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Plants and grazing: an evaluation of the effects on Sardinian endemic plants conservation

Abstract

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We analysed the relationship between the 302 endemic entities of the Sardinian flora and the free-ranging domestic herbivores. This study highlights that the presence of spines, toxic compounds, resins, aromas and the adaptation to specific habitats are very effective defense traits that concur to the conservation of these species. The presence and abundance of 45.4 % endemic entities of the Sardinian flora is not affected by grazing and browsing, while domestic herbivores promote the presence and abundance of 38.4 % of endemic entities by reducing other competing species such as pabular herbs and woody species. However, grazing and browsing may threaten 16.2 % of the endemic species. This study remarks the importance of the management of free-ranging domestic herbivores for effective conservation politics aiming to protect the endemic entities of the Sardinian flora.

Key words: life forms, traits, defense, domestic herbivores, Sardinia.

Introduction

The endemic species characterise the biological history of a given region. A comprehensive understanding of the vegetation dynamic successions and of the relationships between animal and plant is the basis for an effective policy for nature conservation. That relationship could be positive and synergic, as in the case of plant-pollinators, or negative, or controversial, as in the case of herbivores and endemic plants.

The Mediterranean ecosystems, as most ecosystems at global level, have been disturbed for at least three millennia by the presence of free-ranging domestic animals (Naveh 1974; Tomaselli 1976; Di Castri 1981; Camarda 1984; Dell & al. 1986; Camarda 1991, 1992).

Domestic herbivores, in particular, have a specific impact on natural and semi-natural ecosystems in relation to the rangeland management system (Le Houérou 1981). Animal husbandry in Sardinia has affected most of the land in several ways (Le Lannou 1941) that have significantly shaped the vegetation. In Sardinia, the remains of domestic herbivores

(sheep, mouflon, goat, cattle) are documented since the Neolithic period in several caves and are becoming more abundant in the Bronze Age until our time (Wilkins 2012). Their introduction could have caused the extinction of some botanic species, although this should be verified by data of paleobotanical research. In Sardinia, studies on relationship between plants and domestic animals has been only partially investigated (Aru & al. 1982; Camarda 1984, 1987, 1989, 1990; Farris & Filigheddu 2008; Farris & al. 2009; Pisanu & al. 2009; Farris & al. 2010; Pisanu & al. 2012) despite its importance to different ecosystems. In the present study we focus on the endemic species of Sardinia. The availability of specific studies for this plant group (Arrigoni & al. 1977-91; Arrigoni 2006-15) gives the possibility to estimate the impact of domestic herbivores in relation to the different farming systems and rangeland management (Pulina & al. 2011; Pulina & Biddau 2015), aiming to assess the actual influence of domestic herbivores on the Sardinian landscape (Ronchi & al. 2013) and on the conservation of plant resources.

Material and Methods

In the last few decades, some areas formerly characterised by the free-ranging of domestic herbivores has been converted to more modern farming systems with sheds and other facilities that include the availability of extra-farm feeds. Nevertheless, the free-ranging of domestic herbivores is still a very common farming system, and grazing and browsing animals (cows, goats, sheep, pigs, horses, donkeys) use natural plant resources available in the rangelands or locally at the farm. In the present study, we did not take into account the presence and the effects of wild fauna, such as wild boars, mouflons (widespread in much of Sardinia), deers (a wild population is present in SW Sardinia), and roe deers (introduced in many areas of the island), foxes, pine marten and other small mammals such as oak rats.

Plant defensive traits are represented by functional adaptations to the local environment and by specific defensive traits against herbivores. In many cases, the same trait can be both an environmental adaptation and a defensive trait. The habitat type, such as rock outcrops and cliffs may be completely inaccessible to domestic herbivores, thus constituting a shelter that can protect the full plant life cycle. Geophytism is a life form that represents a natural adaptation to fire but also an effective defense against grazing and browsing. Geophytes with bulbs in the deep soil layers can survive for some time also in the absence of seed production. The presence of rhizomes, the prostrate or trailing habit, the presence of spines or hairiness, the production of toxic compounds (alkaloids, latex) or repellents (resins, aromas and flavours) are all very important defensive traits. The production of a high number of seeds is also an important indirect defense mechanism. Several defense traits can be shared by a single species to produce an effective defensive syndrome that could provide a competitive advantage in rangelands.

We took into account the entities that have a range restricted to Sardinia (endemic in the narrow sense) and also those species whose range includes Corsica, Balearic Islands, Tuscany Archipelago and Sicily. In a limited number of cases, we considered also those species which might be present also in the Italian southern regions facing

the Tyrrhenian see. We did not consider those species with a range that includes Africa and continental Europe.

Mostly all plant species, whenever available forage resources are scarce, could be browsed by domestic herbivores. All the endemic entities of *Fabaceae*, *Brassicaceae* and *Poaceae* are edible and are often browsed, despite their specific differences. Different parts of the same species might be browsed differently. Plant species with toxic or irritant latex are usually avoided or browsed only occasionally. Other endemic species have alkaloids or glycosides that might be toxic (*Helleborus argutifolius*), irritant (*Urtica atrovirens*) or repellent, as in the case of *Lamiaceae* (despite having an agreeable smell to men). Many other species, belonging to different families, have a very small size and therefore are neglected by herbivores. As already mentioned, geophytism with the presence of bulbs or rhizomes buried in the soil is a defensive trait against grazing and browsing. Prostrate and sub-fruticose (sub-shrubs) growth forms are tolerant to browsing as well, especially when spines or thorns are present. Endemic and rare species, or species with a punctiform range, are of course the most threatened by grazing and browsing.

Results

Table 1 lists 302 entities (species, subspecies, varieties) and their main traits such as life forms and growth forms, their distribution in Sardinia, pabularity (yes/no), defensive traits against browsing. In addition, for each entity, we estimated whether their presence and abundance is promoted or reduced by browsing and grazing (see Tab. 1 and the respective graphics in Fig. 1 and Fig. 2).

Life forms and growth forms

The biological form of plant species expresses the conditions of adaptation to the environmental conditions as an effective response during the adverse season to its survival and development of the aerial parts of each species. This is also an effective defense to grazing (Camarda 1989). Hemicriptophytes (38.4 %), are the most common life form among the 302 endemic entities and present a high number of buds protected in different ways at the ground level. This mechanism favors the plant survival over time, and could be enhanced by the plant's shape, as in the case of caespitose (43.7 % over the total) whose basal part remains are a further protection for the basal overwintering buds. Chamaephytes (36.1 %) are the second most common life form. Pulviniform (cushion-shaped) chamaephytes have often thorny branches (*Genista morisii*, *Berberis aetnensis*) or thorny leaves (*Astragalus terraccianoii*, *Centaurea horrida*) acting as a defensive barrier protecting the full life cycle. Pulviniform chamaephytes can be a shelter for many other species (*Polygala sinisica*, *Saponaria alsinoides*, *Lamium corsicum*, *Viola limbarae*). Hemicryptophytes / Chamaephytes such as many species of *Limonium*, have often only a reduced leaf system and very small woody branches. The defense system may be further enhanced by specie leaf properties, branches or root system defensive traits. Endemic geophytes with bulbs or rhizomes buried and protected by the soils are the 13.2 % of the total endemic species (e.g. *Colchicum gonarei*, *Crocus minimus*,

Aristolochia tyrrhena). Therophytes are in general more exposed to herbivores, but for many of them the very small plant size (*Herniaria litardierii*, *Euphrasia genargentea*, *Veronica brevistyla*) or the very early cycle (before the presence of free-ranging animals in the mountain rangelands) or short life span are traits that allow them to be neglected by herbivores.

Habitat

The habitat type is a very important element to consider in relation to the conservation of the endemic species of the Sardinian flora. Some species are strictly casmophilous (*Ptychotis sardoa*, *Campanula forsythii*, *Cymbalaria muelleri*, *Limonium morisianum*, *Saxifraga cervicornis*), while other (*Brassica insularis*, *Centaurea filiformis*, *Psoralea morisiana*, *Barbarea rupicola*, *Lactuca longidentata*, *Seseli praecox*) are usually casmophilous but, if not disturbed by grazers, can thrive also at the bottom of rocks and cliffs.

