, pratelli; sporadica (Ballero & Angiolino 1991).
162. ***Poa bulbosa*** L. (*) – H caesp – Paleotemp. – rocky areas, arid grasslands and garrigues; WBL.
Massiccio del Marganai, pratelli, radure fra la roccia; comune (Ballero & Angiolino 1991).
163. ***Polypogon monspeliensis*** (L.) Desf (*) – T scap – Medit.-Trop. – humid soils and also subsalt; WRL.
Massiccio del Marganai, radure assolate e ben esposte; comune (Ballero & Angiolino 1991).
Radura presso Punta Sca Martini, Iglesias. Quota 860 m s.l.m.; substrato calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).
164. ***Psilurus incurvus*** (Gouan) Schinz et Thell. (*) – T scap – Medit.-Irano-Turan. – roadsides, untilled lands, grasslands and clearings; WRS.
Massiccio del Marganai, ai margini di alcuni sentieri; diffusa (Ballero & Angiolino 1991).
165. ***Rostraria cristata*** (L.) Tzvelev subsp. ***cristata*** (*) – T caesp – Medit.-Irano-Turan. – untilled lands, roadsides, often infestant; WRL.
Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991, sub *Lophochloa cristata* (L.) Hyl.).
Obs. Near S. Benedetto.
166. ***Sesleria insularis*** Sommier subsp. ***morisiana*** Arrigoni (*) – H caesp – Endem. SA – cliffs and cacuminal grasslands, on limestone; NRL.
Inter rupes Marganai (Moris 1827, sub *S. caerulea* Ard.).
Marganai, *majo inter fissuram rupium*. Herb. Moris (Barbey 1885, sub *S. caerulea* Ard.).
Holotypus: Iglesias, Monte Marganai, presso la Punta San Michele. Arrigoni, 4.VII.1969 (FI).
Iglesias, M.te Marganai, presso la Punta San Michele, 4.VI.1969, Arrigoni (FI).
Punta S. Michele, Monte Marganai, Iglesias. Ballero et Di Martino, 10.IX.1989 (CAG).
Massiccio del Marganai, P.ta San Michele, sporadica (Ballero & Angiolino 1991).
Campu Spina, assai diffusa (Ballero & Angiolino 1991).
Punta S. Michele, Monte Marganai, Iglesias. Scrugli et Ballero, 10.IV.1992 (CAG).
Punta S. Michele, Domusnovas. Substrato: calcari paleozoici; esposizione NE 40°; inclinazione 20°; bioclima: mesomedit. inf./subumido inf. Bacchetta, Brullo, Cogoni et Scrugli, 4.VI.2002 (CAG).
Baueddu, Iglesias, 26.IV.1999 (Angiolini & Bacchetta 2003).
Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
Presso Punta Reigraxius, Iglesias. Quota 880 m s.l.m., esp. WSW; inclinazione 30°; 39°21'194 N; 8°35'328 E. Pontecorvo, Bacchetta, Angius et Serra, 14.IV.2005 (CAG).
Marganai, majo inter fissuras rupium, sine die, Moris (TO).
167. ***Setaria pumila*** (Poir.) Roem et Schult (*) – T scap – Boreo-Trop. – infestant in vegetable gardens, vineyards, corn and potato crops ; NRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991, sub *S. glauca* (L.) Beauv.).
168. ***Stipa capensis*** Thunb. (*) – T scap – Medit. – untilled lands, grasslands and garrigues; NRL.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
169. ***Trachynia distachya*** (L.) Link (*) – T scap – Medit.-Irano-Turan. – grasslands, garrigues and degraded bush; WBL.
Massiccio del Marganai, fra la macchia; comune (Ballero & Angiolino 1991, sub *Brachypodium distachyum* (L.) Beauv.).
170. ***Trisetaria flavescens*** (L.) Baumg. subsp. ***splendens*** (C. Presl) Banfi & Soldano (*) – H caesp – Endem. SA-SI – reaped and manured meadows; NRL.
Massiccio del Marganai, pratelli; diffuso (Ballero & Angiolino 1991, sub *Trisetum flavescens* (L.) Beauv.).
171. ***Triticum ovatum*** (L.) Raspail (*) – T scap – Medit.-Irano-Turan. – ruderal zones, untilled lands and grasslands; WBL.
Massiccio del Marganai, comune nei pratelli (Ballero & Angiolino 1991, sub *Aegilops geniculata* Roth).
172. ***Triticum ventricosum*** (Tausch) Cesati, Passerini et Gibelli (*) – T scap – W-Medit. – arid untilled lands; WRL.
Massiccio del Marganai, pratelli sassosi; diffusa (Ballero & Angiolino 1991, sub *A. ventricosa* Tausch.).
173. ***Vulpia bromoides*** (L.) Gray (*) – T caesp – Boreo-Trop. – arid untilled lands and pastures; WRS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
Radura presso Punta Sca Martini, Iglesias. Quota: 860 m s.l.m.; substrato calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).
174. ***Vulpia ciliata*** Dumort. (*) – T scap – Medit. – garrigues, untilled lands and roadsides; WRS.
Massiccio del Marganai, diffusa nelle radure (Ballero & Angiolino 1991).
175. ***Vulpia sicula*** (C. Presl) Link. (*) – H caesp – W-Medit. – clearings and pastures; NRS.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).

Ranunculanae[10] Takht. (1967)
Ranunculales Dumort. (1829)
Papaveraceae Juss. (1789)

176. ***Chelidonium majus*** L. (*) – H scap – Circumbor. – walls, ruins; NRS.
Massiccio del Marganai, sporadica nelle zone ombrose (Ballero & Angiolino 1991).
Marganai (Arrigoni 2006).
177. ***Fumaria bastardii*** Boreau (*) – T scap – Medit.-Atl. – vegetable gardens, vineyards and untilled lands; WBS.
Obs. nitrophilous grasslands in basal areas of Marganai.
178. ***Fumaria capreolata*** L. subsp. ***capreolata*** (*) – T scap – Euro-Medit. – roadsides, untilled lands, grasslands and garrigues; WBL.
Massiccio del Marganai, diffusa nelle radure (Ballero & Angiolino 1991).
179. ***Fumaria officinalis*** L. subsp. ***officinalis*** (*) – T scap – Paleotemp. – ruderal areas, untilled lands and grasslands; WBS.
Massiccio del Marganai, comune nelle radure e pratelli (Ballero & Angiolino 1991).
180. ***Papaver pinnatifidum*** Moris (*) – T scap – Medit. – grasslands, untilled and ruderal areas; NRS.
Massiccio del Marganai, comune nelle radure e nei pratelli (Ballero & Angiolino 1991).
Marganai (Arrigoni 2006).
181. ***Papaver rhoeas*** L. subsp. ***rhoeas*** (*) – T scap – Paleotemp. – ruderal areas, roadsides, untilled lands and grasslands; WBL.
Massiccio del Marganai, luoghi ruderali; comune (Ballero & Angiolino 1991).
182. ***Papaver setigerum*** DC. (*) – T scap – Medit. – ruderal and anthropized areas, roadsides and grasslands; WRL.
Massiccio del Marganai, pratelli e radure; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2006).

Ranunculaceae Juss. (1789)

183. ***Anemone hortensis*** L. subsp. ***hortensis*** (*) – G bulb – Medit. – grasslands and clearings; WBL.
Massiccio del Marganai, diffusa ai margini della macchia (Ballero & Angiolino 1991).
184. ***Anemone palmata*** L. (*) – G rhiz – W-Medit. – arid untilled lands; WRS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2006).
185. ***Clematis cirrhosa*** L. (*) – P lian – Medit. – shrublands and holm oak woods; WRL.
Massiccio del Marganai, comune nella macchia (Ballero & Angiolino 1991).
186. ***Clematis flammula*** L. (*) – P lian – Euro-Medit. – thermophilous and/or xerophilous shrublands; WRS.
Massiccio del Marganai, comune tra le siepi (Ballero & Angiolino 1991).
187. ***Clematis vitalba*** L. (*) – P lian – Euro-Medit. – ilex groves and riparian woods; WRL.
Massiccio del Marganai, diffusa nella macchia (Ballero & Angiolino 1991).
Presso la grotta di S. Giovanni, versante N. Substrato: calcari paleozoici; 300 m s.l.m. Pontecorvo, 13.IX.2005 (CAG).
188. ***Consolida ajacis*** (L.) Schur (*) – T scap – Medit.-Atl. – tilled lands; NRS.
Sa Duchessa, Domusnovas. Substrato: discariche minerarie; esposizione E 80°; inclinazione 5-10°; bioclima: mesomedit. inf./subumido inf.; quota 355 m s.l.m. Bacchetta, Brullo, Cogoni et Scrugli; 4.VI.2002 (CAG).
189. ***Delphinium pictum*** Willd. subsp. ***pictum*** (*) – H scap – Endem. SA-CO-H-BL – alluvial mattresses, stony areas and ravines; WRS.[11]
Domusnovas, Grotta di S. Giovanni, versante Sud, m 200, 17.V.1963, Bavazzano et Ricceri (FI).
Domusnovas, presso la grotta di San Giovanni, 21.VI.1982, Valsecchi, Villa et Camarda (SS).
S. Giovanni, Domusnovas. Scrugli et Del Prete, 7.VI.1987 (CAG).
Massiccio del Marganai, solo nell'alveo del Rio Corongiu; sporadica (Ballero & Angiolino 1991).
Massiccio del Marganai, diffusa nei pratelli (Ballero & Angiolino 1991, sub *D. staphysagria* L.).
M. Marganai (Arrigoni 2006, sub *D. staphysagria* L.).
190. ***Nigella damascena*** L. (*) – T scap – Medit. – tilled lands, arid untilled lands and roadsides; WRL.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
191. ***Ranunculus bullatus*** L. (*) – H ros – N-Medit. – clearings and grasslands; WBL.
Massiccio del Marganai, suoli umidi; comune (Ballero & Angiolino 1991).
192. ***Ranunculus ficaria*** L. subsp. ***ficaria*** (*) – H scap – Euro-Medit. – edges of paths and grasslands; WBL.

[10] The following taxa are part of Eudicotyledones, an informal group of APG, which includes most of the ancient Dicotyledones.

[11] Field surveys conducted in spring 2005 by Prof. Blanche in Southern Sardinia allow to doubt the presence of *D. staphysagria* L. in Sardinia (Orellana et al. 2009). It therefore appears that reports of this species should be attributed to *D. pictum*.

Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
Marganai, Domusnovas. Quota 640 m s.l.m.; esp. WNW; incl. 10°; substrato calcari; 21.VI.2001. (Bacchetta & Mossa 2004).
Zone collinari e montane: (...) M. Marganai (Arrigoni 2006).
193. ***Ranunculus lanuginosus*** L. (*) – H scap – N-Medit. – mesophilous woods and clearings; WBS.
Massiccio del Marganai, radure e pratelli; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2006).
194. ***Ranunculus machrophyllus*** Desf. (*) – H scap – SW-Medit. – humid areas; WRS.
Massiccio del Marganai, comune lungo i corsi d'acqua, su terreni asfittici (Ballero & Angiolino 1991).
Marganai (Arrigoni 2006).
195. ***Ranunculus muricatus*** L. (*) – T scap – Medit. – gravel bed streams and humid grasslands; WRS.
Massiccio del Marganai, suoli umidi; comune (Ballero & Angiolino 1991).
M. Marganai (Arrigoni 2006).
196. ***Ranunculus paludosus*** Poir. (*) – H scap – Medit. – grasslands, clearings in shrublands; WRS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991, sub *R. flabellatus* Desf.).
197. ***Ranunculus sardous*** Crantz s.l.[12] (*) – T scap – Euro-Medit. – muddy grasslands; WRS.
Massiccio del Marganai, lungo gli alvei su suoli pantanosi ed acidi; diffusa (Ballero & Angiolino 1991).
M. Marganai (Arrigoni 2006).

Unplaced order[13]
Saxifragales Dumort. (1829)
Paeoniaceae Raf. (1815)

198. ***Paeonia corsica*** Sieber ex Tausch[14] (*) – G rhiz – Endem. SA-CO – clearings and mesophilous woods; WRS.
In sylvaticis opacisque umbrosis, editis (...) Marganai (Moris, 1837, sub *P. corallina* Retz.).
Massiccio del Marganai, diffusa nella zona cacuminale (Ballero & Angiolino 1991, sub *P. mascula* (L.) Miller subsp. *russii* (Biv.) Cullen et Heyw.).
Punta S. Michele, Domusnovas. Substrato: calcari paleozoici; coordinate: UTM E 465873 N 4354504; esposizione 260° W; inclinazione 30°. Bacchetta, Gamper et Pontecorvo, 9.VI.2004 (CAG).
Marganai (Arrigoni 2010, sub *P. morisii* Cesca, Bernardo et Passalacqua).
Obs. Punta Arbona, Domusnovas.

Saxifragaceae Juss. (1789)

199. ***Saxifraga corsica*** (Duby) Gren. et Godr. subsp. ***corsica*** (*) – H scap – Endem. SA-CO – rocks, cool and shady cliffs; NRS.
Sul Monte Marganai a mezzogiorno. Biondi, 1.V.1873 (FI).
Marganai (Bornemann ex Barbey 1885, sub *S. granulata* L. ß *corsica* Duby).
Iglesiente. monte Marganai. Arrigoni, 15.V.1963 (FI).
Iglesias. Malacalzetta, calcari paleozoici tra Arcu Sa Cruxi e q. 751 a Nord di punta Genna Aragosta. Arrigoni et Ricceri, 16.V.1967 (FI).
Iglesias. Rocce calcaree paleozoiche presso il valico fra San Benedetto ed Arenas, esp. SE. Arrigoni Mori et Nardi, 30.IV.1974 (FI).
Iglesias. Rocce calcaree paleozoiche sopra San Benedetto, esp. NO. Arrigoni Mori et Nardi, sine die (FI).
Domusnovas. Strada per la miniera di Sa Duchessa. Corrias et Diana, 27.IV.1978
Massiccio del Marganai, zone rocciose presso P.ta S. Michele ove forma fitti popolamenti seppur discontinui (Ballero & Angiolino 1991).
200. ***Saxifraga tridactylites*** L. (*) – T scap – Euro-Medit. – escarpments and roadsides; NRS.
Massiccio del Marganai, diffusa nei pratelli (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).

Crassulaceae J. St.-Hil. (1805)

201. ***Phedimus stellatus*** (L.) Raf. (*) – T scap – Medit. – rocks exposed to the sun, gravels, walls; WBL.
Massiccio del Marganai, litosuolo, pratelli; comune (Ballero & Angiolino 1991, sub *Sedum stellatum* L.).
202. ***Sedum album*** L. (*) – Ch succ – Paleotemp. – rocks exposed to the sun, gravels, walls; WRL.
Massiccio del Marganai, luoghi rocciosi; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
203. ***Sedum caeruleum*** L. (*) – T scap – S-Medit. – siliceous cliffs and gravel, red soils (calcifugous); WRL.
Massiccio del Marganai, litosuolo, pratelli; diffusa

[12] Conti et al. (2005) indicate for this species two subspecies: the nominal one and the subdichotomicus Gerbault, the distributional range of which has yet to be verified.
[13] The taxonomic classification of Saxifragales as part of a superfamily still requires further information before it can be defined (Chase & Reveal, 2009).
[14] Name reassessed by De-Yuan and Xiao-Quan (2006), who exclude the presence in Sardinia of *P. mascula* (tetraploid) and assert that only diploid *P. corsica* exists, also present in Corsica, the Ionian islands and the Akarnania Province in Greece.

(Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
204. ***Sedum dasyphyllum*** L. (*) – Ch succ – Euro-Medit. – rocky fissures, rocky ravines and cliffs; WRL.
Obs. frequent in rupicolous areas.
205. ***Tillaea muscosa*** L. (*) – T scap – Euro-Medit. – depositional sands of streams; WRS.
Massiccio del Marganai, diffusa esclusivamente nei pratelli, o ai margini dei sentieri, nelle zone basali più calde (Ballero & Angiolino 1991, sub *Crassula tillaea* Lester-G.).
Marganai (Arrigoni 2010, sub *C. tillaea* Lester-Garland).
206. ***Umbilicus horizontalis*** (Guss.) DC. (*) – G bulb – Medit.-Trop. – humid cliffs, walls; WRS.
Massiccio del Marganai, comune su roccia (Ballero & Angiolino 1991).
Tintillonis, Marganai, Iglesias. Fogu, 24.V.1993 (CAG).
Marganai, Iglesias. Fogu, 25.V.1993 (CAG).
207. ***Umbilicus rupestris*** (Salisb.) Dandy (*) – G bulb – Medit.-Trop. – shaded and humid cliffs; WRS.
Obs. frequent in non-calcareous rupicolous areas.

Rosanae Takht. (1967)
Vitales Juss. ex Bercht. & J. Presl. (1820)
Vitaceae Juss. (1789)

208. ***Vitis vinivera*** L. subsp. ***sylvestris*** (C.C. Gmel.) Hegi (*) – P lian – Euro-Medit. – edges of streams, near sources; NRS.
Obs. Mitza preri Giuanni Antoni (east of Punta Planotza), well of Colonia Beneck near Rio Sarmentus.

Zygophyllales Link (1829)
Zygophyllaceae R. Br. (1814)

209. ***Tribulus terrestris*** L. (*) – T rept – Cosmop. – sandy untilled lands; WRL.
Massiccio del Marganai, comune nei luoghi ruderali (Ballero & Angiolino 1991).

Fabales Bromhead (1838)
Fabaceae Lindl. (1836)

210. ***Anagyris foetida*** L. (*) – P caesp – Medit. – shrublands and cliffs, on limestone stains and crags; WBL.
Massiccio del Marganai, macchie e radure, alla base del rilievo (Ballero & Angiolino 1991).
211. ***Anthyllis vulneraria*** L. subsp. ***rubriflora*** (DC.) Arcang. (*) – H bienn – Euro-Medit. – shrublands, garrigues and untilled grasslands; WBL.
Massiccio del Marganai, pratelli e radure; diffusa (Ballero & Angiolino 1991, sub *A. vulneraria* L.).
212. ***Astragalus hamosus*** L. (*) – T scap – Medit. – depositional areas of streams, grasslands and garrigues; WRS.
Massiccio del Marganai, radure erbose; diffuso (Ballero & Angiolino 1991).
213. ***Bituminaria bituminosa*** (L.) C.H. Stirt. (*) – H scap – Medit. – roadsides; WRL.
Massiccio del Marganai, radure e siepi; diffusa (Ballero & Angiolino 1991, sub *Psolarea bituminosa* L.).
214. ***Bituminaria morisiana*** (Pignatti et Metlesics) Greuter (*) – Ch frut – Endem. SA-TN (La Galite) –rocky walls exposed to the sun; NRL.
Massiccio del Marganai, radure soleggiate; sporadica (Ballero & Angiolino 1991).
215. ***Calicotome villosa*** (Poir.) Link (*) – NP – Medit. – degraded shrublands, often after fire, mainly on acid soils; WBL.
Massiccio del Marganai, macchia; comune (Ballero & Angiolino 1991).
216. ***Ceratonia siliqua*** L. (*) – P scap – Medit. – gravel bed streams and shrublands up to 350 m altitude; NBS.
Massiccio del Marganai, pochi esemplari isolati; sporadica (Ballero & Angiolino 1991).
217. ***Coronilla valentina*** L. – NP – Medit. – limestone rocks, garrigue. Not observed in the study area.
Massiccio del Marganai, pratelli fra la macchia; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
218. ***Cytisus villosus*** Pourr. (*) – NP – Medit. – shrublands and mesophilous woods; WBL.
Monte Marganai, Domusnovas. Mossa, 28.IV.1985 (CAG).
Massiccio del Marganai, lecceta; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
219. ***Dorycnium pentaphyllum*** Scop. (*) – Ch suffr – W-Medit. – mining dumps; WBS.
Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991, sub *D. pentaphyllum* Scop. subsp. *suffruticosum* (Vill.) Rouy).
220. ***Dorycnium rectum*** (L.) Ser. (*) – Ch suffr – Medit. – ditches, sources and humid places; WRL.
Massiccio del Marganai, fra le siepi; sporadica (Ballero & Angiolino 1991).
Marganai, Domusnovas. Quota 640 m s.l.m.; esp. WNW; incl. 10°; substrato calcari; 21.VI.2001. Bacchetta & Mossa (2004).

Sorgente presso l'ingresso della Grotta di S. Giovanni, Domusnovas. Quota 190 m s.l.m.; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).

221. ***Genista corsica*** (Loisel.) DC. (*) – NP – Endem. SA-CO – shrublands, xerophilous garrigues and mining dumps; WBL.

In monte S. Giovanni presso Iglesias. Forsyth-Major, IV.1884 (FI).

Miniera Lai, Iglesias. Taricco, 1913 (SASSA).

Massiccio del Marganai, garigue e radure; diffusa (Ballero & Angiolino 1991).

Monte Marganai, Domusnovas. Fogu, 25.V.1993 (CAG, sub *G. salzmannii* DC. Revidit Angius et Pontecorvo, 2.X.2007).

Sa Duchessa, Domusnovas. Substrato: discariche minerarie; 340 m s.l.m. Bacchetta, 8.IV.2001 (CAG).

Baueddu, Iglesias, 26.IV.1999 (Angiolini & Bacchetta 2003).

S. Giovanni Miniera, Iglesias, 11.VI.1998; 3.VI.2001; 6.VI.2002; P.ta Pitzianti, Fluminimaggiore, 3.IX.2000 (Angiolini et al. 2005).

222. ***Genista morisii*** Colla – NP – Endem. SA – shrublands and thermo-xerophilous garrigues. Not observed in the study area.

Massiccio del Marganai, garigue e radure; diffusa (Ballero & Angiolino 1991, sub *G. morisii* (Loisel.) DC.).

Marganai (Arrigoni 2010).

223. ***Genista sulcitana*** Vals. (*) – NP – Endem. SA –mining dumps; WBS.

Sa Duchessa, Domusnovas. Substrato: discariche minerarie; 560 m s.l.m. Bacchetta, 8.IV.2001 (CAG).

Baueddu, Iglesias, 26.IV.1999; Tinny, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003).

224. ***Genista valsecchiae*** Brullo et De Marco (*) – NP – Endem. SA – thermophilous shrublands, mainly coastal; NRL.

Domusnovas: presso la grotta S. Giovanni. Valsecchi, Villa et Camarda, 21.VI.1982 (SS, sub *G. ephedroides*).

Marganai, dopo la grotta di S. Giovanni. Corrias, 27.V.1984 (SS, sub *G. ephedroides*).

Domusnovas, strada Grotta di S. Giovanni – Miniera Sa Duchessa, ca. Km 2,5, Corrias et Diana, 29.IV.1985 (SS, sub *G. ephedroides*).

Massiccio del Marganai, solo nel versante SW; sporadica (Ballero & Angiolino 1991, sub *G. ephedroides* DC.).

225. ***Hippocrepis biflora*** Spreng. (*) – T scap – Medit. – untilled lands, shrublands; NRS.

Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991, sub *H. unisiliquosa* L.).

226. ***Hymenocarpus circinnatus*** (L.) Savi (*) – H scap – Medit. – pastures, vineyards, olive groves; NBS.

Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).

Marganai (Arrigoni 2010).

227. ***Lathyrus aphaca*** L. subsp. ***aphaca*** (*) – T scap – Euro-Medit. – infestant in wheat fields, untilled lands, calcicolous; WRS.

Massiccio del Marganai, comune tra la macchia (Ballero & Angiolino 1991).

228. ***Lathyrus cicera*** L. (*) – T scap. – Medit. – untilled lands, grasslands and garrigues; WBS.

Massiccio del Marganai, siepi; comune (Ballero & Angiolino 1991).

Sa Duchessa, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003).

Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).

229. ***Lathyrus clymenum*** L. (*) – T scap – Medit. – untilled lands, grasslands and garrigues; WBL.

Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991, sub *L. articulatus* L.).

230. ***Lathyrus latifolius*** L. (*) – H scand – Euro-Medit. – untilled lands and hedges; NRL.

Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).[15]

Marganai (Arrigoni 2010).

231. ***Lotus corniculatus*** L. subsp. ***corniculatus*** (*) – H scap – Cosmop. – synanthropic environments; WRS.

Massiccio del Marganai, siepi, pratelli; comune (Ballero & Angiolino 1991).

232. ***Lotus edulis*** L. (*) – T scap – Medit. – roadsides, untilled lands and grasslands; WBL.

Massiccio del Marganai, pratelli e radure; comune (Ballero & Angiolino 1991).

233. ***Lotus ornithopodioides*** L. (*) – T scap – Medit. – roadsides, untilled lands and grasslands; WBL.

Massiccio del Marganai, prati; diffuso (Ballero & Angiolino 1991).

234. ***Lupinus angustifolius*** L. (*) – T scap – Medit. – clearings and grasslands; WRS.

Obs. Roadsides and grasslands between Serra Abis and Punta Palmeri.

235. ***Lupinus gussoneanus*** Agardh. (*) – T scap – Medit. – roadsides, untilled lands and grasslands; WRS.

Massiccio del Marganai, radure e pratelli; comune (Ballero & Angiolino 1991, sub *L. micranthus* Guss.).

236. ***Medicago arabica*** (L.) Huds. (*) – T scap –

[15] The presence of this species in clearings at Marganai, where it is even reported as common, is surprising.

Euro-Medit. – ruderal areas, roadsides, untilled lands and grasslands; WBS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
237. ***Medicago lupulina*** L. (*) – T scap (H) – Paleotemp. – ruderal areas, also trampled, and arid, untilled lands; NRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
238. ***Medicago minima*** (L.) L. (*) – T scap – Euro-Medit. – arid grasslands; WRS.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).
239. ***Medicago murex*** Willd. (*) – T scap – Medit. – untilled lands; WRS.
Massiccio del Marganai, pratelli, radure; comune (Ballero & Angiolino 1991).
240. ***Medicago orbicularis*** (L.) Bartal. (*) – T scap – Medit.-Irano-Turan. – roadsides, untilled lands and grasslands; WBS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
241. ***Medicago polymorpha*** L. (*) – T scap – Medit.-Irano-Turan. – arid untilled and tilled lands; WRS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991, sub *M. articulata* Willd. and *M. hispida* Gaertner).
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991, sub *M. hispida* Gaertner).
Marganai (Arrigoni 2010, sub *M. turbinata* (L.) All.).
242. ***Medicago praecox*** DC. (*) – T scap – N-Medit. – untilled lands, grasslands, garrigues and clearings in shrublands; WBS.
Massiccio del Marganai, pratelli e radure; comune (Ballero & Angiolino 1991).
243. ***Medicago rugosa*** Desr. (*) – T scap – W-Medit. – untilled grasslands and limestone cliffs; NRS.
Massiccio del Marganai, margini delle vie, prati; comune (Ballero & Angiolino 1991).
244. ***Medicago truncatula*** Gaertn. (*) – T scap – Medit.-Atl. – roadsides, untilled lands, grasslands and garrigues; WBS.
Massiccio del Marganai, prateli, radure; comune (Ballero & Angiolino 1991, sub *M. truncatula* Gaertner var. *tribuloides* (Desr.) Bernat).
245. ***Medicago turbinata*** (L.) All. (*) – T scap – Medit. – untilled and tilled lands; WRS.
Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991, sub *M. tuberculata* (Retz.) Willd.).
246. ***Melilotus italicus*** (L.) Lam. – T scap – Medit. – untilled lands and grasslands. Not observed in the study area.
Massiccio del Marganai, radure erbose; comune (Ballero & Angiolino 1991, sub *M. italica* (L.) Lam.).
247. ***Melilotus sulcatus*** Desf. (*) – T scap – Medit. – tilled lands, olive groves and arid, untilled lands; WBS.
248. ***Ononis natrix*** L. subsp. ***natrix*** (*) – H caesp/Ch suffr – Medit. – arid grasslands; WRS.
Massiccio del Marganai, radure erbose; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010, sub *O. natrix* L.).
249. ***Ononis ornithopodioides*** L. (*) – T scap – Medit. – cliffs and arid grasslands; WRS.
Massiccio del Marganai, luoghi erbosi; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
250. ***Ononis pusilla*** L. subsp. ***pusilla*** (*) – H scap – Euro-Medit. – pastures and garrigues, arid grasslands; NRS.
Massiccio del Marganai, radure e pratelli; sporadica (Ballero & Angiolino 1991).
251. ***Ornithopus compressus*** L. (*) – T scap – Medit. – roadsides, arid grasslands and garrigues; WBS.
Massiccio del Marganai, diffusa nelle radure (Ballero & Angiolino 1991).
252. ***Ornithopus pinnatus*** (Mill.) Druce (*) – T scap – W-Medit. – roadsides, untilled lands and grasslands; WBS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
253. ***Pisum sativum*** L. subsp. ***biflorum*** (Raf.) Soldano (*) – T scap – Medit. – anthropized areas, olive groves and untilled lands; WRS.
Massiccio del Marganai, diffuso nei pratelli (Ballero & Angiolino 1991, sub *P. sativum* L. subsp. *elatius* (Bieb.) Asch. et Gr.).
254. ***Robinia pseudacacia*** L. (*) – P caesp – Inv. (N-Amer.) – naturalized at the edges of roads and in syn-anthropic areas; NRL.
Massiccio del Marganai, introdotta e spontaneizzatasi (Ballero & Angiolino 1991).
255. ***Scorpiurus muricatus*** L. (*) – T scap – Medit. – stony grounds, grasslands, garrigues and degraded shrublands; WBS.
Obs. Roadsides and grasslands between Serra Abis and Punta Palmeri.
256. ***Scorpiurus sulcatus*** L. (*) – T scap – W-Medit. – garrigues, untilled lands, shrublands, arid untilled lands; WRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991, sub *S. muricatus* L. subsp. *sulcatus* L.).
257. ***Teline monspessulana*** (L.) K. Koch (*) – P caesp – Medit. – mesophilous woods and shrublands; WRS.
In sylvestribus Iglesias et Sardiniae centralis (Barbey,

1884).
M.te Marganai, radure macchie alte ad erica e corbezzolo, Iglesias. Mossa, 27.V.1984 (CAG).
Massiccio del Marganai, ai margini della lecceta; diffusa (Ballero & Angiolino 1991).
Tinny, Domusnovas. Substrato: graniti; esposizione S 175°; inclinazione 5°. Bacchetta, Casti et Pontecorvo, 22.IV.2002 (CAG).
Marganai (Arrigoni 2010).
258. ***Trifolium angustifolium*** L. subsp. ***angustifolium*** (*) – T scap – Medit. – roadsides, grasslands and degraded shrublands; WBS.
Massiccio del Marganai, prati e radure; comune (Ballero & Angiolino 1991, sub *T. angustifolium* L.).
259. ***Trifolium arvense*** L. subsp. ***arvense***[16] (*) – T scap – Euro-Medit.-Irano-Turan. – arid untilled lands, not on calcareous substrates; WRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
260. ***Trifolium campestre*** Schreb. (*) – T scap – Euro-Medit. – grasslands, garrigues and clearings in shrublands; WBL.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
261. ***Trifolium cherleri*** L. (*) – T scap – Medit. – ruderal areas, roadsides, untilled lands, grasslands and garrigues; WBS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
262. ***Trifolium fragiferum*** L. subsp. ***fragiferum*** – H rept – Euro-Medit. –untilled lands and pastures, mainly humid and subsalted. Not observed in the study area.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010, sub *T. fragiferum* L.).
263. ***Trifolium glomeratum*** L. (*) – T scap – Medit.-Atl. – stony grounds, grasslands and garrigues; WRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
264. ***Trifolium ligusticum*** Balb. (*) – T scap – W-Medit. – grasslands and untilled lands; WBS.
Massiccio del Marganai, prati e radure; comune (Ballero & Angiolino 1991).
265. ***Trifolium nigrescens*** Viv. subsp. ***nigrescens*** (*) – T scap – Medit. – grasslands and untilled lands; WBS.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991, sub *T. nigrescens* Viv. subsp. *nigrescens*).
266. ***Trifolium pratense*** L. subsp. ***pratense*** (*) – H scap – Paleotemp. – grasslands, pastures, untilled and tilled lands; NRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991, sub *T. pratense* L.).
267. ***Trifolium repens*** L. s.l.[17] (*) – H rept – Circumbor. – grasslands and untilled lands; NRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991, sub *T. repens* L.).
268. ***Trifolium scabrum*** L. subsp. ***scabrum*** (*) – T scap – Medit. – grasslands; WRS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
269. ***Trifolium stellatum*** L. (*) – T scap – Medit.-Irano-Turan. – ruderal areas, roadsides, grasslands and garrigues; WBL.
Massiccio del Marganai, comune nelle radure assolate (Ballero & Angiolino 1991).
270. ***Trifolium subterraneum*** L. s.l.[18] (*) – T rept – Euro-Medit. – roadsides, grasslands and garrigues; WBL.
Massiccio del Marganai, comune nei pratelli tra la macchia (Ballero & Angiolino 1991, sub *T. subterraneum* L.).
271. ***Tripodion tetraphyllum*** (L.) Fourr. (*) – T scap – Medit. – garrigues, untilled lands; NRS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010, sub *Anthyllis tetraphylla* L.).
272. ***Vicia cracca*** L. (*) – T scap – Circumbor. – grasslands, ruins; WRS.
Massiccio del Marganai, radure e siepi; comune (Ballero & Angiolino 1991).
Obs. Mount S. Michele.
273. ***Vicia disperma*** DC. (*) – T scap – W-Medit. – depositional areas of streams and garrigues; WBL.
Massiccio del Marganai, macchie, pratelli; diffusa (Ballero & Angiolino 1991).
274. ***Vicia hirsuta*** (L.) Gray (*) – T scap – Paleotemp. – grasslands and untilled lands; NRS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
275. ***Vicia lutea*** L. (*) – T scap – Medit. – untilled lands, arid pastures, shrublands and coppices, not on calcareous substrates; WBL.
Massiccio del Marganai, diffusa (Ballero & Angiolino 1991, sub *V. lutea* L. subsp. *vestita* (Boiss.) Rouy).

[16] For Sardinia only subspecies *arvense* is reported (Conti et al. 2005). However, the effective absence of subspecies *gracilis* (Thuill.) Nyman, not reported by Pignatti (1982), should be verified.

[17] Conti et al. (2005) reported for Sardinia the subspecies *prostratum* Nyman only. However, the presence of the subspecies *repens* is also conceivable.

[18] Conti et al. (2005) reported for Sardinia the subspecies *yanninicum* Katzn et F. Morley only; the presence of other subspecies needs verifying.

276. ***Vicia monantha*** Retz. subsp. ***calcarata*** (Desf.) Romero Zarco – T scap – Medit. – arid pastures and garrigues. Not observed in the study area.
Massiccio del Marganai, prati e siepi; comune (Ballero & Angiolino 1991, sub *V. monantha* Retz.).
Marganai (Arrigoni 2010, sub *V. articulata* Hornem. and sub *V. monantha* Retz.).
277. ***Vicia pubescens*** (DC.) Link (*) – T scap – Medit. – tilled lands and arid pastures; WRS.
Massiccio del Marganai, siepi, pratelli; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
278. ***Vicia sativa*** L. subsp. ***macrocarpa*** (Moris) Arcang. (*) – T scap – Medit. – tilled lands and arid pastures; WRS.
Massiccio del Marganai, fra la macchia; comune (Ballero & Angiolino 1991).
Foresta del Marganai, presso il Rio Sarmentus, Domusnovas. Quota 280 m s.l.m.; substrato calcari paleozoici. Pontecorvo et Carai, 8.IV.2006 (CAG).
Marganai (Arrigoni 2010, sub *V. macrocarpa* (Moris) Bertol.).
279. ***Vicia sativa*** L. subsp. ***sativa*** (*) – T scap – Medit.-Irano-Turan. – arid grasslands and tilled lands; WBL.
Sa Duchessa, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003).
280. ***Vicia villosa*** Roth s.l.[19] (*) – T scap – Euro-Medit. – roadsides, ruderal areas and grasslands; NRS.
Massiccio del Marganai, siepi; comune (Ballero & Angiolino 1991).

Polygalaceae Hoffmanns. & Link (1809)

281. ***Polygala monspeliaca*** L. (*) – T scap – Medit. – grasslands and untilled lands; WRL.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
282. ***Polygala sardoa*** Chodat (*) – H scap – Endem. SA – grasslands, roadsides, on calcareous substrates; NRL
Domusnovas, versante Nord del Monte Marganai. Arrigoni, 12.VI.1966 (FI).
Massiccio del Marganai, solo nei pressi di P.ta San Michele e in alcuni pratelli in località Tintillonis; sporadica (Ballero & Angiolino 1991).
P.ta Reigraxius, Marganai, Iglesias. Fogu, 25.V.1993 (CAG).
Baueddu, Iglesias, 26.IV.1999 (Angiolini & Bacchetta 2003).
Punta S. Michele, Domusnovas. Substrato: calcari paleozoici; coordinate UTM E 465873 N 4354504; esposizione 260° W; inclinazione 30°; 900 m s.l.m. Bacchetta, Gamper et Pontecorvo, 9.VI.2004 (CAG).

Rosales Perleb (1826)
Rosaceae Juss. (1789)

283. ***Aphanes arvensis*** L. (*) – T scap – Cosmop. – ruderal areas, roadsides and untilled lands; WRS.
Massiccio del Marganai, comune nelle radure fresche (Ballero & Angiolino 1991).
284. ***Crataegus monogyna*** Jacq. (*) – P caesp – Medit.-Irano-Turan. – shrublands and mesophilous woods, hedges; WBL.
Massiccio del Marganai, diffuso nella macchia (Ballero & Angiolino 1991).
285. ***Geum urbanum*** L. (*) – H scap – Euro-Medit.-Irano-Turan. – clearings and edges of mesophilous woods; NRS.
Massiccio del Marganai, luoghi erbosi; diffuso (Ballero & Angiolino 1991).
M. Marganai (Arrigoni 2010).
286. ***Potentilla reptans*** L. (*) – H ros – Paleotemp. – humid places, water courses, particularly in riparian woods; WBL.
Massiccio del Marganai, comune nei pratelli (Ballero & Angiolino 1991).
287. ***Prunus spinosa*** L. subsp. ***spinosa*** (*) – P caesp – Euro-Medit. – rocky areas and pastures; WBS.
Massiccio del Marganai, ai margini della macchia, radure; sporadico (Ballero & Angiolino 1991).
288. ***Pyrus spinosa*** Forssk. (*) – P caesp – Medit. – clearings and edges of woods; WBL.
Massiccio del Marganai, radure e ai bordi delle vie; comune (Ballero & Angiolino 1991).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
289. ***Rosa canina*** L. (*) – NP – Paleotemp. – clearings and edges of mesophilous woods; NRL.
Massiccio del Marganai, comune tra le macchie (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
290. ***Rosa gallica*** L. – NP – Avv. (Euroasiat.) – coppices, brushwoods, arid grasslands. Not found in the study area.
Massiccio del Marganai, siepi; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
291. ***Rosa sempervirens*** L. (*) – NP – Medit. – shrublands and woods; WRS.

[19] Conti et al. (2005) reported for Sardinia the subspecies *varia* (Host) Corb. in the wild, and the nominal subspecies as introduced and naturalized.

Massiccio del Marganai, siepi e macchioni; comune (Ballero & Angiolino 1991).
292. ***Rubus*** gr. ***ulmifolius*** Schott[20] (*) – NP – Euro-Medit. – shrublands, woods, sources and riverbeds; WBL.
Massiccio del Marganai, macchie e siepi; comune (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Marganai, Domusnovas, 27.IV.1999; Buggerru, 29.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas. 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005, sub *R.* gr. *ulmifolius* Schott).
293. ***Sanguisorba minor*** Scop. subsp. ***balearica*** (Bourg. ex Nyman) Muñoz Garm. et C. Navarro (*) – H scap –Paleotemp. – arid grasslands, garrigues, untilled lands, on calcareous substrates; WRL.
Baueddu, Iglesias, 26.IV.1999; Tinny, Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003, sub *S. minor* Scop. subsp. *muricata* (Gremli) Briq.).
S. Giovanni Miniera, Iglesias, 11.VI.1998; 6.VI.2002; Rio Sa Duchessa, Domusnovas. 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; 13.VII.2001; Sa Duchessa, Domusnovas, 3.IX.2000; 3.IX.2000 (Angiolini et al. 2005, sub *S. minor* Scop. subsp. *muricata* (Gremli) Briq.).
294. ***Sanguisorba minor*** Scop. subsp. ***minor*** – H scap – Paleotemp. – arid grasslands, garrigues and untilled lands; probably confused with subsp. *balearica*.
Massiccio del Marganai, pratelli, garrigues; comune (Ballero & Angiolino 1991, sub *S. minor* Scop.).
295. ***Sanguisorba verrucosa*** (Link ex G. Don) Ces. (*) – H scap – Medit.-Irano-Turan. – arid grasslands, garrigues, untilled lands, on calcareous substrates; NRS.
Obs. Near the Caves of S. Giovanni, entrance opposite Domusnovas village. Substrate: Paleozoic limestones, inc. 30 °, esp. 90 ° E.[21]
296. ***Sorbus torminalis*** (L.) Crantz – P caesp/P scap – Paleotemp. – mesophilous woods. Not considered autochthonous in the study area.
Massiccio del Marganai, nei pressi della caserma della AFD; rarissimo (Ballero & Angiolino 1991).
M. Marganai (Arrigoni 2010).