Thorns

The presence of spines can only partly reduce the browsing of the species in the genus *Genista*, *Anthyllis*, *Astragalus*, while the seeds in the legumes of these species are very rich in starch and proteins. On the contrary, the large amount of spines on leaves, stems and inflorescences of *Ptilostemon casabonae* and *Dipsacus valsecchiae* constitutes the ultimate defense against browsing.

Toxicity

Some endemic species have high contents of alkaloids and glycosides (*Aquilegia* sp.pl., *Paeonia morisii*, *Arum pictum*) and, despite their rich shoot system, are completely avoided by domestic herbivores during the summer season. *Helleborus argutifolius* is always unpalatable, even when dry, due to the presence of spines on the leaves, and for the high content of alkaloids and glycosides that are toxic. *Ruta corsica* produces furocumarins that are very irritating (Ena & Camarda 1990). Other species (*Nepeta foliosa*, *Santolina insularis*, *Santolina corsica*, *Stachys glutinosa*) produce aromas that may be agreeable to men but that are often repellent for domestic herbivores. *Thymus catharinae* is a species very rich in essential oils and as a result it is browsed only during the late summer period when there is less availability of other more palatable species. In spite of the very dense shoot systems, *Vinca sardoa* is always neglected by herbivores having a high content of toxic alkaloids.

Rarity

Browsing and grazing can seriously threaten rare and very rare endemic species, and those species with a punctiform range (*Ribes sardoum*, *Rubus limbarae*). This could increase extinction risk and surely reduce population size. Browsing and grazing should always be taken into account in the assessment of the conservation status of endangered species.

Conclusions

The free range of domestic herbivores reduces the presence and abundance of woody and herbaceous edible species. At the same time this phenomenon promotes the abundance of those endemic species which have defensive traits against browsing and grazing. This mechanism explains the local abundance of species such as *Paeonia morisii*, *Astragalus genargenteus*, *Aquilegia* sp.pl., *Helleborus argutifolius*, and *Ruta corsica* in areas strongly degraded by grazing, while being considered as rare species at Island level. Species lacking of defensive traits against browsing and grazing are in total 92 (30.5 %), mostly *Poaceae* (*Festuca morisiana*, *Festuca sardoa*, *Sesleria insularis*) but also belonging to other families (*Scorzonera callosa*, *Hypochoeris robertia*, *Astragalus maritimus*, *Astragalus verrucosus*, *Borago pygmaea*, *Borago morisiana*, *Echium anchusoides*). We list 156 (51.7 %) endemic species that can be browsed by domestic herbivores and 146 (48.3 %) species that do not elicit pabular interest or are completely avoided because of their very limited plant size or inaccessibility of the habitat. The presence and abundance of 137 (45.4 %) species is not affected by browsing and grazing, 116 (38.4 %) species are promoted by grazing; and only 49 (16.2 %) decrease because of the presence of domestic herbivores. Nevertheless, these relationships are influenced by the species of domestic herbivores, the number of grazing animals, the presence of wild fauna, which could favor the spread of some seeds or propagules. Other driving forces are the anthropic activities, the road network, the movement of soil or other substrata that could promote the local presence of species such as *Tanacetum audiberti*, *Dipsacus valsecchia*, *Hieracium templare*, *Ptilostemon casabonae*. *Urtica atrovirens* thrives very well close to sheep farms, specifically in sites where there is a high content of organic matter.

The present study highlights the complexity of the exciting relationships between free-ranging domestic herbivores and the endemic entities of the Sardinian flora. The knowledge of these relationships is a fundamental basis for conservation politics and action aiming to protect endemic species in rangelands both in Sardinia and in the Mediterranean region.

Table 1. The table shows endemic species with their life forms and growth forms and attributes regards relationships between pabularity, defense types, kind of presence (com.=common; freq. = frequent; spor.=sporadic; punct.=punctiform; rare/ab.= rare but locally abundant; v.r. = very rare) and favorite by grazing (fav = favorite; unfav = unfavorite; ind = indifferent).

| No. | Family | Taxon | Life forms | Growth forms | Pabularity | Defense-types | Presence | Favorite or not by herbivores |
|-----|---------------|--|------------|--------------|------------|---------------|----------|-------------------------------|
| 1 | Lamiaceae | <i>Acinos sardous</i> (Asch. & Levier) Arrigoni | H | scap | no | arom | rare | fav |
| 2 | Liliaceae | <i>Allium parviflorum</i> Viv. | G | bulb | no | arom | com. | fav |
| 3 | Liliaceae | <i>Allium roseum</i> var. <i>insulare</i> Gennari | G | bulb | no | arom | com. | fav |
| 4 | Brassicaceae | <i>Alyssum tavorlae</i> Briquet | Ch | caesp | no | hab | rare | ind |
| 5 | Boraginaceae | <i>Anchusa capellii</i> Moris | H | caesp | yes | no | rare | ind |
| 6 | Boraginaceae | <i>Anchusa crispa</i> Viv. | H | caesp | no | no | rare | ind |
| 7 | Boraginaceae | <i>Anchusa maritima</i> Valsecchi | T | caesp | no | no | rare | ind |
| 8 | Boraginaceae | <i>Anchusa formosa</i> Selvi, Bigazzi & Bacchetta | H | caesp | yes | no | punct. | unfav |
| 9 | Boraginaceae | <i>Anchusa littorea</i> Moris | H | caesp | no | no | rare | unfav |
| 10 | Boraginaceae | <i>Anchusa montelinasana</i> Angius, Pontecorvo & Selvi | H | caesp | yes | no | rare | unfav |
| 11 | Boraginaceae | <i>Anchusa sardoa</i> (Ilario) Selvi & Bigazzi | H | prost | yes | no | v.r. | ind |
| 12 | Fabaceae | <i>Anthyllis hermanniae</i> subsp. <i>ichnusae</i> Brullo & Giusso | Ch | pulv | no | spin | rare | ind |
| 13 | Ranunculaceae | <i>Aquilegia barbaricina</i> Arrigoni & Nardi | H | scap | no | tox | punct. | ind |
| 14 | Ranunculaceae | <i>Aquilegia nugorensis</i> Arrigoni & Nardi | H | scap | no | tox | punct. | ind |

Table I. continued.