[20] The presence and distribution of species of the genus *Rubus* in Sardinia have yet to be clarified. For this, a specific investigation would be necessary, taking all populations into consideration and analyzing their differences through an organic study of their morphology, molecular biology and chemotaxonomy.

[21] The species is treated sensu Flora Iberica (Muñoz-Garmendia & Navarro 1998).

Rhamnaceae Juss. (1789)

297. ***Rhamnus alaternus*** L. subsp. ***alaternus*** (*) – P caesp – Medit. – thermophilous shrublands; WBL.
Massiccio del Marganai, nella macchia; comune (Ballero & Angiolino 1991).
298. ***Ziziphus jujuba*** Mill. (*) – P scap – E-Asiat. – introduced but not spontaneized species.
Obs. Along Canale Aleni and near ruins situated below Punta Fenu Trainu, in the gorge Gutturu Farris.

Ulmaceae Mirb. (1815)

299. ***Ulmus minor*** Mill. subsp. ***minor*** (*) – P caesp – Paleotemp. – edapho-hygrophilous forest and brushwoods; WRL.
Massiccio del Marganai, diffuso lungo alcuni sentieri (Ballero & Angiolino 1991).

Cannabaceae Martinov (1820)

300. ***Celtis australis*** L. subsp. ***australis*** (*) – P scap – Medit. – valley bottoms, ravines and riparian environments; NRS.
Massiccio del Marganai, isolati nuclei nei pressi di San Benedetto (Ballero & Angiolino 1991).

Moraceae Link (1831)

301. ***Ficus carica*** L. var. ***caprificus*** Risso (*) – P scap – N-Medit. – sources and riverbeds; WRS.
Massiccio del Marganai, zone ruderali ed antropiche; comune (Ballero & Angiolino 1991, sub *F. carica* L.).

Urticaceae Juss. (1789)

302. ***Parietaria judaica*** L. (*) – H scap – Euro-Medit.-Irano-Turan. – ruderal areas, roadsides and sheepfolds; WBL.
Massiccio del Marganai, zone marginali; comune (Ballero & Angiolino 1991).
303. ***Parietaria lusitanica*** L. subsp. ***lusitanica*** (*) – T rept – Medit. – rocks and damp walls; WRS.
Massiccio del Marganai, zone ombrose ed umide; sporadica (Ballero & Angiolino 1991).
304. ***Soleirolia soleirolii*** (Req.) Dandy (*) – H rept – Endem. SA-CO-AT-BL[22] – sources, cool or sunlit rocks; NRS.
Massiccio del Marganai, in una forra nei pressi di P.ta

[22] This species certainly occurs in the wild in Sardinia and Corsica. There are doubts about its nativeness to other territories, including the Balearic Islands where, maybe imported for ornamental purposes, it was later naturalized.

Rosmarino; rarissima (Ballero & Angiolino 1991).
Marganai, Domusnovas. Quota 640 m s.l.m.; esp. WNW; incl. 10°; substrato calcari; 21.VI.2001. Miniere di Su Zurfuru, Fluminimaggiore. Quota 180 m s.l.m.; esp. N; incl. 40°; substrato metamorfiti; 5.V.1997. Bacchetta & Mossa (2004).
Marganai (Arrigoni 2006).
305. ***Urtica atrovirens*** Req. ex Loisel. (*) – H scap – Endem. SA-CO-AT – sheepfolds and ruderal areas; WRL.
Massiccio del Marganai, radure e luoghi ruderali; sporadica (Ballero & Angiolino 1991).
306. ***Urtica dioica*** L. subsp. ***dioica*** – H scap – Cosmop. – sheepfolds and roadsides. Not found in the study area.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2006).
307. ***Urtica membranacea*** Poir. ex Savigny (*) – T scap – Medit. – sheepfolds, ruderal areas and roadsides; WRL.
Massiccio del Marganai, radure erbose; diffusa (Ballero & Angiolino 1991, sub *U. dubia* Forsskal).
308. ***Urtica pilulifera*** L. (*) – T scap – Medit. – edges of paths and ruderal areas at low altitudes; WRL.
Massiccio del Marganai, non molto comune (Ballero & Angiolino 1991).

Fagales Engl. (1892)
Fagaceae Dumort. (1829)

309. ***Castanea sativa*** Mill. (*) – P scap – Euro-Medit. – planted in different areas and rarely spontaneous; NRS.
Massiccio del Marganai, introdotta, rara (Ballero & Angiolino 1991).
310. ***Quercus dalechampii*** Ten. (*) – P scap – C-Medit. – mesophilous woods; NRS.
Massiccio del Marganai, sporadica nei versanti Nord orientali (Ballero & Angiolino 1991, sub *Q. pubescens* Willd.).
Marganai (Arrigoni 2006, sub *Q. pubescens* Willd.).
311. ***Quercus ilex*** L. subsp. ***ilex*** (*) – P scap – Medit. – woods and shrublands; WBL.
Massiccio del Marganai, lecceta; comune (Ballero & Angiolino 1991).
Marganai, Tinny, Barraxiutta, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas. 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; Sa Duchessa, Domusnovas, 3.IX.2000; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005).
312. ***Quercus suber*** L. (*) – P scap – Medit. – woods, shrublands and wood pastures; WBL.
Massiccio del Marganai, presente in isolati popolamenti solo alla base del Massiccio, nel versante N-NW (Ballero & Angiolino 1991).

Betulaceae Gray (1821)

313. ***Alnus glutinosa*** (L.) Gaertn – P scap – Paleotemp. – riparian woods with oligotrophic waters, not on calcareous substrates. Not found in the study area.
Massiccio del Marganai, sporadico lungo le rive dei corsi d'acqua (Ballero & Angiolino 1991).[23]

Cucurbitales Dumort. (1829)
Cucurbitaceae Juss. (1789)

314. ***Bryonia marmorata*** Petit (*) – G rhiz – Endem. SA-CO – roadsides and shrublands; WBS.
Massiccio del Marganai, diffusa nella macchia (Ballero & Angiolino 1991).
315. ***Ecballium elaterium*** (L.) A. Rich. (*) – G bulb – Medit. – anthropized areas of Coddu Is Inzoncas; WRS.
Massiccio del Marganai, ai margini delle vie, diffusa (Ballero & Angiolino 1991).

Oxalidales Heintze (1927)
Oxalidaceae R. Br. (1818)

316. ***Oxalis pes-caprae*** L. (*) – G bulb – Inv. (S-Africa) – ruderal and anthropized areas; WRL.
Massiccio del Marganai, pratelli, bordi delle vie; comune (Ballero & Angiolino 1991).

Malpighiales Mart. (1835)
Euphorbiaceae Juss. (1789)

317. ***Euphorbia amygdaloides*** L. subsp. ***arbuscula*** Meusel (*) – Ch suffr – Endem. SA-SI-ITM (Calabria and Sicily) – riverbeds, sources and humid places WRL.
Obs. Rio Canonica; entrance of S. Giovanni caves, near the little dam.
318. ***Euphorbia amygdaloides*** L. subsp. ***semiperfoliata*** (Viv.) Radcl.-Sm. (*) – Ch suffr – Endem. SA-CO – cool and shady cliffs, at highest altitudes; NRS.

[23] Calcifugous species, not present in study area.

Massiccio del Marganai, comune nelle radure fresche fra la lecceta (Ballero & Angiolino 1991).
319. ***Euphorbia characias*** L. (*) – NP – W-Medit. – synanthropic areas, garrigues and open shrublands; WBL.
Massiccio del Marganai, comune (Ballero & Angiolino 1991).
320. ***Euphorbia dendroides*** L. (*) – NP – Medit. – rocky areas, stony grounds and degraded shrublands; WBL.
Massiccio del Marganai, macchie; diffusa (Ballero & Angiolino 1991).
S. Benedetto, Iglesias. Substrato: calcari; bioclima: termomedit. sup./subumido inf. Coordinate UTM: 32SMJ5957; 280 m s.l.m. Navarro, Jimenez, Casti et Cano, 19.V.2004 (CAG).
321. ***Euphorbia helioscopia*** L. subsp. ***helioscopia*** (*) – T scap – Paleotemp. – ruderal areas, sheepfolds, roadsides and grasslands; WRL.
Massiccio del Marganai, prati, macchie; comune (Ballero & Angiolino 1991, sub *E. helioscopia* L.).
322. ***Euphorbia peplus*** L. (*) – T scap – Circumbor. – ruderal areas, sheepfolds, roadsides and grasslands; WBL.
Massiccio del Marganai, prati, macchie; comune (Ballero & Angiolino 1991).
323. ***Euphorbia pithyusa*** L. subsp. ***cupanii*** (Guss. ex Bertol.) Radel-Sm. (*) – Ch suffr – Endem. SA-CO-SI – roadsides, escarpments, mining dumps and stony areas; WBL.
Grotta di S. Giovanni, dopo il bivio, Domusnovas. Scrugli et Cogoni, 28.V.1989 (CAG).
Massiccio del Marganai, sporadica sui versanti, più comune nelle prime pendici (Ballero & Angiolino 1991, sub *E. pithyusa* var. *capanii* (Guss.) A.R. Sm.).
Baueddu, Iglesias, 26.IV.1999; Marganai, Tinny, Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003, sub *E. cupanii* Guss. ex Bertol.).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000; Barraxiutta, Domusnovas, 10.VI.2001 (CAG);
324. ***Euphorbia pterococca*** Brot. (*) – T scap – W-Medit. – untilled lands and pastures; WRS.
Massiccio del Marganai, nella macchia; sporadica (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
325. ***Euphorbia segetalis*** L. (*) – Ch suffr – Medit. – ruderal areas; NRS.
Massiccio del Marganai, radure fra la macchia; rara (Ballero & Angiolino 1991, sub *E. pinea* L.).
326. ***Euphorbia spinosa*** L. subsp. ***spinosa*** (*) – Ch suffr – N-Medit. – rocky areas and mountain tops on calcareous substrates; NRL.
In montanis Marganai (Moris, 1827, sub *E. spinosa* L.).
Domusnovas. Sine coll., 1869 (CAG).
Massiccio del Marganai, diffusa nelle "garrigues" di pendio subito sotto le cime (Ballero & Angiolino 1991, sub *E. spinosa* L.).
Marganai (Arrigoni 2010, sub *E. spinosa* L.).
327. ***Euphorbia terracina*** L. (*) – H scap – Medit. – untilled lands, grasslands and garrigues; WRS.
Massiccio del Marganai, zone soleggiate; diffusa (Ballero & Angiolino 1991).
328. ***Mercurialis annua*** L. (*) – T scap – Paleotemp. – synanthropic areas; WBL.
Massiccio del Marganai, bordi delle vie; comune (Ballero & Angiolino 1991).

Salicaceae Mirb. (1815)

329. ***Salix alba*** L. (*) – P scap – Paleotemp – humid places, gravel bed streams;NRS.
Obs. Rio Canonica, downstream of dam of Punta Gennarta and near San Benedetto (Iglesias); Rio San Giovanni, downstream of the caves (Domusnovas).
330. ***Salix atrocinerea*** Brot. subsp. ***atrocinerea*** (*) – P scap – W-Medit. – humid depressions; NRL.
Massiccio del Marganai, diffusa lungo i corsi d'acqua (Ballero & Angiolino 1991, sub *S. pedicellata* Desf.).
Rio Canonica, Rio S'Arriali, Iglesias; Rio Sarmentus, Rio San Giovanni, Domusnovas.

Violaceae Batsch (1802)

331. ***Viola alba*** Besser subsp. ***dehnhardtii*** (Ten.) W. Becker (*) – H ros – Medit. – mesophilous wood and shrublands over 500 m of altitude; WRL.
Massiccio del Marganai, comune nelle stazioni più fresche della lecceta (Ballero & Angiolino 1991).

Linaceae DC. ex Perleb (1818)

332. ***Linum bienne*** Mill. (*) – H bienn – Medit.-Atl. – grasslands and garrigues; WBS.
Massiccio del Marganai, diffusa tra la macchia (Ballero & Angiolino 1991).
Rio Sa Duchessa, Domusnovas. 27.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
333. ***Linum maritimum*** L. subsp. ***maritimum*** – H scap – Medit. – substalted grasslands. Not found in the study area.
Massiccio del Marganai, diffusa nei pratelli (Ballero & Angiolino 1991).
334. ***Linum muelleri*** Moris (*) – Ch suffr – Endem.

SA – coastal limestone and skeleton prevailing substrates; WRL.
Domusnovas, versante Nord del Monte Marganai. Arrigoni, 12.VI.1966 (FI).
Massiccio del Marganai, solo nei pressi dell'abitato di S. Benedetto, tra la macchia a cisto; rara (Ballero & Angiolino 1991).
335. ***Linum strictum*** L. subsp. ***strictum*** (*) – T scap – Medit.-Irano-Turan. – shrublands, garrigues; WBS.
Massiccio del Marganai, prati e macchie; diffusa (Ballero & Angiolino 1991).
336. ***Linum trigynum*** L. (*) – T scap – Medit. – grasslands, garrigues and degraded shrublands; WBS.
Radura presso Punta Sca Martini, Iglesias. Quota 860 m s.l.m.; substrato calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).

Hypericaceae Juss. (1789)

337. ***Hypericum hircinum*** L. subsp. ***hircinum*** (*) – NP – Endem. SA-CO-AT – humid places and gravel bed streams; WRL.
Obs. Near S. Benedetto stream.
338. ***Hypericum perfoliatum*** L. (*) – H scap – Medit. – roadsides, untilled lands, grasslands and garrigues; NRL.
Massiccio del Marganai, margini della macchia; diffusa (Ballero & Angiolino 1991).
Tinny, Barraxiutta, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
339. ***Hypericum perforatum*** L. (*) – H scap – Paleotemp. – roadsides and untilled lands; WBL.
Massiccio del Marganai, macchie e siepi; comune (Ballero & Angiolino 1991).

Geraniales Dumort. (1829)
Geraniaceae Juss. (1789)

340. ***Erodium cicutarium*** (L.) L'Hér. (*) – H ros – Paleotemp. – ruderal areas, roadsides, untilled lands and grasslands; WBS.
Massiccio del Marganai, diffusa tra la macchia (Ballero & Angiolino 1991).
341. ***Geranium colombinum*** L. (*) – T scap – Circumbor. – roadsides and grasslands; WBS.
Nei pressi delle Grotte di S. Giovanni, Domusnovas. Legit Scrugli, determinavit Zedda 15.V.1987 (CAG).
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).
342. ***Geranium dissectum*** L. (*) – T scap – Circumbor. – clearings and grasslands; WBS.
Massiccio del Marganai, comune in radure e pratelli (Ballero & Angiolino 1991).
343. ***Geranium lucidum*** L. (*) – T scap – Paleotemp. – walls, cliffs, shady and humid places; WRS.
Massiccio del Marganai, diffusa in radure e pratelli (Ballero & Angiolino 1991).
344. ***Geranium molle*** L. (*) – T scap – Paleotemp. – ruderal areas, roadsides, untilled lands and grasslands; WBS.
Massiccio del Marganai, prati, luoghi erbosi, macchie; comune (Ballero & Angiolino 1991).
345. ***Geranium purpureum*** Vill. (*) – T scap – Paleotemp. – garrigues, clearings and shrublands; WBL.
Massiccio del Marganai, diffusa in pratelli e radure (Ballero & Angiolino 1991).
Barraxiutta, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; San Giovanni Miniera, Iglesias, 6.VI.2002 (Angiolini et al. 2005).
346. ***Geranium pusillum*** L. (*) – T scap – Paleotemp. – fertilized soils, ploughed crops near houses; WBL.
Massiccio del Marganai, comune in radure e pratelli (Ballero & Angiolino 1991).
347. ***Geranium robertianum*** L. (*) – T scap – Circumbor. – shrublands and clearings in woods; WBL.
348. ***Geranium rotundifolium*** L. (*) – T scap – Euro-Medit. – ruderal areas and roadsides; WRS.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).

Myrtales Rchb. (1828)
Lythraceae J. St.-Hil. (1805)

349. ***Lythrum salicaria*** L. (*) – H scap – Paleotemp. – edges of streams; WRL.
Massiccio del Marganai, radure fresche; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
350. ***Lythrum thymifolia*** L. – T scap – Euro-Medit. – Salt marsh. Not found in the study area.
Marganai (Arrigoni 2010).

Onagraceae Juss. (1789)

351. ***Epilobium hirsutum*** L. (*) – H scap – Circumbor. – slushy areas, ditches and streams; WRL.
Massiccio del Marganai, radure erbose; diffuso (Ballero & Angiolino 1991).
352. ***Epilobium lanceolatum*** Sebast. et Mauri (*) – H scap – Euro-Medit. – humid rocks, sources and streams; WRS.
Massiccio del Marganai, prati; sporadico (Ballero &

Angiolino 1991).
353. ***Epilobium montanum*** L. (*) – H scap – Paleotemp. – humid and slushy areas, gravel bed streams, clearings in woods, edges of paths; NRS.
Marganai, Domusnovas. Quota 640 m s.l.m.; esp. WNW; incl. 10°; substrato calcari; 21.VI.2001. Bacchetta & Mossa (2004).

Myrtaceae Juss. (1789)

354. ***Myrtus communis*** L. subsp. ***communis*** (*) – P caesp – Medit. – thermophilous shrublands; WBL.
Massiccio del Marganai, comune componente della macchia (Ballero & Angiolino 1991).

Sapindales Dumort. (1829)
Anacardiaceae R. Br. (1818)

355. ***Pistacia lentiscus*** L. (*) – P caesp – Medit. – garrigues, shrublands and woods; WBL.
Massiccio del Marganai, comune componente della macchia (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Marganai, Tinny, Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
356. ***Pistacia terebinthus*** L. subsp. ***terebinthus*** (*) – P scap –Medit. – arid slopes and cliffs, thermophilous woods; NRS.
In sylvis montibus d'Iglesias, Marganai, Iglesias. Gennari (sine firma), VI.1859 (CAG).
Sa Duchessa, Domusnovas. Bocchieri, 3.VI.1987 (CAG).
Massiccio del Marganai, diffusa nel versante Nord-Orientale, rara negli altri (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010, sub *P. terebinthus* L.).

Sapindaceae Juss. (1789)

357. ***Acer monspessulanum*** L. subsp. ***monspessulanum*** (*) – P scap – Euro-Medit.-Irano-Turan. – mesophilous woods; NRL.
Massiccio del Marganai, nelle zone alte, ai margini della lecceta, abbastanza diffuso (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010, sub *A. monspessulanum* L.).

Rutaceae Juss. (1789)

358. ***Ruta angustifolia*** Pers. (*) – Ch suffr. – W-Medit. – arid grasslands and garrigues; NRS.
Tra S. Benedetto ed il Passo della Croce. Quota 455 m s.l.m.; substrato metamorfiti paleozoiche. Pontecorvo et Carai, 9.VII.2006 (CAG).
359. ***Ruta chalepensis*** L. (*) – Ch suffr – Medit. – cliffs, sometimes on old walls; calcicolous species; WRS.
Massiccio del Marganai, macchie secondarie; comune (Ballero & Angiolino 1991).

Malvales Dumort. (1829)
Malvaceae Juss. (1789)

360. ***Lavatera olbia*** L. (*) – NP – W-Medit. – roadsides and rocky areas; WBL.
Massiccio del Marganai, bordi delle strade; comune (Ballero & Angiolino 1991).
361. ***Malva cretica*** Cav. subsp. ***cretica*** (*) – T scap – Medit. – arid untilled lands; NRS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010, sub *M. cretica* Cav.).
362. ***Malva nicaeensis*** All. (*) – T scap/H bienn – Medit. – arid untilled lands, paths, pastures; NRS.
Obs. Near to Giardino Linasia.
363. ***Malva sylvestris*** L. subsp. ***sylvestris*** (*) – H scap – Euro-Medit. – ruderal areas, sheepfolds, roadsides, untilled lands and grasslands; WBL.
Massiccio del Marganai, radure e pratelli; comune (Ballero & Angiolino 1991, sub *M. sylvestris* L.).
364. ***Tilia platyphyllos*** Scop. subsp. ***platyphyllos*** (*) – P scap (P caesp) – Avv. (Euro-Medit.)[24] – introduced but not spontaneous species.
Massiccio del Marganai, introdotta (Ballero & Angiolino 1991).