| No. | Family | Taxon | Life forms | Growth forms | Pubularity | Defense-types | Presence | Favorite or not by herbivores |
|-----|------------------|---|------------|--------------|------------|---------------|----------|-------------------------------|
| 15 | Ranunculaceae | <i>Aquilegia nuragica</i> Arrigoni & Nardi | H | scap | no | tox | punct. | ind |
| 16 | Caryophyllaceae | <i>Arenaria balearica</i> L. | H | rept | no | hab | freq. | ind |
| 17 | Aristolochiaceae | <i>Aristolochia tyrrhena</i> Nardi & Arrigoni | G | rhiz | no | tox | rare | fav |
| 18 | Plumbaginaceae | <i>Armeria morisii</i> Boiss. in A. DC. | H | caesp | yes | hab | rare | fav |
| 19 | Plumbaginaceae | <i>Armeria sardoa</i> subsp. <i>genargentea</i> Arrigoni | H | caesp | yes | hab | v.r. | fav |
| 20 | Plumbaginaceae | <i>Armeria sardoa</i> Sprengel subsp. <i>sardoa</i> | H | caesp | yes | hab | rare | fav |
| 21 | Plumbaginaceae | <i>Armeria sulcitana</i> Arrigoni | H | caesp | yes | hab | v.r. | fav |
| 22 | Asteraceae | <i>Artemisia variabilis</i> Ten. | Ch | caesp | no | arom | rare | fav |
| 23 | Asteraceae | <i>Artemisia corensis</i> Vals. & Filigh. | Ch | caesp | no | arom | rare | fav |
| 24 | Asteraceae | <i>Artemisia densiflora</i> Viv. | Ch | caesp | no | arom | v.r. | fav |
| 25 | Araceae | <i>Arum pictum</i> L. fil. | G | rhiz | no | tox | com. | fav |
| 26 | Rubiaceae | <i>Asperula deficiens</i> Viv. | H | rept | no | hab | punct. | ind |
| 27 | Rubiaceae | <i>Asperula pumila</i> Moris | H | caesp | no | hab | v.r. | ind |
| 28 | Fabaceae | <i>Astragalus genargenteus</i> Moris subsp. <i>genargenteus</i> | Ch | pulv | yes | spin | rare/ab. | fav |
| 29 | Fabaceae | <i>Astragalus genargenteus</i> subsp. <i>gennarii</i> (Bacchetta & Brullo) Arrigoni | Ch | pulv | yes | spin | rare | fav |
| 30 | Fabaceae | <i>Astragalus maritimus</i> Moris | H | scap | yes | spin | punct. | fav |
| 31 | Fabaceae | <i>Astragalus terraccianoii</i> Valsecchi | Ch | pulv | yes | spin | rare | fav |
| 32 | Fabaceae | <i>Astragalus thermensis</i> Valsecchi | Ch | pulv | yes | spin | punct. | fav |
| 33 | Fabaceae | <i>Astragalus verrucosus</i> Moris | T | scap | yes | no | rare | unfav |
| 34 | Brassicaceae | <i>Barbarea rupicola</i> Moris | H | scap | yes | hab | spor. | unfav |
| 35 | Asteraceae | <i>Bellium bellidioides</i> L. | H | rept | yes | hab | com. | ind |
| 36 | Asteraceae | <i>Bellium crassifolium</i> Moris | H | ros | yes | hab | rare | unfav |
| 37 | Berberidaceae | <i>Berberis aetnensis</i> C. B. Presl | Ch | caesp | no | spin | rare | fav |
| 38 | Brassicaceae | <i>Biscutella morisiana</i> Raffaelli | T | scap | yes | no | rare | unfav |
| 39 | Boraginaceae | <i>Borago morisiana</i> Bigazzi & Ricceri | H | scap | yes | no | spor. | unfav |
| 40 | Boraginaceae | <i>Borago pygmaea</i> (DC.) Chater & Greuter | H | scap | yes | no | spor. | unfav |
| 41 | Brassicaceae | <i>Brassica insularis</i> Moris | Ch | suff | yes | hab | rare | unfav |
| 42 | Brassicaceae | <i>Brassica tyrrhena</i> Giotta, Piccitto & Arrigoni | Ch | suff | yes | hab | com. | unfav |
| 43 | Cucurbitaceae | <i>Bryonia marmorata</i> Petit | G | lian | no | hab | com. | unfav |
| 44 | Boraginaceae | <i>Buglossoides minima</i> (Moris) R. Fernandes | T | scap | yes | no | rare | fav |
| 45 | Asteraceae | <i>Bupththalmum inuloides</i> Moris | Ch | caesp | yes | arom | rare | fav |
| 46 | Amiryllidaceae | <i>Narcissus supramontanus</i> Arrigoni | G | bulb | no | tox | rare/ab. | fav |
| 47 | Amiryllidaceae | <i>Narcissus supramontanus</i> subsp. <i>cunicularius</i> | G | bulb | no | tox | rare | fav |
| 48 | Lamiaceae | <i>Calamintha sandalioica</i> Bacchetta & Brullo | H | scap | yes | arom | spor. | ind |
| 49 | Campanulaceae | <i>Campanula forsythii</i> (Arcangeli) Podlech | H | caesp | yes | hab | rare | ind |
| 50 | Asteraceae | <i>Carduus corymbosus</i> Ten. | H | scap | yes | spin | com. | fav |
| 51 | Asteraceae | <i>Carduus fasciculiflorus</i> Viv. | H | scap | yes | spin | rare | fav |
| 52 | Asteraceae | <i>Carduus sardous</i> DC. | T | scap | yes | spin | rare | fav |
| 53 | Cyperaceae | <i>Carex caryophyllaea</i> subsp. <i>insularis</i> (Christ ex Barbey) Arrigoni | H | caesp | yes | no | rare | unfav |
| 54 | Cyperaceae | <i>Carex microcarpa</i> Bertol. ex Moris | H | caesp | yes | spin | rare | fav |
| 55 | Cyperaceae | <i>Carex panormitana</i> Guss. | H | scap | no | spin | v.r. | fav |
| 56 | Asteraceae | <i>Carlina macrocephala</i> Moris | Ch | scap | yes | spin | punct. | fav |
| 57 | Asteraceae | <i>Centaurea corensis</i> Filigheddu & Valsecchi | Ch | suff | yes | arom | rare | fav |
| 58 | Asteraceae | <i>Centaurea filiformis</i> subsp. <i>ferulacea</i> (Martelli) Arrigoni | Ch | suff | yes | hab | rare | ind |
| 59 | Asteraceae | <i>Centaurea filiformis</i> Viv. subsp. <i>filiformis</i> | Ch | caesp | yes | hab | rare | ind |
| 60 | Asteraceae | <i>Centaurea horrida</i> Bad. | Ch | pulv | yes | spin | rare/ab. | unfav |
| 61 | Asteraceae | <i>Centaurea magistrorum</i> Arrigoni & Camarda | Ch | pulv | no | arom | v.r. | fav |
| 62 | Valerianaceae | <i>Centranthus amazonum</i> Friedlender | H | scap | yes | hab | punct. | unfav |
| 63 | Dipsacaceae | <i>Cephalaria bigazzii</i> Bacchetta, Brullo & Giusso del Galdo | Ch | scap | yes | hab | rare | ind |
| 64 | Dipsacaceae | <i>Cephalaria mediterranea</i> (Viv.) Szabó | Ch | scap | no | hab | rare | ind |
| 65 | Caryophyllaceae | <i>Cerastium palustre</i> Moris | T | scap | yes | no | rare | fav |
| 66 | Caryophyllaceae | <i>Cerastium supramontanum</i> Arrigoni | H | caesp | yes | hab | rare | fav |
| 67 | Colchicaceae | <i>Colchicum actupii</i> Fridl. | G | bulb | yes | tox | rare | fav |
| 68 | Colchicaceae | <i>Colchicum gonarei</i> Camarda | G | bulb | yes | tox | rare | fav |
| 69 | Colchicaceae | <i>Colchicum verlaqueae</i> Fridl. | G | bulb | yes | tox | rare | fav |
| 70 | Iridaceae | <i>Crocus minimus</i> DC. in Rédouté | G | bulb | no | hab | com. | fav |
| 71 | Scrophulariaceae | <i>Cymbalaria aequitiloba</i> (Viv.) A. Chevalier | H | rept | yes | hab | rare | ind |
| 72 | Scrophulariaceae | <i>Cymbalaria muelleri</i> (Moris) A. Chevalier | H | caesp | no | hab | v.r. | ind |
| 73 | Ranunculaceae | <i>Delphinium longipes</i> Moris | H | scap | no | tox | rare | fav |
| 74 | Ranunculaceae | <i>Delphinium pictum</i> Wild. | H | scap | no | tox | rare | fav |
| 75 | Caryophyllaceae | <i>Dianthus siculus</i> subsp. <i>cyatophorus</i> (Moris) Arrigoni | Ch | caesp | yes | hab | rare | fav |
| 76 | Caryophyllaceae | <i>Dianthus siculus</i> subsp. <i>morisianus</i> (Valsecchi) Arrigoni | Ch | caesp | yes | no | rare | fav |
| 77 | Caryophyllaceae | <i>Dianthus siculus</i> subsp. <i>moissanus</i> (Bacchetta & Brullo) Arrigoni | Ch | caesp | yes | hab | rare | fav |
| 78 | Caryophyllaceae | <i>Dianthus siculus</i> subsp. <i>stellaris</i> (Camarda) Arrigoni | Ch | caesp | yes | hab | rare | fav |
| 79 | Caryophyllaceae | <i>Dianthus siculus</i> subsp. <i>tenuifolius</i> (Moris) Arrigoni | Ch | caesp | no | hab | rare | fav |
| 80 | Dipsacaceae | <i>Dipsacus ferox</i> Loisel. | H | scap | no | spin | rare | fav |
| 81 | Dipsacaceae | <i>Dipsacus valsecchiae</i> Camarda | H | scap | no | spin | rare | fav |
| 82 | Araceae | <i>Dracunculus muscivorus</i> (L. fil.) Parlatore | G | scap | no | tox | rare | fav |
| 83 | Boraginaceae | <i>Echium anchusoides</i> Bacchetta, Brullo & Selvi | H | rept | yes | no | rare | unfav |
| 84 | Geraniaceae | <i>Erodium corsicum</i> Lèman in Lam. & DC. | H | rept | yes | hab | com. | fav |
| 85 | Geraniaceae | <i>Erodium nervulosum</i> L'Hér. | H | prost | yes | hab | rare | ind |
| 86 | Euphorbiaceae | <i>Euphorbia cupanii</i> Guss. ex Bertol. | T | caesp | no | tox | punct. | fav |
| 87 | Euphorbiaceae | <i>Euphorbia insularis</i> Boiss. | H | caesp | no | tox | rare | fav |
| 88 | Euphorbiaceae | <i>Euphorbia meuseilii</i> Mazzola & Raimondo | H | caesp | no | tox | spor. | fav |

Table 1. continued.

| No. | Family | Taxon | Life forms | Growth forms | Pubularity | Defense-types | Presence | Favorite or not by herbivores |
|-----|------------------|--|------------|--------------|------------|---------------|----------|-------------------------------|
| 89 | Euphorbiaceae | <i>Euphorbia semiperfoliata</i> Viv. | T | caesp | no | tox | rare | fav |
| 90 | Scrophulariaceae | <i>Euphrasia genargentea</i> (Feoli) Diana | T | scap | no | no | rare | fav |
| 91 | Asteraceae | <i>Evax rotundata</i> Moris | H | scap | no | no | spor. | ind |
| 92 | Apiaceae | <i>Ferula arrigonii</i> Bocchieri | H | scap | no | tox | rare | fav |
| 93 | Poaceae | <i>Festuca morisiana</i> Parl. | H | caesp | yes | no | rare | fav |
| 94 | Poaceae | <i>Festuca sardoa</i> (Hackel in Barbey) Richter | H | caesp | yes | no | rare/ab. | fav |
| 95 | Rubiaceae | <i>Galium corsicum</i> Sprengel | H | prost | yes | hab | rare | fav |
| 96 | Rubiaceae | <i>Galium glaucophyllum</i> E.Schmid | H | prost | yes | hab | rare | fav |
| 97 | Rubiaceae | <i>Galium schmidii</i> Arrigoni | T | prost | no | hab | rare | fav |
| 98 | Fabaceae | <i>Genista aetnensis</i> (Biv.) DC. | P | scap | yes | spin | com. | unfav |
| 99 | Fabaceae | <i>Genista arbusensis</i> Valsecchi | Ch | caesp | no | spin | com. | fav |
| 100 | Fabaceae | <i>Genista bocchierii</i> Bacchetta, Brullo & Feoli Chiapella | Ch | caesp | no | spin | rare | fav |
| 101 | Fabaceae | <i>Genista cadasonensis</i> Valsecchi | Ch | caesp | no | spin | com. | fav |
| 102 | Fabaceae | <i>Genista corsica</i> (Loisel.) DC. in Lam. & DC. | Ch | caesp | no | spin | com. | fav |
| 103 | Fabaceae | <i>Genista desoleana</i> Valsecchi | Ch | caesp | no | spin | com. | fav |
| 104 | Fabaceae | <i>Genista ephedroides</i> DC. | P | caesp | no | spin | rare | fav |
| 105 | Fabaceae | <i>Genista insularis</i> Bacchetta, Brullo & Feoli Chiapella | Ch | caesp | no | spin | rare | fav |
| 106 | Fabaceae | <i>Genista insularis</i> subsp. <i>fordinae</i> Bacchetta, Brullo & al. | Ch | caesp | no | spin | rare | fav |
| 107 | Fabaceae | <i>Genista ovina</i> Bacchetta, Brullo & Feoli Chiapella | Ch | caesp | no | spin | com. | fav |
| 108 | Fabaceae | <i>Genista morisii</i> Colla | Ch | caesp | no | spin | com. | fav |
| 109 | Fabaceae | <i>Genista pichi-sermolliana</i> Valsecchi | P | caesp | no | spin | com. | fav |
| 110 | Fabaceae | <i>Genista salzmannii</i> DC. | Ch | caesp | no | spin | rare | fav |
| 111 | Fabaceae | <i>Genista sardoa</i> Valsecchi | Ch | caesp | no | spin | rare | fav |
| 112 | Fabaceae | <i>Genista sulcitana</i> Valsecchi | Ch | caesp | no | spin | rare | fav |
| 113 | Fabaceae | <i>Genista toluensis</i> Valsecchi | Ch | caesp | no | spin | rare | fav |
| 114 | Lamiaceae | <i>Glechoma sardoa</i> (Bég.) Bég. | Ch | caesp | yes | hab | rare | ind |
| 115 | Cistaceae | <i>Helianthemum allionii</i> Tineo | Ch | caesp | yes | hab | rare | unfav |
| 116 | Cistaceae | <i>Helianthemum morisianum</i> Bertol. | Ch | caesp | yes | hab | rare | unfav |
| 117 | Asteraceae | <i>Castrovilleja montelinasana</i> E.Schmid | Ch | caesp | yes | hab | rare | ind |
| 118 | Asteraceae | <i>Helichrysum saxatile</i> Moris | Ch | caesp | yes | hab | rare | ind |
| 119 | Asteraceae | <i>Helichrysum saxatile</i> subsp. <i>morisianum</i> Bacchetta & al. | H | caesp | no | hab | spor. | fav |
| 120 | Ranunculaceae | <i>Helleborus argutifolius</i> Viv. | H | caesp | no | tox | rare | fav |
| 121 | Caryophyllaceae | <i>Herniaria litardierei</i> (Gamis.) Greuter & Burdet | H | scap | yes | no | rare | fav |
| 122 | Asteraceae | <i>Hieracium gallurensis</i> Arrigoni | H | scap | yes | no | rare | unfav |
| 123 | Asteraceae | <i>Hieracium lolai</i> Arrigoni | H | scap | yes | no | rare | ind |
| 124 | Asteraceae | <i>Hieracium irginianum</i> Arrigoni | H | scap | yes | no | rare | ind |
| 125 | Asteraceae | <i>Hieracium limbarae</i> Arrigoni | H | scap | yes | no | rare | unfav |
| 126 | Asteraceae | <i>Hieracium martellianum</i> (Zahn) Arrigoni | H | scap | yes | no | rare | ind |
| 127 | Asteraceae | <i>Hieracium oliastreae</i> Arrigoni | H | scap | yes | no | rare | ind |
| 128 | Asteraceae | <i>Hieracium soleirolianum</i> Arv. Touv. & Briquet | H | scap | yes | no | rare | ind |
| 129 | Asteraceae | <i>Hieracium supramontanum</i> Arrigoni | H | scap | yes | hab | rare | ind |
| 130 | Asteraceae | <i>Hieracium templare</i> Arrigoni | H | scap | yes | no | com. | unfav |
| 131 | Asteraceae | <i>Hieracium zizianum</i> subsp. <i>sardonium</i> Zahn | H | scap | yes | no | com. | unfav |
| 132 | Hypericaceae | <i>Hypericum annulatum</i> Moris | Ch | caesp | no | tox | rare | fav |
| 133 | Hypericaceae | <i>Hypericum hircinum</i> L. subsp. <i>hircinum</i> | P | caesp | yes | tox | com. | ind |
| 134 | Asteraceae | <i>Hypochoeris linearifolia</i> Moris | H | caesp | yes | hab | rare | unfav |
| 135 | Brassicaceae | <i>Iberis integerrima</i> Moris | H | prost | yes | no | rare | unfav |
| 136 | Asteraceae | <i>Lactuca longidentata</i> Moris | H | scap | yes | hab | rare | unfav |
| 137 | Lamiaceae | <i>Lamium corsicum</i> Godr. & Gren. | H | caesp | yes | hab | rare | fav |
| 138 | Asteraceae | <i>Lamyropsis microcephala</i> (Moris) Dittrich & Greuter | H | caesp | yes | spin | v.r. | ind |
| 139 | Malvaceae | <i>Lavatera plazzae</i> Atzei | H | caesp | yes | no | rare | unfav |
| 140 | Malvaceae | <i>Lavatera triloba</i> subsp. <i>pallescens</i> (Moris) Nyman | P | scap | yes | no | rare | unfav |
| 141 | Amaryllidaceae | <i>Leucojum roseum</i> Martin | G | bulb | no | no | rare/ab. | fav |
| 142 | Plumbaginaceae | <i>Limonium acutifolium</i> subsp. <i>cornusianum</i> (Arrigoni & Diana) Arrigoni | Ch | caesp | no | hab | rare | ind |
| 143 | Plumbaginaceae | <i>Limonium acutifolium</i> subsp. <i>obtusifolium</i> (Rouy) Diana | Ch | caesp | no | hab | rare | ind |
| 144 | Plumbaginaceae | <i>Limonium acutifolium</i> subsp. <i>acutifolium</i> | Ch | caesp | no | hab | rare | ind |
| 145 | Plumbaginaceae | <i>Limonium acutifolium</i> subsp. <i>bosanum</i> (Arrigoni & Diana) Arrigoni | Ch | caesp | no | hab | rare | ind |
| 146 | Plumbaginaceae | <i>Limonium acutifolium</i> subsp. <i>nymphaeum</i> (Erben) Arrigoni | Ch | caesp | no | hab | rare | ind |
| 147 | Plumbaginaceae | <i>Limonium acutifolium</i> subsp. <i>tenuifolium</i> (Bertol.ex Moris) Arrigoni | Ch | caesp | no | hab | rare | ind |
| 148 | Plumbaginaceae | <i>Limonium acutifolium</i> subsp. <i>tharrosianum</i> (Arrigoni & Diana) Arrigoni | Ch | caesp | no | hab | rare | ind |
| 149 | Plumbaginaceae | <i>Limonium ampuriense</i> Arrigoni & Diana | Ch | caesp | no | hab | rare | ind |
| 150 | Plumbaginaceae | <i>Limonium angustifolium</i> (Tausch) Degen | Ch | caesp | no | hab | rare | ind |
| 151 | Plumbaginaceae | <i>Limonium articulatum</i> (Loisel.) O.Kuntze | Ch | caesp | no | hab | punct. | ind |
| 152 | Plumbaginaceae | <i>Limonium capitis-ellae</i> Erben | Ch | caesp | no | hab | rare | ind |
| 153 | Plumbaginaceae | <i>Limonium capitis-marci</i> Arrigoni & Diana | Ch | caesp | no | hab | punct. | ind |
| 154 | Plumbaginaceae | <i>Limonium carisae</i> Erben | Ch | caesp | no | hab | rare | ind |
| 155 | Plumbaginaceae | <i>Limonium contortiforme</i> (Mabille) Erben | Ch | caesp | no | hab | freq. | ind |
| 156 | Plumbaginaceae | <i>Limonium coralliforme</i> Mayer | Ch | caesp | no | hab | rare | ind |
| 157 | Plumbaginaceae | <i>Limonium cornusianum</i> Arrigoni & Diana | Ch | caesp | no | hab | rare | ind |
| 158 | Plumbaginaceae | <i>Limonium cucularium</i> Arrigoni & Diana | Ch | caesp | no | hab | rare | ind |
| 159 | Plumbaginaceae | <i>Limonium dictyocladum</i> (Boiss. in A. DC.) O. Kuntze | Ch | caesp | no | hab | rare | ind |
| 160 | Plumbaginaceae | <i>Limonium dubium</i> (Andr. ex Guss.) R. Lit. | Ch | caesp | no | hab | rare | ind |
| 161 | Plumbaginaceae | <i>Limonium gallurensis</i> Arrigoni & Diana | Ch | caesp | no | hab | rare | ind |
| 162 | Plumbaginaceae | <i>Limonium glomeratum</i> (Tausch) Erben | Ch | caesp | no | hab | freq. | ind |