Rafflesiaceae Dumort. (1829)

365. ***Cytinus ruber*** Fourr. ex Fritsch (*) – G rad – Medit. – usually a parasite of *Cistus creticus* L. subsp. *eriocephalus*; WRL.
Massiccio del Marganai, cisteti; comune (Ballero & Angiolino 1991).

Thymelaeaceae Juss. (1789)

366. ***Daphne gnidium*** L. (*) – NP – Medit. – little evolved stages of shrublands; WRL.
Massiccio del Marganai, macchie; comune (Ballero & Angiolino 1991).
Presso la Grotta di S. Giovanni, Domusnovas. Substrato: metamorfiti paleozoiche. Pontecorvo, 13.IX.2005 (CAG).

[24] Taxon present in the Mediterranean area, but given as occasional in Sardinia by Conti et al. (2005).

Strada tra S. Benedetto ed il Passo della Croce, Iglesias. Quota 455 m s.l.m.; substrato metamorfiti paleozoiche. Pontecorvo et Carai, 9.VII.2006 (CAG).
367. ***Thymelaea hirsuta*** (L.) Endl. (*) – NP – Medit. – garrigues; WRL.
Massiccio del Marganai, macchie; comune (Ballero & Angiolino 1991).

Cistaceae Juss. (1789)

368. ***Cistus creticus*** L. subsp. ***eriocephalus*** (Viv.) Greuter et Burdet (*) – NP – Medit. – garrigues, shrublands and clearings in woods; WBL.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991, sub *C. incanus* L.).
Baueddu, Iglesias, 26.IV.1999; Tinny, Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003); Rio Sa Duchessa, Domusnovas, 27.IV.1999; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005, sub *C. eriocephalus* Viv.).
369. ***Cistus monspeliensis*** L. (*) – NP – Medit. – garrigues, shrublands and clearings in woods; WBL.
Massiccio del Marganai, lande; comune (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999.
370. ***Cistus salviifolius*** L. (*) – NP – W-Medit. – garrigues and shrublands; WBL.
Monte Marganai, Domusnovas. Fogu, 25.V.1993 (CAG).
Baueddu, Iglesias, 26.IV.1999; Marganai, Tinny, 26.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini et al. 2005).
371. ***Fumana laevipes*** (L.) Spach (*) – Ch suffr – Medit. – garrigues and rupicolous areas; WRS.
Massiccio del Marganai, radure fra la macchia; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
372. ***Fumana thymifolia*** (L.) Spach ex Webb (*) – Ch suffr – Medit. – arid and stony grasslands, on calcareous substrates; NRS.
Massiccio del Marganai, radure e prati; comune (Ballero & Angiolino 1991).
373. ***Halimium halimifolium*** (L.) Willk. subsp. ***halimifolium*** – NP – W-Medit. – a mainly psammophilous species. Not found in the study area.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
374. ***Tuberaria guttata*** (L.) Fourr. (*) – T scap – Euro-Medit. – roadsides, grasslands and depositional areas of streams; WBL.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).

Brassicales Bromhead (1838)
Resedaceae Bercht. et J. Presl (1820)

375. ***Reseda alba*** L. subsp. ***alba*** (*) – H scap – Medit. – ruderal areas, untilled lands and grasslands; WBS.
Massiccio del Marganai, radure, margini delle vie; comune (Ballero & Angiolino 1991, sub *R. alba* L.).
Marganai (Arrigoni 2010).
376. ***Reseda lutea*** L. subsp. ***lutea*** (*) – H scap – Euro-Medit. – untilled lands, ruins and roadsides; WRS.
Gennamari (Bornemann ex Barbey 1885, sub *R. lutea* L.).
Massiccio del Marganai, radure e prati; comune (Ballero & Angiolino 1991, sub *R. lutea* L.).
Marganai (Arrigoni 2010, sub *R. lutea* L.).
377. ***Reseda luteola*** L. (*) – H scap –Euro-Medit. – roadsides, grasslands and xerophile garrigues; WBL.
Sa Duchessa, Domusnovas. Substrato: discariche minerarie; 340 m s.l.m. Bacchetta, Català, Pontecorvo et Sotgiu-Cocco, 8.IV.2001 (CAG).
Baueddu, Iglesias, 26.IV.1999; Tinny, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
San Giovanni Miniera, Iglesias, 6.VI.2002 (Angiolini et al. 2005).
Radura presso la caserma di Marganai, Iglesias. Calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).

Brassicaceae Burnett (1835)

378. ***Arabidopsis thaliana*** (L.) Heyn. (*) – T scap – Cosmop. – roadsides, depositional sand and stony grounds; WBS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
379. ***Arabis collina*** Ten. subsp. ***collina*** (*) – H scap – N-Medit. – rocks and cliffs; WRS.
Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010, sub *A. collina* Ten.).
380. ***Arabis verna*** (L.) R. Br. (*) – T scap – Medit. – rocks, stony grounds and gravel bed streams; WRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
Presso Caserma Marganai, Iglesias. Quota 670 m s.l.m.; substrato graniti e metamorfiti. Pontecorvo, 2.IV.2006 (CAG).
381. ***Barbarea rupicola*** Moris (*) – Ch suffr – En-

dem. SA-CO – rocky walls and cliffs at the highest altitude; NRS.
Massiccio del Marganai, rupi, a P.ta Reigraxius ove non di rado si associa ad *Iberis integerrima*; sporadica (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
382. ***Biscutella morisiana*** Raffaelli (*) – T scap – Endem. SA-CO – roadsides, grasslands and garrigues; WRS.
Massiccio del Marganai, luoghi aridi e soleggiati; comune (Ballero & Angiolino 1991).
Punta S. Michele, Domusnovas. Substrato: calcari paleozoici; coordinate: UTM E 465873 N 4354504; esposizione 260 W; inclinazione 30°; 900 m. s.l.m. Bacchetta, Gamper et Pontecorvo, 9.VI.2004 (CAG).
Presso Punta S. Michele, Domusnovas. Substrato calcarei paleozoici; 815 m s.l.m. Pontecorvo, 2.IV.2006 (CAG).
383. ***Brassica insularis*** Moris (*) – Ch suffr – SW-Medit. – slopes and stony areas; WRS.
Massiccio del Marganai, ai margini di un sentiero, tra le fenditure del calcare, nei pressi di P.ta San Michele; sporadica (Ballero & Angiolino 1991).
M. Marganai (Arrigoni 2010).
384. ***Brassica rapa*** L. subsp. ***campestris*** (L.) A.R. Clapham (*) – H scap – Nat. (Europ.) – untilled and roadsides; NRS.
Massiccio del Marganai, luoghi ruderali; rara (Ballero & Angiolino 1991, sub *B. rapa* L.)[25].
Marganai (Arrigoni 2010, sub *B. campestris* L.).
385. ***Brassica tournefortii*** Gouan – T scap/H bienn – Medit.-Irano-Turan. – untilled lands, grasslands and brackish areas. Not found in the study area.
Massiccio del Marganai, prati e radure; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
386. ***Bunias erucago*** L. (*) – T scap – Euro-Medit. – roadsides, depositional areas, grasslands and untilled lands; WBS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
387. ***Calepina irregularis*** (Asso) Thell. (*) – T scap – Euro-Medit. – untilled grasslands; NRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
388. ***Capsella bursa-pastoris*** (L.) Medik. subsp. ***bursa-pastoris*** (*) – H bienn – Cosmop. – untilled lands and roadsides; WBL.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).
389. ***Capsella rubella*** Reut. (*) – T scap – Medit. – grasslands and clearings; WBL.
Massiccio del Marganai, radure e pratelli; comune (Ballero & Angiolino 1991).
390. ***Cardamine hirsuta*** L. (*) – T scap – Circumbor. – roadsides, grasslands and depositional areas of streams; WBL.
Massiccio del Marganai, pratelli aridi; comune (Ballero & Angiolino 1991).
391. ***Clypeola jonthlaspi*** L. s.l. (*) – T scap – Medit. – arid untilled lands; NRS.
Massiccio del Marganai, pratelli e radure; diffusa (Ballero & Angiolino 1991).
Punta S. Michele, Domusnovas. Quota 890 m s.l.m.; substrato calcarei paleozoici. Pontecorvo, 2.IV.2006 (CAG).
392. ***Draba muralis*** L. (*) – T scap – Circumbor. – untilled lands, roadsides and drystone walls; NRS.
Massiccio del Marganai, pratelli e radure; comune (Ballero & Angiolino 1991).
393. ***Erophila verna*** (L.) Dc. subsp. ***praecox*** (Steven) Walp. (*) – T scap – Paleotemp. – arid untilled lands, prefers acid substrates; NRS.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991, sub *E. verna* (L.) Chevall subsp. *praecox* (Steven) P. Fourn.).
Marganai (Arrigoni 2010, sub *E. praecox* (L.) DC.).
394. ***Hirschfeldia incana*** (L.) Lagr.-F. subsp. ***incana*** (*) – H scap – Medit. – roadsides, escarpments and mining dumps; WRL.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).
395. ***Hornungia petraea*** (L.) Rchb. subsp. ***petraea*** – T scap (*) – Euro-Medit. – depositional sands and grasslands; NRS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
Obs. Near Rio Sarmentus.
396. ***Iberis integerrima*** Moris (*) – Ch suffr – Endem. SA – mining dumps and environments contaminated by heavy metals; WRL.
Marganai. Gennari, V.1866 (FI).
In Monte Marganai *prope* Iglesias. Biondi, 30.IV.1873, (FI).
Sulla montagna di Marganai presso Iglesias. Biondi, 30.IV.1873 (FI).
In summo Monte Marganai, Iglesias. Biondi, VI.1880 (FI).
S. Benedetto. Bornemann ex Schweinfurth (1885).

[25] The lack of indication of a subspecies generally indicates reference to the nominal one. In this case, given that the subspecies *rapa* is not recorded from Sardinia, nor from Italian Tyrrhenian regions (Conti et al. 2005), while the subspecies *campestris* has been repeatedly observed and reported of Iglesiente, the record by Ballero & Angiolino (1991) must refer to the latter.

Massiccio del Marganai, solo nella sommità del massiccio, su roccia; rara (Ballero & Angiolino 1991).
Punta S. Michele, Marganai, Iglesias. Ballero et Scrugli, 1.VI.1992 (CAG).
Barraxiutta, Domusnovas. Substrato: discariche minerarie; esposizione 80°E; inclinazione 5-10°; bioclima: mesomedit. inf./subumido inf.; 345 m s.l.m. Bacchetta, Brullo, Cogoni et Scrugli, 4.VI.2002 (CAG).
Tinny, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005).
Radura presso Punta Sca Martini, Iglesias. 850 m s.l.m.; substrato calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).
397. ***Lepidium draba*** L. subsp. ***draba*** (*) – H scap – Euro-Medit. – roadsides, ruderal areas and untilled lands; NRS.
Massiccio del Marganai, comune nelle radure (Ballero & Angiolino 1991, sub *Cardaria draba* (L.) Desv.).
398. ***Lobularia maritima*** (L.) Desv. subsp. ***maritima*** (*) – H scap – Medit. – rocks and walls; WBL.
Massiccio del Marganai, comune specie nelle località soleggiate (Ballero & Angiolino 1991, sub *L. maritima* (L.) Desv.).
399. ***Nasturtium officinale*** R. Br. subsp. ***officinale*** (*) – H scap – Boreo-Trop. – edges of streams and slushy areas; NRS.
Massiccio del Marganai, comune lungo l'alveo dei torrenti (Ballero & Angiolino 1991).
400. ***Raphanus raphanistrum*** L. subsp. ***raphanistrum*** (*) – T scap – Euro-Medit. – ruderal areas, sheepfolds and untilled lands; WRS.
Massiccio del Marganai, zone marginali; comune (Ballero & Angiolino 1991, sub *R. raphanistrum* L.).
401. ***Sinapis alba*** L. subsp. ***alba*** (*) – T scap – Nat. (E-Medit.) – tilled lands and synanthropic areas; WRL.
Obs. San Lorenzo, Guardia is Arbuzzus, Carraras; in grasslands, edges of tilled lands and pastures.
402. ***Sinapis arvensis*** L. subsp. ***arvensis*** (*) – T scap – Euro-Medit. – cereal fields, untilled lands, ruins; NRS.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).
403. ***Sisymbrium irio*** L. (*) – T scap – Paleotemp. – untilled lands, ruins and vegetable gardens; NRS.
Massiccio del Marganai, pratelli e radure; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
404. ***Sisymbrium officinale*** (L.) Scop. (*) – T scap – Euro-Medit. – untilled lands and grasslands; WRS.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).
405. ***Teesdalia coronopifolia*** (J.P. Bergeret) Thell. (*) – T scap – Euro-Medit. – roadsides, untilled lands and grasslands; WRS.
Massiccio del Marganai, diffusa (Ballero & Angiolino 1991).

Santalanae Thorne ex Reveal (1992)
Santalales Dumort. (1829)
Santalaceae R. Br. (1810)

406. ***Osyris alba*** L. (*) – NP – Medit. – shrublands and woods; WBL.
Massiccio del Marganai, comune nelle radure e nelle chiarie fra la macchia (Ballero & Angiolino 1991).

Caryophyllanae Takht. (1967)
Caryophyllales Perleb (1826)
Polygonaceae Juss. (1789)

407. ***Persicaria maculosa*** (L.) Gray – T scap – Cosmop. –infestant in irrigated crops, more rarely in ruderal zones, not observed in the study area.
Massiccio del Marganai, pratelli e radure; diffusa (Ballero & Angiolino 1991, sub *Polygonum persicaria* L.).
Marganai (Arrigoni 2010, sub *Polygonum persicaria* L.).
408. ***Polygonum aviculare*** L. subsp. ***aviculare*** (*) – T rept – Boreo-Trop. – roadsides and grasslands; WRS.
Massiccio del Marganai, comune nei pratelli (Ballero & Angiolino 1991, sub *P. aviculare* L.).
409. ***Polygonum scoparium*** Loisel. (*) – Ch suffr – Endem. SA-CO – alluvial mattresses and stony beds of streams; NRL.
Massiccio del Marganai, zone umide; prossimità di ruscelli e fontanili, su substrato roccioso (Ballero & Angiolino 1991).
Presso il Rio di M. Narba, versante N della Grotta di S. Giovanni, Domusnovas. Pontecorvo, 13.IX.2005 (CAG).
Marganai (Arrigoni 2010).
410. ***Rumex acetosa*** L. subsp. ***acetosa*** (*) – H scap –Circumbor. – reaped and manured meadows; NRS.
Massiccio del Marganai, radure soleggiate, comune (Ballero & Angiolino 1991).
M. Marganai (Arrigoni 2010, sub *R. arifolius* All.).
411. ***Rumex bucephalophorus*** L. subsp. ***bucephalophorus*** (*) – T scap – Medit. – depositional areas of streams, grasslands, garrigues and mining dumps; WBL.
San Giovanni Miniera, Iglesias, 6.VI.2002 (Angiolini

et al. 2005).
412. ***Rumex obtusifolius*** L. subsp. ***obtusifolius*** (*) – H scap – Paleotemp. – untilled lands and roadsides; NRS.
Massiccio del Marganai, pratelli, margini dei sentieri; comune (Ballero & Angiolino 1991).
413. ***Rumex pulcher*** L. subsp. ***woodsii*** (De Not.) Arcang. (*) – H scap – Medit. – sheepfolds, ruderal areas and roadsides; NRS.
Massiccio del Marganai, pratelli, margini delle vie; diffusa (Ballero & Angiolino 1991, sub *R. pulcher* L. subsp. *divaricatus* (L.) Murb.).
414. ***Rumex scutatus*** L subsp. ***glaucescens*** (Guss.) Brullo, Scelsi et Spampinato (*) – H scap – Endem. SA-SI-ITM (Calabria) – alluvial mattresses and stony areas; WRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991, sub *R. scutatus* L.).
Rio Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini et al. 2005).
415. ***Rumex thyrsoides*** Desf. (*) – H scap – W-Medit. – depositional areas of streams, grasslands and clearings; WBS.
Massiccio del Marganai, radure e pratelli; comune (Ballero & Angiolino 1991).

Caryophyllaceae Juss. (1789)

416. ***Arenaria balearica*** L. (*) – Ch suffr – Endem. SA-CO-AT-BL – shaded and humid rocks, dripping rocks and sources; WRL.
Monti sopra Domusnovas. Gennari, V.1861 (FI).
Caverne oscure delle miniere di S. Giovanni, Iglesias, De Sardagna. Sine coll., 22.V.1883 (FI).
In humidis silvaticis Montis Marganai. Martelli, 8.IV.1894 (FI).
Monte Marganai. Arrigoni, I.VII.1963 (FI).
Domusnovas, versante Nord di M. Marganai. Arrigoni, 12.VI.1966 (FI).
Massiccio del Marganai, su pareti rocciose e fresche sotto P.ta Reigraxius; rarissima (Ballero & Angiolino 1991).
417. ***Arenaria serpyllifolia*** L. subsp. ***serpyllifolia*** (*) – T scap – Boreo-Trop. – edges of paths and grasslands; WRS.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991, sub *A. serpyllifolia* L.).
418. ***Cerastium glomeratum*** Thuill. (*) – T scap – Circumbor. – untilled lands and grasslands; WRS.
Massiccio del Marganai, siepi, radure, prati; comune (Ballero & Angiolino 1991).
419. ***Dianthus cyatophorus*** Moris (*) – Ch suffr – Endem. SA-SI – limestone rocks; NRS.
Presso la Grotta di S. Giovanni, lato opposto a Domusnovas, Domusnovas. Quota 510 m s.l.m.; substrato metamorfiti paleozoiche. Pontecorvo, 4.VI.2006 (CAG).
Marganai (Arrigoni 2010).
420. ***Dianthus sardous*** Bacch., Brullo, Casti et Giusso (*) – Ch suffr – Endem. SA – rocks and garrigues; WBL.
Marganai, Iglesias. Camarda et Milia, 30.V.1976 (CAG, sub *D. siculus* C. Presl. Revidit Ballero, 11.II.1983).
Massiccio del Marganai, comune sulle pareti rocciose (Ballero & Angiolino 1991, sub *D. siculus* C. Presl.).
Baueddu, Iglesias, 26.IV.1999 (Angiolini & Bacchetta 2003, sub *D. siculus* C. Presl.).
San Giovanni Miniera, Iglesias, 6.VI.2002 (Angiolini et al. 2005).
Ingresso di una miniera presso il Passo della Croce, Iglesias. Quota 660 m s.l.m.; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
421. ***Minuartia hybrida*** (Vill.) Schischkin subsp. ***hybrida*** (*) – T scap – Paleotemp. – arid untilled lands, on limestone; NRS.
Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991).
422. ***Paronychia echinulata*** Chater (*) – T scap – Medit. – depositional areas of streams; NRS.
Massiccio del Marganai, pratelli e garigue; comune (Ballero & Angiolino 1991).
423. ***Petrorhagia prolifera*** (L.) P.W. Ball et Heywood (*) – T scap – Euro-Medit. – rocky areas, edges of paths, clearings and shrublands; WBS.
Massiccio del Marganai, comune nelle radure e pratelli (Ballero & Angiolino 1991).
Radura presso Punta Sca Martini, Iglesias. Quota 860 m s.l.m.; substrato calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).
424. ***Petrorhagia saxifraga*** (L.) Link subsp. ***gasparrinii*** (Guss.) Greuter & Burdet[26] (*) – H caesp – C-Medit.. – arid grasslands, on limestone; NRS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991, sub *Petrorhagia saxifraga* (L.) Link).
425. ***Polycarpon tetraphyllum*** (L.) L. subsp. ***tetraphyllum*** (*) – T scap – Euro-Medit. – arid grasslands; WRS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991, sub *P. tetraphyllum* L.).
426. ***Sagina apetala*** Ard. (*) – T scap – Paleotemp. – arid untilled lands; WRS.
Massiccio del Marganai, sporadica nei pratelli (Bal-

[26] Conti et al. (2005), as well as Pignatti (1982), reported for Sardinia only the subsp. *gasparrini*, to which is assigned the record by Ballero & Angiolino (1991).

lero & Angiolino 1991).
427. ***Saponaria officinalis*** L. (*) – H scap – Euro-Medit. – humid untilled lands, edges of streams; NRS.
Massiccio del Marganai, spazi erbosi; sporadica (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
428. ***Silene bellidifolia*** Jacq. (*) – T scap – Medit. – untilled lands, roadsides, infestant in vegetable gardens; NBS.
Barraxiutta, Domusnovas. Scrugli, 27.V.2004 (CAG).
429. ***Silene gallica*** L. (*) – T scap – Euro-Medit. – grasslands and garrigues; WBL.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).
430. ***Silene latifolia*** Poir. subsp. ***latifolia*** (*) – H bienn – Medit. – ruins and untilled lands; WBS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
431. ***Silene nodulosa*** Viv. (*) – H ros – Endem. SA-CO – cliffs and mountain crests; NRS.
Massiccio del Marganai, pareti rocciose a P.ta Reigraxius; rara (Ballero & Angiolino 1991).
432. ***Silene velutinoides*** Pomel – Ch suffr – Endem. SA-AG – shaded and calcareous cliffs, not observed in the study area.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
Marganai (Arrigoni 2010).
433. ***Silene vulgaris*** (Moench) Garcke subsp. ***tenoreana*** (Colla) Soldano et F. Conti (*) – H scap – Medit. – grasslands; NRS.
S. Giovanni Miniera, Iglesias, 11.VI.1998; 6.VI.2002; Rio Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini et al. 2005, sub *S. vulgaris* (Moench) Garcke subsp. *angustifolia* Hayek).
434. ***Silene vulgaris*** (Moench) Garcke subsp. ***vulgaris*** – H scap – Circumbor. – grasslands, not observed in the study area.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991) [27].
435. ***Spergula arvensis*** L. (*) – T scap – Cosmop. – ruderal areas, untilled lands and grasslands; WBS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
436. ***Stellaria media*** (L.) Vill. subsp. ***media*** (*) – T rept – Cosmop. – roadsides, untilled lands and grasslands; WBS.
Massiccio del Marganai, prati e luoghi erbosi; comune (Ballero & Angiolino 1991, sub *S. media* (L.) Vill.).

Amaranthaceae Juss. (1789)

437. ***Atriplex patula*** L. (*) – T scap – Circumbor. – anthropized and nitrophilous areas and ruins; NRS.
Massiccio del Marganai, nei pratelli; comune (Ballero & Angiolino 1991).
Marganai (Arrigoni 2006).
438. ***Beta vulgaris*** L. subsp. ***vulgaris*** (*) – H scap – Nat. – roadsides, grasslands and synanthropic areas; WRL.
Massiccio del Marganai, incolti e pratelli; comune (Ballero & Angiolino 1991).
439. ***Chenopodium album*** L. subsp. ***album*** (*) – T scap – Cosmop. – ruderal areas, sheepfolds and untilled lands; WRL.
Massiccio del Marganai, luoghi ruderali; comune (Ballero & Angiolino 1991).
440. ***Chenopodium murale*** L. (*) – T scap – Boreo-Trop. – ruderal areas, roadsides and untilled lands; WBS.
Massiccio del Marganai, ruderi, macerie; comune (Ballero & Angiolino 1991).

Montiaceae Raf. (1820)

441. ***Montia fontana*** L. subsp. ***variabilis*** Walters – I rad – Medit.-Atl. – humid areas.
Massiccio del Marganai, pratelli umidi; rara (Ballero & Angiolino 1991). Da noi non ritrovata e da riferire probabilmente alla subspecie *chondrosperma* (Fenzl) Walters.

Portulacaceae Juss. (1789)

442. ***Portulaca oleracea*** L. subsp. ***oleracea*** (*) – T scap – Boreo-Trop. – roadsides and untilled lands; WRL.
Massiccio del Marganai, bordi delle strade; comune (Ballero & Angiolino 1991).

Cactaceae Juss. (1789)

443. ***Opuntia ficus-indica*** (L.) Mill. (*) – P succ – Nat. (Neotrop.) – rock walls and stony areas; WBL.
Massiccio del Marganai, comune nei versanti caldi e soleggiati (Ballero & Angiolino 1991, sub *O. ficus-barbarica* A. Berger).

Asteranae Takht. (1967)
Ericales Dumort. (1829)
Primulaceae Batsch (1786)

[27] Probably confused with subsp. *tenoreana*.

444. ***Anagallis arvensis*** L. s.l.[28] (*) – T rept – Boreo-Trop. – untilled lands, grasslands and garrigues; WBL.
Obs. Carraras, quarry near Riu de Cerbu.
445. ***Anagallis foemina*** Mill. (*) – T rept – Boreo-Trop. – roadsides, untilled lands and grasslands; WBS.
Massiccio del Marganai, pratelli e radure; diffusa (Ballero & Angiolino 1991, sub *A. coerulea* Schreber).
446. ***Anagallis monelli*** L. subsp. ***monelli*** (*) – H scap – S-Medit. – mining dumps, stony areas and road escarpments; NRL.
La Duchessa (Bornemann ex Barbey 1885, sub *A. collina* Schousb.).
Detriti di miniera, Marganai, Iglesias. Mossa (sine firma), 27.V.1984 (CAG).
Pressi Grotte di S. Giovanni, Domusnovas. Scrugli, 15.V.1987 (CAG).
Sa Duchessa, Domusnovas. Bocchieri, 3.VI.1987 (CAG).
Massiccio del Marganai, molto rara solo sul versante occidentale su discariche calaminari ove vegeta assai rigogliosa (Ballero & Angiolino 1991).
Sa Duchessa, Domusnovas. Substrato: discariche minerarie; 340 m s.l.m. Bacchetta, Català; Pontecorvo et Sotgiu-Cocco, 8.IV.2001 (CAG).
Sa Duchessa, Domusnovas, 3.IX.2000; San Giovanni, Iglesias, 6.VI.2002 (Angiolini et al. 2005).
Marganai (Arrigoni 2010, sub *A. monelli* L.).
447. ***Asterolinon linum-stellatum*** (L.) Duby (*) – T scap – Medit. – grasslands and garrigues; WBS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
448. ***Cyclamen repandum*** Sm. subsp. ***repandum*** (*) – G bulb – W-Medit. – shrublands and woods; WRL.
Massiccio del Marganai, comune nelle zone ombrose anche con litosuolo affiorante (Ballero & Angiolino 1991).
Grotte di S. Giovanni, Domusnovas. Esemplare con corolla purpureo-violetto uniforme. Scrugli, 16.IV.2002 (CAG).
Grotte di S. Giovanni, Domusnovas. Esemplare con corolla quasi completamente bianca. Scrugli, 16.IV.2002 (CAG).
449. ***Samolus valerandi*** L. (*) – H scap – Boreo-Trop. – humid places and sources; WRL.
Massiccio del Marganai, pratelli umidi; diffuso (Ballero & Angiolino 1991).

[28] Conti et al. (2005) reported for Sardinia the presence of the nominal subspecies and also of subspecies *latifolia* (L.) Arcang., which was not considered by Pignatti (1982) and is of dubious taxonomic value.

Ericaceae Juss. (1789)

450. ***Arbutus unedo*** L. (*) – P caesp – Medit.-Atl. – shrublands and woods; WBL.
Massiccio del Marganai, comune costituente della lecceta (Ballero & Angiolino 1991).
Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999.
Tinny, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999.
451. ***Erica arborea*** L. (*) – P caesp – Medit.-Trop. – shrublands and woods; WBL.
Massiccio del Marganai, lecceta; comune (Ballero & Angiolino 1991).
Rio Sa Duchessa, Domusnovas. 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999 (Angiolini et al. 2005).
452. ***Erica scoparia*** L. subsp. ***scoparia*** – P caesp – Medit. – xerophilous shrublands. Not found in the study area.
Massiccio del Marganai, macchia; comune (Ballero & Angiolino 1991)[29].

Gentianales Lindl. (1833)
Rubiaceae Juss. (1789)

453. ***Asperula laevigata*** L. (*) – H scap – W-Medit. – thermophilous woods and shrublands; WRS.
Massiccio del Marganai, macchie e siepi; diffusa (Ballero & Angiolino 1991).
454. ***Crucianella latifolia*** L. (*) – T scap – Medit. – arid grasslands and road escarpments; NRS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
455. ***Cruciata glabra*** (L.) Ehrend. s.l. (*) – H scap – Euro-Medit.-Irano-Turan. – edges of woods, hedges and shrublands; NRS.
Massiccio del Marganai, diffusa tra la macchia (Ballero & Angiolino 1991).
456. ***Galium aparine*** L. (*) – T scap – Paleotemp. – untilled lands and hedges; WBL.
457. ***Galium corsicum*** Spreng. (*) – H scap – Endem. SA-CO – open places; NRS.
Versante Nord del Monte Marganai, Domusnovas, 12.VI.1966, Arrigoni (FI).
Massiccio del Marganai, P.ta Marganai, fra i cespugli; molto rara (Ballero & Angiolino 1991).
458. ***Galium divaricatum*** Lam. (*) – T scap – Euro-Medit. – untilled lands and grasslands; NRS.

[29] The present survey tends to exclude the presence of this species in the Marganai massif.

Massiccio del Marganai, nelle radure; diffusa (Ballero & Angiolino 1991).
459. ***Galium glaucophyllum*** Em. Schmid (*) – H caesp – Endem. SA – cool cliffs; NRL.
Monte Marganai, Iglesias, rocce calcaree e boschi sopra Reigraxius. Arrigoni, 1969 (FI).
Marganai (Arrigoni 1972).
Monte Marganai, Domusnovas. Ballero, VI.1988 (CAG).
Massiccio del Marganai, nei pressi della Grotta di S. Giovanni, tra la macchia a cisto specie nelle stazioni più degradate; diffusa (Ballero & Angiolino 1991) [30].
460. ***Galium murale*** (L.) All. (*) – T scap – Medit. – walls and rocky areas; WRS.
Obs. Mount S. Michele.
461. ***Galium parisiense*** L. (*) – T scap – Euro-Medit. – grasslands, garrigues and thermophilous shrublands; NBS.
Obs. Mount Marganai.
462. ***Galium rotundifolium*** L. subsp. ***rotundifolium*** – H scap – Euro-Medit. – woods, mostly mesophilous; probably confused with *G. scabrum*.
Monte Marganai, Iglesias. Chiappini, 27.VI.1975 (CAG).
Massiccio del Marganai, siepi, radure; diffusa (Ballero & Angiolino 1991).
463. ***Galium scabrum*** L. (*) – H scap – W-Medit. – shrublands and woods; WBS.
Massiccio del Marganai, fra la macchia; diffusa (Ballero & Angiolino 1991).
Sotto Punta S. Michele, Iglesias. 820 m s.l.m.; esp. W; incl. 10°; calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).
Presso il Rio Cruccueu, vicino alle Grotte di S. Giovanni, Domusnovas. Quota 180 m s.l.m.; esp. W 275°; incl. 40°; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
464. ***Galium schmidii*** Arrigoni (*) – H scap– Endem. SA – rocky places; indifferent to the nature of the substrate; NRS.
P.ta Reigraxius, Marganai, Iglesias. Ballero et Marras, 10.VI.1992 (CAG).
465. ***Galium spurium*** L. (*) – T scap – Euro-Medit.-Irano-Turan. – arid untilled lands, garrigues; calcicolous species; WRS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
466. ***Galium tricornutum*** Dandy (*) – T scap – Euro-Medit.-Irano-Turan. – tilled lands, mainly cereal crops; NRS.
Massiccio del Marganai, radure soleggiate; sporadica (Ballero & Angiolino 1991).
467. ***Galium verrucosum*** Huds. s.l.[31] (*) – T scap – Euro-Medit. – depositional areas and annual grasslands; WBS.
Massiccio del Marganai, siepi; comune (Ballero & Angiolino 1991, sub *G. verrucosum* Huds.).
468. ***Rubia peregrina*** L. subsp. ***peregrina*** (*) – P lian – Medit. – shrublands and woods; WBL.
Case Marganai, Iglesias. Fogu, 30.V.1989 (CAG).
Massiccio del Marganai, macchie secondarie; comune (Ballero & Angiolino 1991).
Tinny, Sa Duchessa, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999
Arenas, Fluminimaggiore, 26.VI.1999; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
469. ***Sherardia arvensis*** L. (*) – T scap – Euro-Medit. – roadsides, untilled lands and garrigues; WBL.
Massiccio del Marganai, siepi e macchie; comune (Ballero & Angiolino 1991).
470. ***Theligonum cynocrambe*** L. (*) – T scap – Medit. – stony grounds and stony areas; WRS.
Massiccio del Marganai, pratelli tra il litosuolo; comune (Ballero & Angiolino 1991, sub *Thelygonum cynocrambe* L.).
Sa Duchessa (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas. 27.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
471. ***Valantia muralis*** L. (*) – T scap – Medit. – stony areas and walls; WRS.
Massiccio del Marganai, nei pratelli; comune (Ballero & Angiolino 1991).

Gentianaceae Juss. (1789)

472. ***Blackstonia perfoliata*** (L.) Huds. subsp. ***perfoliata*** (*) – T Scap – Euro-Medit. – clearings and grasslands; WRS.
Massiccio del Marganai, diffusa nei pratelli (Ballero & Angiolino 1991, sub *Chlora perfoliata* L.).
Baueddu, Iglesias, 26.IV.1999; Tinny, Sa Duchessa, Buggerru, 29.IV.1999 (Angiolini & Bacchetta 2003).
Marganai, Domusnovas. Quota 640 m s.l.m.; esp. WNW; incl. 10°; substrato calcari; 21.VI.2001 (Bacchetta & Mossa 2004).
Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Flu-

[30] The presence of *G. glaucophyllum* in garrigues of *Cistus* sp. seems rather unlikely.

[31] Conti et al. (2005) reported for Sardinia the subspecies *halophilum* (Ponzo) Lambinon, endemic to Sardinia, Sicily, Corsica and Elba Island, and not reported by Pignatti (1982). However, one cannot exclude the presence of the nominal subspecies.

minimaggiore, 26.VI.1999; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini & Bacchetta 2003).
Presso uscita Grotta di S. Giovanni (lato opposto a Domusnovas), Domusnovas. Substrato: calcari paleozoici; 220 m s.l.m. Pontecorvo, 4.VI.2006 (CAG).
Ingresso di una miniera presso il Passo della Croce, Iglesias. Quota 660 m s.l.m.; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
473. ***Centaurium erythrea*** Rafn subsp. ***erythrea***[32] (*) – T scap – Euro-Medit. – muds, humid sands, shrublands and garrigues; WBL.
Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
Distretto minerario di Montevecchio (Bacchetta et al. 2007).
Monte Arcuentu, fanghi e sabbie umide, macchie e garighe; pc-WBL (Bacchetta et al., in press-b).
474. ***Centaurium erythraea*** Rafn. subsp. ***rhodense*** (Boiss. et Reut.) Melderis (*) – T scap – Medit. – grasslands and garrigues; WBL.
Obs. Sa Duchessa.
475. ***Centaurium erythrea*** Rafn. subsp. ***rumelicum*** (Velen.) Melderis – T scap – Paleotemp. – grasslands and garrigues. Not found in the study area.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).

Apocynaceae Adans. (1763)

476. ***Asclepias fruticosus*** L. (*) – P caesp – Nat. (S-Africa) – alluvial mattresses and gravel bed streams; NRS.
Massiccio del Marganai, sporadica negli alvei dei torrenti, nella zona basale del versante meridionale, periodicamente asciutti (Ballero & Angiolino 1991, sub *Gomphocarpus fruticosus* (L.) Aiton fil.).
477. ***Nerium oleander*** L. subsp. ***oleander*** (*) – P caesp – Medit. – gravel bed streams; WRL.
Massiccio del Marganai, comune lungo gli argini dei ruscelli (Ballero & Angiolino 1991).
Rio Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini et al. 2005).
478. ***Vinca difformis*** Pourr. subsp. ***sardoa*** Stearn (*) – Ch rept – Endem. SA – roadsides, hedges and water courses; WRL.
Massiccio del Marganai, comune; siepi (Ballero & Angiolino 1991, sub *V. sardoa* (Stearn) Pign.).

Unplaced family[33]
Boraginaceae Juss. (1789)

479. ***Borago officinalis*** L. (*) – T scap – Medit. – ruderal areas, roadsides, untilled lands and grasslands; WRL.
Massiccio del Marganai, prati, luoghi aperti; comune (Ballero & Angiolino 1991).
480. ***Buglossoides arvensis*** (L.) I.M. Johnst. (*) – T scap – Paleotemp. – untilled lands, arid grasslands and garrigues; WRS.
Punta S. Michele, Domusnovas. Substrato: calcari paleozoici; coordinate: UTM E 465873 N 4354504; esposizione 260 W; inclinazione 30°; 900 m s.l.m. Bacchetta, Gamper et Pontecorvo, 9.VI.2004 (CAG).
Punta S. Michele, Domusnovas. Quota 890 m s.l.m.; substrato calcari paleozoici. Pontecorvo, 2.IV.2006 (CAG).
481. ***Cerinthe major*** L. s.l.[34] (*) – T scap – Medit. – roadsides and untilled lands; WRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
482. ***Cynoglossum cheirifolium*** L. subsp. ***cheirifolium*** (*) – H bienn – W-Medit. – arid grasslands, garrigues; calcicolous species; WBS.
Massiccio del Marganai, in alcune radure tra la lecceta; sporadica (Ballero & Angiolino 1991).
483. ***Cynoglossum creticum*** Mill. (*) – H bienn – Medit.-Irano-Turan. – roadsides, untilled lands and grasslands; WBL.
Massiccio del Marganai, radure soleggiate; diffusa (Ballero & Angiolino 1991).
Radura presso Punta Sca Martini, Iglesias. 850 m s.l.m.; substrato calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).
484. ***Echium anchusoides*** Bacch., Brullo et Selvi (*) – H ros – Endem. SA – stony areas and mining dumps; NBL.
Sa Duchessa, substrato argillo-ferroso, 340 m, Domusnovas. Angiolini et Bacchetta, 27.V.1999 (CAG).
Sa Duchessa, Domusnovas, su argille ferrose minerarie, 280 m. Bacchetta et Selvi, 27.V.1999 (CAG).
S. Benedetto, Iglesias. Substrato: calcari; bioclima: termomedit. sup./subumido inf.; coordinate UTM 32 SMJ 595751; 280 m s.l.m. Navarro, Jiménez et Casti, 19.V.2004 (CAG).
485. ***Echium creticum*** L. subsp. ***creticum*** (*) – H bienn – W-Medit. – arid untilled lands, semiruderal

[32] It is likely that some of the following records, most of which do not indicate a subspecific name, do not refer to the nominal subspecies but to the species s.l.

[33] The taxonomic limits of Boraginaceae, as well as the classification of the family as part of an order, still require further information before they can be defined (APG III 2009).

[34] The presence in Sardinia of the two subspecies reported by Conti et al. (2005) needs verifying.

areas, ruins, rocks; NBS.
Marganai (Iglesias). Martelli, 1905 (FI).
486. ***Echium italicum*** L. subsp. ***italicum***[35] (*) – H bienn – Euro-Medit. – synanthropic and ruderal areas, untilled lands and grasslands; WBL.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
487. ***Echium plantagineum*** L. (*) – T scap – Medit. – ruderal areas, roadsides and untilled lands; WRL.
Massiccio del Marganai, pratelli, margini delle vie; comune (Ballero & Angiolino 1991).
Periferia di Domusnovas. Substrato terreni di riporto. Pontecorvo, 4.VI.2006 (CAG).
488. ***Echium vulgare*** L. s.l. (*) – H bienn – Euro-Medit. – untilled lands and pastures; WRS.
Massiccio del Marganai, prati e radure; diffusa (Ballero & Angiolino 1991).
489. ***Heliotropium europaeum*** L. (*) – T scap – Euro-Medit.-Irano-Turan. – ruderal areas, roadsides and untilled lands; WRL.
Massiccio del Marganai, luoghi ruderali; comune (Ballero & Angiolino 1991).
490. ***Myosotis arvensis*** (L.) Hill subsp. ***arvensis*** (*) – T scap – Euro-Medit. – untilled lands and grasslands; WRS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
491. ***Myosotis ramosissima*** Rochel ex Schult. subsp. ***ramosissima*** (*) – T scap – Euro-Medit.-Irano-Turan. – grasslands and garrigues; WRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991, sub *E. italicum* L.).