Table I. continued.

| No. | Family | Taxon | Life forms | Growth forms | Pubularity | Defense-types | Presence | Favorite or not by herbivores |
|-----|------------------|---|------------|--------------|------------|---------------|----------|-------------------------------|
| 163 | Plumbaginaceae | <i>Limonium hermaeum</i> (Pignatti) Pignatti | Ch | caesp | no | hab | rare | ind |
| 164 | Plumbaginaceae | <i>Limonium insulare</i> (Bég. & Landi) Arrigoni & Diana | Ch | caesp | no | hab | rare | ind |
| 165 | Plumbaginaceae | <i>Limonium laetum</i> (Nyman) Pignatti | Ch | caesp | no | hab | v.r. | ind |
| 166 | Plumbaginaceae | <i>Limonium lausianum</i> Pignatti | Ch | caesp | no | hab | punct. | ind |
| 167 | Plumbaginaceae | <i>Limonium malfaticum</i> Erben | Ch | caesp | no | hab | rare | ind |
| 168 | Plumbaginaceae | <i>Limonium merxmuelleri</i> subsp. <i>oristanum</i> (Mayer) Arrigoni | Ch | caesp | no | hab | freq. | ind |
| 169 | Plumbaginaceae | <i>Limonium merxmuelleri</i> subsp. <i>sulcitanum</i> (Arrigoni) Arrigoni | Ch | caesp | no | hab | rare | ind |
| 170 | Plumbaginaceae | <i>Limonium merxmuelleri</i> subsp. <i>tigulianum</i> (Arrigoni & Diana) Arrigoni | Ch | caesp | no | hab | rare | ind |
| 171 | Plumbaginaceae | <i>Limonium merxmuelleri</i> Erben subsp. <i>merxmuelleri</i> | Ch | caesp | no | hab | spor. | ind |
| 172 | Plumbaginaceae | <i>Limonium morisianum</i> Arrigoni | Ch | caesp | no | hab | punct. | ind |
| 173 | Plumbaginaceae | <i>Limonium multifurcatum</i> Erben | Ch | caesp | no | hab | rare | ind |
| 174 | Plumbaginaceae | <i>Limonium protohermaeum</i> Arrigoni & Diana | Ch | caesp | no | hab | rare | ind |
| 175 | Plumbaginaceae | <i>Limonium pseudolaetum</i> Arrigoni & Diana | Ch | caesp | no | hab | rare | ind |
| 176 | Plumbaginaceae | <i>Limonium pulviniforme</i> Arrigoni & Diana | Ch | caesp | no | hab | rare | ind |
| 177 | Plumbaginaceae | <i>Limonium racemosum</i> (Lojac.) Diana | Ch | caesp | no | hab | rare | ind |
| 178 | Plumbaginaceae | <i>Limonium retirameum</i> subsp. <i>calaritanum</i> (Erben) Arrigoni | Ch | caesp | no | hab | rare | ind |
| 179 | Plumbaginaceae | <i>Limonium retirameum</i> Greuter & Burdet subsp. <i>retirameum</i> | Ch | caesp | no | hab | rare | ind |
| 180 | Plumbaginaceae | <i>Limonium strictissimum</i> (Salzmann) Arrigoni | Ch | caesp | no | hab | punct. | ind |
| 181 | Plumbaginaceae | <i>Limonium tibulatum</i> Pignatti | Ch | caesp | no | hab | punct. | ind |
| 182 | Plumbaginaceae | <i>Limonium tigulianum</i> Arrigoni & Diana | Ch | caesp | no | hab | rare | ind |
| 183 | Plumbaginaceae | <i>Limonium tyrhenicum</i> Arrigoni & Diana | Ch | caesp | no | hab | rare | ind |
| 184 | Plumbaginaceae | <i>Limonium ursanum</i> Erben | Ch | caesp | no | hab | rare | ind |
| 185 | Scrophulariaceae | <i>Limonium viololae</i> Arrigoni & Diana | Ch | caesp | no | hab | v.r. | ind |
| 186 | Scrophulariaceae | <i>Linaria arcusangeli</i> Atzei & Camarda | Ch | caesp | yes | hab | rare | unfav |
| 187 | Scrophulariaceae | <i>Linaria flava</i> subsp. <i>sardoa</i> (Sommer) Arrigoni | T | scap | yes | hab | rare | ind |
| 188 | Linaceae | <i>Linum muelleri</i> Moris | T | scap | yes | no | rare | ind |
| 189 | Caprifoliaceae | <i>Lonicera cyrenaica</i> Viv. | P | lian | yes | hab | rare | unfav |
| 190 | Cyperaceae | <i>Luzula italica</i> Parl. | H | scand | yes | no | rare | unfav |
| 191 | Lamiaceae | <i>Mentha insularis</i> Requien | H | rept | no | arom | rare | ind |
| 192 | Fabaceae | <i>Mentha requienii</i> Benth. | H | caesp | no | arom | rare | ind |
| 193 | Euphorbiaceae | <i>Mercurialis corsica</i> Cosson | Ch | caesp | no | tox | v.r. | fav |
| 194 | Lamiaceae | <i>Micromeria cordata</i> (Moris ex Bertol.) Moris | H | caesp | no | hab | rare | ind |
| 195 | Lamiaceae | <i>Micromeria filiformis</i> (Aiton) Benth | T | prost | yes | hab | rare | ind |
| 196 | Brassicaceae | <i>Morisia monantha</i> (Viv.) Ascherson ex Barbey | H | ros | yes | no | rare | unfav |
| 197 | Boraginaceae | <i>Myosotis soleirolii</i> Godr. in Gren. & Godr. | H | scap | no | hab | rare | ind |