Solanales Dumort. (1829)
Convolvulaceae Juss. (1789)

492. ***Calystegia sepium*** (L.) R. Br. subsp. ***sepium*** (*) – H scand – Paleotemp. – edges of streams, humid grasslands and untilled lands; WRS.
Massiccio del Marganai, luoghi erbosi; diffusa (Ballero & Angiolino 1991, sub *C. sepium* (L.) R. Br.).
493. ***Convolvulus althaeoides*** L. (*) – H scand – Medit. – roadsides, grasslands and garrigues; WBS.
Massiccio del Marganai, prati e siepi; comune (Ballero & Angiolino 1991).
Marganai 29.IV.1999 (Angiolini & Bacchetta 2003).
494. ***Convolvulus arvensis*** L. (*) – G rhiz – Paleotemp. – roadsides, grasslands and garrigues; WBS.
Massiccio del Marganai, prati, radure, siepi; comune (Ballero & Angiolino 1991).
495. ***Convolvulus cantabrica*** L. (*) – H scap – Euro-Medit. – arid grasslands, garrigues (calcicolous); WRS.
San Giovanni Miniera, Iglesias, 6.VI.2002 (Angiolini et al. 2005).
496. ***Convolvulus siculus*** L. subsp. ***agrestis*** (Schweinf.) Verdc. (*) – T scap – S-Medit. – sunlit and dry rock fissures; NRS.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).
497. ***Cuscuta epithymum*** (L.) L. subsp. ***corsicana*** (Yunck.) Lambinon (*) – T par – Endem. SA-CO – parasite of various herbs and shrubs of the Fabaceae family; WBS.
Massiccio del Marganai, diffusa su specie diverse (Ballero & Angiolino 1991).

Solanaceae Juss. (1789)

498. ***Hyoscyamus niger*** L. (*) – T scap – Paleotemp. – debris, sheepfolds, under walls and rubble; NRS.
Massiccio del Marganai, luoghi ruderali; diffusa (Ballero & Angiolino 1991).
499. ***Lycium europaeum*** L. – NP – Medit. – alluvial mattresses in torrential water courses. Not found in the study area.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
500. ***Nicotiana glauca*** Graham – NP – Avv. (Neotrop.) – cultivated and naturalized on walls, rocks and rubble. Not found in the study area.
Massiccio del Marganai, diffusa nella zona basale, in prossimità di zone antropizzate (Ballero & Angiolino 1991).
501. ***Solanum nigrum*** L. (*) – T scap – Boreo-Trop. – sheepfolds and ruderal areas; WRL.
Massiccio del Marganai, pratelli, siepi; sporadica (Ballero & Angiolino 1991).
502. ***Solanum sodomaeum*** L. (*) – NP – Nat. (S-Africa) – ruderal areas, untilled lands, in the more thermophilous areas; NRS.
Massiccio del Marganai, presente sporadicamente solo alla base, ai margini delle vie (Ballero & Angiolino 1991).

Lamiales Bromhead (1838)
Oleaceae Hoffmanns. & Link (1809)

503. ***Fraxinus angustifolia*** Vahl subsp. ***oxycarpa***

[35] Conti et al. (2005) also reported the subspecies *bieberstein* (Lacaita) Greuter et Burdet for Italy, albeit with a range to be defined, as well as the subspecies *siculum* (Lacaita) Greuter et Burdet, endemic of Sicily. In absence of records of these subspecies from Sardinia and on the basis of reports of the nominal subspecies, all records of *E. italicum* are attributed to the latter,

(Willd.) Franco et Rocha Afonso – P scap – W-Medit. - riparian woods and shrublands. Not found in the study area.
Massiccio del Marganai, introdotta quale essenza ornamentale; comune (Ballero & Angiolino 1991).
504. ***Fraxinus ornus*** L. subsp. ***ornus*** (*) – P scap – Avv. (N-Medit.) – mesophilous woods; NRS.
Rio de Bau (Bornemann ex Barbey 1885).
Obs. North-facing slopes at Punta Sa Martinedda and Sca Martini, Iglesias.
505. ***Olea europea*** L. var. ***sylvestris*** Brot.[36] (*) – P caesp/P scap – Medit. – thermophilous woods and shrublands; WBL.
Massiccio del Marganai, macchie e radure; comune (Ballero & Angiolino 1991, sub *O. oleaster* Hoffmgg. et Link).
M. Sigue, Iglesias. Bacchetta & Mossa, 16.IV.1992 ex Bacchetta et al. (2004).
Rio Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini et al. 2005).
506. ***Phillyrea angustifolia*** L. (*) – P caesp – Medit. – garrigues and thermophilous shrublands; WBL.
Massiccio del Marganai, comune tra la macchia, specie nelle prime pendici calde e ben esposte (Ballero & Angiolino 1991).
507. ***Phillyrea latifolia*** L. (*) – P scap – Medit. – thermophilous shrublands and woods; WRL.
Massiccio del Marganai, macchie e radure; comune (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Tinny, Sa Duchessa, Domusnovas, 27.IV.1999; Buggerru, 29.IV.1999 (Angiolini & Bacchetta 2003, sub *P. media* L.).
Rio Sa Duchessa, Domusnovas. 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999 (Angiolini et al. 2005).

Plantaginaceae Juss. (1789)

508. ***Antirrhinum majus*** L. subsp. ***majus*** – Ch frut – Nat. (W-Medit.) – cliffs, rocky slopes, ruins and walls. Not found in the study area.
Massiccio del Marganai, radure, pietraie; sporadica (Ballero & Angiolino 1991).
509. ***Callitriche stagnalis*** Scop. (*) – I rad – Circumbor. – stagnant or slowly flowing water. Not found in the study area; NRS.
Massiccio del Marganai, solo in alcune pozzette della zona basale (Ballero & Angiolino 1991).

[36] Conti et al. (2005) did not take this variety into account, and brought *O. europaea* L. subsp. *oleaster* (Hoffmanns. et Link) Negodi into synonymy with *O. europaea* L. It is considered necessary to maintain, even in scientific nomenclature, a different name for the cultivated olive tree and the wild olive, in order to distinguish them in regions such as Sardinia, where both are abundant.

510. ***Cymbalaria aequitriloba*** (Viv.) A. Chev. subsp. ***aequitriloba*** (*) – Ch rept – Endem. SA-CO-BL-AT – shady and humid rocks, sources; WRS.
Pressi Grotte di S. Giovanni, Domusnovas. Fogu, 15.V.1987 (CAG).
Massiccio del Marganai, diffusa nelle zone fresche ed ombrose (Ballero & Angiolino 1991).
511. ***Digitalis purpurea*** L. var. ***gyspergerae*** (Rouy) Fiori (*) – H scap – Euro-Medit. – clearings and edges of paths over 320 m of altitude; NRS.
Obs. Holm oak woods near Arenas, Tinny.
512. ***Linaria arvensis*** (L.) Desf. (*) – T scap – Euro-Medit. – tilled and arid untilled lands; NRS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
513. ***Linaria pelisseriana*** (L.) Mill. (*) – T scap – Medit.-Atl. – edges of mule tracks, grasslands and garrigues; WRS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
514. ***Misopates orontium*** (L.) Raf. subsp. ***orontium*** (*) – T scap – Paleotemp. – arid grasslands and rocky areas; WRS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
515. ***Plantago bellardii*** All. (*) – T scap – Medit. – roadsides, untilled lands and grasslands; WBS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991, sub *P. bellardi* All.).
516. ***Plantago coronopus*** L. subsp. ***coronopus*** (*) – T scap – Medit. – roadsides, untilled lands and grasslands; WBL.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
517. ***Plantago lagopus*** L. (*) – T scap – Medit. – arid grasslands and untilled lands; WRL.
518. ***Plantago lanceolata*** L. (*) – H ros – Circumbor. – ruderal areas, roadsides and grasslands; WBS.
Massiccio del Marganai, radure e pratelli; comune (Ballero & Angiolino 1991).
519. ***Veronica arvensis*** L. (*) – T scap – Paleotemp. – synanthropic areas, untilled lands and grasslands; WBS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
Monte Marganai, Domusnovas. Fogu, 25.V.1993 (CAG).
520. ***Veronica beccabunga*** L. (*) – H rept – Paleotemp. – slowly flowing waters and slushy areas; WRS.
Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991).
521. ***Veronica cymbalaria*** Bodard subsp. ***cymbalaria*** (*) – T scap – Medit. – rocks, walls, vineyards, olive

groves, gardens, ruins; WBL.
Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991).
Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
Punta S. Michele, Domusnovas. Quota 890 m s.l.m.; substrato calcari paleozoici. Pontecorvo, 2.IV.2006 (CAG).

Scrophulariaceae Juss. (1789)

522. ***Scrophularia canina*** L. subsp. ***bicolor*** (Sm.) Greuter (*) – H scap – Endem. SA-CO-SI – stony areas and mining dumps; NRL
Sa Duchessa, Domusnovas. Substrato: discariche minerarie; esposizione NNW 330°; 540 m s.l.m. Angiolini & Bacchetta, 27.IV.1999 (CAG).
Sa Duchessa, Domusnovas. Substrato: discariche minerarie; 340 m s.l.m. Bacchetta, Català, Pontecorvo et Sotgiu-Cocco, 8.IV.2001 (CAG).
Baueddu, Iglesias, 26.IV.1999; Marganai, Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003, sub *S. bicolor* (Sibth. et Sm.) Greuter).
Rio Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini et al. 2005).
523. ***Scrophularia peregrina*** L. (*) – T scap – Medit. – clearings of woods and shrublands, stony areas; WBS.
Massiccio del Marganai, tra la macchia; comune (Ballero & Angiolino 1991).
524. ***Scrophularia trifoliata*** L. (*) – H scap – Endem. SA-CO-AT – humid and shady cliffs, riparian areas; WBS.
S. Benedetto. V. Bornemann ex Barbey (1885).
Domusnovas, strada per la miniera Sa Duchessa, 27.IV.1978, Corrias (SS)
Massiccio del Marganai, pochi esemplari in alcuni prati umidi e nei pressi di alcuni fontanili; sporadica (Ballero & Angiolino 1991).
525. ***Verbascum conocarpum*** Moris subsp. ***conocarpum*** (*) – H bienn – Endem. SA-CO-AT – escarpments, rocks and rocky walls; NRS.
Tinny, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
526. ***Verbascum creticum*** (L.) Kuntze (*) – H bienn – W-Medit – humid grasslands and untilled lands; WRL.
527. ***Verbascum pulverulentum*** Vill. (*) – H bienn – Euro-Medit. – grasslands, also arid; WRL.
Marganai, Punta S. Michele, Domusnovas. Ballero et Di Martino, 10.IX.1989 (CAG).
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
528. ***Verbascum sinuatum*** L. (*) – H bienn – Medit. – roadsides and untilled lands; WRL.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
S. Giovanni di Bindua, Iglesias, 24.IV.1999; Baueddu, Iglesias, 26.IV.1999; Sa Duchessa, Domusnovas, 27.IV.1999; Buggerru, 29.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas. 27.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).

Lamiaceae Martynov (1820)

529. ***Ajuga iva*** (L.) Schreb. s.l.[37] (*) – Ch suffr – Medit. – arid grasslands and untilled lands; WBS.
Massiccio del Marganai, sporadica lungo alcuni costoni ove il litosuolo affiora maggiormente (Ballero & Angiolino 1991).
530. ***Ballota nigra*** L. s.l.[38] (*) – H scap – Euro-Medit. – ruins, untilled lands and hedges; WBS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991, sub *B. nigra* L.).
531. ***Calamintha nepeta*** (L.) Savi subsp. ***glandulosa*** (Req) P.V. Ball (*) – H scap (Ch suffr) – Medit. – arid grasslands, untilled lands, walls, stony and rocky areas; WBL.
Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991, sub *C. nepeta* (L.) Savi).
532. ***Clinopodium vulgare*** L. subsp. ***arundanum*** (Boiss.) Nyman (*) – H scap – W-Medit. – edges of woods and riparian environments; NRS.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).
Sotto punta S. Michele, Iglesias. Quota 820 m s.l.m.; esp. W; incl. 10°; substrato calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).
533. ***Lamium album*** L. subsp. ***album*** (*) – H scap – Euro-Medit.-Irano-Turan. – untilled lands, ruins; nitrophilous species; NBS.

[37] Pignatti (1982) reported for Sardinia subspecies *pseudoiva* and the nominal subspecies, but without indicating in what they differ. Since, these subspecies have been revalued (Kergélen 1993; Conti et al. 2005). Therefore, it is not possible to know which of the following records, all sub *A. iva* (L.) Schreb, refer to the nominal subspecies, and which to subspecies *pseudoiva*. This subspecies was observed in two locations of the Iglesiente reported for this taxon, but its distribution is certainly wider. Instead, there are no data reflecting the presence of the nominal subspecies.

[38] Pignatti (1982) and Conti et al. (2005) reported for Sardinia only the subspecies *uncinata* (Fiori et Bèg) Patzak. The following records, without indication of subspecies, probably relate to this one.

Massiccio del Marganai, macchie; comune (Ballero & Angiolino 1991).
534. ***Lamium bifidum*** Cirillo subsp. ***bifidum*** (*) – T scap – E-Medit. – grasslands, garrigues and thermophilous shrublands; WBS.
Massiccio del Marganai, diffusa tra la macchia (Ballero & Angiolino 1991, sub *L. bifidum* Cyr.).
535. ***Lavandula stoechas*** L. subsp. ***stoechas*** (*) – Ch frut – Medit. – garrigues and degraded shrublands; WRL.
Massiccio del Marganai, lande e radure; comune (Ballero & Angiolino 1991).
Rio Sa Duchessa, Domusnovas. 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; S. Giovanni Miniera, Iglesias, 3.VI.2001 (Angiolini et al. 2005).
536. ***Marrubium vulgare*** L. (*) – H scap – Paleotemp. – ruderal areas, sheepfolds and roadsides; WBL.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
537. ***Melissa officinalis*** L. subsp. ***officinalis*** (*) – H scap – Euro-Medit. – untilled lands, ruins; sometimes cultivated and spontaneous; WRL.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
Obs. Near Rio canonica, junction to S. Benedetto, edges of *Populus* and *Salix atrocinerea* wood.
538. ***Mentha aquatica*** L. subsp. ***aquatica*** (*) – H scap – Boreo-Trop. – humid soils, hygromorphic environments and edges of streams; WRS.
Obs. Wet grasslands near Rio Corongiu and Rio S. Giovanni, source De su Capitolo, source Mamenga.
539. ***Mentha pulegium*** L. subsp. ***pulegium*** (*) – H scap – Euro-Medit.-Irano-Turan. – humid areas and edges of streams; WRS.
Massiccio del Marganai, ai margini dei torrenti; sporadica (Ballero & Angiolino 1991).
Rio Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini et al. 2005).
Presso la sorgente all'ingresso della Grotta di S. Giovanni, Domusnovas. Quota 190 m s.l.m.; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
540. ***Mentha requienii*** Benth. subsp. ***requienii*** (*) – H rept – Endem. SA-CO – humid and dripping places, near streams; NRS.
Oss. schistous, dripping cliffs between Canale Bega and Sarmentus.
541. ***Mentha spicata*** L. (*) – H scap – Euro-Medit. – untilled lands, roadsides and grasslands; NRS.
Massiccio del Marganai, cunette, pratelli freschi; diffusa (Ballero & Angiolino 1991).
542. ***Mentha suaveolens*** Ehrh. subsp. ***insularis*** (Req.) Greuter (*) – H scap – Endem. SA-CO-AT-BL – humid places, sources and edges of streams; WBL.
Grotte di Domusnovas: all'esterno, lato Sa Duchessa, 5.VII.1978, Atzei (SASSA, sub *M. insularis* Req. ex Gren. et Godr.).
Massiccio del Marganai, diffusa su suoli pantanosi (Ballero & Angiolino 1991, sub *M. suaveolens* Ehrh. subsp. *insularis* (Req.) Greuter).
Presso le Grotte di S. Giovanni, Domusnovas. Scrugli et Cogoni, 21.X.1992 (CAG, sub *M. insularis* Req. ex Gren. et Godr.).
Sorgente presso l'ingresso della Grotta di S. Giovanni, Domusnovas. Quota 190 m s.l.m.; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG, sub *M. insularis* Req. ex Gren. et Godr.).
543. ***Micromeria graeca*** (L.) Benth. ex Rchb. subsp. ***graeca*** (*) – Ch suffr – Medit. – arid grasslands, stony grounds and rocky areas; WRL.
Tinny, Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999.
Rio Sa Duchessa, Domusnovas. 27.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
544. ***Micromeria graeca*** (L.) Benth. ex Rchb. subsp. ***tenuifolia*** (Ten.) Nyman[39] – Ch suffr – C-Medit. – Rocky areas and stony grounds. Not found in the study area.
Massiccio del Marganai, radure, prati, margine delle vie; comune (Ballero & Angiolino 1991).
545. ***Prasium majus*** L. (*) – Ch frut – Medit. – garrigues and low shrublands; WRL.
Massiccio del Marganai, siepi e macchioni; comune (Ballero & Angiolino 1991).
546. ***Prunella vulgaris*** L. subsp. ***vulgaris*** (*) – H. scap – Circumbor. – humid soils and hygromorphic environments; WBS.
Massiccio del Marganai, nella lecceta; diffusa (Ballero & Angiolino 1991, sub *P. vulgaris* L.).
547. ***Rosmarinus officinalis*** L. subsp. ***officinalis*** (*) – NP – Medit. – shrublands, garrigues and cliffs; calcicolous; WBL.
Massiccio del Marganai, macchie; comune (Ballero & Angiolino 1991).
Tinny, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
548. ***Salvia verbenaca*** L. (*) – H scap – Medit.-Atl. – ruderal areas, roadsides, untilled lands and grasslands; WBL.
Massiccio del Marganai, comune nei pratelli (Ballero & Angiolino 1991).
549. ***Sideritis romana*** L. subsp. ***romana*** (*) – T scap – W-Medit. – grasslands, garrigues and thermophilous shrublands; WRL.

[39] This subspecies possesses distinctive but not very obvious characteristics, and can easily be confused with the habitus that the nominal subspecies takes on in the sciaphilous environments.

Massiccio del Marganai, radure aride; diffusa (Ballero & Angiolino 1991, sub *S. romana* L.).
550. ***Stachys corsica*** Pers. (*) – H rept – Endem. SA-CO – shady and humid cliffs and rocky fissures above 600 m of altitude; WRS.
Massiccio del Marganai, solo in prossimità di P.ta Marganai, anfratti rocciosi; rara (Ballero & Angiolino 1991).
551. ***Stachys glutinosa*** L. (*) – Ch frut – Endem. SA-CO-AT – garrigues, stony beds of streams and rocky areas; WBL.
In rupestribus Monti Marganai. Biondi, V.1880 (FI).
Grotta di S. Giovanni, versante nord, ca. 185 m, Domusnovas. Bavazzano et Ricceri, 24.V.1863 (FI).
Massiccio del Marganai, comune nelle "garrigues" di pendio (Ballero & Angiolino 1991).
Sa Duchessa, Domusnovas. Bacchetta, 8.IV.2000 (CAG).
552. ***Teucrium flavum*** L. subsp. ***glaucum*** (Jord. et Fourr.) Ronniger (*) – Ch frut – Medit. – stony areas; WRS.
Massiccio del Marganai, ai margini della lecceta e delle vie; diffusa (Ballero & Angiolino 1991). Parco Marganai, Iglesias. Legit Desogus et Pani, determinavit Ballero, 1.VII.2001 (CAG, sub *T. flavum* L.).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
553. ***Teucrium marum*** L. (*) – Ch suffr – Endem. SA-CO-AT-BL-H – garrigues, shrublands and rocky areas; WBL.
Massiccio del Marganai, macchia e radure; diffusa (Ballero & Angiolino 1991).
Parco Marganai, Iglesias. Desogus et Pani, 1.VII.2001 (CAG).
Tinny, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
554. ***Teucrium massiliense*** L. (*) – Ch suffr – W-Medit. – gravel bed streams and stony areas; WRL.
Rio Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini et al. 2005).
555. ***Thymus capitatus*** (L.) Hoffmanns. et Link (*) – Ch frut – Medit. – garrigues, arid slopes; calcicolous; NRS.
Massiccio del Marganai, roccia; diffuso (Ballero & Angiolino 1991).
556. ***Thymus herba-barona*** Loisel. – Ch rept – Endem. SA – Present on Mount Linas, but not found in the study area.
Massiccio del Marganai, solo in una località nei pressi di Reigraxius ove è sporadica; rarissima (Ballero & Angiolino 1991).
557. ***Vitex agnus-castus*** L. – P caesp – Medit. – riparian shrublands in coastal zones. Not found in the study area.
Massiccio del Marganai, comune lungo le sponde del Rio Sarmentus (Ballero & Angiolino 1991).