| 198 | Asteraceae | <i>Nananthea perpusilla</i> (Loisel.) DC. | H | prost | no | hab | rare | fav |
| 199 | Lamiaceae | <i>Nepeta foliosa</i> Moris | Ch | caesp | no | arom | rare | fav |
| 200 | Scrophulariaceae | <i>Odontites corsicus</i> (Loisel.) G. Don | T | scap | yes | no | rare | fav |
| 201 | Apiaceae | <i>Oenanthe lisae</i> Moris | H | caesp | yes | no | rare | unfav |
| 202 | Orchidaceae | <i>Ophrys × domus-mariae</i> Grasso | G | bulb | yes | no | rare | ind |
| 203 | Orchidaceae | <i>Ophrys × lacoenensis</i> Scrugli & Grasso subsp. <i>lacoenensis</i> | G | bulb | yes | no | rare | ind |
| 204 | Orchidaceae | <i>Ophrys × marmemae</i> subsp. <i>woodii</i> Corrias | G | bulb | yes | no | rare | ind |
| 205 | Orchidaceae | <i>Ophrys annae</i> Devillers-Tersch. | G | bulb | yes | no | rare | ind |
| 206 | Orchidaceae | <i>Ophrys chestermanii</i> (Wood) Golz & Reinhard | G | bulb | yes | no | rare | ind |
| 207 | Orchidaceae | <i>Ophrys scolopax</i> subsp. <i>conradiae</i> (Melki & Deschâtres) Baumann & al. | G | bulb | yes | no | rare | ind |
| 208 | Orchidaceae | <i>Ophrys eleonorae</i> Devillers-Tersch. & Devillers | G | bulb | yes | no | rare | ind |
| 209 | Orchidaceae | <i>Ophrys morisii</i> (Martelli) Soò in Keller & al. | G | bulb | yes | no | rare | ind |
| 210 | Orchidaceae | <i>Ophrys holoserica</i> subsp. <i>chestermanii</i> J.J. Wood | G | bulb | yes | no | rare | ind |
| 211 | Orchidaceae | <i>Ophrys morisii</i> (Martelli) Soò in Keller & al. | G | bulb | yes | no | rare | ind |
| 212 | Orchidaceae | <i>Ophrys panattensis</i> Scrugli, Cogoni & Pessei | G | bulb | yes | no | rare | ind |
| 213 | Orchidaceae | <i>Ophrys scolopax</i> ssp. <i>sardoa</i> Baumann & al. | G | bulb | yes | no | rare | ind |
| 214 | Orchidaceae | <i>Ophrys sphagodes</i> Miller subsp. <i>praecox</i> Corrias | G | bulb | yes | no | rare | ind |
| 215 | Orchidaceae | <i>Orchis × penzigiana</i> ssp. <i>sardoa</i> Scrugli & Grasso | G | bulb | yes | no | rare | ind |
| 216 | Orchidaceae | <i>Orchis brancifortii</i> Biv.-Bern. | G | bulb | yes | no | rare | ind |
| 217 | Liliaceae | <i>Orchis mascula</i> subsp. <i>ichnusae</i> Corrias | G | bulb | yes | no | rare | ind |
| 218 | Liliaceae | <i>Ornithogalum corsicum</i> Jordan | G | par | no | no | rare | fav |
| 219 | Orobanchaceae | <i>Orobanche denudata</i> Moris | G | par | no | no | com. | ind |
| 220 | Orobanchaceae | <i>Orobanche australis</i> Moris | G | par | no | no | v.r. | ind |
| 221 | Orobanchaceae | <i>Orobanche litorea</i> Guss. | G | par | no | no | rare | ind |
| 222 | Orobanchaceae | <i>Orobanche rigens</i> Loisel. | G | par | no | no | com. | fav |
| 223 | Paeoniaceae | <i>Paeonia morisii</i> Cesca, Bernardo & Passalacqua | G | scap | no | tox | com. | fav |
| 224 | Amarylidaceae | <i>Pancratium illyricum</i> L. | G | bulb | yes | tox | com. | fav |
| 225 | Poaceae | <i>Phalaris rotgeisii</i> (Husnot) Baldini | T | caesp | yes | no | v.r. | unfav |
| 226 | Poaceae | <i>Phleum sardoum</i> (Hackel) Hackel in Franchet | T | caesp | yes | hab | v.r. | ind |
| 227 | Pinaceae | <i>Pinus pinaster</i> ssp. <i>hamiltonii</i> (Ten.) H. Del Villar | P | scap | yes | res | rare | ind |
| 228 | Asteraceae | <i>Plagiopus flosculosus</i> (L.) Alavi & Heywood | H | caesp | yes | no | rare | unfav |
| 229 | Plantaginaceae | <i>Plantago sarda</i> C. Presl | Ch | caesp | yes | no | rare | fav |
| 230 | Poaceae | <i>Poa balbisii</i> Parl. | H | scap | yes | no | spor. | fav |
| 231 | Polygalaceae | <i>Polygala sardoa</i> Chodat | H | scap | yes | pulv | v.r. | ind |
| 232 | Polygalaceae | <i>Polygala sinisica</i> Arrigoni | Ch | scap | yes | pulv | freq. | ind |
| 233 | Polygonaceae | <i>Polygonum scoparium</i> Rêq. ex Loisel. | Ch | caesp | yes | tox | rare | ind |
| 234 | Rosaceae | <i>Potentilla caulescens</i> subsp. <i>nebrodensis</i> (Strobl ex Zimm.) Arrigoni | H | rept | yes | hab | rare | unfav |
| 235 | Rosaceae | <i>Potentilla crassinervia</i> Viv. | H | rept | yes | no | rare | unfav |
| 236 | Rosaceae | <i>Potentilla corsica</i> Soleir. ex Lehman | Ch | rept | yes | no | spor. | unfav |

Table 1. continued.