Orobanchaceae Vent. (1799)

558. ***Bartsia trixago*** L. (*) – T scap – Medit. – roadsides, untilled lands, grasslands and garrigues; WBL.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991, sub *Bellardia trixago* (L.) All.).
559. ***Orobanche canescens*** C. Presl (*) – T par – C-Medit. – on *Eryngium* and varied Asteraceae; NRS.
Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005).
560. ***Orobanche minor*** Sm. (*) – T par – Euro-Medit-Irano-Turan. – parasite of *Trifolium* spp.; WRL.
Massiccio del Marganai, prati e radure; comune (Ballero & Angiolino 1991, sub *O. minor* Sutton).
561. ***Orobanche ramosa*** L. subsp. ***mutelii*** (F.W. Schultz) Cout. (*) – T par – Medit. – grasslands and garrigues; WRL.
Massiccio del Marganai, pratelli e radure; diffusa (Ballero & Angiolino 1991).
562. ***Orobanche schultzii*** Mutel (*) –T par – Euro-Medit. – roadsides and edges of mule tracks; NRS.
Massiccio del Marganai, pratelli fra la lecceta; rara (Ballero & Angiolino 1991).
563. ***Parentucellia latifolia*** (L.) Caruel (*) – T scap – Medit.-Atl. – roadsides, grasslands and garrigues; WBS.
Massiccio del Marganai, comune nei prati (Ballero & Angiolino 1991).
564. ***Parentucellia viscosa*** (L.) Caruel (*) – T scap – Medit.-Atl. – grasslands, garrigues and edges of shrublands; WBS.
Massiccio del Marganai, luoghi erbosi; diffusa (Ballero & Angiolino 1991).

Acanthaceae Juss. (1789)

565. ***Acanthus mollis*** L. subsp. ***mollis*** (*) – H scap – W-Medit. – arid untilled lands and shrublands; WRS.
Massiccio del Marganai, sporadici popolamenti, zone ruderali; rara (Ballero & Angiolino 1991).
Presso l'ingresso della Grotta di S. Giovanni, Domusnovas. Quota 235 m s.l.m.; esp. W 275°; incl. 40°; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).

Verbenaceae J. St-Hil. (1805)

566. ***Verbena officinalis*** L. (*) – H scap – Boreo-

Trop. – roadsides and grasslands, synanthropic environments; WRL.
Massiccio del Marganai, cunette, pratelli; diffusa (Ballero & Angiolino 1991).

Aquifoliales Senft (1856)
Aquifoliaceae DC. ex A. Rich. (1828)

567. ***Ilex aquifolium*** L. (*) – P scap – Euro-Medit. – mesophilous woods above 670 m of altitude; NRS.
In sylvis montanis editis Marganai (...) a 1000 ad 1300 circiter metra supra maris superficiem (Moris 1837-1859).
(...) ma la vera zona popolata di Agrifoglio è attorno ai 750 metri ed esattamente nel settore circostante le "Case Marganai" tra P.ta Su Gruttoni Maurus (m. 754), la quota 739 e la quota 740 entro una cerchia di un paio di centinaia di metri di raggio (Desole 1966).
Massiccio del Marganai, diffusa solo alle quote maggiori. In alcune stazioni forma aggruppamenti monospecifici con esemplari di notevoli dimensioni al disotto dei quali vegetano un buon numero di plantule (Ballero & Angiolino 1991).
Tintillonis, Marganai, Iglesias. Fogu, 24.V.1993 (CAG).

Asterales Lindl. (1833)
Campanulaceae Juss. (1789)

568. ***Campanula erinus*** L. (*) – T scap – Medit. – rocky areas and arid grasslands; WBS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
569. ***Jasione*** gr. ***montana*** L. (*) – H bienn – Euro-Medit. – pebbly or sandy areas and arid parts stream beds; WBL.
Massiccio del Marganai, radure e luoghi erbosi; diffusa (Ballero & Angiolino 1991).
Sa Duchessa, Domusnovas. Substrato: sterili di miniera argillosi e ferrosi; esposizione 0-360°; inclinazione 0°; 280 m s.l.m. Selvi et Bacchetta, 29.V.1999 (CAG).
Sa Duchessa, Domusnovas. Substrato: discariche minerarie; 340 m s.l.m. Bacchetta, Català, Pontecorvo et Sotgiu-Cocco, 8.IV.2001 (CAG).
Baueddu, Iglesias, 26.IV.1999; Marganai, Sa Duchessa (Angiolini & Bacchetta 2003).
P.ta Pitzianti, Fluminimaggiore, 3.IX.2000 (Angiolini et al. 2005).
570. ***Legousia falcata*** (Ten.) Janch. (*) – T scap – Medit. – roadsides, untilled lands and grasslands; WBS.
Chiesetta di S. Giovanni, Marganai, Iglesias. Ballero, 10.VII.1989 (CAG, sub *L. castellana* (Lange) Samp.)[40].
Massiccio del Marganai, diffusa nei pratelli (Ballero & Angiolino 1991).
Massiccio del Marganai, fra le siepi e nei prati; sporadica (Ballero & Angiolino 1991, anche sub *L. castellana* (Lange) Samp.)[41].
571. ***Legousia hybrida*** (L.) Delabre (*) – T scap – Euro-Medit. – infestant in cereal fields; NRS.
Obs. Low altitude parts of the study area.

Asteraceae Martynov (1820)

572. ***Achillea ligustica*** All. (*) – H scap – Medit. – arid slopes exposed to the sun; WRL.
Massiccio del Marganai, margini delle siepi; comune (Ballero & Angiolino 1991).
Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
573. ***Andryala integrifolia*** L. (*) – T scap – Medit. – grasslands, garrigues and clearings in shrublands; WBS.
Massiccio del Marganai, luoghi erbosi; diffusa (Ballero & Angiolino 1991).
574. ***Anthemis arvensis*** L. subsp. ***arvensis*** (*) – T scap – Medit. – ruderal areas, pastures and untilled lands; WBL.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
575. ***Anthemis maritima*** L. (*) – H scap – W-Medit. – sand and dunes; NRS.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).
Obs. Barraxiutta, Arenas.
576. ***Arctium minus*** (Hill.) Bernh. (*) – H bienn – Euro-Medit. – roadsides; NRS.
Obs. A single population observed at the entrance of the Linasia garden (Case Marganai).
577. ***Artemisia arborescens*** L. (*) – NP – Medit. – roadsides, garrigues and thermophilous shrublands; WRL.
Massiccio del Marganai, comune sui versanti assolati (Ballero & Angiolino 1991).
Tra S. Benedetto ed il Passo della Croce, Iglesias. Quota 455 m s.l.m.; substrato metamorfiti paleozoiche. Pontecorvo et Carai, 9.VII.2006 (CAG).

[40] In the exsiccata deposited at the CAG Herbarium, the calix-teeth are about as long as the tube, and not just over half as in *L. castellana*. Also, other characteristics of the sample suggest that it is probably a small sized specimen of *L. falcata*.
[41] See previous note.

578. ***Atractylis cancellata*** L. (*) – T scap – Medit. – garrigues and arid pastures; WRL.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
579. ***Atractylis gummifera*** L. (*) – H ros – S-Medit. – garrigues and arid pastures; WRL.
Iglesias (Fiori 1913, sub *Carlina fontanesii* DC.).
Massiccio del Marganai, ai margini dei pratelli; comune (Ballero & Angiolino 1991).
580. ***Bellis annua*** L. subsp. ***annua*** (*) – T scap – Medit.-Atl. – ruderal areas, roadsides and grasslands; WBL.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
Sentiero sul bordo del Rio Sarmentus, Domusnovas. Coordinate E 46682 N 4356934; quota 275 m s.l.m.; esp/incl.=0. Pontecorvo et Carai, 8.IV.2006 (CAG).
581. ***Bellis perennis*** L. (*) – H ros – Euro-Medit. – roadsides and grasslands; WBL.
Massiccio del Marganai, comune nelle zone fresche (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999 (Angiolini & Bacchetta 2003).
582. ***Bellis sylvestris*** Cirillo (*) – H ros – Medit. – grasslands and clearings; WBL.
Massiccio del Marganai, diffusa ai margini della macchia (Ballero & Angiolino 1991).
583. ***Bellium bellidioides*** L. (*) – H ros – Endem. SA-CO-BL – wet and cool rocks, sources; WBL.
Versante Nord del M. Marganai, Domusnovas. Arrigoni, 12.VI.1966 (FI)
Massiccio del Marganai, solo lungo l'alveo di alcuni ruscelli e in poche zone umide (Ballero & Angiolino 1991).
Sa Duchessa, su argille ferrose minerarie, Domusnovas. Bacchetta, Català, Pontecorvo et Sotgiu-Cocco, 8.IV.2001 (CAG).
Baueddu, Iglesias, 26.IV.1999 (Angiolini & Bacchetta 2003).
584. ***Calendula arvensis*** L. (*) – T scap – Euro-Medit. – ruderal areas, roadsides, sheepfolds and grasslands; WBL.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
585. ***Carduus pycnocephalus*** L. subsp. ***pycnocephalus*** (*) – H bienn – Medit. – ruderal areas and roadsides; WRL.
Massiccio del Marganai, nelle radure; diffusa (Ballero & Angiolino 1991).
586. ***Carlina corymbosa*** L. (*) – H scap – W-Medit. – roadsides, grasslands and garrigues; WBL.
Massiccio del Marganai, radure degradate; comune (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Marganai, Tinny, Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas. 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; Sa Duchessa, Domusnovas, 3.IX.2000; San Giovanni Miniera, Iglesias, 3.VI.2001; 6.VI.2002 (Angiolini et al. 2005).
587. ***Carlina lanata*** L. (*) – T scap – Medit. – roadsides and untilled lands; NRL.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
588. ***Carthamus lanatus*** L. subsp. ***lanatus*** (*) – T scap – Medit.-Irano-Turan. – arid untilled lands, olive groves and vineyards; WRS.
Massiccio del Marganai, luoghi sassosi; comune (Ballero & Angiolino 1991).
589. ***Centaurea calcitrapa*** L. (*) – H bienn – Medit.-Atl. – anthropized areas, roadsides and grasslands; WRS.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
590. ***Centaurea melitensis*** L. (*) – T scap – Medit. – roadsides and arid untilled lands; NRS.
Massiccio del Marganai, comune nelle radure (Ballero & Angiolino 1991).
591. ***Centaurea napifolia*** L. (*) – T scap – W-Medit. – untilled lands and grasslands; NRL.
Iglesias. Gennari (*sine firma*) VI.1859 (CAG).
Massiccio del Marganai, diffusa ai margini dei sentieri nella zona basale (Ballero & Angiolino 1991).
592. ***Chondrilla juncea*** L. (*) – H scap – Euro-Medit.-Irano-Turan. – grasslands and garrigues; WRS.
Massiccio del Marganai, nei prati; comune (Ballero & Angiolino 1991).
593. ***Cichorium intybus*** L. subsp. ***intybus*** (*) – H scap – Paleotemp. – untilled lands and edges of fields; WBL.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).
594. ***Cirsium scabrum*** (Poir.) Bonnet et Barratte (*) – H scap – W-Medit. – woods, hedges and untilled lands; WBS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
595. ***Cirsium vulgare*** (Savi) Ten. (*) – H bienn – Paleotemp. – roadsides and grasslands; WRS.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
596. ***Crepis sancta*** (L.) Babc. subsp. ***sancta*** (*) – T scap – Euro-Medit. – untilled lands, arid grasslands and cliffs; NRS.

Barraxiutta, Domusnovas, 29.IV.1999 (Angiolini & Bacchetta 2003).

597. ***Crepis vesicaria*** L. subsp. ***hyemalis*** (Biv.) Babc. (*) – T scap – Endem. SA-SI – roadsides, untilled lands, grasslands and garrigues; NRS.

Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).

598. ***Crupina crupinastrum*** (Moris) Vis. (*) – T scap – Medit. – grasslands, garrigues and clearings; WBL.

Massiccio del Marganai, prati, margine delle vie; comune (Ballero & Angiolino 1991).

Punta S. Michele, Domusnovas. Substrato: calcari paleozoici; coordinate: UTM E 465873 N 4354504; esposizione 260 W; inclinazione 30°; 900 m s.l.m. Bacchetta, Gamper et Pontecorvo, 9.VI.2004 (CAG).

599. ***Cynara cardunculus*** L. subsp. ***cardunculus*** (*) – H scap – Medit. – roadsides and untilled lands; WRL.

Massiccio del Marganai, diffusa nelle radure degradate (Ballero & Angiolino 1991).

600. ***Dittrichia graveolens*** (L.) Greuter (*) – T scap – Medit. – roadsides, untilled lands and grasslands; NRL.

Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991, sub *Inula graveolens* (L.) Desf.).

601. ***Dittrichia viscosa*** (L.) Greuter s.l. (*) – Ch suffr – W-Medit. – ruderal areas, roadsides and grasslands; WBL.

Massiccio del Marganai, pratelli; molto diffusa (Ballero & Angiolino 1991).

Baueddu, Iglesias, 26.IV.1999; Rio di Monteponi; Tinny, Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999; Buggerru, 29.IV.1999 (Angiolini & Bacchetta 2003).

Rio Sa Duchessa, Domusnovas 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; Sa Duchessa, Domusnovas, 3.IX.2000; P.ta Pitzianti, Fluminimaggiore, 3.IX.2000; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005).

602. ***Erigeron canadensis*** L. (*) – T scap – Cosmop. – arid untilled lands; WRL.

Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991, sub *Conyza canadensis* (L.) Cronq.).

603. ***Eupatorium cannabinum*** L. subsp. ***corsicum*** (Loisel.) P. Fourn. (*) – H scap –Endem. SA-CO-ITM (Basilicata) – sources, streams and riparian woods; WRL.

Massiccio del Marganai, luoghi freschi; diffusa (Ballero & Angiolino 1991, sub *E. cannabinum* L.).

604. ***Filago gallica*** L. (*) – T scap – Euro-Medit. – fields, arid untilled lands; WRL.

Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991, sub *Oglifa gallica* (L.) Chrtek et Holub.).

605. ***Filago pygmaea*** L. (*) – T rept – Medit. – therophytic grasslands and edges of paths of cacuminal areas; WRL.

Is Arenas, Fluminimaggiore. Substrato: discarica mineraria; esposizione S-SW; inclinazione 60°; 595 m s.l.m. Angiolini & Bacchetta, 25.IV.1999 (CAG, sub *Evax pygmaea* (L.) Brot.).

606. ***Filago pyramidata*** L. (*) – T scap – Euro-Medit. – arid untilled lands; NRS.

Massiccio del Marganai, sporadica nei pratelli (Ballero & Angiolino 1991).

607. ***Filago vulgaris*** Lam. (*) – T scap – Paleotemp. – untilled lands, tilled lands after harvest, roadsides, grasslands; WBL.

Punta S. Michele, Domusnovas. Substrato: calcari paleozoici; coordinate: UTM E 465873 N 4354504; esposizione 260 W; inclinazione 30°; 900 m s.l.m. Bacchetta, Gamper et Pontecorvo, 9.VI.2004 (CAG, sub *F. germanica* (L.) Hudson).

608. ***Galactites tomentosa*** Moench (*) – H bienn – Medit. – ruderal areas, roadsides, untilled lands and grasslands; WBL.

Massiccio del Marganai, radure e pratelli; comune (Ballero & Angiolino 1991).

Baueddu, Iglesias, 26.IV.1999 (Angiolini & Bacchetta 2003).

Rio Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini et al. 2005).

609. ***Gazania uniflora*** Sims (*) – H scap – Avv. – cultivated as an ornament and sometimes subspontaneous near human settlements; NRS.

Presso la casermetta di Punta Pilocca, Fluminimaggiore. Quota 630 m s.l.m. Pontecorvo et Carai, 30.X.2005 (CAG).

610. ***Glebionis coronaria*** (L.) Spach (*) – T scap – Medit. – anthropized areas, roadsides and untilled lands; WRL.

Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991, sub *Chrysanthemum coronarium* L.).

611. ***Hedypnois cretica*** (L.) Dum. Cours. (*) – T scap – Medit. – grasslands and garrigues; WRS.

Massiccio del Marganai, radure; diffusa (Ballero & Angiolino 1991).

612. ***Helichrysum microphyllum*** (Willd.) Camb. subsp. ***tyrrhenicum*** Bacch., Brullo et Giusso (*) – Ch suffr – Endem. SA-CO-BL – rocky areas, depositional areas of streams, garrigues and degraded shrublands; WBL.

In aridis et rupestribus montosis Marganari. Martelli, 8.IV.1894 (FI) ex Bacchetta et al. (2003a).

Massiccio del Marganai, rupi, discariche minerarie, radure; comune (Ballero & Angiolino 1991, sub *H. ita-*

licum (Roth.) G. Don. subsp. *microphyllum* (Willd.) Nyman).
Baueddu, Iglesias, 26.IV.1999; Marganai, Tinny, Sa Duchessa, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003, sub *H. italicum* (Roth) G. Don fil. subsp. *microphyllum* (Willd.) Nyman).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; Sa Duchessa, Domusnovas, 3.IX.2000; P.ta Pitzianti, Fluminimaggiore, 3.IX.2000; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005).
613. ***Helichrysum montelinasanum*** Em. Schmid (*) – Ch suffr – Endem. SA – fissures in rocks and cliffs; NRL.
Punta de Tinni, Arenas, Domusnovas. Scrugli et Cogoni, 12.VI.1992 (CAG).
614. ***Helminthotheca echioides*** (L.) Holub (*) – T scap – Medit. – roadsides, ruderal areas and grasslands; WBS.
Massiccio del Marganai, radure erbose; comune (Ballero & Angiolino 1991, sub *Picris echioides* L.).
615. ***Hyoseris radiata*** L. subsp. ***radiata*** (*) – H ros – Medit. – untilled lands, walls and escarpments; WBS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991)
616. ***Hypochaeris achyrophorus*** L. (*) – T scap – Medit. – grasslands, garrigues and clearings in shrublands; WBS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
Presso l'ingresso della Grotta di S. Giovanni, Domusnovas. Quota 235 m s.l.m.; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
617. ***Hypochaeris sardoa*** Bacch., Brullo et Terrasi (*) – H scap – Endem. SA – rocks, cliffs; calcifugous; NRS.
Tinny, Domusnovas. Bacchetta, Brullo, Casti et Giusso, 10.VI.2001 (CAT).
618. ***Leontodon tuberosus*** L. (*) – G bulb – Medit. – stony areas and cliffs; WBL.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas. 27.IV.1999; S. Giovanni Miniera, Iglesias, 6.VI.2002 (Angiolini et al. 2005).
619. ***Nananthea perpusilla*** (Loisel.) DC. (*) – T scap – Endem. SA-CO – grasslands near Rio Cruccueu; NRL.
Rio Cruccueu, Domusnovas. Substrato: scisti paleozoici. Legit Angius, determinavit Bacchetta, 5.I.2005 (CAG).
620. ***Notobasis syriaca*** (L.) Cass. (*) – T scap – Medit. – fields, untilled lands, arid grasslands, roadsides; WBL.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
621. ***Pallenis spinosa*** (L.) Cass. subsp. ***spinosa*** (*) – T scap (H bienn) – Medit. – ruderal areas and roadsides; WRL.
Massiccio del Marganai, radure aride; comune (Ballero & Angiolino 1991, sub *P. spinosa* (L.) Cass.).
622. ***Phagnalon rupestre*** (L.) DC. subsp. ***rupestre*** (*) – Ch suffr – W-Medit. – calcareous cliffs and walls; WRS.
Massiccio del Marganai, diffusa; rupi (Ballero & Angiolino 1991, sub *P. rupestre* (L.) DC.).
623. ***Phagnalon saxatile*** (L.) Cass. (*) – Ch suffr – W-Medit. – sunlit cliffs; WRS.
Massiccio del Marganai, radure, litosuolo; comune (Ballero & Angiolino 1991).
624. ***Phagnalon sordidum*** (L.) Rchb. (*) – Ch suffr – W-Medit. – cliffs and walls; NRS.
Massiccio del Marganai, radure; comune (Ballero & Angiolino 1991).
625. ***Plagius flosculosus*** (L.) Alavi et Heywood (*) – Ch suffr – Endem. SA-CO-AT – beds of streams and alluvial mattresses; WRL.
Massiccio del Marganai, in alcune radure riparate a Su Corovau; diffuso (Ballero & Angiolino 1991, sub *Leucanthemum flosculosum* (L.) P. Giraud).
Sopra il Passo della Croce, Iglesias. Quota 660 m s.l.m.; esp. 350°N; incl. 30°; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG, sub *L. flosculosum* (L.) P. Giraud).
626. ***Ptilostemon casabonae*** (L.) Greuter (*) – H scap – Endem. SA-CO – roadsides and edges of paths, depositional areas of streams, mining dumps; WBL.
Massiccio del Marganai, in ambienti molto eterogenei; comune (Ballero & Angiolino 1991).
Massiccio del Marganai, Iglesias. Fogu, 25.V.1993 (CAG).
Baueddu, Iglesias, 26.IV.1999; Marganai, Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999; Rio Sa Duchessa, Domusnovas, 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; Sa Duchessa, Domusnovas, 3.IX.2000; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005).
627. ***Pulicaria odora*** (L.) Rchb. (*) – H scap – Medit. – clearings, shrublands and woods; WBL.
Massiccio del Marganai, pratelli; molto diffusa (Ballero & Angiolino 1991).

628. ***Reichardia picroides*** (L.) Roth (*) – H scap – Medit. – roadsides and grasslands; WBL.
Massiccio del Marganai, prati; diffusa (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999; Arenas (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; Sa Duchessa, Domusnovas, 3.IX.2000; Barraxiutta, Domusnovas, 10.VI.2001.
629. ***Rhagadiolus stellatus*** (L.) Gaertn. (*) – T scap – Medit. – untilled lands, grasslands and garrigues; WBL.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).
630. ***Robertia taraxacoides*** (Loisel.) DC. (*) – H ros – C-Medit. – rocky areas at highest altitudes; NRL.
Obs. Cacuminal areas of Mount Marganai.
631. ***Santolina corsica*** Jord. et Fourr. (*) – NP – Endem. SA-CO – arid and degraded places, mining dumps; NRS.
Marganai, Iglesias. Chiappini, 23.VI.1975 (CAG). [42]
632. ***Santolina insularis*** (Gennari ex Fiori) Arrigoni (*) – NP – Endem. SA – arid and degraded places, mining dumps; WBL.
Holotypus: Monti d'Iglesias a S. Benedetto. Gennari (*p. insularis* Genn. herb.) sine die (FI, sub *S. chamaecyparissus* L. var. *pectinata* (Benth.) b. *insularis* Genn.).
Miniera di S. Giovanni, Iglesias. Martinoli et al., 3.I.1953 (FI).
Domusnovas, versante Nord del Monte Marganai. Arrigoni, 12.VI.1966 (FI).
Malacalzetta, calcari paleozoici fra Arcu Sa Cruxi e q. 751 a Nord di punta Genna Aragosta. Arrigoni et Ricceri,16.V.1967 (FI).
Massiccio del Marganai, P.ta S. Michele, diffusa anche in lande e discariche minerarie (Ballero & Angiolino 1991).
Punta S. Michele, Massiccio Marganai, Iglesias. Fogu, 25.V.1993 (CAG).
Sa Duchessa, Domusnovas. Substrato: sterili di miniera argillosi et ferrosi; esposizione 0-360°; inclinazione 0°; 280 m s.l.m. Selvi et Bacchetta, 29.V.1999 (CAG).
Sa Duchessa, Domusnovas. Substrato: discariche minerarie; 340 m s.l.m. Bacchetta, 8.IV.2001 (CAG).
Baueddu, Iglesias, 26.IV.1999; Rio Marganai, Tinny, Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; Sa Duchessa, Domusnovas, 3.IX.2000; Radura presso Punta Sca Martini, Iglesias. 850 m s.l.m.; substrato calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).
633. ***Scolymus hispanicus*** L. (*) – H bienn – Euro-Medit. – roadsides and untilled lands; WRS.
Massiccio del Marganai, comune nelle radure (Ballero & Angiolino 1991).
634. ***Scorzonera callosa*** Moris (*) – H ros – Endem. SA – mountain grasslands; WRS.
Versante Nord del Monte Marganai, Domusnovas. Arrigoni, 12.VI.1966 (FI).
Calcarei paleozoici fra Arcu Sa Cruxi e quota 751 a Nord di Punta Genna Aragosta, Malacalzetta, Iglesias. Arrigoni et Ricceri, 16.V.1967 (FI).
Marganai, Iglesias. Camarda et Milia, 30.V.1976 (CAG).
635. ***Scorzonera villosa*** Scop. subsp. ***columnae*** (Guss.) Nyman – G rhiz (H scap) – C-Medit. – arid grasslands and rocky slopes, on limestone.[43] Not found in the study area.
La Duchessa. V. Bornemann ex Barbey (1885).
636. ***Senecio aquaticus*** Hill – H bienn – Euro-Medit. – humid and shady places. Not found in the study area.
Massiccio del Marganai, in piccole radure; sporadica (Ballero & Angiolino 1991, sub *S. erraticus* Bertol.).
637. ***Senecio delphinifolius*** Vahl (*) – T scap – W-Medit. – arid untilled lands; NRS.
Massiccio del Marganai, siepi e radure; comune (Ballero & Angiolino 1991).
Sentiero sul bordo del Rio Sarmentus, Domusnovas. Quota 280 m s.l.m.; esp. 254° WSW; incl. 40°. Pontecorvo et Carai, 8.IV.2006 (CAG).
638. ***Senecio vulgaris*** L. (*) – T scap – Paleotemp. – sheepfolds and ruderal areas; WRS.
Massiccio del Marganai, nei prati; diffusa (Ballero & Angiolino 1991).
639. ***Silybum marianum*** (L.) Gaertn. (*) – H bienn – Medit. – synanthropic and ruderal areas, roadsides and untilled lands; WBL.
Massiccio del Marganai, radure, ovili; comune (Ballero & Angiolino 1991).
640. ***Sonchus asper*** (L.) Hill subsp. ***asper*** (*) – T scap – Cosmop. – roadsides, sheepfolds and untilled lands; WRS.
Massiccio del Marganai, pratelli ombrosi; diffusa (Bal-

[42] Differentiation of the two entities of the chamaecyparissus group seems unclear and all the Corso-Sardinian populations deserve further investigation.

[43] Records of this species, which is not reported from Sardinia (Conti et al. 2005), are likely to refer to *S. callosa* Moris.

lero & Angiolino 1991).
641. ***Sonchus oleraceus*** L. (*) – T scap – Boreo-Trop. – roadsides and untilled lands; WBL.
Massiccio del Marganai, prati e radure; comune (Ballero & Angiolino 1991).
642. ***Sonchus tenerrimus*** L. (*) – T scap – Medit. – roadsides and untilled lands; NRL.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
643. ***Taraxacum*** gr. ***officinale*** Weber (*) – H ros – Circumbor. – ruderal areas, grasslands and clearings; WBL.
Massiccio del Marganai, prati, siepi; comune (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Barraxiutta, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
Arenas, Fluminimaggiore, 26.VI.1999 (Angiolini et al. 2005).
644. ***Tolpis virgata*** (Desf.) Bertol. subsp. ***virgata*** (*) – H scap – Medit. – untilled lands and arid grasslands; WRL.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991, sub *T. virgata* (Desf.) Bertol.).
645. ***Urospermum dalechampii*** (L.) F.W. Schmidt (*) – H scap – Medit. – arid grasslands, untilled lands, roadsides; WBS.
Massiccio del Marganai, prati, margine delle vie; comune (Ballero & Angiolino 1991).
Sa Duchessa, Arenas, Fluminimaggiore, 26.IV.1999; Rio Sa Duchessa, Domusnovas. 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000; P.ta Pitzianti, Fluminimaggiore, 3.IX.2000.
646. ***Urospermum picroides*** (L.) Scop. ex F.W. Schmidt (*) – T scap – Medit. – untilled lands, roadsides; WBS
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).
Tinny, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
647. ***Xanthium spinosum*** L. (*) – T scap – Nat. (Sudamer.) – arid untilled lands, ruins; NRS.
Massiccio del Marganai, pratelli; diffuso (Ballero & Angiolino 1991).

Dipsacales Dumort. (1829)
Adoxaceae E. Mey

648. ***Sambucus nigra*** L. (*) – P caesp – Euro-Medit. – riparian and mesophilous woods and shrublands; WRL.
Massiccio del Marganai, diffusa tra la macchia (Ballero & Angiolino 1991).
Massiccio del Marganai, Iglesias. Fogu, 25.V.1993 (CAG).
649. ***Viburnum tinus*** L. subsp. ***tinus*** – P caesp – Medit. – evolved bush and woods. Not found in the study area.
Massiccio del Marganai, nella lecceta; comune (Ballero & Angiolino 1991).

Caprifoliaceae Juss. (1789)

650. ***Centranthus calcitrapae*** (L.) Dufr. subsp. ***calcitrapae*** (*) – T scap – Medit. – depositional areas of streams, grasslands and garrigues; WRL.
Massiccio del Marganai, radure e pratelli; comune (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Sa Duchessa, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003).
Arenas, Fluminimaggiore, 26.VI.1999; Sa Duchessa, Domusnovas, 3.IX.2000 (Angiolini et al. 2005).
Lato strada presso il Rio Sarmentus, Domusnovas. Quota 280 m s.l.m.; esp./incl.=0; substrato calcari paleozoici. Pontecorvo et Carai, 8.IV.2006 (CAG).
651. ***Dipsacus ferox*** Loisel. (*) – H bienn – Endem. SA-CO – roadsides and untilled lands; WBL.
Monte Marganai, Domusnovas. Ballero, 1.V.1989 (CAG).
Massiccio del Marganai, in alcune radure erbose; non molto comune (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Marganai, Sa Duchessa, Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005).
652. ***Lonicera implexa*** Aiton subsp. ***implexa*** (*) – P lian – Medit. – shrublands and woods; WRS.
Massiccio del Marganai, comune fra la macchia (Ballero & Angiolino 1991, sub *L. implexa* Aiton).
P.ta Pitzianti, Fluminimaggiore, 3.IX.2000 (Angiolini et al. 2005).
653. ***Sixalix atropurpurea*** (L.) Greuter et Burdet subsp. ***grandiflora*** (Scop.) Soldano et F. Conti (*) – H bienn (T scap, H scap) – Medit. – arid untilled lands, roadsides, ruins; WBL.
Massiccio del Marganai, luoghi erbosi; diffusa (Ballero & Angiolino 1991, sub *Scabiosa maritima* L.).
Baueddu, Iglesias, 26.IV.1999; Tinny, Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta

2003, sub *Scabiosa maritima* L.).
Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; Sa Duchessa, Domusnovas, 3.IX.2000; P.ta Pitzianti, Fluminimaggiore, 3.IX.2000; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005, sub *S. atropurpurea* (L.) Greuter et Burdet subsp. *maritima* Greuter et Burdet).
654. ***Valerianella coronata*** (L.) DC. (*) – T scap – Euro-Medit. – untilled lands, arid pastures, also infestant; NRS.
Obs. Monte S. Michele.
655. ***Valerianella microcarpa*** Loisel. (*) – T scap – Medit. – roadsides, untilled lands, grasslands and garrigues; WBS.
Massiccio del Marganai, diffusa nei pratelli e radure (Ballero & Angiolino 1991).

Apiales Nakai (1930)
Araliaceae Juss. (1789)

656. ***Hedera helix*** L. subsp. ***helix*** (*) – P lian – Paleotemp. – shrublands and mesophilous woods; WRL.
Massiccio del Marganai, comune nella lecceta (Ballero & Angiolino 1991).

Apiaceae Lindl. (1836)

657. ***Ammoides pusilla*** (Brot.) Breistr. (*) – T scap – Medit. – arid untilled lands, grasslands and garrigues; WBL.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).
Ingresso di una miniera presso il Passo della Croce, Iglesias. Quota 660 m s.l.m.; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
658. ***Apium nodiflorum*** (L.) Lag. subsp. ***nodiflorum*** (*) – I rad – Paleo-Temp. – muddy puddles, sources and streams; WRL.
Massiccio del Marganai, diffusa lungo i torrenti (Ballero & Angiolino 1991).
659. ***Bifora testiculata*** (L.) Spreng. – T scap – Medit. – infestant in cereal crops. Not found in the study area.
Massiccio del Marganai, radure; molto rara (Ballero & Angiolino 1991).
660. ***Bunium corydalinum*** DC. subsp. ***corydalinum*** (*) – G bulb – Endem. SA-CO – pastures, wind-beaten garrigues.WRS.
Obs. Rocky areas near Su Gruttoni Mauri and Punta Martini (between Punta Martini and Punta San Michele).
661. ***Bupleurum baldense*** Turra (*) – T scap – Euro-Medit. – shrublands, garrigues and pastures; WRL.
Obs. P. Genna Ruxitta, mining area of Reigraxius.
662. ***Bupleurum fruticosum*** L. (*) – NP – Medit. – cliffs, garrigues; preferably on calcareous substrates; NRL.
Monte Marganai, Domusnovas. Ballero, 08:XI.1986 (CAG).
Massiccio del Marganai, rocciai; diffusa (Ballero & Angiolino 1991).
Presso il Passo della Croce, Iglesias. Quota 660 m s.l.m.; esp. 350° N; incl. 30°; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
663. ***Conium maculatum*** L. subsp. ***maculatum*** (*) – H scap – Paleotemp. – clearings in riparian and thermophilous woods and shrublands; NRS.
Massiccio del Marganai, ai margini dei torrenti; diffusa (Ballero & Angiolino 1991).
Presso il Giardino Linasia a Marganai, Iglesias. Substrato: calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).
664. ***Daucus carota*** L. subsp. ***maritimus*** (Lam.) Batt. (*) – H bienn – W-Medit. – thermophilous grasslands; WBL.
Massiccio del Marganai, comune (Ballero & Angiolino 1991).
Baueddu, Iglesias, 26.IV.1999; Rio di Monteponi, Marganai, Tinny, Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; Tinnì, Fluminimaggiore, 27.IV.1999; Arenas, Fluminimaggiore, 26.VI.1999; 13.VII.2001; Sa Duchessa, Domusnovas, 3.IX.2000; Barraxiutta, Domusnovas, 10.VI.2001 (Angiolini et al. 2005).
665. ***Daucus muricatus*** (L.) L. (*) – T scap – W-Medit. – untilled lands and grasslands; NBS.
Massiccio del Marganai, prati; comune (Ballero & Angiolino 1991).
666. ***Eryngium campestre*** L. (*) – H scap – Euro-Medit.-Irano-Turan. – synanthropic environments; WRL.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991).
667. ***Eryngium tricuspidatum*** L. (*) – H scap – SW-Medit. – grasslands and thermophilous garrigues; WRS.
Massiccio del Marganai, zona cacuminale; molto rara (Ballero & Angiolino 1991).
S. Giovanni Miniera, Iglesias, 11.VI.1998 (Angiolini et al. 2005).
668. ***Ferula communis*** L. (*) – H scap – Medit. – synanthropic areas, grasslands and garrigues; WBL.
Massiccio del Marganai, prati; diffusa (Ballero & An-

giolino 1991).
Baueddu, Iglesias, 26.IV.1999; Rio di Monteponi, Barraxiutta, Domusnovas, 27.IV.1999 (Angiolini & Bacchetta 2003).
Rio Sa Duchessa, Domusnovas, 27.IV.1999.
669. ***Foeniculum vulgare*** Mill. (*) – H scap – S-Medit. – roadsides, untilled lands and grasslands; WBL.
Massiccio del Marganai, margini delle vie, luoghi erbosi, pratelli; comune (Ballero & Angiolino 1991, sub *F. vulgare* L. subsp. *piperitum* (Ucria) Coutinho).
Sa Duchessa, Barraxiutta, Domusnovas, 27.IV.1999; Arenas, Fluminimaggiore, 26.IV.1999 (Angiolini & Bacchetta 2003, sub *F. vulgare* L. subsp. *piperitum* (Ucria) Coutinho).
Rio Sa Duchessa, Domusnovas, 27.IV.1999; Sa Duchessa, Domusnovas, 3.IX.2000.
670. ***Magydaris pastinacea*** (Lam.) Paol. (*) – H scap – W-Medit. – garrigues and rocky areas; WBL.
Massiccio del Marganai, luoghi erbosi; diffusa (Ballero & Angiolino 1991).
671. ***Oenanthe crocata*** L. (*) – H scap – Medit.-Atl. – very wet areas, sources and streams; WRL.
Sorgente presso l'ingresso della Grotta di S. Giovanni, Domusnovas. Quota 190 m s.l.m.; substrato calcari paleozoici. Pontecorvo et Carai, 9.VII.2006 (CAG).
672. ***Oenanthe lisae*** Moris – H scap – Endem. SA – swampy areas and sources. Not found in the study area.
Massiccio del Marganai, praterie terofitiche attorno a P.ta Marganai; molto rara (Ballero & Angiolino 1991).
673. ***Oenanthe pimpinelloides*** L. (*) – H scap – Medit.-Atl. – ditches, puddles and sources; WRS.
Rio Sa Duchessa, Domusnovas, 27.IV.1999 (Angiolini et al. 2005).
674. ***Oenanthe silaifolia*** M. Bieb. (*) – H scap – Medit.-Atl. – puddles, wet areas and sources; WRS.
Obs. Drains and wet areas.
675. ***Opopanax chironium*** (L.) W.D.J. Koch – H scap – Medit. – roadsides, edges of fields, pine forests and degraded shrublands. Not found in the study area.
Massiccio del Marganai, pratelli; diffusa (Ballero & Angiolino 1991).[44]
676. ***Orlaya daucoides*** (L.) Greuter (*) – T scap – Medit. – untilled lands, grasslands; NRS.
Obs. Punta S. Michele.
677. ***Pimpinella peregrina*** L. (*) – H bienn – Medit. –untilled grasslands and hedges; WRS.
Massiccio del Marganai, ai margini della macchia; sporadica (Ballero & Angiolino 1991).
Presso la Grotta di S. Giovanni, lato opposto rispetto a Domusnovas, Domusnovas. Quota 210 m s.l.m.; substrato calcari paleozoici. Pontecorvo, 4.VI.2006 (CAG).
678. ***Sanicula europaea*** L. (*) – H scap – Paleotemp. – mesophilous woods; NRS.
Obs. Mesophilous woods above 800 m altitude.
679. ***Scandix pecten-veneris*** L. subsp. ***pecten-veneris*** (*) – T scap – Euro-Medit. – grasslands and garrigues; WRL.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).
680. ***Seseli praecox*** (Gamisans) Gamisans (*) – Ch frut – Endem. SA-CO – rocky ravines and rock fissures, preferably calcareous; WRL.
Massiccio del Marganai, zone rocciose a P.ta San Michele; sporadica (Ballero & Angiolino 1991).
681. ***Smyrnium olusatrum*** L. (*) – H bienn – Medit. – ruderal and anthropized areas, untilled and humid grasslands; WBS.
Massiccio del Marganai, luoghi erbosi; comune (Ballero & Angiolino 1991).
682. ***Smyrnium perfoliatum*** L. subsp. ***rotundifolium*** (Mill.) Hartvig – H bienn (*) – E-Medit. – roadsides, untilled lands; NRS.
Massiccio del Marganai, diffusa nelle zone ombrose e fresche (Ballero & Angiolino 1991, sub *S. rotundifolium* Mill.).
683. ***Thapsia garganica*** L. (*) – H scap – Medit. – sandy areas of streams, grasslands and garrigues; WBL.
San Giovanni Miniera, Iglesias, 6.VI.2002 (Angiolini et al. 2005).
684. ***Tordylium apulum*** L. (*) – T scap – Medit. – sandy areas of streams, grasslands and garrigues; WBL.
Massiccio del Marganai, luoghi erbosi; diffusa (Ballero & Angiolino 1991).
685. ***Torilis arvensis*** (Huds.) Link subsp. ***arvensis*** (*) – T scap – Euro-Medit. – arid untilled lands, ruins, around tilled lands; WRS.
Massiccio del Marganai, radure; sporadica (Ballero & Angiolino 1991, sub *T. arvensis* (Hudson) Link).
686. ***Torilis nodosa*** (L.) Gaertn. (*) – T scap – Euro-Medit.-Irano-Turan. – edges of paths and untilled lands; WBL.
Massiccio del Marganai, pratelli; comune (Ballero & Angiolino 1991, sub *T. nodosa* (L.) Gaertner).

[44] This record is not considered plausible on account of the ecology and rarity of this species. Not observed in the study area. Perhaps confused with *Magydaris pastinacea*.

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