| No. | Family | Taxon | Life forms | Growth forms | Popularity | Defense-types | Presence | Favorite or not by herbivores |
|-----|------------------|--|------------|--------------|------------|---------------|----------|-------------------------------|
| 236 | Rosaceae | <i>Potentilla corsica</i> Soleir. ex Lehman | Ch | rept | yes | no | spor. | unfav |
| 237 | Fabaceae | <i>Psoralea morisiana</i> Pignatti & Metlesics | Ch | caesp | no | hab | spor. | unfav |
| 238 | Asteraceae | <i>Ptilostemon casabonae</i> (L.) Greuter | H | scap | no | spin | rare | ind |
| 239 | Apiaceae | <i>Ptychotis sardoa</i> Pignatti & Metlesics | H | scap | no | arom | rare | ind |
| 240 | Ranunculaceae | <i>Ranunculus cordiger</i> Viviani subsp. <i>cordiger</i> | H | ros | yes | no | rare | ind |
| 241 | Ranunculaceae | <i>Ranunculus cordiger</i> subsp. <i>diffusus</i> (Moris) Arrigoni | H | ros | yes | no | rare | ind |
| 242 | Ranunculaceae | <i>Ranunculus cymbalarifolius</i> Balbis ex Moris | H | ros | yes | no | rare | ind |
| 243 | Rhamnaceae | <i>Rhamnus persicifolia</i> Moris | P | caesp | yes | no | rare | unfav |
| 244 | Saxifragaceae | <i>Ribes sandalioticum</i> (Arrigoni) Arrigoni | P | caesp | yes | no | punct. | unfav |
| 245 | Saxifragaceae | <i>Ribes sardoum</i> Martelli | P | caesp | yes | no | v.r. | unfav |
| 246 | Asteraceae | <i>Hypochaeris robertia</i> Fiori | H | ros | no | hab | com. | unfav |
| 247 | Iridaceae | <i>Romulea requienii</i> Parl. | G | bulb | no | no | rare | fav |
| 248 | Iridaceae | <i>Romulea revelieri</i> Jord. & Fourr. | G | bulb | yes | no | rare | fav |
| 249 | Rubiaceae | <i>Rubia requienii</i> Duby | P | lian | yes | spin | punct. | fav |
| 250 | Rosaceae | <i>Rubus arrigonii</i> Camarda | P | suff | yes | spin | punct. | unfav |
| 251 | Rosaceae | <i>Rubus laconensis</i> Camarda | P | suff | yes | spin | punct. | unfav |
| 252 | Rosaceae | <i>Rubus pignatti</i> Camarda | P | suff | yes | spin | punct. | unfav |
| 253 | Rosaceae | <i>Rubus limbarae</i> Camarda | P | suff | yes | spin | punct. | unfav |
| 254 | Polygonaceae | <i>Rumex suffocatus</i> Moris ex Bertol. | H | ros | no | no | rare | fav |
| 255 | Rutaceae | <i>Ruta corsica</i> DC. | Ch | caesp | no | tox | rare | fav |
| 256 | Caryophyllaceae | <i>Sagina pilifera</i> (DC.) Fenzl | H | pulv | yes | no | rare | fav |
| 257 | Salicaceae | <i>Salix arrigonii</i> Brullo | P | scap | yes | no | com. | ind |
| 258 | Lamiaceae | <i>Salvia desoleana</i> Atzei & Picci | Ch | caesp | no | arom | v.r. | ind |
| 259 | Asteraceae | <i>Santolina corsica</i> Jord. & Fourr. | Ch | caesp | no | arom | com. | fav |
| 260 | Asteraceae | <i>Santolina insularis</i> (Gennari ex Fiori) Arrigoni | Ch | caesp | yes | arom | rare | fav |
| 261 | Caryophyllaceae | <i>Saponaria alsinoides</i> (Viv.) Viv. | H | scand | yes | hab | rare | fav |
| 262 | Saxifragaceae | <i>Saxifraga cervicomis</i> Viv. | H | caesp | no | hab | rare | ind |
| 263 | Saxifragaceae | <i>Saxifraga corsica</i> (Ser. ex Duby) Gren. & Godron | H | scap | yes | hab | rare | ind |
| 264 | Hyacinthaceae | <i>Scilla corsica</i> Boullou | G | bulb | no | no | rare | fav |
| 265 | Caryophyllaceae | <i>Scleranthus burnatii</i> Briquet | H | prost | yes | no | spor. | fav |
| 266 | Asteraceae | <i>Scorzonera callosa</i> Moris | H | ros | no | no | spor. | ind |
| 267 | Scrophulariaceae | <i>Scrophularia morisii</i> Valsecchi | H | scap | yes | tox | rare | fav |
| 268 | Scrophulariaceae | <i>Scrophularia oblongifolia</i> Loisel. | H | rhiz | no | tox | rare | fav |
| 269 | Scrophulariaceae | <i>Scrophularia trifoliata</i> L. | H | scap | no | tox | freq. | fav |
| 270 | Crassulaceae | <i>Sedum villosum</i> subsp. <i>glandulosum</i> (Moris) P. Fourr. | H | caesp | no | hab | spor. | ind |
| 271 | Orchidaceae | <i>Serapias nurica</i> Cortias | G | bulb | yes | no | com. | ind |
| 272 | Apiaceae | <i>Seseli praecox</i> (Gamisans) Gamisans | Ch | caesp | yes | hab | rare | ind |
| 273 | Poaceae | <i>Sesleria insularis</i> subsp. <i>barbaricina</i> Arrigoni | H | caesp | yes | no | rare | fav |
| 274 | Poaceae | <i>Sesleria insularis</i> subsp. <i>morisiana</i> Arrigoni | H | scap | yes | no | rare | fav |
| 275 | Poaceae | <i>Sesleria insularis</i> Sommier subsp. <i>insularis</i> | H | scap | yes | no | rare | fav |
| 276 | Caryophyllaceae | <i>Silene beguinotii</i> Vals. | H | rhiz | yes | no | rare | ind |
| 277 | Caryophyllaceae | <i>Silene corsica</i> DC. | H | rhiz | yes | hab | rare | ind |
| 278 | Caryophyllaceae | <i>Silene martinolii</i> Bocchieri & Mulas | T | scap | yes | hab | rare | ind |
| 279 | Caryophyllaceae | <i>Silene morisiana</i> Bég. & Ravano | H | prost | yes | hab | rare | ind |
| 280 | Caryophyllaceae | <i>Silene nodulosa</i> Viv. | H | prost | yes | hab | rare | ind |
| 281 | Caryophyllaceae | <i>Silene nummica</i> Vals. | H | prost | yes | hab | rare | ind |
| 282 | Caryophyllaceae | <i>Silene sanctae-therasiae</i> Jeanmonod | Ch | scap | yes | no | punct. | unfav |
| 283 | Caryophyllaceae | <i>Silene valsecchiae</i> Bocchieri | Ch | scap | no | no | v.r. | ind |
| 284 | Caryophyllaceae | <i>Silene velutina</i> Pourret ex Loisel. | Ch | caesp | no | hab | v.r. | ind |
| 285 | Urticaceae | <i>Soleirolia soleirolii</i> (Rég.) Dandy | H | rept | no | hab | v.r. | ind |
| 286 | Caryophyllaceae | <i>Solenopsis minuta</i> ssp. <i>corsica</i> Meikle | H | rept | no | hab | rare | ind |
| 287 | Caryophyllaceae | <i>Spergularia macrorhiza</i> (Rég. ex Loisel.) Heynh. | Ch | rept | no | hab | com. | ind |
| 288 | Lamiaceae | <i>Stachys corsica</i> Pers. | H | rept | yes | hab | com. | ind |
| 289 | Lamiaceae | <i>Stachys glutinosa</i> L. | Ch | pulv | yes | arom | punct. | fav |
| 290 | Lamiaceae | <i>Stachys salisii</i> Jord. & Fourr. | H | rept | no | no | rare | ind |
| 291 | Asteraceae | <i>Tanacetum audiberti</i> (Requien) DC. | H | caesp | no | arom | rare | fav |
| 292 | Lamiaceae | <i>Teucrium subspinosum</i> Pourret ex Willd. | Ch | pulv | no | arom | rare | fav |
| 293 | Santalaceae | <i>Thesium italicum</i> DC. | T | prost | yes | no | rare | ind |
| 294 | Brassicaceae | <i>Thlaspi brevistylum</i> Jordan | T | scap | yes | no | com. | ind |
| 295 | Lamiaceae | <i>Thymus catharinae</i> Camarda | Ch | pulv | yes | arom | com. | fav |
| 296 | Poaceae | <i>Trisetaria gracilis</i> (Moris) Banfi & Arrigoni | H | caesp | no | no | spor. | unfav |
| 297 | Urticaceae | <i>Urtica atrovirens</i> Rég. ex Loisel. | H | scap | no | spin | spor. | fav |
| 298 | Scrophulariaceae | <i>Verbascum conocarpum</i> Moris | H | scap | no | tox | rare | fav |
| 299 | Scrophulariaceae | <i>Verbascum plantagineum</i> Moris | T | scap | yes | tox | rare | fav |
| 300 | Scrophulariaceae | <i>Veronica brevistyla</i> Moris in Moris & De Notaris | T | scap | no | no | spor. | fav |
| 301 | Apocynaceae | <i>Vinca sardoa</i> (Steam) Pignatti | H | scand | no | tox | rare | fav |
| 302 | Violaceae | <i>Viola limbarae</i> (Merxm. & Lippert) Arrigoni | H | scand | yes | hab | rare | fav |

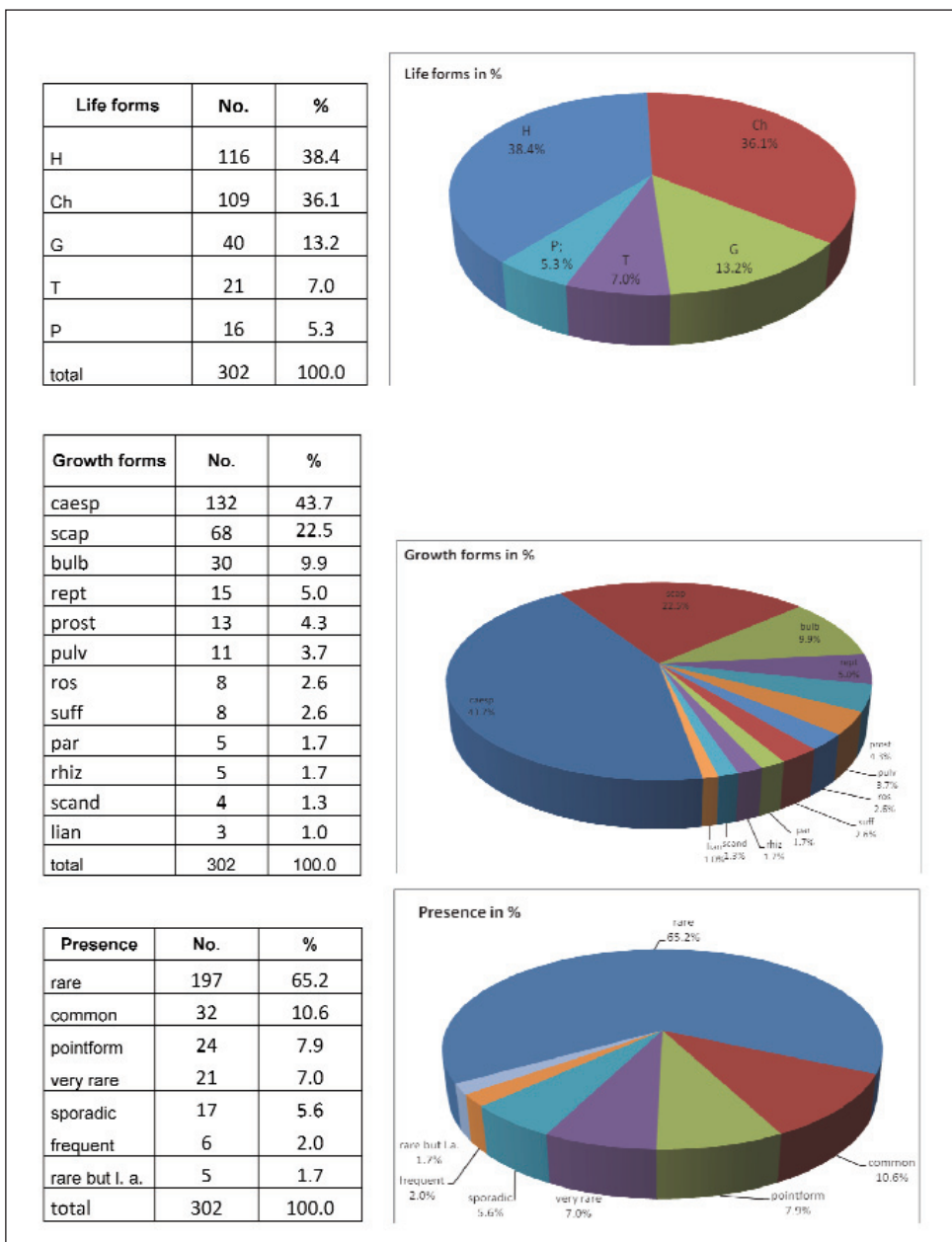


Fig. 1. Tables and related Pie charts expressed in % of the life forms, growth forms and their kind of presence. Abbreviations for Life forms: H = Hemicryptophyte, Ch = Chamaephyte, G = Geophyte, T = Therophyte, P = Phanerophyte. (rare but l. a. = rare but locally abundant). Abbreviations for Growth forms: caesp = caespitose, scap = scapose, bulb = bulbous, rept = reptant, prost = prostrate, pulv = pulvinate, ros = rosulate, suff = suffruticose, par = parassite, rhiz = rhizomatous, scand = scandent, lian = lianas. Abbreviations for Presence: rare but l. a. = rare but locally abundant.

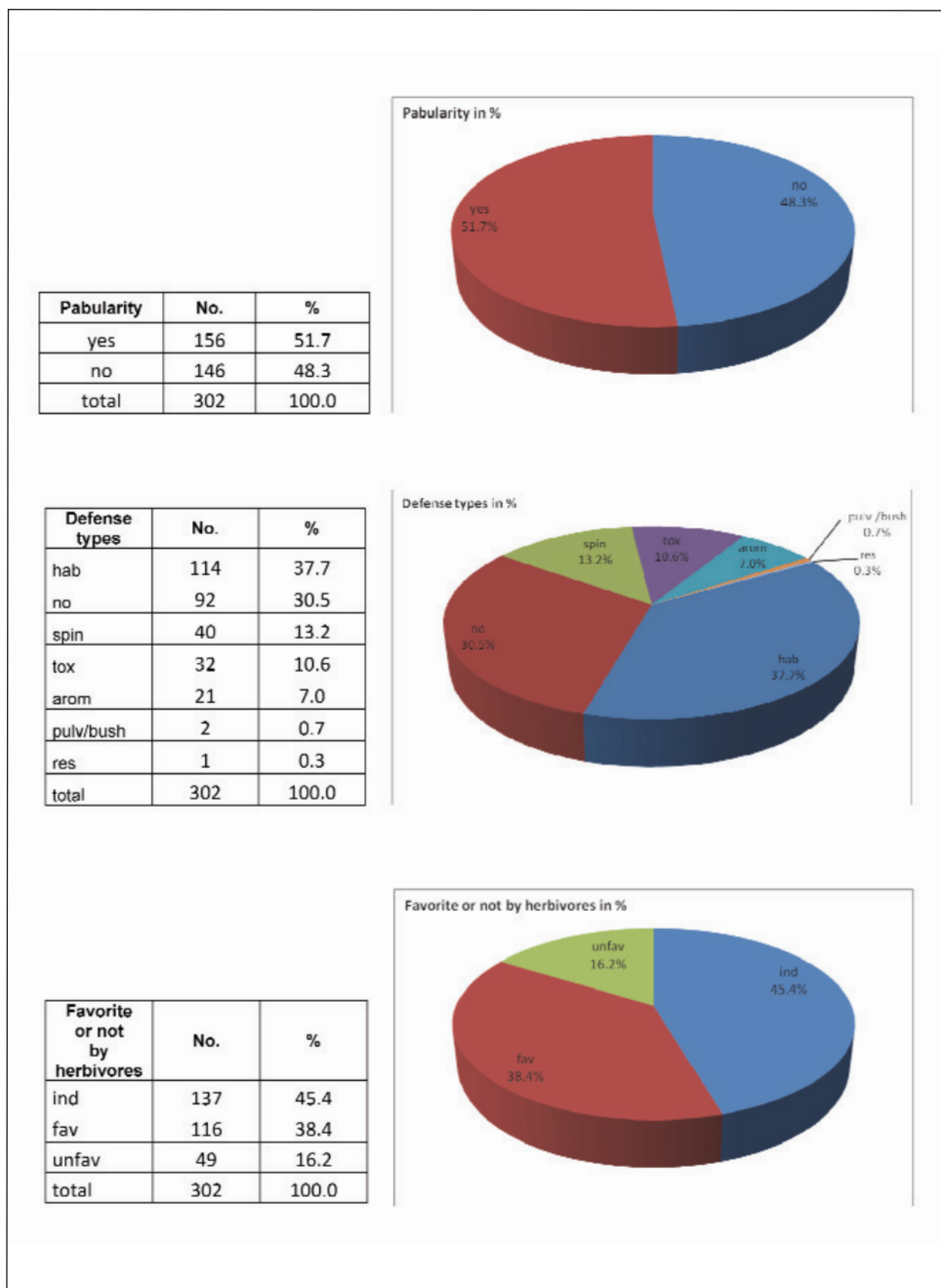


Fig. 2. Tables and relatives Pie charts expressed in % of the pabularity, defense-types and favorite by grazing. Abbreviations for Defense types: hab = habitus, spin = spinescent, tox = toxic, arom = aromatic, pulv/bush = pulvinate/bush, res = resinous. Abbreviations for Favorite or not by herbivores: ind = indifferent, fav = favorite, unfav = unfavorite.

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